

THE MUSIC BOX

a magazine of mechanical music

Volume 6



Number 1

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AUTOMATA

MUSICAL BOXES

CLOCKS



THE MUSIC BOX

a magazine of mechanical music

Journal of
The Musical Box Society of
Great Britain

Hon. Editor: Graham Webb

Volume 6 Number 1

Contents	page
The Editor Writes	1
Hupfeld in 1926	
<i>by Q. David Bowers & Claes O. Friberg</i>	3
International Dentistry Award for MBS	
Founder	13
Repairing Organette Discs	
<i>by Arthur W.J.G. Ord-Hume</i>	14
An Unusual Sewing Clamp	
<i>by Jo Webb</i>	18
Musical Measure	
<i>by Charles Dickens</i>	20
The Geometry of Comb & Cylinder	
<i>by Alfred Thompson</i>	26
MBSI Honours MBSOGB Founder	30
Pictorially Viewed	
<i>by Arthur W.J.G. Ord-Hume</i>	30
Love at First Sight	
<i>by Arthur Heap</i>	32
Tuning & The Musical Box	
<i>by Keith Harding</i>	34
Sheffield Society Meeting Report	38
Classified Advertisements	40
Tenth Anniversary & Society AGM	41
Question & Answer	
<i>by Keith Harding & Cliff Burnett</i>	46
Letters to The Editor	50
Postcards. Depicting Street Music	52
Crossword Puzzle	55
Book Reviews	56
List of Members	60

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The Editor writes:

WITH THIS, the first issue of Volume 6 of THE MUSIC BOX, we have a new cover design and layout from the studios of The Musical Press. We also have a new method of magazine production and if only I knew how it works, I would explain it to you. Suffice it to say that it promises to be cheaper, quicker, and even more important, to make things a little easier for the Editor. Not that I'm complaining, on the contrary I am happy for your next Editor for, as most will know by now, this is the last issue that I shall edit. Unless he can escape in time, and he would need to be somewhat of a Houdini to do that, the honour of being the Hon. Editor falls once more to Arthur W.J.G. Ord-Hume. If you have been reading your Journal from cover to cover (and many members assure me most sincerely that they do), you will have seen at the bottom of the last page that Arthur is now also the printer, which again will make things a little easier for him.

For myself I have mixed feelings. What many of you will not know is that apart from resigning from the Editorship, and also the Committee, on which I have served for many years, I have also closed my shop and I am in the process of moving up to Swaledale in Yorkshire to commence the life of a full time writer. This move, although taking me from London, will not divorce me entirely from the musical box world since I shall become immediately a provincial Member, able to get to the provincial meetings at last, and with a ready made excuse to

come to London twice a year to attend the meetings here. Before breaking away from the fascinating subject of me, may I please thank my many, many good friends who have helped me during my Editorship? Can I really say thank you? Can you, I wonder, accept what I really mean? In any case I do, and I hope you do!

In this issue we have more articles on basic research into musical boxes. A fresh entry into this field is Alfred Thompson, not only a physicist but a patents specialist to boot! Alfred has been doing some work on combs. Not to be outdone, Keith Harding has come up with a brand new theory on scales used for combs which, if not light reading for everyone, is guaranteed to electrify all who have a need to tune combs, indeed all who have an interest in musicology. These and many other fine articles, and lots of pictures, make up my final offering and to crown it all we have an article on mechanical music by Charles Dickens (now there's a scoop).

I have from time to time remarked on the upturn in membership applications for our Society. Lately we appear to have been growing rather faster than before. To help this trend along your Committee decided to contact all those Members of The Musical Box Society International who were not already Members of our Society. The extra work involved for the Hon. Secretary was tremendous, but the idea paid off handsomely since in this year so far we have a huge 107 new applications for membership. They are still coming in at the time of writing. As will be understood this increase in our numbers will greatly

aid our finances and make it possible to do things which have been considered necessary for some time but for which, up to now, we have been unable to spare the finance.

Having been travelling in Europe lately, and talking to such eminent figures in mechanical music as Oscar Grymonprez in Ghent, and Alain Vian in Paris, to name only two, it strikes me quite forcibly that mechanical musical instruments of all kinds are becoming very thin on the ground. Mr. Grymonprez in particular, always working hard on this and that in the larger pieces, is reduced to wondering if he should close his factory or not. Alain, a friend of many years, and proprietor of a shop approaching a wonderland for the likes of you and me, would find it hard to offer an instrument of any type which is ready for sale. A further piece of evidence of scarcity is that, when I asked the price of a small cheaply made automaton doll of the kind one would normally have hoped to buy for about £200 at the most, the owner of a shop on the Left Bank in Paris asked me 12,000.00 Francs, (about £1,050). Add to this my experiences during the last few months in England and all Members can be sure that they are not alone in not finding it very easy to continue their hobby nowadays.

The facts are poor comfort I know, but to be aware that it is a general trend will be of value, if only to make those of us who have a good collection value it even more. We must remember that as the flow of boxes dies to a trickle technology is advancing apace. With this in mind we will realise that no musical box of good quality should

be written off as beyond redemption and used for scrap. The scrap box of today may yet find its place as the centrepiece of the collection of tomorrow. Judging by the prices already asked for such boxes (and worse), it would seem that the word has leaked out to the world at large already, before it has had time to really sink in with us.

As a last word may I ask that you keep the articles and other pieces of interest coming? I cannot tell you how much I have enjoyed being Hon. Editor. What I can tell you is how much I shall enjoy reading my copy of future Journals knowing that I have had some part of it all.

GRAHAM WEBB

HUPFELD IN 1926

by Q. David Bowers and Claes O. Friberg

OF ALL the automatic musical instrument firms the world has ever known, Hupfeld was by far the largest. During the height of its business the firm operated six large factories, hired thousands of workers, and had a business which spanned all five continents.

Hupfeld's business was all-encompassing. The firm sold musical boxes, hand-cranked organs, and other small instruments of all kinds through various retail outlets maintained in larger cities. At one time the firm had an ownership interest in Symphonion, Germany's second largest (Polyphon was first) maker of disc-type musical boxes. The manufacturing activities of Hupfeld encompassed many different types of instruments, mainly of the larger pneumatic types. The omnipresent Phonola once captured 75% of the player piano market in Germany — an amazing figure far exceeding the market shares obtained by rival firms in Britain and in America. In fact, the name 'phonola' came to mean 'player piano' in Germany, just as 'pianola' (from the Aeolian trademark 'Pianola') did in English-speaking lands.

Further up the scale of price and size were many varieties of coin-operated pianos, mostly marketed under such names as Animatic, Clavist,

and Helios. Still larger were Helios orchestrions, some of which reached staggering proportions. Helios V measured nearly 15 feet high and 20 feet wide — and represented an orchestra of between 100 and 120 performers! The height of orchestration sophistication was found in the Pan, an instrument which was never referred to as an 'orchestration', lest this term sound 'mechanical', but which was always referred to as an 'orchestra' or a 'concert instrument'. The Pan was indeed remarkable, and from the standpoint of its complicated instrumentation and multiplexed tracker bar (which permitted 124 holes to accomplish the effects of an even much larger tracker bar) no other orchestration has even come close to it.

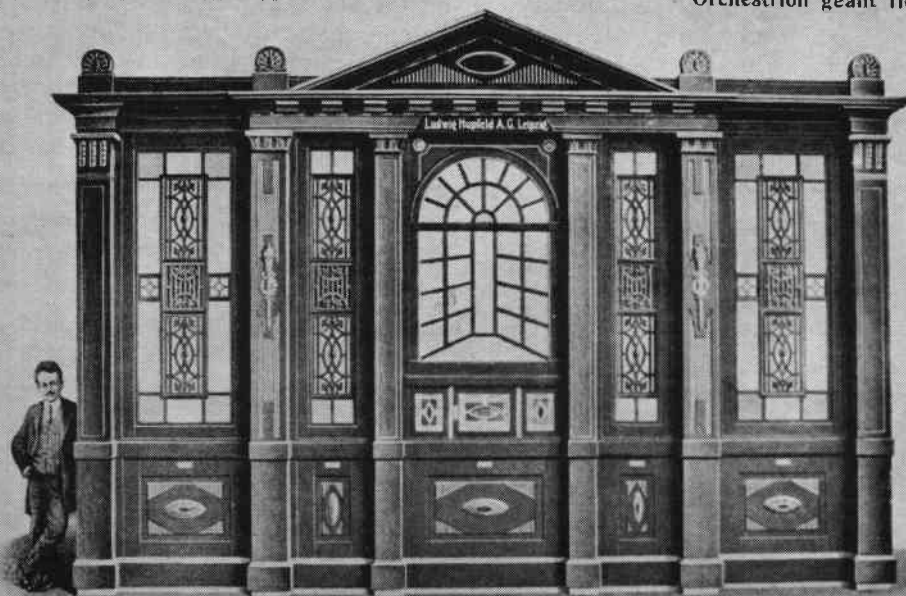
The 'golden age' of Hupfeld was in the 1910–1914 years. In 1911 the opening of Hupfeld's gigantic new factory (over a million square feet in area!) in Bohlitz-Ehrenberg, near Leipzig, dazzled the musical world. Here in one factory was everything from a restaurant to a concert hall, not to mention extensive manufacturing facilities. The multistoried tower of this factory was later incorporated into the Hupfeld trademark.

In Britain the venerable firm of Keith Prowse was the main Hupfeld outlet. The firm is still in business today in a different but somewhat related field — the booking of tours and selling of tickets for various amusements. Prowse issued many catalogs and prospectuses featuring Hupfeld instruments. Unlike the catalogs of other Hupfeld distributors elsewhere in the world, Prowse's literature carefully avoided mentioning that the instruments were manufactured by Hupfeld, or, for that matter, that they were made in Germany. Perhaps a

Hupfeld Riesen-Orchestrion Helios V.

Monster-Orchestrion Helios V.

Orchestrion géant Helios V.



Höhe: 4,50 m, Länge: 6 m, Tiefe: 2,50. — Height: 14'9", width: 19'9", depth: 8'2". — Hauteur: 4,50 m, largeur: 6 m, profondeur: 2,50 m. Modell geschützt.

The Helios V, mainly sold between 1909 and 1914, was the largest production-line orchestrion ever made by any firm. After World War I, the market for such costly and immense instruments had virtually disappeared and the Helios V was no longer carried in stock. Not one of these giant instruments survives today.

strong anti-German feeling in England made this practice good business sense. In any event the photographs were carefully retouched so as to expunge such familiar trademarks such as 'Hupfeld' 'Helios', and so on. Large numbers of Hupfeld instruments of all kinds were sold in the British Isles. Business was so brisk that Prowse set about manufacturing its own music rolls so that the latest in English tunes could be provided in lieu of the less popular (as might be expected!) latest popular German tunes. Our fine friend Eugene

DeRoy, who died a few years ago, used to tell many interesting stories of the days he worked for Keith Prowse. The firm had customers representing almost every type of commercial establishment, but according to Mr. DeRoy the most popular were ballrooms, skating rinks, and motion picture theatres. Apparently pubs were not major customers, at least not for the very large Hupfeld Instrument types. That pubs did indeed provide a good market for coin-operated instruments is not in doubt, however—as the many Polyphon, Symphonion, and

other disc-type musical boxes traceable to these locations can attest!

Perhaps the most famous Hupfeld instrument of all was and still is the remarkable Phonoliszt-Violina violin player. Made in several styles, this instrument combines a Phonoliszt expression piano with three automatically-played violins.

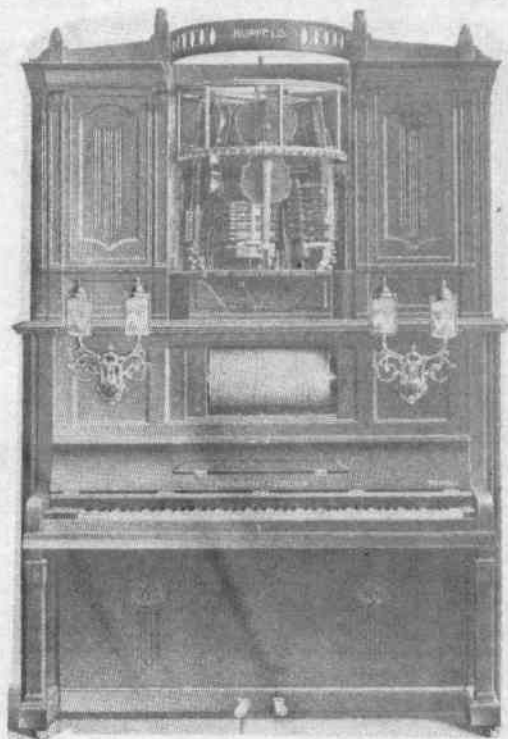
The violin-playing part of the instrument, known as the Violina, consists of three separate violins, each with one active playing string — giving the equivalent of violin strings D, A, and E. Pneumatically operated 'fingers' stop the strings on each violin at appropriate lengths so that the desired note can be sounded. The bowing is done by a circular mechanism containing over 1,500 individual horsehairs. This bowing mechanism operates at the different speeds of 7, 14 and 28 revolutions per minute — with a special accenting device which permits the bow speed to be suddenly increased to 32 rpm if necessary. Despite the relatively heavy weight of the cast aluminium bow wheel the instrument can change speeds from say, 7 rpm to 32 rpm almost faster than the eye can

follow it! To play, each violin is tilted forward so that the playing string comes into contact with the bow. The speed of this contact can be varied as can be the pressure to which the violin string is applied against the bow! Each of the three violins is equipped with a pneumatically-operated tremolo which can be varied infinitely in speed, for each rhythmic movement of the tremolo is controlled by an individual perforation in the music rolls. It is also important to note that each of the three violins can operate simultaneously with a different tremolo speed on each.

To accomplish all of this ingenious artistry within the confines of a small (73 holes wide) music roll, Hupfeld resorted to extensive multiplexing whereby holes have multiple functions when used in combination with each other. All of this clever musical and mechanical engineering would have had no effect had not the music rolls been expertly arranged, and to Hupfeld's everlasting credit the music rolls are indeed superbly done.

Hearing a properly restored and properly regulated Phonoliszt-Violina is an experience which no collector will want to miss. With the various mechanisms adjusted to operate on the correct pressures and at the correct speeds, the Phonoliszt-Violina is a simply fantastic instrument. We might mention here that the key to appreciating the instrument is to restore it properly — for a partially restored Phonoliszt-Violina or one which is just 'made to work' bears no more relationship to the instrument's true abilities than does the playing of a small child on an untuned violin bear to a concert performance of Jascha Heifetz!

Hupfeld was in the height of its glory in 1914, when its fortunes suddenly shifted with the advent of World War I. All of a sudden, exports to England, America, and certain other countries were either not possible or were not practical. The Hupfeld factory was converted in part to the production of war materials. When the war ended 5 years later the market was not the same. Germany was in a physical and financial chaos, and the markets for large orchestras in other parts of the world had diminished sharply. Several factors account for this. Hupfeld products, especially the larger ones, cost immense sums of money — thousands of pounds in some instances. During the early 1920's few commercial establishments had enough extra money to invest in one of these instruments. Competition was furnished by the phonograph, which was much less expensive than a coin-operated piano or orchestration. Contrary to some published thoughts on the subject, the phonograph did not cause the demise of the



Hupfeld Phonoliszt-Violina Model B.

electric piano in public places. It merely contributed to its downfall. Coin-operated phonographs appeared in public places as early as the 1890's and co-existed for several decades with electric pianos and orchestrions. What did precipitate the end of automatic musical instruments, however, was the radio. Played free, or sometimes with a coin-activated mechanism, the radio provided an instantaneous link with the entertainment world giving music and voices that were 'alive'. By the mid-1920's the automatic musical instrument business was in serious financial condition. Many firms in Germany and America (the two leading countries for the manufacture of coin-operated pianos and orchestrions) were in precarious financial condition or were out of business altogether. In Germany, Hupfeld was forced to merge in August, 1926 with Gebr. Zimmermann, a leading manufacturer of pianos. From what we have learned in recent years from Gunther Hupfeld (son of Ludwig Hupfeld; Gunther Hupfeld died in December, 1972) and Herbert Becke (son of one of the former directors of the Hupfeld-Zimmermann firm), Zimmermann was the dominant force after the merger. Research into the manufacture of new and interesting types of automatic musical instruments came to a virtual standstill, and the inventive genius of the firm, Gustav Karl Hennig, was fired. As a side observation it is interesting to relate here that Mr. Hennig promptly went to one of Hupfeld's major competitors, Philipps (in Frankfurt) and sought employment there – but this effort came to no practical end for Philipps also was in serious financial condition and was not about to expend sums in instrument research.

It was thus with interest that we obtained recently a Hupfeld price list dated April 1, 1926. This particular listing must have been one of the latest before the Hupfeld-Zimmermann merger. This listing gives a heretofore unknown (at least to present day collectors) view of what Hupfeld was making during the final days of its independence.

Coin pianos

The basic Hupfeld electric piano of 1926 was the Animatic-Clavist, which was available in various models in walnut, oak, and mahogany. Generally, these took the form of upright keyboard-style pianos. In its cheapest the Animatic-Clavist consisted of a piano which played the loud and soft expression – much like the contemporary 'nickelodeon' pianos of America. Prices ranged from 3,300 marks for a small model in walnut (measuring 132 centimeters high) to the largest style (measuring 194 centimeters high) in mahogany,

which sold for 5,100 marks. Hupfeld offered the Animatic-Clavist buyer several options. A mandolin attachment cost 150 marks extra in each instance. For 450 marks extra one could buy an additional mandolin and xylophone. For 900 to 1,100 marks extra (depending on the model) one could order 'full jazzband effects' consisting of piano, mandolin, xylophone, and various percussion effects. All Animatic-Clavist pianos used special rolls marked 'Animatic-S'. (Later, Hupfeld-Zimmermann was to manufacture a very elaborate model of the Animatic-Clavist called the 'Sinfonie-Jazz' which used a special Animatic-SJ roll, but information concerning this was not included in the earlier 1926 price list under discussion here.)

Next up the scale of sophistication, at least so far as the piano expression mechanisms, were the Animatic-Phonoliszt pianos offered in April, 1926. The expression system of these instruments was the so-called Hupfeld Triphonola or fully reproducing system. It is important to know that 'Animatic-Phonoliszt' means in 1926 'Triphonola', and that in earlier years a different style of instrument called the Phonoliszt was manufactured. The Phonoliszt piano was an expression piano and was not fully reproducing. This terminology is a bit confusing.

Animatic-Phonoliszt pianos were made in various keyboard styles in oak, walnut, and mahogany. Instruments incorporating a Grunert piano (Hupfeld's medium-priced line) sold for 4,500 to 5,000 marks depending upon the size and wood. A special buffet-style (without keyboard) instrument was available for just 4,100 marks. Apparently few of the latter were sold, for we know of none today in any instrument collection. The most expensive Animatic-Phonoliszt of the time was a mahogany style incorporating a Ronisch (the 'quality' piano in the Hupfeld line) which sold for 5,600 marks. Offered separately were two styles of Animatic-Phonoliszt instruments in grand piano (with the strings in a horizontal plane) form. An instrument incorporating a 'Hupfeld' grand piano measuring 180 centimeters long cost 7,700 marks. An instrument with a 'Ronisch' case measuring 200 centimeters long cost 8,800 marks. These grand pianos could be activated by dropping a coin in a nearby wallbox. It is interesting to note that Hupfeld sold electric grand pianos specifically for commercial establishments (in addition to their customary use in the home).

Animatic-Phonoliszt pianos of all types used special 'Animatic-T' rolls. These rolls, also called 'Triphonola' rolls, featured the recorded perform-

ances of over 200 famous pianists – a repertoire which Hupfeld called the 'finest in the world'.

The Phonoliszt-Violina

Next on the 1926 price list was the Phonoliszt-Violin-Pipe Piano. This instrument was housed in a tall oak cabinet measuring 240 centimeters high. The selling price was 7,000 marks. Designed for providing imitation violin music through the medium of pipes, this instrument contained a piano in combination with violin-tuned pipes which were arranged behind special expression shutters. The instrument used a standard Phonoliszt-Violina 73-note roll, or it could use a regular 73-note Phonoliszt roll (which played piano only).

Next in order on the 1926 price list came the famed Phonoliszt-Violina violin player. Offered was the Model B with its uniquely-designed cabinet featuring a curved front containing the Violina mechanism. This was advertised as having 'automatic tuning' a reference to the tuning weight system which took the place of the earlier method of using regular tuning pegs to keep the instrument in proper regulation. We might mention that while this 'automatic tuning' was considered to be an improvement at the time, collectors today often bypass the tuning weight system and prefer to use the pegs instead. This is because the small amount of friction in the lever pivot of the tuning weights often results in the instrument being slightly out of regulation – something which does not happen if the regular tuning pegs are used.

The Model A Phonoliszt-Violina, known to us today only in oak finish, does not appear in the 1926 price list. It would be interesting to know when the Model A was discontinued. Apparently Model A Phonoliszt-Violinas were still being made circa 1920.

The Phonoliszt-Violina used 73-note Phonoliszt-Violina rolls and 73-note Phonoliszt rolls interchangeably. In the roll case of each instrument a special lever was provided whereby the tracker bar (which contained two rows of holes – one row for each type of roll) could be shifted to play the desired roll type. The selling price of 13,000 marks represented a lot of money in 1926. It is interesting to note that the Phonoliszt-Violina sold for about three times the price of the average Animatic-Clavist piano and for more money than many of the large Helios (see following description) orchestrions.

Despite their high cost, over 10,000 Phonoliszt-Violinas were sold from about 1908 until the early 1930's. This compares to somewhat less than 5,000 examples sold of the Violano-Virtuoso, a violin playing machine manufactured in the United

States by the Mills Novelty Company of Chicago. An interesting paradox arises concerning the Phonoliszt-Violina as compared to the Violano-Virtuoso. The Violano-Virtuoso is perhaps the most plentiful of all large coin-operated automatic musical instruments made. According to our own estimate and that of Donald Barr (who has specialized in the study of these Mills instruments), there are approximately 500 known examples of the Violano-Virtuoso, a figure which amounts to roughly 10% of the original quantity manufactured. Using the same percentage one would expect to find perhaps 1,000 Phonoliszt-Violina instruments still in existence. However this is not the case – as any collector who has sought a Phonoliszt-Violina has learned! We have surveyed collections known to us and can account for the following approximate quantities of Phonoliszt-Violinas surviving today in collections: Model A, from 8 to 10 instruments surviving today; Model B (the most popular model), approximately 30 known today; Model C (a style made in the late 1920's; with a 'modern' case design), only 1 specimen known to exist. This gives a total population of about 40 examples still in existence – a figure which amounts to less than ½ of 1% of the original production!

'Why is there such a tremendous difference in the numbers known today?' would be your next logical question. The answer is that the Mills Violano-Virtuoso is electromagnetic (not pneumatic) and is much less sensitive than if it had a pneumatic system. The Mills Violano-Virtuoso will continue to play, and play, and play – and play some more, even though it might not be regulated or touched for many years. The basic electrical connections are simple, and although a neglected instrument might be painful to listen to, it still will make some semblance of violin and piano 'noise'. As such, many Violano-Virtuoso instruments were saved. In contrast is the Phonoliszt-Violina. The systems are very sophisticated and require fine degree of regulation (much as a reproducing piano would require, although even more so) to make them play properly. Neglected, the pneumatic system of the Phonoliszt-Violina is apt to stop playing altogether – for even a medium size leak anywhere in the pneumatic system will effectively silence it. Once regular servicing of Phonoliszt-Violinas was not available to commercial locations, such instruments stopped playing. Their musical and commercial values was quickly lost – and the instruments were discarded. It is for precisely the same reasons that large pneumatic orchestrions by Hupfeld (and other manufacturers as well) are so rare today, despite the fact that



This photograph was taken by the Author in 1965 and it shows a huge Hupfeld Pan Orchestra built in 1926 and sold through Hupfeld's agent in Holland, Duwaer & Naessens. This Pan, which is equipped with the ten-roll magazine device, is now in the collection of Mr. J.B. Nethercutt of Los Angeles, California.

they were originally manufactured by the thousands.

In doing research for the *Encyclopedia of Automatic Musical Instruments*, one of our most interesting discoveries of a major instrument type previously unknown to collectors was the Hupfeld Violina-Orchestra, a large orchestrion containing piano, harmonium (reed organ), flute pipes, clarinet pipes, and drum and trap effects, all in combination with the Violina mechanism with three violins. As is often the case with research, one clue lead to another – and within a year or two of the initial discovery we not only located several different pieces of literature on the Violina-Orchestra, but we located remnants of an original instrument as well!

According to Herbert Becke and Gunther Hupfeld, an estimated 20 examples of this instrument were made. The 1926 price list offers Model I in a tall keyboardless oak case measuring 300 centimeters high and priced at 21,000 marks. Slightly more expensive at 23,000 marks is Model II in walnut and with a keyboard. At first glance the Model II resembles an ordinary Phonoliszt-Violina with two side chests attached. However there are some other differences: a regular Phonoliszt-Violina measures 245 centimeters high (although actual specimens known to us today show slight variations both plus and minus from these measurements) whereas the Violina-Orchestra Model II stands 260 centimeters high. The difference is made up in the piano part above the keyboard – which is larger in the Model II in order to accommodate the large and complex piano stack.

The Violina-Orchestra is unusual among automatic musical instruments in that it could play four distinctly different styles of music rolls! To play all of the orchestral effects and the violin, special rolls called Violina-Orchestra rolls were necessary. These rolls and all other rolls used on the instrument are spaced on the standard 9-holes-to-the-inch scale, the same as used on most American and British instruments. The Violina-Orchestra could also use Phonoliszt-Violina rolls (but of special 9-to-the-inch spacing rather than the normal wider spacing of 73-note Phonoliszt-Violina rolls) which played the piano (with expression) and violins only. A third type of roll that could be used was the Hupfeld Animatic-T (Triphonola) which played the piano with reproducing effects. The fourth and last style was the commonest of all music rolls: regular 88-note home player piano rolls. Why someone would want to invest 23,000 marks in a elaborately orchestrated Violina-Orchestra and then play piano rolls on it is anyone's guess – but the



Helios II/25 providing music in a dance hall.

fact remains that Hupfeld advertised that this interchangeability of four different roll styles was a great feature!

Orchestrions

In 1926 one keyboard style Helios orchestrion was offered at 6,000 marks. Usually sold in a walnut case, the instrument contained piano, mandolin, pipes, ten orchestra bells, and percussion effects.

Helios orchestrions of the larger or classic styles without keyboards were offered in several styles. Before seeing this 1926 price list we had assumed that the manufacture of Helios orchestrions was sharply diminished by this time, if not practically discontinued. We knew that it was not completely discontinued for in certain trade paper advertisements of this era the beautiful Model II/25 was featured prominently. However, most known instruments in collections today date from the 'golden era' from 1910 through 1914. The numbers of Helios orchestrions produced in 1926 must have been very small. By 1930 mention of them had been dropped altogether from Hupfeld advertisements.

In 1926 the following Helios styles were available, all in oak wood. The basic Class I Helios was obtainable in the following models: 1/22 at 7,500 marks; 1/34 at 8,100 marks; 1/30 at 7,900 marks; 1b/37 at 9,300 marks; 1c/31 (this was one of the most popular of all Helios models) at 10,200 marks.

A step further up the scale of musical orchestration were the Class II Helios instruments. The beautiful II/25 was available for 14,000 marks. For

Hupfeld Orchestrions

Mandolina **HELIOS** Helios-Pepita

werden von Künstlern, Fachleuten und Käufern einstimmig als **erstklassig** bezeichnet. Tüchtig lauten. Anerkennungs schreiben eingefordert bei uns ein.

Jedes verkaufte Hupfeld-Orchesterion wirkt unseren Fabrikaten neue Anhalger.

☞ 47 erste Preise ☞

Bestverfügbares Arrangement der Noten.

Großes Notensortiment.

Konkurrenzlose Notenspreise.

Wochenfabrikation:

ca. 90 000 Meter Noten.

♦♦♦♦



☞ 700 Arbeiter ☞

Grossartige Lichteffecte.

Künstlerische Gehäuse.

Tadellose Funktion.

Einfache Bedienung.

Selbsttätige Rückrollung der Noten.

♦♦♦♦

Ludwig Hupfeld Akt.-Ges., Leipzig,

Europas erste und älteste Fabrik von Klavierspielinstrumenten.

This 1908 German advertisement by Hupfeld shows Helios Style 1/22 – one of the earliest Helios models and also one of the latest (in the accompanying article you will not that this style was still being sold in 1926, nearly two decades later). The advertisement notes that the firm was the winner of 47 first prizes at various fairs and expositions, and at that time employed 700 workers in the factory.

the economy-minded buyer Hupfeld thoughtfully provided a cheaper model which lacked the beautiful ceramic figure, the crowned side mirrors, and the beautiful semi-circular ring of backlighted 'opals' on the front. Fortunately few buyers were attracted to this 'economy model' at just 13,100 marks – for each of the Model II/25 orchestrions known to us today are of the fully ornamented type.

Model II/26 was available for 15,000 marks. An economy model (with a plain front lacking animated effects, mirrors, and so on) could be had for 1,100 marks less. Apparently few of these cheaper styles were sold, for we have never seen one pictured and know of none in a private collection. Last on the list of Model II Helios orchestrions offered in 1926 was the beautiful Model II/33 which cost the buyer 17,200 marks.

Class III was the largest class offered to Hupfeld buyers in 1926 (in earlier years Classes IV and V were offered). At the risk of being overly technical in this article we insert here the specifications of the Helios Class III. The instruments were available in 'regular' (with loud voicing) and 'concert' specifications, the latter being for quiet use such as in a concert hall or in a home.

Regular specifications consisted of a cross-strung piano with separate expression controls for base and treble sections; mandolin effects; pipe registers for violina, aeoline, flute, piccolo, clarinet, oboe, horn, bassoon, violi, cello, double bass, and bass violin; orchestra bells; percussion consisting of bass drum, Chinese symbol, and tenor drum –



Helios orchestrion providing music in a roller skating rink. Instruments made for this type of use were voiced more loudly than those made for home or concert use.

each with expression. A xylophone was available at extra cost. This style 'provides finely modulated music of powerful fullness of tone corresponding to a full orchestra. Suited for recitals even in the largest halls.'

The 'concert specifications' for Class III differ slightly in the pipe registers: piano as preceding; mandolin effects; pipe registers consisting of violin, horn, flute, piccolo, clarinet, trumpets, cello, bass horn, principal, double bass, bass viol, and trombone; orchestra bells. Percussion as preceding. A xylophone was available at extra cost. 'Tonal character corresponds to a wind orchestra. Especially suited for dance and concert music in halls.'

Model III/42 was available at 19,000 marks. The stunningly beautiful Model III/39 (in the same case earlier sold as Helios IV) fetched 20,000 marks.

A special remote control mechanism to stop and start the orchestration (for use in dance halls so the the instrument could be stopped periodically in order to collect money) and control the rolls could be obtained on any Helios for 500 marks extra. A xylophone could be obtained on any Helios for 600 marks extra.

Topping the 1926 list of Hupfeld orchestrions were several models of the Pan. As noted earlier, these were never specifically referred to as 'orchestrions', but were always called 'orchestras'. The rationale of all of this was described by Hupfeld: 'The music of the Pan Orchestras lets you discover that these are neither organs nor orchestrions. Rather, they form a special class which can only be compared with a live orchestra'.

'The musical parts of the Pan are entirely independent from each other. At any time a given voice or rank of pipes or particular instrument can be brought out tonally above the others. The Pan comprises all degrees of tonal power from the hushed piano (very soft) to the thundering fortissimo. The drum and trapboard is recorded from a man's hand and imitates it exactly as it ranges from tender gracefulness to strong and tense rhythm'.

'The connoisseur of music has at his call the wonderful strains from Tristan, Parsifal, an entire symphony, a violin concert with the accompaniment of an orchestra, or, yes, even a duet. Solo performances on the cello, flute, xylophone, organ, and other instruments are possible as are trios and chorales. . .'

The Hupfeld description of the Pan goes on to note that all 'models include a reproducing piano. This is available exclusively in the Pan instrument and makes possible the reproduction of actual per-

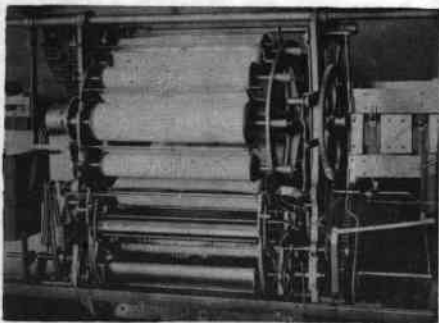
formances from over 200 of the foremost pianists of the world. The music produced is in keeping with the elegant exteriors of the Pan Concert Orchestras which, in all styles and models, can suit the best rooms. Because of its outstanding musical performances the Pan is very popular. Pan Orchestras are found in castles, manor houses, villas, spas, restaurants, theatres, drawing rooms, and on finely appointed boats. All over the world the Pan has come to be appreciated and valued as a work of art. . .'

In 1926 Pan Orchestras were available in the following models: I (13,500 marks); II (18,000 marks); and Model III (20,000 marks). Model IV was also offered, but Hupfeld was reticent about disclosing the apparently astronomical price of this instrument and noted that this could be learned 'on request'.

Hupfeld Helios and Hupfeld Pan orchestrions each used a distinctive type of roll. Hupfeld roll catalogs of the time divided rolls of all types into three groups numbered I, II and III depending upon the length. A short popular tune such as 'Happy Days Are Here Again' would fall into group I and in the Pan series for example would cost 9 marks for the roll. A long overture would fall into group III and would cost 18 marks. A medium length selection for the Pan would fall into group II and would cost 13½ marks. Rolls of all types made up with a wooden rod across the end (to fit on the Hupfeld automatic roll changer) cost 50 pfennigs (½ of a mark) extra.

Other Features

Many options were available to the Hupfeld buyer in 1926. Not all options were available on all types of instruments, but generally one could acquire a piano with a single roll mechanism (standard as used on most common electric pianos, etc. — the style which used a single type of roll), a double-roll mechanism (featuring two single-roll mechanisms side-by-side), and an automatic revolver or roll-changer system using either six rolls or ten rolls. The six-roll 'magazine' (as it was called) was available for the Animatic-Clavittist, the Animatic-Phonoliszt, the Phonoliszt-Violin-Pipe Piano, and the Phonoliszt-Violina Model B. The ten-roll magazine was available for all styles of Pan Orchestras as well as the Violina-Orchestra Model I. Each of these mechanisms was priced at extra cost. The double-roll (two rolls side-by-side) mechanism cost 1,000 marks extra. The six-roll magazine cost 800 marks extra. (Note: The reason that the double-roll mechanism cost more than the six-roll unit is that a special switching device was necessary to make it possible to pneumatically switch back



The 10-roll magazine system which could be remotely controlled.

and forth from one tracker bar to another – something that was not necessary with the magazine). The ten-roll magazine cost 1,500 marks extra.

A special section of the 1926 catalog offered instruments made for theatres. An Animatic-Clavist for theatre use was designated as Model 6 and was priced at 4,600 marks. An Animatic-Phonoliszt Model 2 for theatre use cost 5,500 marks. It is assumed that these were of especially heavy construction to stand up under the tremendous use received in theatre locations.

The Phonoliszt-Violin-Pipe piano made in two sections with the piano in one section and the violin pipes in another was available for 8,000 marks. The Phonoliszt-Violina (with three real violins) was available in two sections in special cabinets for 14,000 marks. Rounding out the offering of theatre instruments were photoplayers known as Kino Pans in styles Ia, IIa, and IIIa priced at 20,000, 24,000 and 27,000 marks respectively. For an extra 3,000 marks one could obtain a cable to operate these remotely from a projection booth. This cable permitted the rolls to be switched instantaneously from one side of the instrument to the other (these models came with either double tracker bars or in the most magnificent instance, with two ten-roll magazines side-by-side!) or to change the playing tempo of the music rolls.

In April 1926 few people imagined that in just six short years Hupfeld's manufacturing of automatic instruments would cease altogether. By early 1932 the last automatic musical instrument had been produced by the firm, and efforts were turned toward the rather ignominious (from the viewpoint of collectors today) task of producing billiard tables, household furniture, and other items. Soon came World War II, and what remained of the automatic music roll business (an

inventory of rolls and some equipment) was junked and efforts concentrated on production of war items. In 1945 Russian troops occupied Leipzig. On one particular day Gunther Hupfeld, at home in the palatial family mansion, was given two hours to gather whatever possessions he could take by hand and to leave his home. This he did, and he never returned. For the next 20 or so years he was employed as a laborer for menial wages in the now state-owned factory which earlier laid the foundation for the Hupfeld family fortune. The glorious past of Hupfeld became but a memory. In 1970 Claes Friberg first visited Gunther Hupfeld in Leipzig. Inspired by Claes' interest in the 'good old days' and upon learning of the *Encyclopedia of Automatic Musical Instruments* project, Gunther Hupfeld gave to Claes what he had in the way of original catalogs, sales literature, and technical data – in the hope that people of the present and future generations would find the information to be of interest and use. Gunther Hupfeld died in December, 1972. In a real way this present article is his, not ours.

Note: Q. David Bowers and Claes O. Friberg are preparing a comprehensive history of the Hupfeld firm and its various products. MBSGB members with catalog material, technical specifications, or other information which might be of interest are urged to contact them. Appropriate credit will be given for any material used.



Helios II/26.



INTERNATIONAL DENTISTRY AWARD FOR M.B.S. FOUNDER

*Dr. Cyril de Vere Green
and US Ambassador Annenberg*

AT a special ceremony held in the Chancery of the American Embassy, Grosvenor Square, London on May 11th, the American Ambassador, Walter H. Annenberg, presented Dr. Cyril de Vere Green with the Elmer S. Best Memorial Award.

The award, in the form of a commemorative plaque, is presented annually by the Pierre Fauchard Academy which strives to serve the interests of dentistry through literature, education and research. It bears the name of one of the Academy founders and is only presented outside the United States to those who, by unanimous verdict of the trustees, have done most to create international understanding in the betterment of the health and welfare of mankind. This is only the second time the award has been presented to an Englishman.

In his opening address before a packed hall representing delegates and friends from many parts of the world, Dr. Howard Hartman, Awards Committee chairman for the Fauchard Academy, stated that Dr. de Vere Green, Dean of the School of Dentistry, University College Hospital of London, had made contributions to dental education in England, on the Continent and also in the United States and Canada which were of marked significance.

Ambassador Walter Annenberg spoke of the distinguished men and women in every walk of life and every field of professional endeavour who have helped to build the bond of understanding

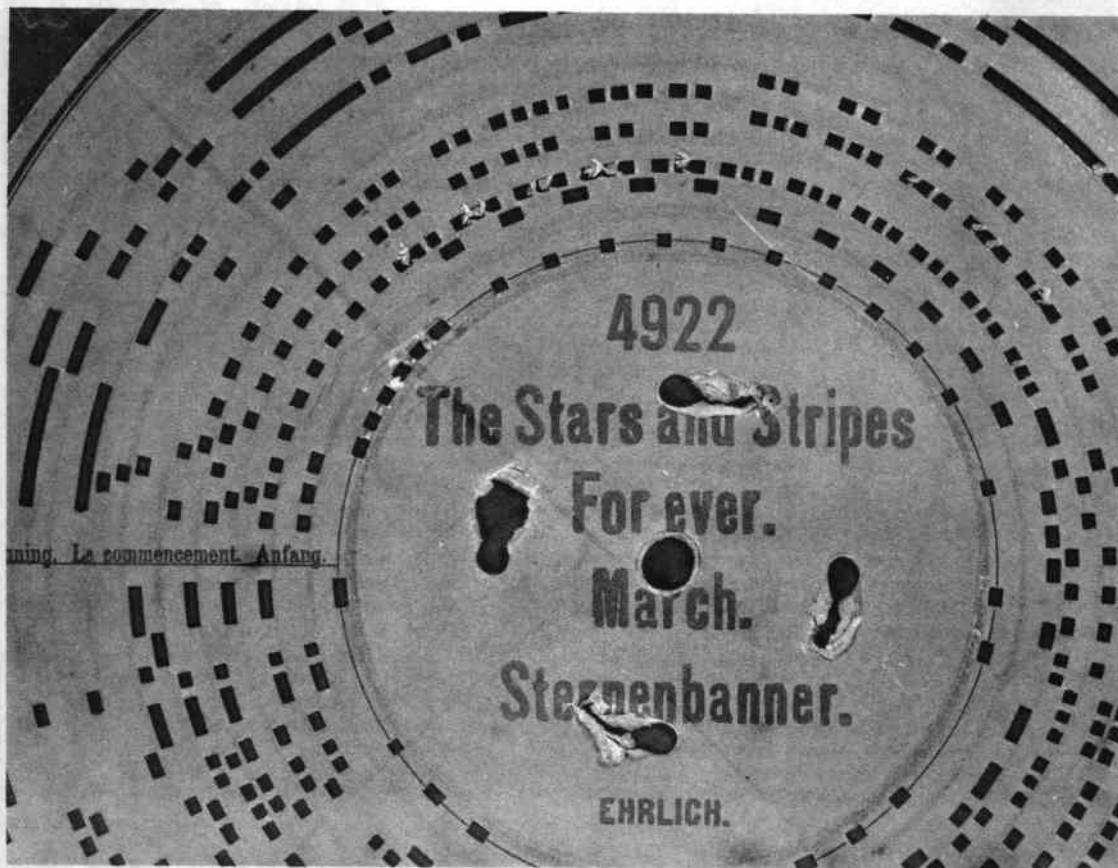
between England and America. 'Dr. de Vere Green's contribution', he stated, 'has been made in the art and sciences of dentistry. Through his sustained efforts and high professional achievement, he has created new dimensions and new horizons for dental education. In doing so, he has expanded man's reservoir of knowledge in the specialised field and stretched for the good of all the general capabilities of dental science'.

In handing over the award, he continued: 'I deem it a great privilege to be the spokesman for the officers and trustees of the Pierre Fauchard Academy, and through them for the men and women of America, in paying tribute to you for your noble work. We are indebted to you for advancing in unique ways the frontiers of dental science.'

Responding to the award, Dr. de Vere Green expressed his appreciation and, in a witty address, made mention of the fact that some of the teeth he was occasionally called upon to work on were made of steel since he was also involved with musical boxes.

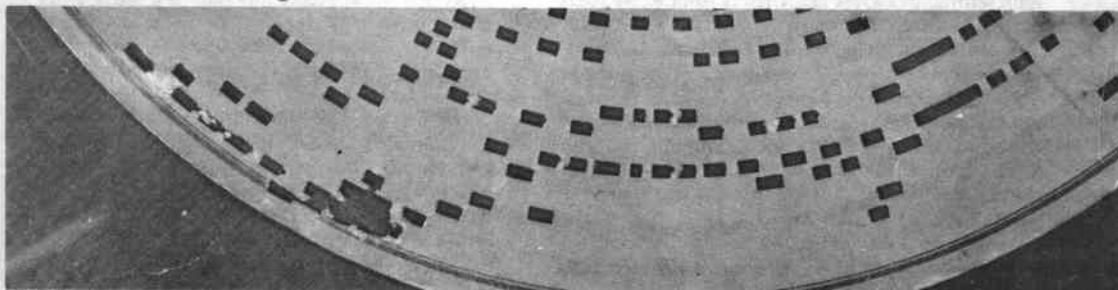
It was on December 1st 1962 that Cyril de Vere Green became founder and first secretary of the Musical Box Society of Great Britain, an office which he held until the summer of 1969. At the Summer Meeting of the Society in 1971, he returned to the Society executive in the office of President which he currently holds.

Arthur W. J. G. Ord-Hume



REPAIRING ORGANETTE DISCS

by Arthur W.J.G. Ord-Hume



CARDBOARD tune discs of the type used on the familiar Ehrlich Ariston organette and the less-common Orpheus piano, are very prone to damage and most collectors have come across examples which have the note perforations torn, so producing discords.

Deterioration of this type is due, fundamentally, to maladjustment of some part of the mechanism. If moth happens to chew the felt strip which is secured under the comb plate for the keys, one or more of the keys will rise higher than the others. A high key therefore protrudes through the cardboard more than the optimum amount and, at the end of the note slot, it requires considerably more pressure to push down again.

For this reason, before making any attempt to repair discs, the mechanism of the instrument needs to be overhauled carefully. It is a mistaken belief that the organette reed will (a) speak more promptly or (b) sound louder if the key rises a great amount. All the key is required to do is to open and close a pallet so as to allow a current of air to flow through a passage which is partly impeded by the reed. The extreme fluidity of air means that the amount of pallet opening need only be very small. All lost motion in the linkages should be removed and the keys so arranged that the difference between 'reeds silent' and 'reeds speaking' is no more than is absolutely necessary at the top of the key. This distance, found by experiment, is usually no less than $1/16''$ and no greater than $1/8''$. At all events, every key should require an equal amount of movement and should, therefore, possess no more movement than necessary. Furthermore, in the 'silent' position, all the key tips must be in lateral alignment, i.e. in the plane of the disc. With the keys in this position, performance will be at its best, smoothest and promptest.

Now for the discs. The increased drag caused by high key points will often have a dual effect on the disc. One or more high keys will simply tear the music slots into continuous trails. However, the increase in resistance to the rotation of the disc also results in wear at the centre of the disc drive holes. Gradually the four drive holes will become oval. The more high key points there are, the greater (and quicker) will be the degree of wear at the drive holes. Ultimately, the disc will resist all attempts to turn it and the drive pegs will just plough four arc-shaped tears through the central part of the disc. In some cases, the centre hole itself will distort into an oval, so throwing the

whole disc off-centre and making it virtually impossible to play more than half the disc before the note perforations shift eccentrically away from the key points.

One point must be made at once. The methods of repairing these discs are my own and, having tried several different operations, the processes I shall describe are believed by me to be the best for enabling the disc to continue to be played and produce music as originally intended. A disc can be restored to original appearance, but such a repair will not suffice to allow the disc to be played. Practical repairs will destroy forever the appearance of the disc. If you will accept that a disc which will not play is of nothing but sentimental value, then the work which I shall describe is acceptable. If you require perfection in appearance, then these repairs should not be attempted.

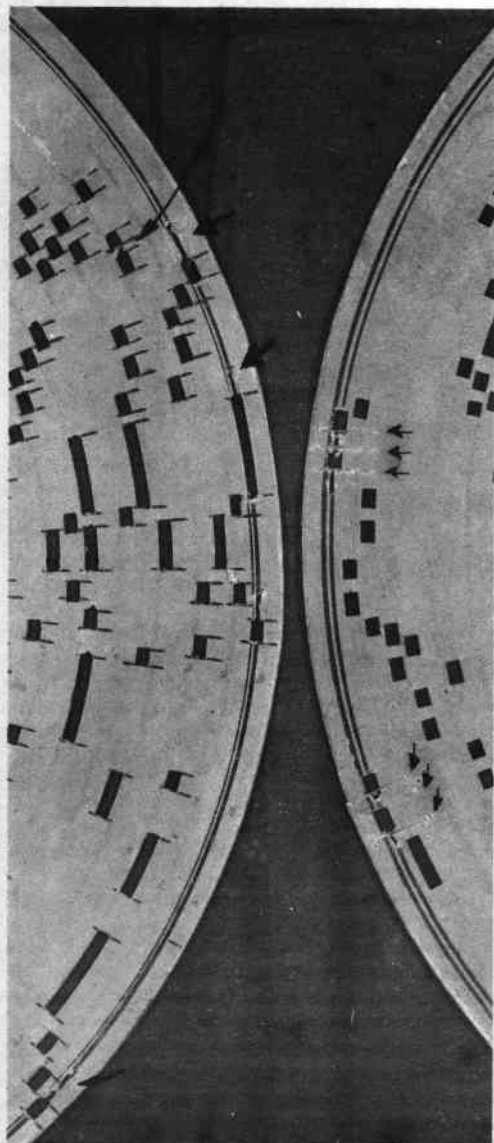
The discs

The substance of the original discs appears to be a shellac-impregnated, highly-compacted fibrous board manufactured without apparent grain. Perforation comprises piercing with a variety of different lengths of concentric slot. There is evidence to suggest that, unlike book music as we know it today, these slots were all pierced with a single-sized punch of width equal to the shortest note, long notes being cut by nibbling. On some early discs, the beginning and ending of each note is indicated by radial marks.

The width of the slots is approximately $1/8''$. The land remaining between concentric punchings is only in the order of $1/32''$ and the land remaining between successive soundings of the same note is about $1/16''$. The thickness of the disc is rather less than $1/32''$.

It is therefore apparent that the manufacturers had both a blind faith in the estimated durability of this cardboard and also in the ability of their instruments to resist any derangement.

Before attempting repairs, consider carefully the methods of operation of the disc on the instrument. The radial pressure arm, which serves to hold the disc firmly against the keyframe and also allows the key points to rise through the disc into serrations on its underside, effectively prevents any restoration attempt which will greatly increase the temporary thickness of the disc (mind you, this pressure bar could be adjusted to allow for a disc consistently twice as thick as normal, but it cannot cope with sudden variations in thickness). Similarly, the plane of the turntable and the key points cannot greatly be influenced, otherwise the disc will be called upon to bend



The disc on the left shows typical minor damage. Note how the narrow divisions between some of the adjacent short notes are torn (top arrow). A high key has been responsible for tearing at least three of the outer notes (lower arrows). On the right damage of this type has been corrected using staples and Araldite.

into a top-hat shape in order to play, so increasing the friction and putting us back where we started.

Occasional torn slots

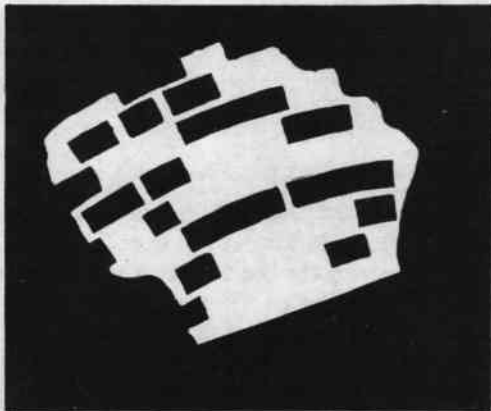
If the disc displays occasional damaged slots, say, on just one note where narrow lands between repeated notes have torn, then it may be possible to create a fresh land by the use of one or more office staples. This is only possible where there are not adjacent notes to the torn ones. The method is to use either an industrial stapler or a 'fold back' type of stapler so that you can support the disc on a piece of softwood and staple down through the disc into the wood. Carefully ease the disc with its staples free of the wood, turn it upside down and snip off the protruding staple legs so that between $1/8''$ and $3/32''$ remains. Now rest the disc, still upside down, on a flat steel block and, with a light tack hammer, hammer over the staple legs and tap the staple quite flat with the disc. You must force the staple into the card so that it is quite flush on both sides. Finally, take just a smear of synthetic resin adhesive such as Araldite and paint it over the sides of the staple on both sides of the disc. This supports the staple in the card (which, because of the hammering, is nearly severed by the staple) and prevents its being dragged out.

Badly-torn slots

Where the disc is in such a state that large numbers of slots are torn through, the method described above may not be possible to use. The answer is to spend a great deal of time and effort on repairs and you must decide if this is worth the effort.

Visit the local engineers' supplies or tool store and buy a pack of steel shimstock. You will only be using one size (3 thousands of an inch thick) but no mechanical musical instrument repairer's materials drawer can be considered complete without some shimstock on hand, so fear not that most of the packet will go unused. Select those parts of the disc which demonstrate the worst damage and cut large patches from the .003" steel shim which will completely cover the damaged areas. Pickle each piece in dilute sulphuric acid for about twenty minutes and then wash them clean in water and detergent. Allow them to dry. The pickling not only removes the grease with which the shimstock is packed, but it imparts a satin surface which will take glue.

Now carefully lay any stray, loose pieces of the disc more or less into the right position. Have on hand two good thick pieces of smooth steel (toolsteel offcuts are ideal) large enough to



cover the shimstock patch. Also have on hand two pieces of polythene sheeting of the same size. Mix up some Araldite and coat the underside of the patch. Place this in position on the top surface of the disc, cover it with a piece of plastic on the other side, and clamp the patch very tightly between the two pieces of flat steel. The clamp or clamps must be very tight to squeeze out all excess adhesive and to keep the patch as flat as possible.

After the glue has dried hard, unclamp the disc and, using a jeweller's saw and piercing files, cut through the note perforations. The remains of the original disc perforations act as a guide. Finally, smooth off all rough edges with emery and, if possible, feather the edges of the patch using a dental burr.

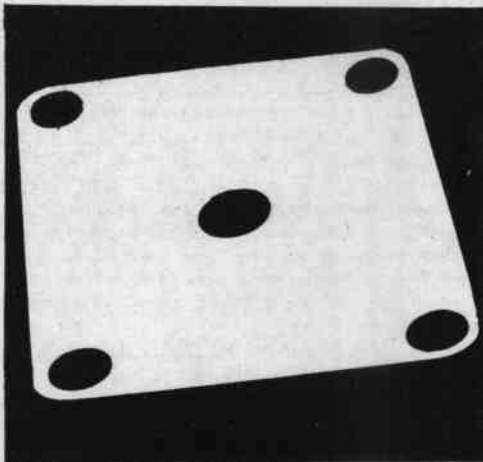
Because this patch is on the top side of the disc, it must naturally serve to lengthen very slightly the speaking length of each note. This lengthening is marginal but if it worries you, dress down the rear edge of each slot end using a hammer and a pin punch.

Drive holes and centre bearing

The strongest repair here, and by far the best solution, is to fit a patch right over the central holes. It may either be circular or square: a square patch is easier to make and should extend 1/4" beyond the outer edges of the four drive holes. Accurately mark off the position of these drive holes and the centre hole tracing from a perfect disc. Cut out these holes, but do not attempt to drill using an ordinary drill – the material is far too thin to pierce in this manner. Use either a proper piercing punch, or file them out to shape with jewellers' files.

If the disc you are repairing has an off-centre, worn middle hole, then place this disc on top of another, perfect disc so that the proper centre can be found. Put the patch in place on top of the disc you are repairing, locate it accurately, and then pencil round the edges. Now remove the patch and take away the perfect disc from underneath.

Coat the patch with Araldite synthetic resin adhesive and put it back in its proper position. Be very careful that it does not slide away from its proper location. For this reason, it is a good idea not to clamp this, but to put weights on it, so that any movement can be detected. Stand the disc on a perfectly level supporting surface, with a piece of polythene sheet between disc and surface. Put as much weight on the patch as is necessary to keep it flat and to squeeze out excess glue.



When all is set and dry, the excess adhesive can be filed away. The disc is now ready to play.

Conclusion

As you will have noticed, this is a straight engineering repair job. If you have done the work carefully, and not made the individual patches so big that the disc is too stiff, then there is no reason why the restored disc should not perform as good as new.

The way to preserve discs and to prevent this sort of work has already been described. Cardboard disc-playing organettes should be serviced carefully every year or so. The first signs of trouble are the uneven appearance of the key points and this suggests hardened or moth-eaten felts.

AN UNUSUAL SEWING CLAMP

by Jo Webb

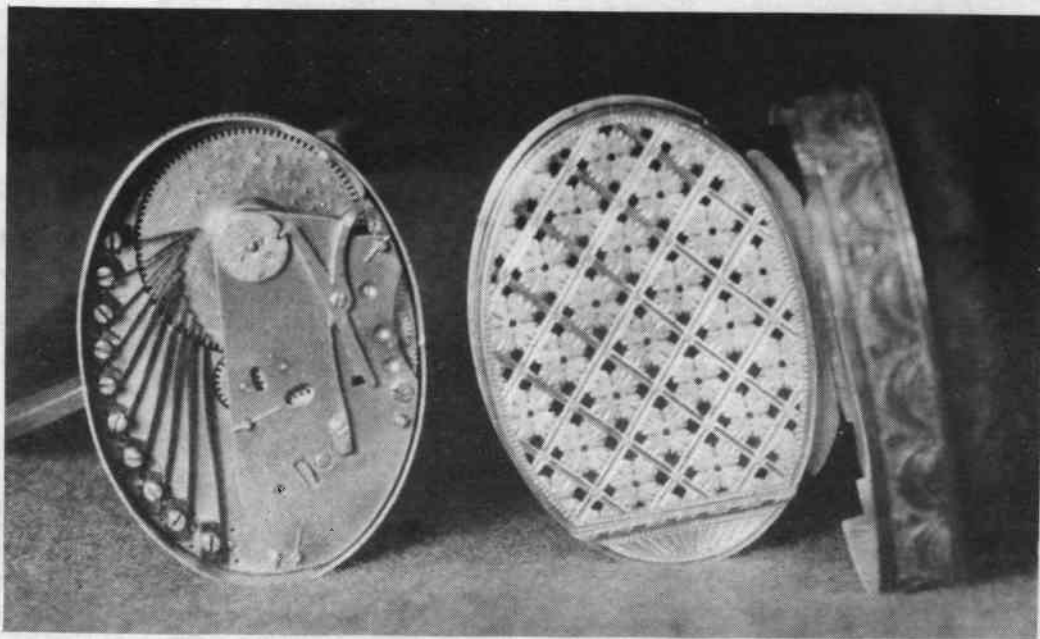
As my husband Graham has dealt in and collected mechanical musical instruments, I have followed, for a lesser number of years and in a smaller way, a similar pattern in sewing tools. My first love and real collection is made up of thimbles but during the last couple of years I have been drawn to other things in that line, in particular to sewing clamps. These take the shape of a clamp which is fixed to the table and on top of which is some means of fastening one end of the material on which the seamstress is working. I find them very varied in both material and design and for the most part extremely interesting to look at.

I have three clamps which are my special favourites: one is late 18th Century and made of beautifully inlaid woods. It is square and has a drawer in which to put cottons, pins and the like. The second is in the form of a metal bird and is what is known as a hemming bird. The wooden clamp has a cushion to which to pin the work, but the hemming bird holds the material in its sprung beak and is very prettily decorated. The third clamp however, in beauty, age, and utter rarity is the most special object I possess. It came to me two Christmasses ago. As soon as I had unwrapped it I realised why I had not been allowed to go to Sotheby's with Graham a week or so before. It had formed part of the C.W. Bruce collection which was sold there.

The clamp is in its original velvet lined red leather box. It is about 6 inches high. The main stem, or the actual clamp part, is of finely cut steel as is the screw which fastens the whole to the table top. The head of the clamp is in gold, and is topped with a faded red cushion. The cushion is on the lid of the top, which opens to reveal a vinaigrette. The workmanship of the interior grill is exceptionally fine. Inside the lid of the vinaigrette is inscribed the name: 'Margaret Sangster'. The whole piece is quite lovely, but – 'the best is yet to be', for enclosed within the head, under the vinaigrette, is a radial musical movement, which dates the clamp at between 1810 and 1825. The music is clear and melodious and takes the form of a single tune, as yet unidentified. The movement is wound by a very long, thin, straight key, the head of which is of gold. I have never found mention of such a musical clamp in any book

How the musical sewing clamp is used.



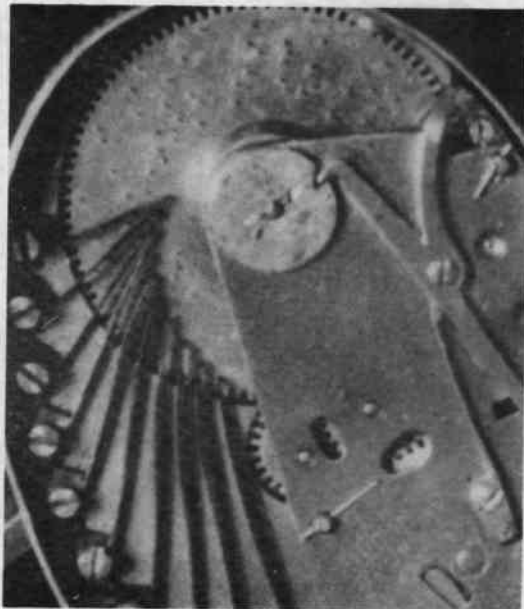


The components of the musical sewing clamp dismantled for examination. The musical movement, seen on the left, is also illustrated below (right) to a larger scale.

on needlework tools, or in any mechanical music books, and I feel that it must be unique.

As can be seen from the illustration the movement has a total of twenty teeth, ten on either side of the plate, this type of movement, named 'fan' or 'sur plateau' is believed to have been invented by Philippe Meylan about 1810. Although this particular movement plays only one tune, other movements often play two tunes and are known to play as many as four. This is achieved by placing the pins for two tunes on each side of the disc, the disc being shifted up or down to play on either the upper or lower set of teeth. In the instrument shown here both sets of teeth, upper and lower, are involved in the playing of the one tune, the notes for which are pinned alternately on the upper and lower surfaces of the disc.

The last paragraph, describing the actual making of the music was explained to me by Graham. It certainly adds to my knowledge and to the enjoyment I get out of my clamp. Most of all I find it a happy co-incidence that in one piece are combined our two interests. As Mrs. Bertha de Vere Green goes on searching for her musical fan, so shall I hunt on for a musical thimble.



Household Words, one of Charles Dickens' weekly journals, contained the following article in the issue for Saturday, May 28th, 1853. Here, Dickens takes a curious look at mechanical music. From the collection of Graham Webb.

MUSIC MEASURE

TWENTY-SIX gallons of wine, or thirty-four gallons of ale, or forty-two gallons of salmon, or two hundred and fifty-six pounds of soap : make one barrel. So we learn from the table of weights and measures in the very respectable old Tutor's Assistant. But it does not divulge how much music makes one barrel. Dry Measure, Corn Measure, Long Measure, and other measures, are duly tabulated. But there is not a single numeral indicative of Music Measure ; yet Bellini, the original "Bones," the Polka-makers, Will you, or May you, or Can you love me now as then—all are witnesses to the union of music measure and barrels. A thousand black-eyed Italians impress the fact on our unwilling ears every day. In fact music is the only beverage which we can quaff by the barrel without paying for it, or without feeling the worse for the draught.

One does not generally give a penny to Giacomo Alessandro for permission to analyse his grinding-organ or his organ-piano ; yet there may be a penny worse laid out. Unless one be too unmusical to know *Qui s'degno* from Pop goes the Weasel, there is something attractive in all that concerns the production of musical sounds ; and although there may possibly be no music in the soul of the man or boy, who grinds music out of a box by turning a handle, there must be much musical knowledge in him who conceived and put into shape the mechanism itself.

A musical snuff-box, possessing a transparent cover, is a good subject on which to commence an examination. Musical box, let us rather call it ; for he deserves to sneeze until further notice, who would choke music with snuff. Each of these tiny boxes, contains a horizontal brass barrel ; and, into the surface of this barrel are stuck some hundreds of small pins. Within reach of these pins are

numerous delicate little springs, all ranged side by side in one plane, and all susceptible of slight vibration or oscillation when touched. In this arrangement, the springs set the music going, the pins set the springs going, the barrel sets the pins going, the watch-spring sets the barrel going, and the key sets the watch-spring going for our purpose. As "the end justifies the means," we must begin at the end, and describe the music springs first. Any little slip of metal if firmly fixed at one end and left free everywhere else, will emit a musical sound if struck or bent and then suddenly relaxed. The more rapidly it vibrates, the higher is the pitch of the note which it yields ; and, as a thick slip or a short slip vibrates more rapidly than one which is thinner or longer, the springs to produce the upper notes of the musical scale must be either thicker or shorter (or both) than those for the lower notes. Let no one attempt to count the number of these vibrations by the aid of his sharp eyes : he will be baffled ; for that medium note which musicians call middle C or tenor C, is the result of two hundred and fifty-six double vibrations in a second, and the highest musical note is due to some thousands of these vibrations in a second. The springs in a musical box are numerous enough to give all the notes and half notes for several octaves ; and by judicious filing in one spot and loading in another, they are attuned to great nicety.

To make these springs discourse sweet music, they must be touched in the proper order and after proper intervals ; and to do this, is the work of the pins stuck in the barrel. If they are arranged in a ring, directly round the barrel at one particular part of its length, they will strike the same spring repeatedly during the rotation of the barrels ; but if arranged in a row from end to end of the barrel, parallel to the axis, they will strike

many or all of the springs at one time. In the first we have the simplest element of melody, one note often repeated; in the other we have the simplest element of harmony, two or more notes sounded together; and it is for the artist to work up these two elements so as to produce a rich piece of music. The pins appear to be strewn over the surface of the barrel in utter confusion; but it is not so; according as few or many notes are sounded at once, according as the tune has many crotchets or many semiquavers, so are the pins sparsely or closely congregated. Every touch of every pin causes some one of the springs to vibrate, and in vibrating to emit its sound. Lucy Neal being a more sober personage than Jack Robinson, and telling her story more slowly, requires fewer pins, placed more widely apart, to work out her music.

There is a great deal of philosophy in the turning or revolving of the barrel: much ingenuity, much care, and a most potent influence on the harmonic effect thence resulting. We insert a tiny key into a tiny key-hole, wind up our musical box, and thereby coil up a spring. The spring in its impatient eagerness to unwind itself again, drags round a little ratchet-wheel, and this ratchet-wheel drags round another little wheel affixed to the end of the barrel, and this second little wheel drags round the barrel itself. Until the spring has fully recovered its former position of independence, it continues to pull away heartily; and as long as it pulls, so long will the barrel turn round, and so long will the pins on the barrel draw forth sweet music. Generally speaking matters are so arranged that a tune is played once through during one revolution of the barrel; inasmuch that a continuance of the revolution produces a repetition of the tune. Were it not so, the pins for the end of the tune would be mingled up with those for the beginning, and all would be confusion. But most musical boxes play two tunes—some more; and yet they have but one barrel each. This result is brought about in an exceedingly ingenious way; and we pray that the goddess of Lucidity (whoever she may be) will assist us making clear that which is somewhat difficult to describe. If the box played but one tune, the pins would be arranged in equidistant rings round the barrel, all the pins in any one

ring acting upon one particular spring; and there would be as many rings of pins as there are springs, each opposite to each. But when the box plays two tunes, there are intermediate rings of pins, forming another series alternating with the former. One set belong to one tune, and one to the other; one set act upon the springs, and at the same moment the other set, being opposite to the vacancies or spaces between the springs, do not touch them, and therefore elicit no sound. After having played (let us suppose) "Where the bee sucks," and being desirous then of a visit from Judy Callaghan, we must somehow or other put the one series out of gear, and bring the other series of pegs into action. This is effected by shifting the barrel a very minute distance longitudinally, so as to bring the hitherto idle rings of pins exactly opposite the springs; there is a small stud or button on the outside of the box, by means of which this shifting of the barrel is effected. Some musical boxes rise to the dignity of three, four, five, or even six tunes, by a much more complex arrangement of pins.

We are not in a position to understand Giacomo's smart little French-polished crimson-silked organ-piano which he rests upon a stick, and out of which he grinds his bread and butter. Why the musical box grinds its own music, and leaves the organ-piano to be ground by another, is simply because the former has a coiled spring, and the latter has none. The handle or winch which Giacomo turns so many hundred times in a day, is connected by cog-wheels to the barrel; and the barrel is thus made to revolve by manual power instead of by the tension of a watch-spring. The barrel of the organ-piano, like that of the musical box, is studded with pins all over the surface; these pins acting mediately or immediately, on a series of strings, to bring out their twanging music.

But the legitimate old-fashioned barrel-organ, of greater weight, bulk, and solidity of sound, is better worth a little analysis than the organ-piano. It has a large and interesting family of pipes; and every pipe pipes to its own tune. When the leader of the orchestra belonging to the Fantoccini, or the Acrobatic Brothers, plays his mouth-organ, he simply blows air into a number of little tubes, each of which yields a particular

musical note, more or less acute in pitch as the tube is shorter or longer. So with the barrel-organ: the tubes want to be blown upon or into, and they are so blown accordingly. But who is the blower? Our blackeyed, swarthy-faced friend is a grinder, and a blower; for he carries a pair of bellows cunningly boxed up in his organ, and the same grinding which sets the barrel to work, works the bellows also. The manufacturer, bearing in mind that a church-organ has reed-pipes as well as open pipes, to give difference in *timbre* or quality of tone, has both kinds also in his grinding organ. It may not be that both kinds are in the same organ; but the flute-like tones of some, and the clarinet-like tones of others, will illustrate the fact. The barrel is studded, not merely with brass pins, but with brass staples; these, as the barrel rotates, act upon levers which open the pipes, and enable them to speak. If a mere pin act upon a lever, the pipe is open only for an instant, and we have a short staccato note; but if the longer staple act upon a lever, the pipe is kept open until the staple has wholly passed, and a continuous note is produced. All this mechanism—the pipes, the reeds, the barrel, the pins, the staples, the bellows, the cog-wheels, are packed together very snugly, each doing its own work at the proper time without interfering with its neighbours.

At our elbow, at this present moment, is an olive-coloured acquaintance, with a hat of indescribable colour and impossible shape; he comes at a particular hour, on a particular day of every week, and plays the same tunes in the same order; he alternates from the Hundredth Psalm to Gettin' up Stairs; and then goes to one of Balfe's Ballads, followed by a Waltz of König's, the Marseillaise Hymn, a Polka, and so back to the Hundredth Psalm. We know another organ, in which the Swiss Boy plays at bo-peep with the Lass o' Gowrie, and a number of other companions. In all such cases we shall see the grinding organist, at the termination of each tune, busy himself with a little bit of mechanism at the side or end of the instrument; he is touching a stud or lever, which brings about a slight movement of the barrel, shifting it to such a distance that a different set of pins and staples may act upon the pipes.

Make room here for a cavalcade! Onward comes a little horse; behind the horse is a little carriage; upon the carriage is a big organ; and in immediate command over these are three Italians. The horse stops; a man mounts upon a stage, and turns a winch, not much smaller than that of a mangle; and there comes forth a volume of sound that can be heard half-a-mile off. Another man holds out a little saucer for a little money; and the third man looks about with his hands in his pockets. How they all live—the three men and the horse—out of the pence which they pick up, is a perfect marvel. The instrument has been brought from Pavia or Milan or Mantua, and has cost fully a hundred guineas. It is quite orchestral in its effects, imitating with tolerable success the tones of many musical instruments. The truth is, these are pipes of many different shapes, analogous to the various stops of a church organ: each shape (independent of size) giving the tones peculiar to some particular instrument. The barrel arrangements, for bringing into action so many pipes, are very intricate, and require careful workmanship to guard against frequent mishaps. These are the instruments which an honourable member of a certain august body has visited with crushing severity. Yet we cannot conceal a kindness for them. We have pleasant reminiscences of Nume Benefico, La Mia Delizia, the last movement in the Overture to William (we beg pardon—Guglielmo) Tell, and the March in Le Prophète—as played in some of these ponderous organs. The harmonies are bold and rich; although in mere mechanical music there is, of course, no scope for feeling or passion.

If ever music by the barrel were really graced, it was in the days when the Apollonicon rolled forth its vast body of sound. This enormous instrument employed Messrs. Flight and Robson five years in its construction; and cost ten thousand pounds. It was an organ with a whole orchestra in its inside; played either by keys or by a revolving barrel. But there was provision for a grander display than this; there were five distinct key-boards, at which five performers could be seated, each having command over certain particular stops or powers in the instrument. It is, however, on the ground of its automatic

or self-acting power, that the Apollonicon takes up a position as the big brother of the street organ. So vast was the number of pipes, that one barrel could not contain all the pins necessary for working them; there were three, somewhat under a yard in length each, studded in a very complex manner. Mechanism worked the bellows and rotated the barrels, and the barrels drew out the stops and opened the pipes. There were forty-five stops and nineteen hundred pipes; one pipe was twenty-four feet in length by two feet in diameter. So long and elaborate were the pieces of music which this instrument played automatically, that the barrels could only accommodate (so to speak) two at one time; but at intervals of a few years new barrels with new tunes were introduced, until the collection comprised Mozart's overtures to Figaro, to the Zauberflöte, and to La Clemenza di Tito, Cherubini's overture to Anacreon, Weber's overture to Der Freischütz, Handel's introduction to the Dettingen Te Deum, and Haydn's military movement from his Twelfth Symphony. Not a note of the scores was omitted; and all the fortes and pianos, the crescendos and diminuendos, were given with precision and delicacy.

The Apollonicon is still in existence; but has arrived at the position of a superannuated veteran, no longer fitted for the deeds which won for it its former glory. The maladies of age have come upon it. It suffers from rheumatism in its keys and levers, and from asthma in its pipes and bellows; it is shaky and nervous; it is not its former self; and its guardians wisely deem it better that its voice shall not be heard at all, than that its decadence from former splendour should be made manifest. *Requiescat in pace!*

Music by the barrel, then, has been sold or given in many different forms, by many different persons, in many different places, and under many different circumstances. But who sells music by the yard?

In the Great Exhibition the reader may perchance remember a dusky-looking instrument, something in shape between a cabinet-pianoforte and a small church-organ. The exhibitor was wont to take a sheet of perforated card-board, insert one end of it between two rollers, and then turn a handle; a tune resulted, somewhat lugubrious, it is

true, but still a tune, and evidently produced with the aid of this perforated card-board. The instrument is called the Autophon—not yet, that we are aware of, brought much into use, but certainly displaying considerable ingenuity, and founded on a principle which admits of very extensive application. The cardboard is perforated by some kind of punch or punching machine; the holes (a quarter of an inch or so in diameter) appear irregular, but they are systematic in respect to the purpose for which they are intended. Each sheet is the symbolic representative of one tune, usually a psalm tune; and all the holes are cut with especial reference to that tune; they are in rank and file—ranks for the notes heard together in harmony, and files for the notes heard consecutively in the progress of the tune. When one end of such a sheet of cardboard is placed between two rollers, and a handle turned, the cardboard is drawn into the instrument; the perforations, as they arrive at particular spots, allow wind to pass into pipes in the instrument; whereas the unperforated part acts as a barrier across which the wind cannot penetrate—or at least the intermediate mechanism is such, that this difference results from the manner in which the perforations are arranged.

This is a principle entirely different from that of the barrel-organ. In the latter, you can only play such tunes as are set or pinned upon the barrel; and either to substitute a new barrel, or to re-arrange the pins upon the old one, is a costly affair. But in the Autophon the power of change is illimitable. A few pence will pay for a sheet of the perforated cardboard; and indifferent good music is to be got at sixpence or eightpence a yard. We do not say that if you were to apply for a couple of feet of *Adeste Fideles*, or a yard and a quarter of the *Sicilian Mariners' Hymn*, that they would be sold to you precisely in those lengths; but it is quite true that an oblong strip of cardboard, say about a yard in length, contains the perforations necessary for one tune; and there is not the slightest reason, mechanically, why ten thousand tunes should not be played on this identical grinding-organ; the only question being, whether the demand would be sufficient to pay the manufacturer for setting up the type,

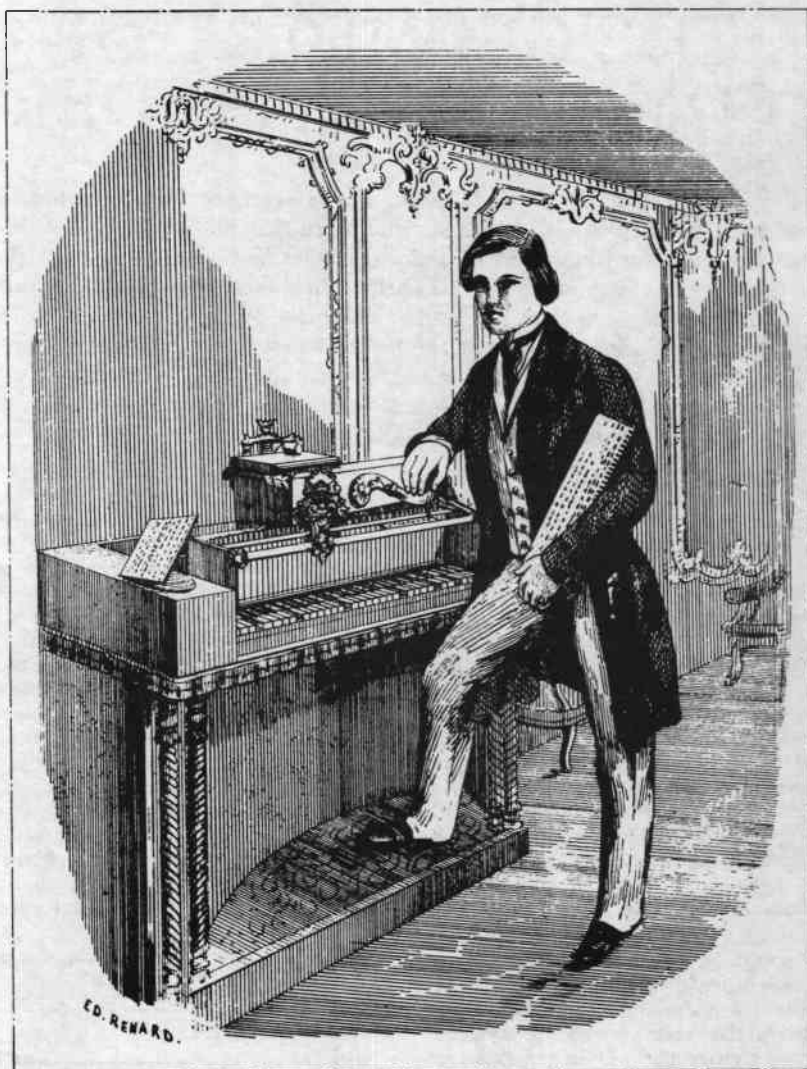
as it were, for each tune: this being once done, the charge for each single copy need not exceed a few pence. The musician will of course regard this as a very poor affair, and so it is when tested by the standard which he could employ; but it enables many to enjoy a humble kind of music at times and under circumstances when the services of a skilful player are unattainable. No skill is here required. The player has only to place the right sheet of cardboard in its right place, and then grind away. In small chapels, a constant supply of tunes might be thus obtained, without necessitating the employment of a skilled organist. We are offering no opinion on the quality of the tones thus produced; we only speak of the mechanism which does really seem to be capable of supplying unlimited music at a very low figure. It bears some such relation to real music that photography bears to portrait-painting: not high art, but a cheap and convenient substitute.

The pianoforte can also produce music by the yard. The *piano-mécanique* by M. Debain of Paris, is a sort of cottage-piano richly-toned. It can be played on with keys, and no one need know that there is any peculiar *mécanique* about it at all. But the player may bring forward certain odd-looking yards or music, and transform himself at once from an intellectual player to a mere music-grinder. These yards of music are—not pieces of cardboard, as in the case of the Autophon—but thin planks or boards, studded on the under surface with pins. Such board may be as little as six inches or as much as two feet long, according to the length of the piece of music to be played; or there must be several of them, if the music be an overture or any other elaborate composition. The player (we trust he will not deem us disrespectful if we designate him the grinder) places one of the studded boards on the top of the instrument, and proceeds to turn a handle. The board is drawn slowly onward; and the pins, projecting downwards from its under surface, press as they pass upon the tops of certain metallic points; these points are the extremities of small levers, and these levers act upon hammers which strike the strings. The pins in the studded board are arranged in definite order according to the tune to be

played, pressing one, two, or more of the metallic points at once, and eliciting an equal number of tones at once. The player becomes a commander of Rossini or any other musical luminary at once. He puts *Una voce poco fa* into a box, and grinds it out again, bran new and uncurtailed. So nearly does this approach to our designation of music by the yard, that we find eight inches of the studded board is about equal to the contents of one ordinary page of music. Where the piece of music is of very great length, the grinder puts one board after another on the top of the instrument, and pieces them together as girls and boys do the slivers of wool in a worsted mill. If he do not place them exactly end to end there will be a hole in the ballad.

The inventor of this ingenious mechanism, reminds us, in his advertisement, that "Although music at the present day forms a portion of regular education, it is certain that the absorption of time in more serious pursuits, and the want of disposition for study is such, that in a hundred families we can scarcely find ten individuals who can play music. Among this number, some play only the pianoforte or the organ, but without being able to master the finer compositions." For such families, then, M. Debain tells us his *piano-mécanique* is intended; and he tells us also at how much per yard, he will supply us with music when we have been supplied with the instrument itself. Thus, a plank of polka costs about four shillings; consequently, the overture to Semiramide or to La Gazza Ladra would cost very much more; but the grand overture would be just as easy for the grinder to play as the simple polka. There have not been many of these instruments brought to England; but one of them has gratified many thousand hearers. It has plenty of "power;" a pianoforte player can not increase his fingers and thumbs beyond the recognised number of ten; but this mechanism could play many more than ten notes at a time, and so far beats Thalberg or Moscheles.

We must observe, also, that it is not merely the pianoforte which is thus treated. The apparatus itself is called the *Antiphonel*, or at least one variety of it, so designated, is capable of being attached to organs, and thus become available for sacred music. And we



must not forget that the mechanism may be so attached that, by a slight adjustment, it can be freed altogether from the pianoforte strings, and allow the instrument to be played by means of finger-keys in the ordinary way. The mechanism is sold alone; it is sold with the pianoforte which is to be played only by its means; it is sold with a pianoforte which has the double or alternative

action; it is sold, in the antiphonel form, for attachment to organs; and lastly, the music boards alone are sold at nine shillings a yard.

When, therefore, the next compiler of a table of weights and measures sets about his labours, let him remember that among the commodities which are sold by the barrel or by the yard, he must include music.

THE GEOMETRY OF COMB AND CYLINDER

by Alfred Thompson

EVEN when it has not been damaged, a nineteenth century movement has usually suffered quite significant wear; and more often than not it has been tampered with so that the proper setting of comb against cylinder has been lost. Quite slightly altered volume and timing of the teeth relative to each other can make a box sound quite disappointing, especially when there is more than one comb, and most of us must have tried our hand at improving matters. The Spring 1973 Journal contained a very interesting reprint of some turn of the century workshop instructions, and the editor remarked that the description of the proper angle of the comb against the cylinder was most interesting. This led me to think that perhaps members might like to follow a rather more detailed study of this geometry.

A good way to start is to consider the timing of a tooth. When does it start to vibrate? Clearly not when it is contacted by the cylinder pin, but when it is released. Since tooth deflections are fairly small we can simplify matters by assuming that the tip of the tooth is deflected along an arc of a circle with centre at the root of the tooth. Figure 1 illustrates this, with the deflection grossly exaggerated for the sake of clarity, and it shows the situation at the moment a tooth of length 'a' is released from a cylinder pin on a radius 'b'. The intermesh between the tooth and the pin is given by the length 'x' on the line AB between the centre of the cylinder and the root of the tooth.

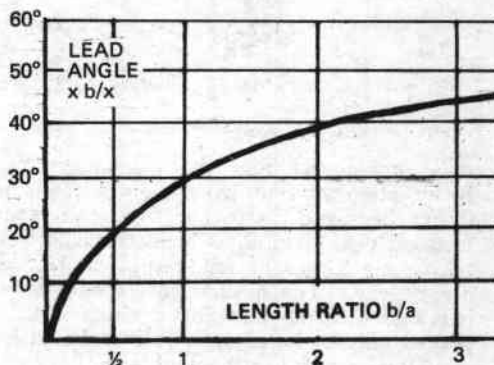
Calculation of the angles of the triangle ABC shows that for small tooth deflections the angle A in degrees is given by the expression

$$A = \frac{60a}{a+b} \cdot \frac{x}{b}$$

If $a = b$ the angle A is $30x/b$, but if the tooth length a is only half the cylinder radius b then A is only $20x/b$. This means that if different teeth are contacted at the same moment by cylinder pins, then the shorter pin will be released first after the cylinder has turned through a small angle A, and it will therefore lead the longer tooth which will not be released until the cylinder has turned through a larger angle A. The graph gives the lead angles of different teeth over each other in terms of the ratios b/x and b/a . This permits a quick rough calculation of lead angles for any values of a, b and x.

As an example of how this works out in practice consider a two inch diameter cylinder ($b = 1$)

working a bass tooth two inches long ($b/a = 1/2$) and a treble tooth one inch long ($b/a = 1$), each with an intermesh x of 0.06 inches so that x/b is 0.06. In this case the lead angle of the short tooth over the long is calculated as shown by the dotted lines on the graph and is $(30 - 20) \times 0.06 = 0.6$ degrees. If the full cylinder rotation of 360 degrees lasted one minute, then this 0.6 degrees would correspond to a tenth of a second. Now a lead of a tenth of a second of one note over another in a chord is clearly audible, and manufacturers must have deliberately arranged to eliminate it. One method is to lower the cylinder axis opposite the treble teeth, so that the cylinder pins contact the treble teeth a little later. This retards them so that they sound in time with the bass teeth. Calculation shows that in the case we have used as an illustrative example, when $b = 1$ and $x = 0.06$, a distance y of a hundredth of an inch is all that is needed to retard



sufficient adjustment on its own. The cylinder bearing height may also need correction.

It is most probably because of the need to set up the comb correctly for both volume and timing that manufacturers chose to place it on an intermediate line BD rather than on the geometrically simpler line BA. It is clearly much easier to achieve two correct adjustments at the same time when the tips are at an intermediate position D than when they are at an extreme position on the line BA. The best position for D depends on the angle through which the teeth are to be plucked. If for instance the tooth plucking angle DBC on figure 1 is to be five degrees and the tooth length equals the cylinder radius then an angle ADE of ten degrees will put D midway between BA and C. With this in mind it is in no way surprising to find that manufacturers usually chose about 15 degrees for angle ADE. This is a good middling position between C and AB from which to achieve perfect setting up of both B and D by careful adjustment.

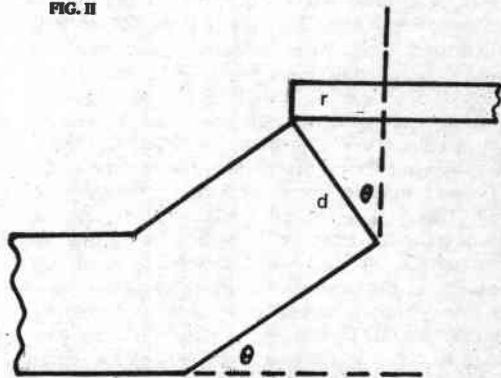
Nowadays of course we are not tackling the problem of setting up a box as a step in initial manufacture. We are tackling the problem of restoration. The box was correctly adjusted once, and what we need to do depends on what fate has overtaken it. No single adjustment is capable of altering timing without any effect on volume, or of altering volume without any effect on timing. However two sorts of adjustment seem to be very commonly needed; making the bass both louder and earlier by tipping the comb at its bass end only, as if to compensate for wear on bass tips or pins; and shimming under the feet of one comb to retime it with respect to another, as if to correct someone's mistaken efforts to make them look right instead of sound right. The treble end of one comb and the bass end of an adjacent comb will usually not be at the same height when the adjacent long bass and short treble teeth are properly timed.

The next thing to consider after the timing of the release of a tooth is the method of its release. The tooth should clearly be raised and released cleanly and precisely, with a minimum of scraping. Now if the cylinder pin extended radially and had an extremely small diameter, its end would contact the tooth at a distance 'r' from its tip, and as it lifted the tooth to C on figure 1 it would scrape through the distance 'r' along the under side of the tooth until the tooth was released. The effect of the thickness of the pin itself will be that after the pin has scraped along the tooth through the distance 'r' the tip of the tooth will then also

scrape across the end of the pin until it is finally released.

The very principal of using a cylinder pin to lift and release a tooth inevitably involves a certain amount of scraping between pin and tooth. This cannot be avoided; but it can be very considerably reduced by raking the cylinder pins after grinding. If the pins are raked so that their top edges just contact the tips of the teeth at point D and their bottom edges just release the tips of the teeth at point C, then the only scraping action will be of the end of the tip across the end of the pin, and scraping of the pin along the underside of the tooth will be eliminated. This is illustrated by figure 2, and on this reasoning the best angle of rake θ should be given by the formula $\sin \theta = r/d$ where r is the required intermesh of pin and tooth at D of figure 1 and d is the diameter of the pin wire. Looked at from the point of view of restoring a box with already raked pins, this means that there will be a best working intermesh, for which the box was designed, given by $r = d \sin \theta$. Of course if r is bigger than d this degree of perfection cannot be achieved, but raking will still have the benefits of reducing scraping and improving the precision of release.

FIG. II



I do not want to suggest that the actual setting up of a box should be done in practice by means of these measurements and calculations. In the end it must be a matter of making trial adjustments and watching and listening until the box 'comes right'. However I think setting up should be more systematic and therefore more enjoyable if the adjustments are made with these geometrical principles in mind.



The picture shows Member Richard Jefferies of Surrey working hard with his Pasquale street barrel piano at Guildford, Surrey, to make money for cancer research. Popular as we know these instruments are, the sum collected by Richard was staggering – £580 in five hours. How much of this sum can be attributed to the instrument and how much to Richard's personality we shall never know, but the results are so exciting as to be sure to encourage other Members who own similar machines to get out with them and do some good while enjoying themselves and entertaining others.

Photo: Jeremy Marks, Guildford.

MBSI HONOURS MBSOGB

AWARD FOR FOUNDER

At an impromptu ceremony after the Annual Dinner on June 2nd 1973, Member Hughes Ryder, representing and on behalf of the Musical Box Society International, presented MBS Founder-Secretary and now President, Cyril de Vere Green, with a plaque bearing the following inscription:

Presented to Dr. Cyril de Vere Green in token of his distinguished and outstanding service as President of The Musical Box Society of Great Britain by his friends of The Musical Box Society International, 1973.

During the same presentation, Member Hughes Ryder, again on behalf of The Musical Box Society International, presented President Cyril de Vere Green with a gavel and block, a gift to the MBSOGB from the MBSI. The ceremonies are illustrated on page 42.

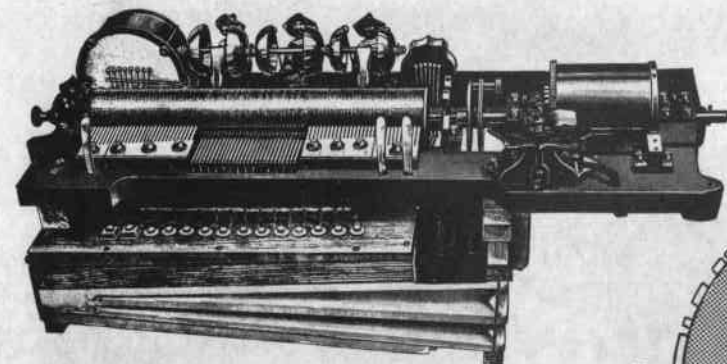
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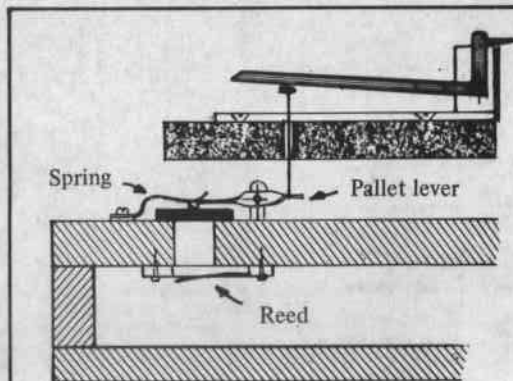
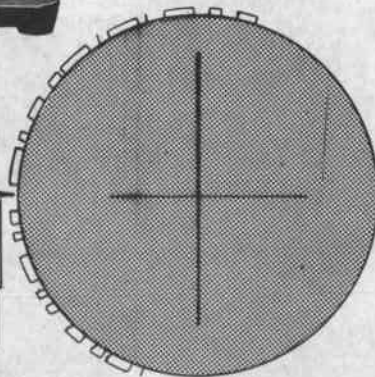
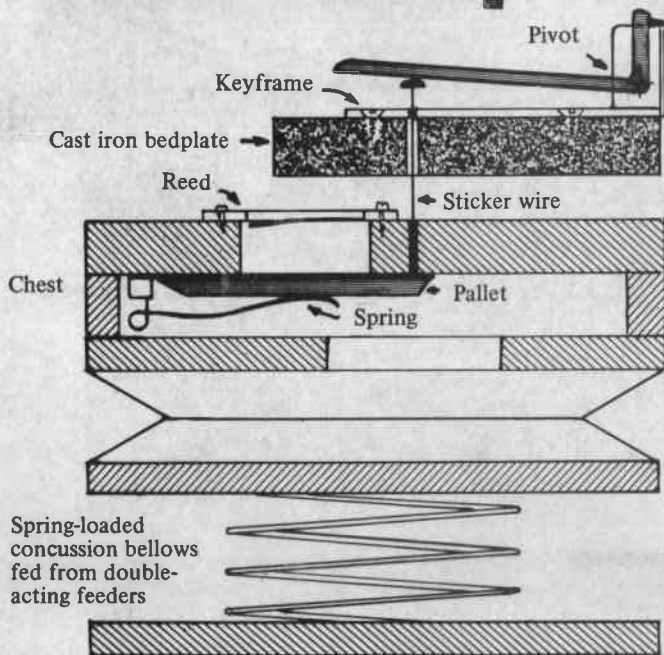
PICTORIALLY VIEWED

This is the first of a new series of illustrated features prepared by Member Arthur Ord-Hume which will deal with various details and problems relating to mechanical musical instruments. The theme of the series will centre on the simple drawing/caption presentation with perhaps a short related text as necessary.

This first drawing illustrates the mechanism of the musical box fitted with a reed organ – a subject upon which nobody has ever written (or drawn) before. At a later date, an illustrated article on the repair of this type of instrument will be published.



An orchestral-type musical box (left) which includes a reed-playing barrel organ in the centre part of the cylinder. The organ shown here has the external type of pallet as shown in the sketch in the lower right-hand corner.



An alternative type has the reeds fixed internally and the passages closed by small circular exterior pallets

LOVE AT FIRST SIGHT

by Arthur Heap



“ARTHUR, can you come round?” said Brian my antique dealer friend when he telephoned me one evening, “MIRA’S MET WITH AN ACCIDENT and I wonder if you can put her right without having to call in a Specialist.” I could tell by his voice that Brian was worried, so with Vera my wife, I went as soon as possible to Brians home. Although he had said she was one of the family, neither of us had met Mira and did not know quite what to expect, so it was something of a relief to find her standing in the hall awaiting our arrival.

She was an attractive redhead of average height, well shaped with pleasing curves, and her small neat feet caught my eye as did the unusual adornments she was wearing. At first glance one could see no sign of damage, but with a feeling of sickness and shock Vera and I soon realised that Mira, to whom we had both taken an immediate liking, had completely lost her voice.

I examined her at length, carefully and as gently as possible to ensure I did not inadvertently cause further damage, but finally was compelled to tell Brian that Mira was in a bad way, and to restore her voice required expert knowledge and ability far beyond my capability, and that such Specialist treatment could well take many months and prove expensive.

We adjourned to the lounge, and over a drink discussed Miras future with Brian and his wife. Brian told us that they had taken Mira into their home when a very old Lady with whom she had been living had died some months before, and although they had intended finding a home for Mira, her beautiful voice had made them decide to keep her in the family.

By this time I realised my feelings for Mira were a combination of love and sympathy. I knew instinctively that she once possessed a lovely voice,



and I longed to take her into my charge, get her voice restored, care for her and eventually be repaid by hearing her repertoire of beautiful music rendered just for me.

Vera in the way only a loving wife can do, sensed my intense desire to possess Mira, and so raised no objection when I asked if I could take her home with me. Brian who had also become very fond of Mira, took a while to persuade, but eventually agreed to an arrangement I suggested, and poor Mira was unable to voice an opinion for or against.

Now after many anxious months, Miras voice has been restored, and we are thrilled to hear it although, understandably there are a few squeaks, and her rendering tends to be a little fast. However, the Specialist into whose care we entrusted Mira assures us that with a little more attention and treatment he will make her voice as good as ever.

Mira is obviously contented in her new home. She loves to stand in a corner of the lounge and entertain us with her beautiful musical renderings, and the loving care we have bestowed upon her is reflected in her sparkling appearance. As for me, well I would not part with her for anything, even though she is now about 75 years of age.

The first Mira disc musical box was introduced by the Swiss firm of Mermod Freres in 1903. Makers of cylinder boxes of merit, Mermod Freres had first made the Stella, famous for its ingenious mechanics and its hardy projectionless disc. For the Mira, also sold in the U.A.S. under the name of Empress, the design was changed to the more orthodox style of discs with projections. The box shown in these excellent photographs is almost identical to the model illustrated in a 1904 advertisement by the Jacot Music Box Co. of New York. Since this console type of case was much more popular in America than in England it is most unusual to find one in this country.

Arthur Heap's Mira plays 1 7/8 inch discs, and it can be seen that the pressure bar is designed similarly to that of the Stella in that, instead of having a hinge at one end, the bar is turned lengthwise to release the disc. The Mira was also made as a combination gramophone-disc box in both small and large sizes, including one with a cabinet very similar to that shown. Models were made with both interior and exterior horns.

TUNING AND THE MUSICAL BOX

by Keith Harding

I WOULD begin by referring to Bob Minney's excellent article on page 306 of Volume 5, in which he describes a method of tuning with the aid of the Clavioline. Now if musical boxes are indeed tuned to Equal Temperament this is a most valuable method. I understand from Mr Jean Reuge that modern musical boxes are turned this way, (using a Conn strobometer), but it is not safe to assume that this was always the case. In fact Bach did not use Equal Temperament, and the word he uses, 'wohitemperirte', does not mean this; he 'well-tempered (proportioned, adjusted, regulated) his instrument until all keys were found satisfactory.' (Dr Leigh Silver, Journal of the Acoustical Society of America, April 1957). It took a very long time for Equal Temperament tuning to come into general use, because of its drawbacks, and as late as 1851 not a single one of the British organs shown at the Great Exhibition was so tuned.

Theoretical Considerations

The problem of temperament is the result of two of nature's little jokes; 1. Twelve pure fifths in the ratio 2 : 3 exceed seven octaves in the ratio 1 : 2 by 48 cycles (the comma of Didymus). 2. Three pure thirds in the ratio 4 : 5 do not make an octave. The human ear likes to listen to perfect intervals, but if we are to keep the octaves perfect we must flatten the fifths. Two forms of temperament, or adjustment, are the old one known as Mean Tone and the modern one known as Equal Temperament.

Mean tone tuning keeps the thirds pure, as in the interval *ut* to *mi*, but whereas the third was divided into two unequal tones, the mean is used instead, hence the name. The intervals are purer, and hence it sounds much sweeter than Equal Temperament tuning, but it has the disadvantage than an instrument tuned to it can be played in only one or two keys, which is surely not a limitation in the musical box.

Equal temperament is another compromise, in which the exact interval 1 : 2 is spread evenly over the twelve semitones which make up the octave. In other words, each step of one semitone increases the frequency by a factor of 1.05946, which is the twelfth root of two. Not a single one of the intervals, except the octave, is pure, and it demands that three thirds make an octave, so that the thirds are sharp and sound rough. Unfortunately this form of tuning is necessary for the modulation and key changes of modern music.

This, then, is the problem, and if we are to find just how old musical boxes were tuned, we must take up the challenge of 'The Next Ten Years', as set out by Ord-Hume on page 394, Volume 5, and 'start analysing musical box combs'.

An Experimental Investigation

The following apparatus was used for the purpose of our experiment.

1. Microphone. Vibration pick up type V.P.5. manufactured by Rothermel, heavy to favour the fundamental and not its overtones.
2. BFO Bruel and Kjoer Beat Frequency Oscillator.
3. Counter. A RACAL frequency meter.
4. CRO Telequipment D52 double beam oscilloscope.
5. Amplifier and speaker.

The installation diagram for this apparatus is shown on page 36.

The musical box selected for our experiment was a Nicole Freres keywind, Serial number 32459, gamme number 660, playing six airs by Bellini, with 116 teeth in the comb. The tuning scale was found to be marked.

The cylinder was removed from the movement, and the movement was replaced in its box.

The probe on the pick-up was held against the back of the comb near to the tooth being tested, and a small piece of paxolin insulating material was used as a plectrum to pluck the tooth.

The waveform from the comb was shown on the lower trace of the oscilloscope, and compared with that from the BFO on the upper trace. The frequency of the BFO was altered until the two waveforms coincided exactly, which meant that the frequency produced by the BFO was exactly the same as that produced by the comb.

The amplifier and speaker made it possible to hear the frequency of the BFO and compare it audibly with the sound of the comb for purposes of coarse tuning, final tuning being effected visually.

When the frequency of the BFO and the comb

were exactly the same, the BFO frequency was read off the counter and recorded.

Results

A table was constructed showing the frequency of each tooth, being numbered from the base end,

and also the original tuning marks scribed on the comb base. Frequencies of teeth which had lost their dampers were enclosed in brackets.

The following results were obtained:

Teeth numbered from the base end, frequency as measured, scale as marked.

Tooth	Frequency	Mark	Tooth	Frequency	Mark	Tooth	Frequency	Mark
1.	(60)	<i>sol</i>	41.	403		81.	1219	
2.	(79)	<i>ut</i>	42.	425	<i>fa</i>	82.	1219	
3.	79		43.	424		83.	1220	
4.	(88)	<i>re</i>	44.	454	<i>#</i>	84.	1296	<i>ut</i>
5.	100	<i>mi</i>	45.	454		85.	1292	
6.	104	<i>fa</i>	46.	(480)	<i>sol</i>	86.	1294	
7.	111	<i>#</i>	47.	(480)		87.	1376	<i>#</i>
8.	119	<i>sol</i>	48.	(480)		88.	1468	<i>re</i>
9.	118		49.	(541)	<i>la</i>	89.	1468	
10.	119		50.	542		90.	1466	
11.	132	<i>la</i>	51.	602	<i>ti</i>	91.	1468	
12.	(148)	<i>ti</i>	52.	602		92.	1549	<i>#</i>
13.	148		53.	601		93.	1634	<i>mi</i>
14.	157	<i>ut</i>	54.	638	<i>ut</i>	94.	1634	
15.	157		55.	637		95.	1631	
16.	179	<i>re</i>	56.	(640)		96.	1632	
17.	178		57.	680	<i>#</i>	97.	1742	<i>fa</i>
18.	199	<i>mi</i>	58.	723	<i>re</i>	98.	1743	
19.	200		59.	724		99.	1742	
20.	211	<i>fa</i>	60.	722		100.	1831	<i>#</i>
21.	223	<i>#</i>	61.	722		101.	1829	
22.	(238)	<i>sol</i>	62.	769	<i>#</i>	102.	1940	<i>sol</i>
23.	(238)		63.	814	<i>mi</i>	103.	1938	
24.	239		64.	(820)		104.	1931	
25.	251	<i>#</i>	65.	815		105.	2027	<i>#</i>
26.	269	<i>la</i>	66.	862	<i>fa</i>	106.	2189	<i>la</i>
27.	268		67.	862		107.	2192	
28.	299	<i>ti</i>	68.	915	<i>#</i>	108.	2278	<i>#</i>
29.	300		69.	914		109.	2414	<i>ti</i>
30.	299		70.	913		110.	2415	
31.	316	<i>ut</i>	71.	(981)	<i>sol</i>	111.	2573	<i>ut</i>
32.	316		72.	(982)		112.	2577	
33.	317		73.	(982)		113.	2939	<i>re</i>
34.	334	<i>#</i>	74.	(983)		114.	2937	
35.	356	<i>re</i>	75.	1021	<i>#</i>	115.	2830	
36.	357		76.	(1108)	<i>la</i>	116.	2616	
37.	357		77.	(1108)				
38.	378		78.	1097				
39.	404	<i>mi</i>	79.	1148	<i>#</i>			
40.	402		80.	1220	<i>ti</i>			

Teeth numbers 115 and 116 are not used, and are thus not tuned.

Analysis and an astonishing discovery

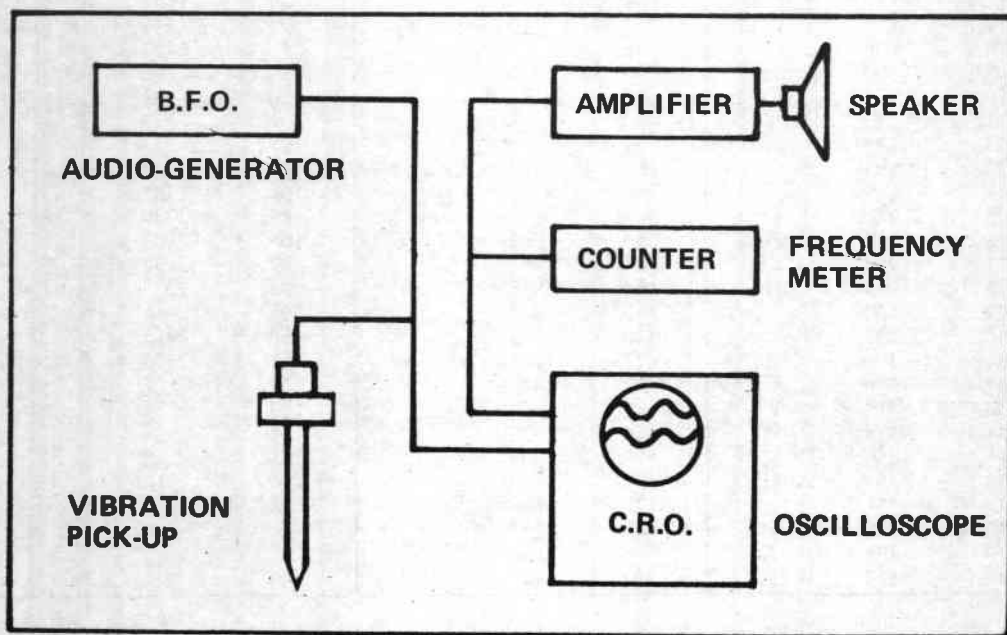
A rise of one octave in the ratio 1 : 2 should double the frequency, but it is apparent that the comb is tuned progressively sharp as the note goes up the scale. This tendency is very common among piano tuners, who claim to do it deliberately to add brightness to the upper octaves.

It was noticed that the waveform on the oscilloscope was almost a pure sine wave. This means that the note produced by one tooth is a pure fundamental tone with almost no harmonics. This is not surprising in view of its similarity to a tuning fork. It was sometimes found necessary to damp out adjacent teeth which were resonating and producing beats.

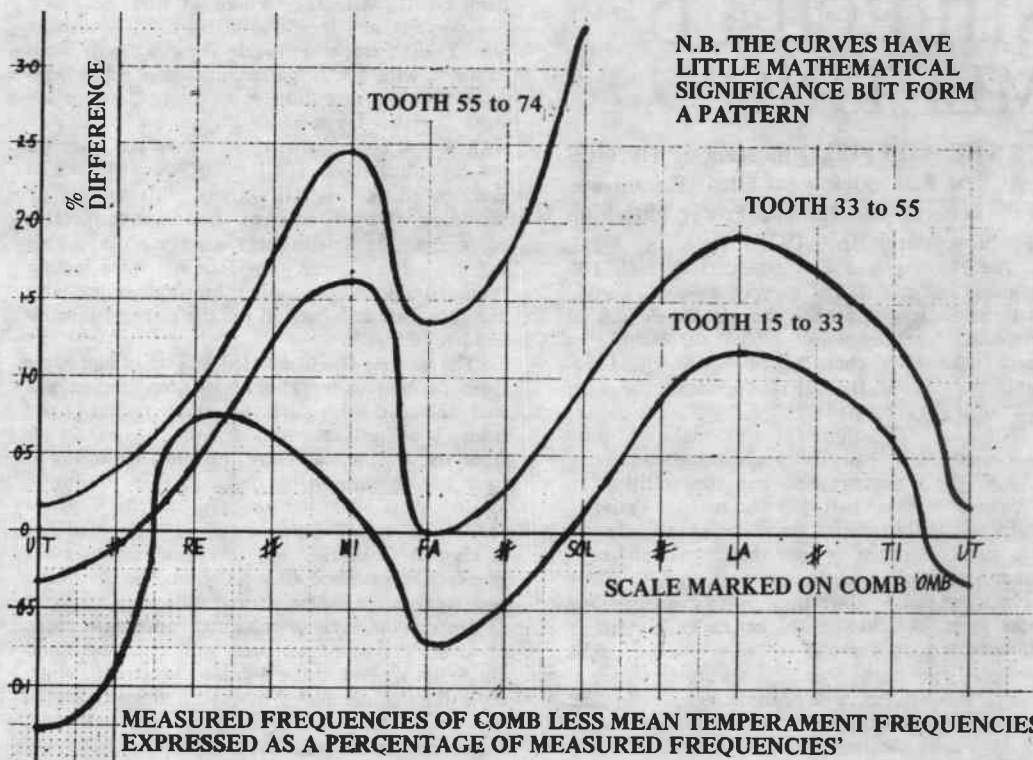
The scale as measured was compared with theoretical scales as calculated for Mean Tone and Equal Temperament taking the same value for *ut*. While the Equal Temperament scale was slightly the closer of the two, they were both so far out as to be useless for practical purposes. They were then plotted as a graph against the measured scale, and were found to have large peaks of difference coinciding with the semitones between *mi* and *fa* and between *ti* and *ut*.

Taking the measured scale on its own, an attempt was made to work out a tuning pattern. All of a sudden the solution presented itself, staggering in its simplicity and totally unexpected. The comb is tuned in perfect fifths with an exact ratio of three to two. In other words, the scale is not tempered at all. It is not Equal Temperament as Bob Minney assumed; it is not Mean Tone as I expected. It is, in fact, Pythagorean, the scale of ancient and medieval music.

The advantages of the Pythagorean scale for the musical box at once became apparent, so much so that it is clearly the best scale for the purpose. The Pythagorean octave is made up of five equal tones and of two equal hemitones, which are rather less than half tones. 'In addition to the concord of the octave, it contains no fewer than four fifths and five fourths, a greater wealth of concords than can be attained from any other selection of eight notes' (Sir James Jeans, *Science and Music*), and this is without taking into consideration the sharps. Because a note on a musical box does not produce audible harmonics, we do not have to take harmonics into consideration when considering accordant intervals, and the Pythagorean scale is



The apparatus used in the experiments



thus more perfect for our purposes than Just Intonation or the closely related Mean Tone. It is not possible to modulate into another key (without using another set of notes, which is possible), but this is not necessary in a musical box which only plays short tunes.

It is important to remember that we have only carried out a pilot experiment on one musical box by a particular maker, and a great many more experiments must be carried out before our findings are accepted for general application. It may well be that disc musical boxes do use equal temperament, as their combs are expected to play a greater range of pieces, although they do seem to stick to one key.

For the time being, I will make the tentative suggestion that it is perhaps the use of Pythagorean tuning which gives at least some of the early musical boxes their special quality.

In practical terms, it is good news for tuners if we can tune using only octaves and pure fifths, which are much the easiest intervals to hear, but

all tuning aids, especially the piano, are definitely out.

Tuning pattern for Nicole Freres Gamme No. 660

Start with *ut* = 317 c.p.s.
 Up one fifth 3:2 gives *sol* = 475.5
 Down one octave 1:2 gives *sol* = 237.75
 Up one fifth 3:2 gives *re* = 356.62
 Down one octave 1:2 gives *re* = 178.31
 Up one fifth gives *la* = 267.46
 Up one fifth 3:2 gives *mi* = 401.19
 Up one fifth 3:2 gives *ti* = 601.78
 Down one octave 1:2 gives *ti* = 300.84
 Up one fifth 3:2 gives *fa* = 451.26
 Down one octave 1:2 gives *fa* = 225.63
 Up one fifth 3:2 gives *ut* = 338.44
 Up one fifth 3:2 gives *sol* = 507.66
 Up one fifth 3:2 gives *re* = 761.48
 Up one fifth 3:2 gives *la* = 1141.88
 Down one octave 1:2 gives *la* = 570.94
 Up one fifth 3:2 gives *fa* = 856.41

SHEFFIELD MEETING

THE SHEFFIELD meeting of The Musical Box Society of Great Britain was held at the Hallam Tower Hotel on Saturday, March 3rd., 1973.

The Meeting was well attended by over 100 Members and guests, and if proof were still needed that the Society is broadly based enough to hold Provincial Meetings every bit as successfully as London Meetings, then this one in Sheffield certainly provided it. It must rank amongst the most successful yet convened.

Not only did those present make it quite clear that they had thoroughly enjoyed every minute, the organisers also had the gratification of being able to say that they had realised a modest profit. While this will no doubt be a very welcome help to those grappling with the costs of the next London Meeting, it also presents them with either a challenge, or a suggestion, whichever way one looks at it. If a loss in the centre of London is convertible into a profit in the Provinces, might one break even in the home counties?

For this success, and possible signpost for the future, thanks are due to the sterling efforts of the Organising Secretary Geoff. Worrall of Sheffield.

field. Geoff., with the support of Hon. Secretary Reg Waylett, and the Committee, did an excellent job. Thanks are also due to Mrs. Worrall, who, together with her helpers, coped ably and cheerfully with the reception desk, money, and paperwork on the day, and doubtless, as is the way with wives, coped with many other problems on the preceding days. The Hallam Tower Hotel also contributed very significantly to this success by providing a set of four pleasant interconnecting room areas, each with large windows overlooking the city. These areas provided in turn a lecture room, dining room and exhibition room with entrance hall and bar, all for the price of lunches and bar takings.

The Meeting also benefitted by attracting people from far and wide. The London contingent was well balanced by a party of members and guests from Scotland. Our old friend Hughes Ryder from the U.S.A. was there; his presence seems to have become almost *de rigeur* at these meetings, an encouragement to those who feel the distance too far to travel! Once again we welcomed Dr. J. Haspels from Holland, this time as our guest speaker. It was good to see a sprinkling of brand new Members as well as the old stalwarts.

During the early part of the morning a crush of over a hundred people milled happily and excitedly around the exhibition of boxes, which more than compensated in quality and interest for any lack of quantity. Singling out individual boxes can invite invidious comparison or display

A happy group Hughes Ryder; Geoff. Worrall, Organising Secretary; Mrs. Marjorie Burnett; Cyril de Vere Green; Mrs. Bertha de Vere Green.





Dr. Robert Burnett with a proprietary hand on his beautiful overture box.
Director Jan Jap Haspels of Utrecht with his mechanician Dick van Minnen.

eccentricity in the reporter's tastes, but no one could deny the impact of Geoff. Worrall's 33 inch Komet with bells, its brilliant clarity, echoing and re-echoing through the rooms, or of Dr. Burnett's Grand Format 41,000 series Nicole Freres overture box, superbly restored and repinned by Member George Worswick. This box was almost unbelievably perfect, its intricately patterned lid promising great things which were in no way belied by its immaculately gleaming movement. The box, ostensibly of conventional four-air design, in fact played one overture through four revolutions and would only stop at the end of the whole overture. Its rendering of Mansaniello, by Karafe, was superb. John Reynolds displayed a rather lovely three overture Nicole Freres key-wind, repinned by Keith Harding, which sounded beautiful, Graham Love a very good Nicole Freres 'two-per-turn', Mr. Alflat a Baker Troll organ box and Mr. Tissiman a P.V.F. as musical as could be wished for.

Although he was, happily, well enough to be present, Dr. Burnett had recently been very ill, and was unable to give his talk 'Quality in Musical Boxes'. Arthur Ord-Hume stepped manfully into the breach with a talk on early mechanical organs, delivered with his customary erudition and panache. His theme was based on the very interesting observation that while gramophone recordings provide evidence of past musical styles only back to about the turn of the century, before that only mechanical music can add stylistic evidence of the music we read on the printed page. Serious musicians



may smile at mechanical music, but Arthur's reply was to play a recording of a ten foot high barrel organ in Leipzig which was pinned by an 18th century craftsman. This provided evidence of the embellishment and harmonisation by a real 18th century man, and not a 20th century musicologist. From that point Arthur treated us to an illustrated tour right up to the late 19th and early 20th centuries, including dance and fairground organ music.

After an excellent lunch, Dr. J.J. Haspels, Conservator-Directeur of the Nationaal Museum Van Speeldoos tot Pierement in Utrecht, Holland, presented a fascinating illustrated talk about his museum. This extremely knowledgeable but modestly charming young man held his audience spell-bound for most of the afternoon. He showed a large number of pictures, describing each instrument at the same time, with great artistry, each picture being held just long enough to see and understand. His very English sense of humour was much appreciated, judging by the gales of laughter as his light hearted comments, although when he mentioned some of the things which had been given to the museum, there was an audible sigh of envy and a muttered 'No one ever gives me anything like that' which brought, in turn, a smile from Dr. Haspels.

Once again selection may tell the reader more about the tastes of the reviewer than about the multifarious treasures of the museum; but I remember most vividly a Black Forest clock with wooden wheels and glass bells, a large book playing Libellion clock, a Hupfeld violin player, and a Philipps Paganini orchestrion, to name but a few among the host of others. With encouragement close to insistence from both the audience in general and Mr. de Vere Green — the next billed speaker — in particular, Dr. Haspels continued through Dawkins; Lecoultre; Kalliope; Atlas; Gavioli, and Mermod, until the last slide was shown. Time had stood still for us all and the tea interval was surprisingly close. Mr. de Vere Green, with usual air of gracious bonhomie decided to give a very shortened version of his talk on musical snuff boxes and with great skill and some help from Geoff. Worral with the tape recorder controls, produced an impromptu selection of pictures and sounds, of which the highlights were, perhaps, his beautiful photographs of some very fine snuff box lids, in particular a close up of the Coliseum in micro-mosaic showing details of its superb craftsmanship.

It was the sight of these boxes in the 'flesh' after they had been shown on the screen that

caused quite a group of Members to gather round Cyril de Vere Green who was sitting at a table with eyeglass and treasures before him, still patiently answering questions long after everything was being packed away and carried out. The reluctance of Members to let him go was a further confirmation of a most exciting day.

GRACE THOMPSON

Photographs by Alfred Thompson

CLASSIFIED ADVERTISEMENTS

THE MUSICAL BOX SOCIETY OF GREAT BRITAIN cannot hold itself responsible for any article, or the skill of any person, advertised in this journal.

WANTED

WANTED: Member with Nicole Freres key-wind needing repair wishes to acquire 15½ inch (upright) Polyphon movement. Anyone interested in an exchange? Michael Miles, Robertsbridge 614.

WANTED: Member requires the following: can anyone help? 15½ inch upright Polyphon bedplate assembly; 195/8 inch Polyphon motor. Also discs for 195/8 Polyphon; 12¼ Regina; and 8¼ Symphonion. Other discs offered in exchange if required. Michael Miles, Robertsbridge 614.

WANTED: motor and governor for 17¼ inch Stella, or complete scrap machine. Will buy or exchange. Neale, York House, Warren Park Road, Hertford, Herts.

WANTED: discs for 9½ inch Symphonion. Will buy, or exchange 195/8 or 15½ Polyphon discs. Neale, York House, Warren Park Road, Hertford, Herts.

WANTED: a Welte "98" (green roll) reproducing grand piano, or a Duo-Art, or an Ampico grand (model B), or would consider a late model upright in good operating condition, complete with rolls. Write: D.B. Fillinger, 36, Rue Vermont, 1202, Geneva, Switzerland.

WANTED: organettes and barrel organs.

FOR SALE: nine Symphonion discs 75/8 inches. Offers to: K.G. Parrott, 50, Hillmorton Road, Rugby, Telephone 3724.

FOR SALE

FOR SALE: 80 rolls for an 88 note Kastanome, all in excellent condition. H.W. Turner, 230, Sudbury Heights Avenue, Greenford, Middlesex. Telephone: 01-902-5788.

TENTH ANNIVERSARY AND SOCIETY AGM REPORT

THE Tenth Anniversary and Annual General Meeting of The Musical Box Society of Great Britain was held on Saturday and Sunday, June 2nd and 3rd 1973 at the Kensington Close Hotel, Wrights Lane, London, W.8.

Overseeing the registration we had that most efficient and seemingly irreplaceable pair Mrs. Sarah Tallis and Mrs. Marie Waylett, and as usual the raffle was profitably and capably handled by Mrs. Jo Webb. The rooms provided by the hotel were excellent and spacious.

The first lecture of the day was given by Keith Harding, and was about the book 'De Naturae Simia' by Robert Fludd, otherwise known as Fluctibus. Some most interesting slides of various pages of the book were shown and the talk was concluded with a discussion from the floor. That part of the book dealing with mechanical music is full of fallacies and dream children. Even so the conclusion seemed to be that the ideas, extensions of earlier theories of Hero and others represented some attempt, however lacking in practical application, to add to the then meagre knowledge of the subject. A good translation of the text, which is in Latin, would make an interesting study.

The talk by Terry Hathaway of California which followed contained some interesting glimpses of, not only some American machines, but also little known parts of the United States. Terry's delivery of the talk was fast and sure and he took us into details of the Encore Banjo as neatly as he took us into some rather seedy parts of his country. One could almost hear that sometime familiar cinema voice rolling out 'and so we say farewell' etc., as Terry brought his talk to a close. In the ten minutes allowed him by lack of time, Claes Friberg gave us an ingenious run-down on points to take into account if contemplating opening a private museum of mechanical music. The points were: 1. Create interest. 2. Entertain. 3. Inform. 4. Preserve. 5. Survive. Claes made it all seem very easy and not a little amusing. Anyone who has visited the M.M.M. in Copenhagen which Claes runs, however, will know that a lot of hard and serious work goes into such a project.

Not the least of the problems is the last mentioned – the survival of the Director and his family.

Lunch was followed by the A.G.M., chaired by our President Cyril de Vere Green. During the Hon. Secretary's report it was learned that no fewer than 140 new Members had joined the Society in the last year, bringing our membership total to 520. This good news was followed by the bad news that the work of the Secretary was getting out of hand. Your Secretary badly needs some voluntary help!

The report of the Hon. Treasurer gave us another sad fact. We found that the Society virtually stood still with its finances in 1972. After discussion a vote was taken and the decision made to raise the annual subscription to £4.00. A further vote was taken to decide whether an entrance or initiation fee of £1.00 should be charged to all new Members. The voting being extremely close the Chairman decided to refer the proposal to the Winter Meeting.

The Hon. Editor reported formally and then thanked every one for their help in supplying material for the Journal. He ended by wishing the incoming Editor good luck.

The election of Officers to the Committee was concluded quickly since there was no opposition to any of the incoming Members. The new Committee is now comprised:

President	C. de Vere Green Esq.
Vice President	D.A.R. Tallis Esq.
Hon. Secretary	A.R. Waylett Esq.
Hon. Treasurer	W.K. Harding Esq.
Hon. Editor	A.W.J.G. Ord-Hume Esq.
Active Members	R. Baines Esq. S. Cockburn Esq.

Under 'Any other business' a vote was taken as to whether the Society should publish a full Directory of Members every 5 years, or a List of Members every 2 years. The vote was strongly in favour of the List of Members every 2 years, and so it was decided.

A talk by Bruce Angrave followed the A.G.M. and provided welcome light relief. Bruce, ever able to keep us enthralled, used a talk recorded for the B.B.C. in 1964, illustrated with slides. Among the slides were, I am glad to say, some of his inimicable drawings.



Above: Claes O Friberg itemising the five important considerations in establishing a museum. His planned talk on Hupfeld had to be postponed due to the shortage of time and the extremely full programme. Top right: Cyril de Vere Green receiving from Hughes Ryder a plaque from the Musical Box Society International. Below right: A further presentation from the Musical Box Society International to our Society in the form of a gavel and block. The full story of these awards is to be found on page 30. Below left: Arthur Ord-Hume indicating missing projections on a disc during his lecture on methods of replacement.



The presentation by Hughes Ryder of his talk on 'The Capital Cuff Box' seemed to me even better than the original, given some years ago, which he was requested to repeat. An interesting story of a most interesting machine and its makers.

After Hughes Ryder we were treated by Howard Fitch, Hon. Editor of the Journal of the M.B.S.I., to slides of San Francisco, venue for the Annual Meeting of that Society for 1973. This was followed by views of the New Jersey venue for the 25th Anniversary Meeting in 1974. The suggestion was that we should attend one, or better still two of these Meetings. Well, it's a good idea, and air fares are getting cheaper all the time!

The Annual Dinner, attended by some 80 Members and guests, was a great success. During the dinner Mr. Cyril de Vere Green was presented with a plaque for his outstanding services to mechanical music. A further presentation was made, of a gavel and striking plate, to The Musical Box Society of Great Britain on the occasion of its 10th anniversary, both presentations were made on behalf of The Musical Box Society (International), by Hughes Ryder, Hon. Treasurer and Trustee of **that** Society. After

the dinner which was excellent, Hughes, who was the main speaker, showed a very rare and interesting film of a meeting before the founding of our Society. The film was taken in 1962, and shown in it were Hughes himself; Hon. Murtagh Guinness; Gerry Planus; Alan Ridsdell; Philip Radford, and, seen by many for the first time, John E.T. Clark, first President of our Society.

On Sunday morning the proceedings opened with a lecture by Arthur Ord-Hume on replacing projections on discs. Arthur has that enviable knack of taking a mundane subject like this and turning it into an interesting and humorous discussion which makes an hour seem like ten minutes.

There followed a talk by Keith Harding with slides and Cliff Burnett with a practical demonstration, on the repinning of cylinders. This was very well received and sparked off a great variety of questions. During the latter part of this demonstration the audience split in two, some of them going to watch David Tallis dismantle and re-assemble a cylinder musical box. David not only did this with panache but accompanied his dramatic actions with a stream of advice, all, I am sure, very good.

G.W.

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FROM THE MUSICAL BOX TO THE PIANOLA
FROM AUTOMATON LADY VIRGINAL
PLAYERS TO ORCHESTRION

ARTHUR W. J. G. ORD-HUME

Illustrated with contemporary material

During the twenty or so years in which I have been working with and collecting mechanical musical instruments, I have amassed a great deal of information and history, a fair proportion of which has been published during the past eight years in the *Journal of the Musical Box Society of Great Britain*, *The Music Box*. Many of the early issues of that limited-circulation quarterly publication are now long out of print and back numbers are as scarce as the proverbial gold dust. Some of the material herein is from those editions and all of it, I venture to suggest, is deserving of a wider audience.

What are you going to find in here? For a start, there is a complete catalogue of Polyphon musical boxes, published in the early 1900s. There is a catalogue of barrel organs, original descriptions of organettes, a facsimile of a very rare treatise written by Vaucanson on his incredible automaton duck, a description of a visit to a street barrel piano factory in the 1900s, a reprint of the classic and very scarce Jacot musical box repair manual, an interview with the inventor of the disc musical box in 1885, a description of a concert given by an automaton violinist, a catalogue of Aeolian Orchestrelle player organs of seventy years ago, a rare catalogue of carousel organs made in Waldkirch by Ruth & Söhne, and so on. Oddities and the unusual abound—such as the American Steam Man and Tipu Sahib's macabre 'Man-eating-Tiger-organ'. Then there is the Steel Tarantula Spider and the Anthropoglossos. . . .

CONTENTS 1. Mechanical Music in Antiquity 2. Automaton Displays and Museums
of Ingenuity 3. The Early Musical Box 4. Tin Discs and Music for the
Masses 5. Orchestrion Organs and Automatic Orchestras 6. Parlour
Organettes and Self-Playing Organs 7. Player Pianos and a Maestro in
Every Home 8. The Gramophone 9. Miscellany APPENDIX—Names
of Instruments and their Makers

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THE MECHANICS OF Mechanical Music THE ARRANGEMENT OF MUSIC FOR AUTOMATIC INSTRUMENTS

ARTHUR W. J. G. ORD-HUME

The first practical treatise on how to set music on an organ barrel was that written in 1775 by Father Dominique Joseph Engramelle. His writings were expanded three years later by a Benedictine monk, Dom Bedos de Celles, who not only described in copious detail how to transcribe ordinary musical notation into the wire pins and staples of an organ barrel, but added a valuable treatise on musical ornamentation. His terminology was somewhat archaic but his instructions, in the form of highly-detailed engravings, were remarkably thorough and are as practical today as they were two hundred years ago.

MECHANICAL MUSIC is a modern treatise on how barrel pinning was undertaken and is based directly on the original French. It includes in entirety Dom Bedos' outstanding illustrations showing graphically, in the form of sections of the organ barrel, how a musical score is treated by the barrel-noter.

The instructions given in MECHANICAL MUSIC are such that they can be applied with equal facility to the arrangement of book music for fair-organs, paper strip music for organettes, or even player-piano rolls.

Shortly before the First World War, the Leabarjan Company in the United States produced a home perforating machine with the aid of which anybody could punch out their own music rolls for player pianos. Although naturally referring to the Leabarjan perforator, long, long since defunct, the booklet published by this company not only gave a fair amount of detail as to how the machine worked, but contained a lot of sound, practical information on how to set out and cut piano-rolls at home. These instructions are also reproduced in MECHANICAL MUSIC.

Two complete musical scores for pieces of 18th century music are included, combined with comprehensive instructions how to pin these on a barrel. The same instructions will serve for punching cardboard music. So detailed are these instructions, illustrated by the original 18th century engraved plates, that no musical knowledge is needed to set out the music. There are 28 fine-line engravings – ten of them double-page – providing pinning information and illustrating the special tools and techniques used. MECHANICAL MUSIC is an indispensable handbook for the practical reader who wishes to experiment either in 18th century musical embellishment for keyboard music, or in the arrangement of music for a self-acting instrument

published by the author

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£3.90 (£4.14 or \$ 12.00 inclusive of postage and packing)

QUESTION AND ANSWER

by Keith Harding and Cliff Burnett

Mr Pierre Germain of Switzerland writes:—

Answering your request in the last issue of 'The Music Box', please find the following information concerning a Nicole Freres, I recently bought.

Serial Number : 28404 Gamme number : 1136.

Unfortunately, the tune sheet is missing. If, by any chance, you could find the tune list in your files, I should be extremely grateful to hear from you. Apparently, the tunes are Scottish songs. The cylinder has also a number (2412) which is stamped in two places while the gamme number is scratched on the left side and on the first lead resonator. What is the meaning of the 2412 number?

I hope to attend the meeting on 2nd and 3rd June in London and have the pleasure to meet you.

Intending to stay a few days in London I would like to visit you at the Hornsey Road too.

We do not have a record for this gamme number at present, but your name is now in our files as owning a box with this number, and as soon as another one turns up we will let you have the programme.

The number 2412 which is stamped on the cylinder in two places is not original to the box, but is Messrs. Baud Freres repinning number. We prefer to mark our repinning numbers more discreetly.

You say that the gamme number is scratched on the left hand side of the cylinder and on 'the first lead resonator'. Please call it 'the first lead tuning weight'. It is not a resonator as it does not resonate, and this is a wrong name given to it by an early writer on musical boxes before the correct terminology was established.

We were pleased to have details of Mr. Wetherell's Nicole Freres Pianoforte Overture box for our records. The winding key with lever and ratchet were only supplied with boxes of exceptional quality.

Howard Hope of Exeter, Devon, writes:—

I have just obtained, very cheaply, a Victorian Swiss cylinder box of the run-of-the-mill kind, 12 tunes

on one barrel, cheapish inlaid case etc. The most important part — the comb — is missing but as complete value would be around £85 and I bought this box for a fiver I thought it worth taking at the time. The remainder is perfect — the original comb having been taken out and simply 'lost' years ago. Could an expert make a single comb for such a box if provided with the mechanism to take measurements from? Obviously I could afford a fair sum of money to complete — but if it is impossible nowadays or too much I will break the box for spares.

It is theoretically possible to make such a comb, but it would not be easy to find the tuning scale. To do so, the positioning of the pins on one tune would have to be plotted, perhaps on graph paper, and the chord structure worked out. When it was possible to write the tune on music paper and play it on the piano we would then have the tuning scale. So, yes, it would be possible, but very, very definitely it would not be worth it except in the case of a special box, and even then it would only be economic by way of a hobby. Even given the tuning scale, there is no one at present offering a service of making entirely new combs. However, do not break this box or any other box up for spares unless you actually need them, so that posterity will have a chance of doing what you could not do. I have in the past bought many boxes for spares that were not then worth repairing, but many such boxes which we could not bear to break up because they had once been good can now be repaired, and we are so glad to have saved them.

With our collection of data on Nicole Freres, including tuning scales, and the fact that Nicole Freres employ so many standard parts, the time will come in the foreseeable future when we will be making entirely new Nicole combs, so please, dear reader, do not break up any Nicole Freres boxes for spares, whatever the state of the comb, or lack of it, or you will live to bitterly regret it.

J. Stafford of Shoreham-by-Sea writes:—

I have two questions that I should like to put to Question and Answer.

1) I have a cylinder box with a type of air brake that I have not met before. It is a brass ring 7 mm wide, 13 mm internal diameter, with one wing of brass 28mm long by 14mm. wide, this wing lies inside the ring but cannot be upright as it is wider than the internal diameter of the ring. When I bought the box both the ring and the wing were loose on the top of the endless screw. The problem as I see it is whether the wing should be soldered to the top of the endless screw, or to be free to find its own position as the screw rotates. I have already soldered the ring to the endless screw. The wing has two tunnels in it half on one side half on the other through which the top on the screw goes. Should this wing be soldered to the inside of the ring or be a press fit or be free to find its own position?

The second problem is:-

I have just replaced three teeth and six tips that were broken off from a comb of 43 teeth. I now find that one of the teeth at the base end of the comb, that is one of the original teeth has a tip that is about 1/64 of an inch shorter than all the others and does not play as it just misses the pins.

Should I:-

- 1) ignore it?
- 2) put in a new tip?
- 3) hone down all the other 42 teeth until they are all level?

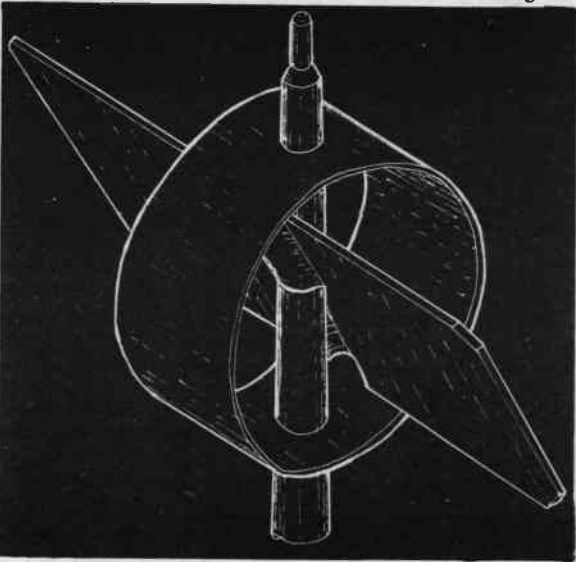
1. This type of air brake is found on some small late movements. Nothing should ever be soldered to the endless, as there is a risk of drawing the

temper and making it too soft, with consequent risk of bending and a run. The top of the endless is a long taper, and the air brake is always a push fit onto this. If the holes in the brass are too large they can be closed up as required by placing a large ball bearing over them and tapping it with a hammer. Holes should never be closed up by making punch marks round them. The wing is in one piece, and has a hole in the centre through which the endless arbor passes. When the wing is upright the arbor lies in what you call the tunnels. In this position it will give the maximum air resistance and the box will run at its slowest. The wing should be held in the desired position by friction against the inside of the ring, in which it should be a fairly tight fit. In answer to your question, it should not be soldered to the inside of the ring, or you will then have no way of regulating the speed, but nor should it be free to find its own position.

2. One tip is short on the base end of the comb. Should you 1) ignore it? Well at least this is safe, but as you have already successfully replaced six other tips, why not just replace this one and make sure the new one is the right length. 2) Should you put in a new tip? Answer: Yes. Should you 3) hone down all the other 42 teeth until they are all level? Now then Mr. Stafford! I am sure you are pulling my leg. Obviously honing down all the tips is going to play havoc with the tuning and ruin the box. Such an act of barbarian folly would be totally contrary to the basic principles of conservation, and I am sure you would not be capable of it. Oddly enough I have seen it done. I bought a very large three comb sublime harmony many years ago in the early hours of a dark and rainy morning at Bermondsey open air market, and did not discover the tragedy till I got it home. I have also found combs repaired with silver painted matchsticks in the same market, but that is another story.

George Speight of Richmond, Surrey, writes:-

Reference your appeal in The Music Box. I have a Nicole Freres box. The number 32040 is stamped on the bedplate and also on the left hand end of the cylinder (looking at it with the butterfly on the right); the number 40 is stamped on the right hand end of the cylinder. I cannot see any number scratched on the cylinder nor on the comb (unless it is on the underside). The tune sheet is missing, but I am told the cylinder contains arias from operas by Bellini. Sorry I cannot give more information. I should



be glad to allow any one with more expert knowledge to inspect the box.

The gamme number is often scratched fairly faintly, and can be difficult to see. Arrange the box with a good light, preferably daylight, shining on the end of the cylinder, and play the box until the number comes into view. It may be obscured with a film of dirt or oil, which can be wiped off. The gamme number is also scratched on the tuning lead of the extreme base tooth, but this is not usually visible without removing the comb. Likewise a number which may be scratched on the comb base under the tuning scale if any. As a matter of interest, I have recently found a gamme number scratched on the base of a comb with the Serial number stamped over it, indicating that this particular rather late box was allotted a gamme number before it was given a serial number. This is the sort of thing we must look out for when playing detective.

If your gamme number can be found, we may be able to let you have the programme. Incidentally, we use the term tune card to avoid confusion, with the name tune sheet which is sometimes used to refer to the discs of the disc musical box.

When sending us information about Nicole Freres boxes, please also let us know the number of tunes, and if possible the size of the cylinder and any unusual features.

We would like to thank the many people who have helped our research project by sending in details of Nicole Freres boxes, and continue our appeal for information on Serial numbers, Gamme numbers and programmes to be sent direct to us please at 93, Hornsey Road, London N76DJ, England.

Dr. N. H. Gale of Oxford, writes:-

I have recently acquired a small cylinder musical movement with single-piece comb in a tin box with loose lid which is so highly decorated as to lead me to question the theory that there were merely 'transit boxes', and should welcome further information about these miniature movements. The box in which my movement is housed is tinned on the inside, bearing the number 5 painted inside the lid and inside the box; the exterior is enamelled to resemble tortoiseshell, the top of the lid is elaborately decorated in gold leaf. The movement has a cylinder 3" long by $\frac{3}{4}$ " diameter, pinned to play three airs selected by a snail cam. The comb has 70 very finely cut and rather long teeth; the Geneva stop-work is not recessed into the spring barrel, which has a domed top. The brass bedplate

Queries for the Question & Answer feature should be sent direct to Keith Harding and Cliff Burnett at 93, Hornsey Road, London, N.7.

bears the number 970 in the bottom left-hand corner, and apparently no other distinguishing marks.

Is there anything yet established which enables Lecoultré boxes to be dated from the movement numbers? I have one box by Lecoultré Freres (with characteristic lozenge containing LF G^{ve}. stamped on the comb) which may help. It plays 8 operatic airs, is lever wound with glass covering the whole movement except the control levers, and has three control levers including an instant stop. The number 35200 is stamped on the brass bedplate, and the interesting thing is that the bottom of the box is inscribed in pencil with: 35200 21/12/67P. Perhaps this may date its manufacture as 1867, or before 1867? Incidentally this box is superbly set up, both in the bass and treble, and gives the lie to the myth that Lecoultré boxes are always weak in the bass. One last question which may perhaps do for the Question and Answer section. Is it ever satisfactory to partially repin a cylinder, and if so, how exactly can it be done? I seem to have a depressingly large number of boxes which partial repinning would improve marvellously, if only it is a practical proposition.

I hope that Dr. Gale's letter will stimulate someone to start collecting information on Lecoultré boxes, their serial numbers and dating just as we have done with Nicole Freres. We will be happy to help them in every way possible, but it is a task to be taken very seriously, and a training in Scientific method would be a help.

I do not think that Lecoultré boxes are weak in the bass if they are properly set up. The real trouble is that they tend to be tuned so sharp in the treble that the treble is unpleasantly shrill, and the comb may be taken back too far to counteract this, thereby weakening the base.

It is not practicable to partially repin a cylinder with one weak tune. Such a box will have to be repinned, and if you buy a box with a weak tune you must allow for the cost of repinning in the price you pay. Some really silly prices have been paid in auctions recently for boxes which have weak tunes and need repinning. If it is a case of an orchestral box, say, which just needs the drum section at one end repinning, that is possible, but the method has not yet been fully worked out.

GRAHAM WEBB ANNOUNCES

Many Members will now be aware that I have sold the lease of my shop
in Portobello Road.

I HAVE NOT SOLD THE GOOD WILL!

Although I wish my very good friend Jack Donovan all the luck in the world I have retained the good will of my business because I have other interests in mechanical music. It is in my blood, and always will be.

I am very pleased and proud to announce that I am in partnership with
Douglas Berryman, a fellow Member and a very good friend, in

THE WEST CORNWALL MUSEUM OF MECHANICAL MUSIC
Goldsithney, Penzance

Further I am a director, again with Douglas Berryman, of

THE WEST OF ENGLAND AUTOMATIC PIANO COMPANY LIMITED
Gears Lane, Goldsithney, Penzance. Telephone 0736-710679

I ask all of my good friends and customers to remember that I am still
an interested party and happy to be of service through one or another
of my interests.

Douglas and I cordially invite you to visit the Museum and enjoy our
instruments with us, remembering that none of the pieces in the
Collection is for sale. We have an entirely separate business for that, and
we invite your enquiries regarding what we have for sale. We tend to
specialise in **FULLY RESTORED** larger pieces.

Letters to the Editor

Member Patrick McCrossan writes:

I have recently been in correspondence with George Worswick, who has also written to you concerning Nicole gamme 158. Mr. Worswick mentions having two specimens with this number through his hands, with the same programme but with the tunes in varying order. By a coincidence I have also had two of gamme 158, keywind 32712 and leverwind 43025. I still have the keywind, the programme being:

- | | |
|-----------------------------|---------|
| 1. Marche de Figaro | Mozart |
| 2. Vedrai Carino. Don Juan. | Mozart |
| 3. O Dolce Contento. | |
| Flute Enchantee | Mozart |
| 4. Waltz No. 3. | Strauss |
| 5. Mon Coeur Soupire | Mozart |
| 6. Wiener Waltzer | Lanner |

(Standard six air eleven inch cylinder)

On the leverwind example tunes 4 and 5 were transposed, the arranger presumably thinking it a good idea to group the four Mozart pieces together.

This emphasizes the point that 'gamme' is basically the tuning scale, not a reference to the list of tunes, and there is no particular reason why the actual order of tunes cannot be varied, or in fact why one or two tunes cannot be altered, if they still fit in with a particular scale.

Fortunately (for tune identification purposes) Nicole did almost always associate a given gamme number with a fixed programme set out in a fixed order. From the records of hundreds of numbers accumulated by Keith and myself, gamme 158 is one of a very few isolated exceptions that have so far come to light.

A different and equally interesting point about this gamme is that it is a very low number. Reference to Keith's graph shown in the last Magazine would indicate that it was first used in the 1830's probably on a pre- 17000 box, yet it is still appearing a good forty years on, on a 43000 series box. Assuming that 158 was always associated with that mainly Mozart programme, it is obvious that it was popular over quite a period, and it would be interesting to know if any member has a further specimen with either a very early or very late serial number. To me this programme is one of the most enjoyable I have come across on a 6 air Nicole, both the examples mentioned being very well set up.

Incidentally, this programme is listed in the

report of the Wales & McCulloch catalogue of 1853 (Col. 3 No. 7.), the tunes being shown in the same order as on my box 32712, which although of about the same date, was supplied by T. Cox Savory & Co.

Now, if I may, a request: can we please have some more reprints of catalogues listing Nicole boxes?

The Editor writes:

Having in a weak moment given the Nicole Freres box, mentioned as mine, to my wife, I have been able to examine it at my ease. I have also asked the above Members to double check, to make sure no mistake is being made, at least in the observation of the evidence.

I find that Nicole Freres key-wind box number 35602 is marked on both bass lead and tune sheet with the Gamme number 158, Apart from the number 4 tune on this box being number 5 on Reg. Waylett's box, tune number 6, being La Coquette Polka, is entirely different to the number 6 tune on Patrick's 32712, Wiener Waltzer. The difference between a waltz and a polka is apparent even to me.

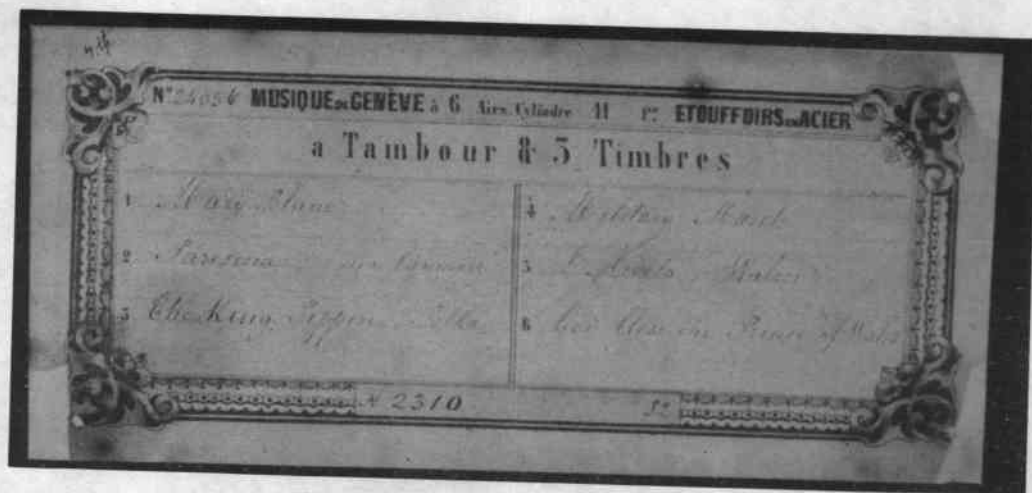
The list of tunes on Nicole Freres 35602

- | | |
|----------------------------|----------|
| 1. Marche de Figaro | Mozart |
| 2. Vedrai Carino, Don Juan | Mozart |
| 3. O Dolce Contento | |
| Flute Enchantee | Mozart |
| 4. Waltz No. 3 | Strauss |
| 5. Mon Coeur Soupire | Mozart |
| 6. La Coquette Polka | d'Albert |

The French *gamme* translates literally as *scale*, in fact the *gamme chromatique* is the *chromatic scale*, whereas the English *Programme* is the same in both languages. It seems to me that any tune which will fit the scale of a particular comb, and is suitable in length, or can be made so, can be included in the programme of the movement to which the comb belongs. How else can we have any number of interchangeable cylinders, with many tunes between them, using the same movement for which there is only one gamme number?

Dr. N. H. Gale of Oxford, writes:

The drum and three bells box which you kindly illustrated in Vol. 5. No. 6. 283, and ascribed to L'Epee. I am now, following the recent article by Dr. Roesch in the M.B.S.I. Winter 1973 issue, absolutely convinced is by L'Epee, since my box has no less than sixteen of the features listed by Dr. Roesch as characteristic of this maker. Perhaps the most important are the triangular oil hole in the spring barrel lid; the



The tune-sheet of Dr. Gale's L'Epee musical box

characteristic shapes of the governor cock, governor gear plate, and detent; glass lid sliding out from the left; threaded holes in the baseplate; U-shaped steel click springs; chamfered cylinder wheel gear; arrangement of treble notes; and bedplate of highly polished cast iron plated with brass over copper. I had been completely unaware of the last feature until Dr. Roesch's article caused me to re-examine my box; I had thought the bedplate to be solid brass. One interesting feature which may indicate that my box is earlier than any of the eight seen by Roesch is the very plain tunesheet (I enclose a photo), in contrast to the rather florid ones illustrated in his article. All-in-all a considerable verification of the Editor's own powers of observation, when one recalls that he attributed the box to L'Epee merely from a couple of photographs!

Member George Worswick of Bardney writes:

The research into Nicole Freres history has apparently failed to notice an odd item which has come to my notice.

It has been assumed that the Gamme No. referred to a particular combination of comb tuning and programme, including the order in which it is performed. Having at times a good memory, a recent repin I carried out for Graham Webb brought back the memory of the almost identical programme on a box of Reg Waylett's I had through my hands earlier. Both were Gamme No. 158, the former 35602, keywound, the latter No. 44272, leverwind. When returning Reg's box, I remarked that tune

No. 4 was usually known as 'Voi Che Sapete', from 'The Marriage of Figaro', by Mozart. I was about to make the same remark to Graham when I noticed a difference. His was tune No. 5. Both were entitled 'Mon Coeur Soupire' by 'Mozart'.

Naturally the combs would have identical tuning, if the scores were the same, even though the programme had transposed tunes Nos. 4 and 5. As cylinders would be pricked tune by tune, the order would be of no consequence. The finished cylinder would show some slight difference in appearance, if carefully examined. The word 'Gamme' means 'scale', musically. The scale has been un-altered, but the programme order is.

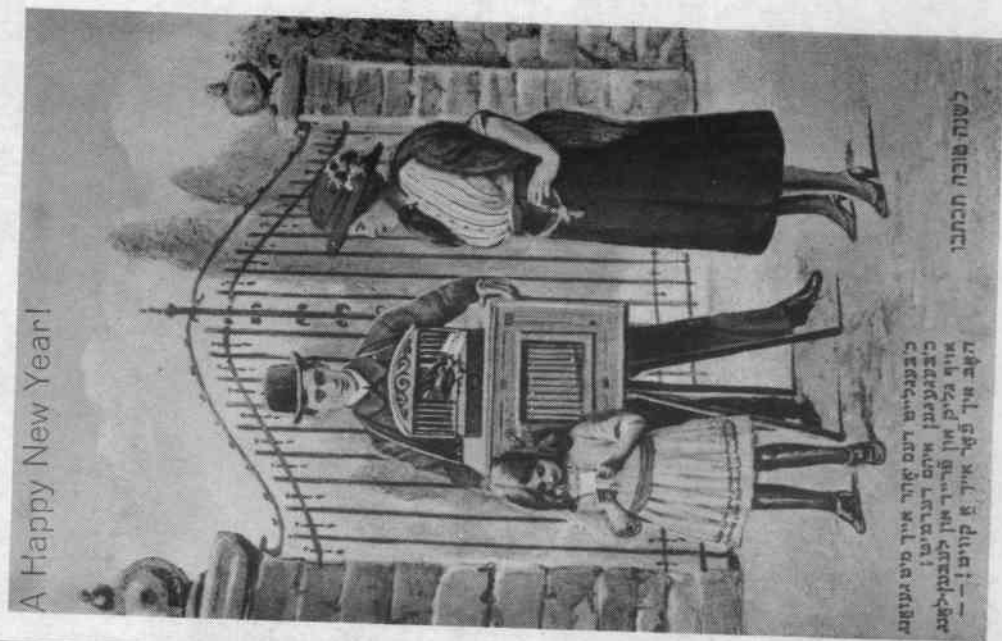
So beware, Keith Harding's carefully recorded programmes may sometimes be in the wrong order for your box. Any comments Keith?

Member Arthur Heap of Cheshire writes:

I was very sorry to read that you are resigning as Editor and as a member would very much like to thank you sincerely for the excellence of the 'Music Box' editions you have produced and which have been read from cover to cover immediately received, and later referred to for specific information required. As a Society we have been extremely lucky that members like yourself have been willing to give so much of their time, knowledge and experience for the benefit of the rank and file, may it long continue and I am keeping my fingers crossed that your successor will be able to maintain the high standards you have achieved.



The postcards on these pages are reproduced by kind permission of Mrs. June Dowsett of Exeter, Devon. They form part of her large collection. The pictures are mostly self explanatory and date from the first decade



of this century. They all appear to show barrel organs but the interesting part is that three of the five cards show live birds in conjunction with the organs. Unless this is poetic license on the part of the postcard manufacturers it points to a hitherto unknown practice, at least to the Editor.

THE MISTLETOE BOUGH.



Crossword Puzzle

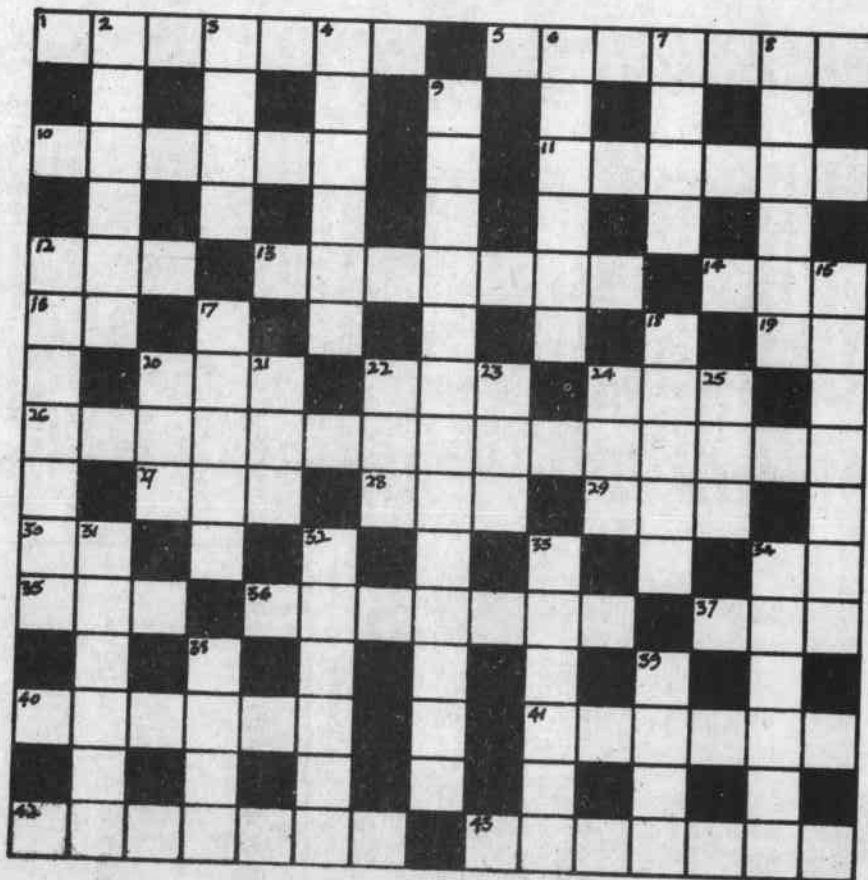
Compiled by A. J. L. Wright

ACROSS

1. Phonola seems to have been the operative word.
5. The cat and little donkey-o built many a street piano.
10. The measure of a musical-box maker.
11. A perch for bells.
12. Most musical box wheels are this.
13. What to do to that obliterated title.
14. Langdorf had one to help him.
16. Indefinite head of a planchette player.
19. The Harp Eolienne ends in this direction
20. Just the thing for recording!
22. She only needs one eye for Verdi's opera.
24. Dust or discs are equally at home here.
26. Recognised by hairpins, diamonds and glass slots.
27. Every box was this once.
28. The headless member of the train is a bit fishy.
29. What one wants to work in.
30. Rpyal monogram in the musical box era.
34. Hosts of M.B.S. meetings initially.
35. An eternity.
36. Lochmann might be called this of the disc box.
37. Such a case would sound a bit dead.
40. The pipe does.
41. This part of the disc is always missing.
42. Ye Gods! What an instrument!
43. Every player is the same to the uninitiated.

DOWN

2. Its name implies this book-player is uncommon.
3. The rare box is one of these.
4. The most rewarding thing to do to a musical box.
6. Windy instruments in a body.
7. Book-player sounds as though it will finish Meccano.
8. Two tunes per disc starts a knighthood.
9. In and out and round about draws the tune out, without doubt.
12. Only a bird in a gilded cage.
15. Home of that very popular disc ding-a-ling.
17. Piano builder or composer, as you like.
18. A Birmingham musical box agent, Begorrah!
20. Every one a note!
21. When you must have that bargain box.
22. Give Maria her head for a fine Polyphon



23. disc.
24. Everything from the beginning of Altez & Berguer.
25. This plate is old if its brass.
26. The girl in the Bornand Music Box Co.
27. Salford music maker.
28. Does this Polyphon clock have a Japanese movement?

33. Very prolific family of mechanical music makers.
34. The brewer and the organ builder like different shapes.
38. British or damper, - it moves either way.
39. The unknown part of Canon Wintle.

Solution on page 57

Book Reviews

CLOCKWORK MUSIC by Arthur W.J.G. Ord-Hume, George Allen and Unwin Ltd. £5.95. Illustrated.

If we start by saying that the title 'Clockwork Music' is misleading please do not imagine that I am complaining. On the contrary, to be promised a treat and given more is the dream of every small boy of whatever age, and I am no exception. To be precise (and perhaps a little pedantic) the book is mainly about clockwork or mechanical music but also contains a goodly amount of material on automata, which over the years have become closely associated with mechanical music whether they contain a musical movement or not. That some of the automata turn out not only to have no music but also not to be automata at all, just 'the half-machines of trickery and magic', is also a bonus in the opinion of the reviewer. It makes the book what it is: a conglomerate of interesting, exciting and often useful information.

Basically a book of reproduced material from many sources, including **THE MUSIC BOX**, Clockwork Music has some nine general groupings of ephemera which are linked with short chapters. Kept short, one suspects, deliberately and sen-

sibly. The material used is varied in the extreme, and gives an insight into many spheres which will give pleasure to the casual reader, while the whole makes another book for reference by those in search of knowledge in a more serious vein. That much of the content has already been seen in **THE MUSIC BOX**, as the author readily admits, is not so much a drawback as one might at first imagine. It has always been that Members tend to skip reproduced material in the Journal until they have 'enough time' to study it. The time hardly ever offers itself. Also, as the author again points out, many of the earlier Journals are out of print.

If one is to find fault with the book it is in the price, which seems rather high when one thinks that it is cheaper to print a page of already printed material than it is to set a page of typescript and then print it. One must however say that without doubt a deal of care has gone into the photographing of the material and this may well be partly the cause.

About the author, or perhaps more accurately the compiler of the book, little can be said that has not already gone before. A clever man, A.W.J.G. O-H. and his talents are well known to us all. On reading this book one feels that he has relaxed a little and is asking us to join him. He gives us the usual generous index, and a most helpful list of names and makers of instruments.

If you are short of earlier copies of the Journal the book will be essential, if not then it is at least one which the wife must be persuaded to buy for your next birthday.

G.W.

THE MECHANICS OF MECHANICAL MUSIC by Arthur W.J.G. Ord-Hume, 14, Elmwood Road, Chiswick, London W.4. £3.90. Illustrated.

Latest of the books to appear as a result of the researches of Arthur Ord-Hume, one of our very few seriously concerned writers on mechanical music, **The Mechanics of Mechanical Music** is probably the first serious attempt to explain the mystique of arranging music for playing mechanically this century. It consists of an excellent précis of the work of Dom Bedos 'L'Art du Facteur d'Orgues', and of others, including fully worked examples of pinning tunes for the barrel organ; a sadly much too brief reference to pinning barrels for street pianos; a reprint of an article 'How Piano Rolls Are Made', c.1912, by Harry Ellingham, and a reprint of the manual issued with the Leabharan music roll perforator.

Although at first glance this book is a manual for those who wish to 'do it themselves', it needs reading and re-reading most carefully. Further reference reading of at least one suitable book on musical terminology is also recommended

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before one should attempt to go beyond precise copying of the two listed examples of barrel organ pinning.

Unfortunately no reference has been made in the book to the essential differences between the pinning of barrels for an organ, where bridges can be used to sustain notes, and those for pianos, or indeed cylinder musical boxes. A completely different approach is required for the pinning of barrels for these machines, it is necessary to embellish the tune while arranging, with trills and runs etc., in order to 'fill in' the music.

The terminology used in the various reprinted articles is of so differing a nature that one feels that the book would have benefitted from a linking chapters spanning the hundred or so years between them, although the chapter dealing with the Leabarjan perforator, without a detailed constructional drawing is really of academic interest only, and not of direct practical use.

Although it would have been useful to have an explanatory chapter on the previously published material, for the benefit of those of us who have neither the knowledge or the library of the author, the material is well chosen and put together. The index, which we have come to regard as invaluable in books by Arthur Ord-Hume, is not too conspicuous by its absence but a short one would have been of assistance.

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All being said, the book is a unique example in a barren field. To envisage such a book, and to realise the idea, is an indication of the value of the author to our cause. All of those seriously interested in mechanical music will find it a must for their bookshelf.

D.B.

EXCHANGE. I have for exchange or possible sale 39, 61 note Phoneon organ rolls. Roger Booty, 3, Foxborough Chase, Stock, Ingatestone, Essex. CM4 9RA.

Grand Crossword Solution:

Across: 1. Hupfeld. 5. Tomasso. 10. Lignes. 11. Gantry. 12. Cog. 13. Reprint. 14. Son. 16. An. 19. No. 20. Pen. 22. Ada. 24. Bin. 26. Thibouville Lamy. 27. New. 28. Eel. 29. Den. 30. VR. 34. BR. 35. Eon. 36. Genitor. 37. Oak. 40. Speaks. 41. Centre. 42. Aeolian. 43. Pianola.

Down: 2. Unikon. 3. Find. 4. Listen. 6. Organs. 7. Arno. 8. Sirion. 9. Plerodienique. 12. Captive. 15. New York. 17. Weber. 18. Riley. 20. Pin. 21. Now. 22. Ave. 23. All. 24. Bed. 25. Nan. 31. Roepke. 32. Geisha. 33. Cocchi. 34. Barrel. 38. Rail. 39. Anon.

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Mekanisk Musik Museum

Lots of Activity at the MMM!

We've been very busy here at the Mekanisk Musik Museum lately. The Larry Givens Collection catalogue has been released, and orders are coming in nicely—for which we thank you! If you haven't sent us an order yet, there's nothing we would like better than to hear from you in this regard. There are many, many fine orchestrions, reproducing pianos, organs, coin-operated pianos, disc and cylinder music boxes, and other fine instruments in the MMM stock awaiting your selection.

We have just purchased for our inventory two large collections: The Nielsen Collection, one of Scandinavia's finest, contains over sixty items, including many interesting types of phonographs. The Armand Duval Collection was formed many decades ago in Switzerland. Following several exhibition tours in Europe the collection was sent to America. In the 1949-1952 years it was exhibited in Rockefeller Center and other centers around the United States where it attracted "millions of visitors and admirers," according to the many newspaper clippings acquired with the group. The late Adrian V. Bornand was a partner in the exhibition of the Duval Collection and supervised the instruments during their display.

Are You One of the 350?

In our opinion, being on the MMM mailing list is an absolute MUST for any active collector or dealer. Happily, about 350 members of the Musical Box Society International and the Musical Box Society of Great Britain have already sent their \$5 U.S. (or 2 pounds sterling) subscription for our next six catalogues. If you're one of these 350 you can look forward to lots of interesting reading and many good buys in the future.

IMPORTANT NOTE: Although we've sent out some sample copies to Society members in the past, this will be discontinued in the future. If you want to receive our large illustrated catalogues as they are issued, a subscription is necessary. As we know that some people think about this, we might mention that we're not making a profit by selling you six catalogues at our subscription price (this should be self-evident if you've seen our large Larry Givens Collection catalogue, for instance). The subscription covers our costs, or nearly does. Send your subscription today. Not tomorrow; today! Otherwise you'll miss what we consider to be the best buys in the business today!

GUARANTEE: You are not risking much by subscribing to the MMM catalogues. If for any reason you are not 100% delighted, the unused portion of your subscription will be refunded at any time—with no explanation necessary. Interesting and possibly significant note: as of this writing no one has ever requested such a refund!!!

So, "get with it," as they say—and send your subscription now!

Collections Wanted

If you're not an active buyer of instruments now, how about selling some instruments to us? We realize the time, care, patience, and love that went into the formation of your collection. When time comes to sell it is important to think the matter over carefully and to make the right decision.

We think the 'right decision' is to sell to the Mekanisk Musik Museum; to Claes O. Friberg and Q. David Bowers. And here's what we offer you in this regard:

*A fair price for your instruments. We're not seeking bargains. We know that quality is never cheap and that the market for choice instruments is strong. We're willing to pay generously for what you have.

*Immediate cash payment in full. We will pay you instantly for all items purchased. There's no waiting for your money. No delays or wondering what your instruments "might" bring at auction or on consignment. You get the price you want and you receive cash payment in full. And, all details of the transaction will be held in the strictest confidence—even the fact that you sold instruments to us, if you wish.

*An enjoyable transaction. We think you'll like doing business with Claes O. Friberg and Q. David Bowers. We're collectors and enthusiasts ourselves, and we will treat you as we would like to be treated. You'll also have the satisfaction that your fine instruments will be well cared for after we buy them and that they will find new homes with collectors who appreciate owning them.

The 'right decision' to sell to Claes and Dave has been made by others in the past. We've had the privilege of purchasing these outstanding collections (a partial list) in the past ten years:

The Cliff House Collection/Sutro Museum Collection; The Wayne Collection; The Marvin Collection; The Hamilton Collection; The Museum of Music Collection; The Bursens Warehouse Hoard; The Marvin Collection; The Eugene DeRoy Properties; Petersen & Steenstrup A/S; the recently-offered Larry Givens Collection; and the soon-to-be-offered Neilsen Collection and the Armand Duval Collection, not to mention millions of dollars worth of other instruments not included in this list. Follow the footsteps of 'those who've gone before' and make the 'right decision.' A friendly reception awaits you!

Holiday Planning

It is not too early to plan your holiday trip for the coming summer. We invite you to visit "Wonderful Copenhagen," Europe's fourth-largest tourist center (after London, Rome, and Paris). While you're here you'll want to visit the Mekanisk Musik Museum, of course!

If you're coming to see the MMM exhibit then we invite you to stop by anytime without advance notice. If you're coming to see a selection of instruments for sale, then it's best to write to Claes O. Friberg (our Danish director) or to Fritz Hartz (our museum tourguide) so one or the other can be expecting you, for many of the things we have for sale are stored in other locations around Copenhagen (the MMM simply isn't large enough to hold everything!).

"The Encyclopedia of Automatic Musical Instruments"

The first printing of the *Encyclopedia of Automatic Musical Instruments* sold out quickly. The second printing is now ready, and we've been shipping copies for several weeks from this new group. This 1008-page book is 8½x11" in size, weighs about 7 pounds(!), contains thousands of illustrations, and is what the Musical Box Society International review terms "the definitive book on automatic musical instruments." (Reference: review appearing on pp. 93-95 of the Christmas 1972 issue). Copies are available for \$25 U.S. funds to U.S. addresses; \$27 elsewhere. Q. David Bowers, the author, will personally autograph your copy on request. Orders from North American collectors can be sent to: Q. David Bowers; Box 1669; Beverly Hills, California U.S.A. Orders from European and Asian collectors can be sent to the MMM in Denmark. Our price includes postage. Your complete satisfaction is guaranteed. (We've sold hundreds of copies, and not one buyer has ever asked for a refund! However, quite a few buyers have ordered additional copies for use as gifts or to have a second copy for the office, etc.!).

Your Friends at the MMM!

At the MMM we enjoy instruments a lot. We would like to share our interest and enthusiasm with you. We look forward to your telephone calls and letters!

Mekanisk Musik Museum

Directors: Claes O. Friberg and Q. David Bowers

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