

From the Editors' Desk

Tempus Fugit - and how fast it does fly by! It seems amazing that this is Issue number 20 of our journal that we are welcoming you to enjoy.

The content of number 20 is as varied as our members' interests. While musical boxes still form the 'bed rock' of our collections our musical interests spill much further afield and encompass all manner of self-playing instruments, clockwork, automata, recorded sound via the gramophone and phonograph, together with the preservation and restoration of the instruments we enjoy.

Thinking of restoration, it is very good news that the Restoration book has again sold out. It is a valuable reference book, full of practical advice. If you have not yet obtained a copy please contact Paul Bellamy regarding a possible future print run.

It was thought to be appropriate to feature time passing in this issue - hence the musical bracket clock, together with a short article on a Black Forest barrel organ clock that had been a casualty in the Los Angeles earthquake of 1994 and has needed an extensive restoration. We have also included an article from the second edition of 'The Artificial Clockmaker' book, published in 1700, by Revd. William Derham on the setting out and pinning of barrels for chiming and musical clocks.

We were delighted to receive an article by Bill

Wineburgh about another interchangeable cylinder prototype musical box in his collection. The sharing and pooling of our knowledge is one of the more valuable and tangible advantages of belonging to our Association. Please keep your comments and observations coming - we love to hear from you.

David Soulsby's thoughtful article on charity collection boxes is delightful - we thoroughly enjoyed both text and illustrations and are sure that you will too. The ingenuity of the makers of these automata is amazing and David's article certainly enables the reader to appreciate their finer points.

The meeting at Petworth was a great success and Chris Fynes has done his usual fantastic job with the illustrations throughout the magazine as well as contributing the article on re-housing orphaned musical movements successfully. His meticulous and imaginative work is always fascinating.

In view of recent events with the Corona virus pandemic, advertised meetings may have to be abandoned or postponed. Please contact Ted Brown for the current situation before you travel.

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Chairman's Report

Well, congratulations to all on our Fifth Anniversary! My wife Kay, membership secretary, has asked me to thank all of you who have paid your annual subscription early or on time, as it makes her job a lot easier. If you pay by PayPal please address it to *ambcmembership@gmail.com* and kindly add an extra £1.00 (whether UK, Europe, USA or other country) to cover the PayPal commission charge. Also, would you please email the Treasurer (*bellamypaul@btinternet.com*) whenever a payment is made through PayPal or bank, so that we can keep a look out for it. Just to remind you, the current membership subscriptions are:

UK single £13 (two members at the same address £15); Europe £22 (£24); Rest of the world £28 (£30).

Please note that The Collector's and Restorer's Handbook is sold out and a further print run will only be made on payment of a refundable £25 deposit. P&P will be extra. Also please remember to send us your address. You can contact us by email at *bellamypaul@btinternet.com* or *info@ambc.org.uk*.

Don't forget if you live within travelling distance of the Old School you are welcome to bring friends for two visits to whet their appetites for mechanical music, after which we hope they will wish to join AMBC. To be a member it is not necessary to have a collection of instruments, you just have to enjoy listening to mechanical music and want to spend a fun day with like-minded people. We are planning to hold another auction towards the end of the year. Further details will be published in the next magazine.

Ted Brown

A FAIRYTALE MARRIAGE

I got to know Burnley fairly well, when, some years ago one of my sons owned some rental property there. I liked the place and was always happy to visit with him, not least for the pleasant walk across some parkland from our hotel to the antiques centre.

On one such occasion I spotted a small early fruitwood musical box. My excitement was soon dashed as it turned out to be just an empty box. It was in excellent condition, so what could have happened to the movement? They had no idea what it was and just a few pounds changed hands. It found its way into Chris's Christmas stocking and thence disappeared into his dungeon workshop for the next few years.

Orphan movements came along but they were always too big until, at the Rudesheim mart last November, he acquired a lovely little movement languishing, grubby and forlorn, in a tatty clock base. From his article (centre pages) you will see that it cleaned up beautifully, and better still it fitted perfectly into the little box like Cinderella and the glass slipper. And they lived together happily ever after.

Juliet Fynes

Officers of the AMBC

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Publication Dates for "Mechanical Music World"

Winter issue 28th January; Spring issue 28th April; Summer issue 28th July; Autumn issue 28th October

We need articles and advertisements (unless repeats) to reach the Editors at least one month in advance of these dates. Please allow more time for involved articles with many illustrations.

AMBC Meeting Dates

Please contact the host to ensure a place is reserved and for needs to be catered for. Include any guests you may be thinking of bringing. Also please advise if a booking has to be cancelled so that places can be offered to others.

Chanctonbury Ring at the Old School

Sunday 26th April - AGM, lunch provided

Sunday 14th June - Organ Grind, bring your own lunch, puddings provided

Sunday 13th September - lunch provided

Sunday 29th November - lunch provided

Meetings start at 10.30 a.m. in the canteen.

Please let Ted know if you intend to come.

Another AMBC AUCTION!
Saturday December 12th!

Musical Bracket Clock by Robert Roskell, Liverpool

by David Evans

This fine mahogany musical bracket clock (see front cover) stands 40" tall on its turntable base, so arranged that the clock can be easily rotated to see the back without having to lift it. The twelve tune movement plays on twelve bells arranged across the top of the movement and played from a pinned barrel. The clock was made by Thwaites and Reed of London in 1801, the name Robert Roskell, Liverpool, seen on the dial being the retailer. Thwaites and Reed tended to act as a trade supplier, making clocks for many of the "famous" makers of the mid-18th Century to the end of the 19th Century. The firm was established in 1740 and is still in business to this day. Amongst the many famous makers they supplied are Vulliamy, Ellicott, Dutton, Moore, Elliotts and many others.

The clock has an anchor escapement, three trains with fusees and strikes the hours in addition to the music - typical of English work at the time. The barrel has brass pins, which was traditional with clockmakers since the late 17th Century. Experience indicates that they wear very little over several centuries of use. In the course of restoration, the bells were sent to Whitechapel Bell Foundry to have the tuning checked and adjusted. They were almost certain to have cast the bells when new.

The off-white painted iron dial is a fairly early

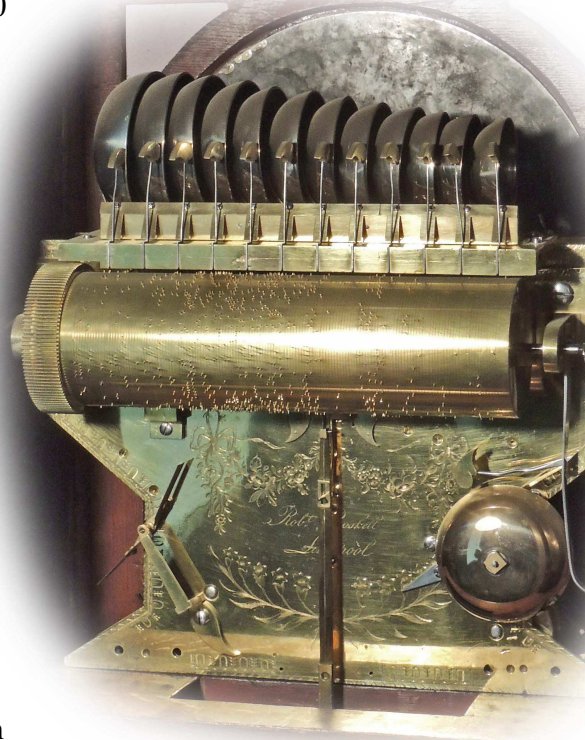
example of what was to become commonplace. Ten years earlier a clock such as this would have had a brass dial with matted centre, separate silvered chapter ring and ormolu spandrels.

The tune programme as indicated in the arch of the dial is:

1. **Tink-a-Tink**
2. **Batchelor's Hall**
3. **Jem of Aberdeen**
4. **Speed the Plough**
5. **Duke of York's March**
6. **Hail Columbia**
7. **God Save the King**
8. **Marcell
o i s e
Hymn**
9. **Minuet by
Green**
10. **104 Psalm**
11. **100 Psalm**

Many of these tunes were popular on contemporary chamber barrel organs as well.

A clock such as this would have been sold to one of the new 'Nouveau Riche' wealthy mill owners of Lancashire at a time when cotton (and child labour) was prevalent in Britain. They tended to build huge, opulent mansions in an attempt to rival the old-established estates of the nobility whose families had been established centuries earlier.



AMBC Meeting

Petworth, Sunday February 15th

An intrepid group of members braved storm Dennis to visit Petworth for this 'show and tell' meeting. Notably Paul Tucker drove all the way from Swindon, bringing with him an exquisitely restored early exposed-control cylinder musical box (picture 1). Stamped on the bedplate were the names 'Golay et F Lecoultre' and the serial no. 5476 (picture 2). Paul dated the movement to about 1829. It had a sectional comb in groups of five, adding up to 96 teeth altogether. This remarkable box played a fine selection of four pieces from Rossini's 'William Tell' including the overture 'March of the Swiss soldiers'. The newly made case was formed out of figured fruitwood in correct period style (picture 3).

Over coffee and cake two of Juliet's collection of composition snuff boxes were passed around. Both dated from around 1835 and were somewhat smaller, with metal hinges and of blacker material than the later snuff boxes with Laurencekirk hinges. One had a view of Milan and played two beautiful, but unidentified, tunes on a 68-note sectional comb. The other was decorated in a dainty Regency style design with a floral cartouche. Rather unusually it still bore its tune sheet identifying two patriotic French airs, together with the London retailer's label.

Tony Waddell then demonstrated another stunning cylinder box. It was a Langdorff, serial no 9899, dating to about 1857 (picture 4). The movement was in perfect original condition with no repairs to comb or teeth. The lid was rosewood veneered with boxwood inlay and banding (picture 5). The ratchet-wound movement had 125 teeth with a 33 x 5.5cm cylinder, playing 12 airs at 2 per turn on a slow turning cylinder. In order to achieve this speed, the reduction ratio of the governor is set higher than usual. The tunesheet lists a fine repertoire of tunes (picture 6), including a mix of Italian opera, waltzes and dance tunes by Verdi, Donizetti, Hoklenberg, Gung and Labitzky.

Next up was Anna Svenson with her Peerless Pneumatic Organ (picture 7), which she had meticulously restored. The lid bore a label for John G Murdoch & Co., London, retailers, wholesalers and import agents. It was marketed as 'The Fairy Musician'. Amongst the tunes played was a lively Music Hall song, entitled "Mary Ann, I'll Tell Your Ma". No doubt very popular in its day, it told the story of the courtship of Mary Ann, who seems to have had

quite a reputation.

At lunchtime two members went to check on their dogs patiently waiting in the car, whilst others took the opportunity for a wander around the town and a visit to the Antiques Centre. They failed to find any musical boxes but saw some very expensive gramophones.

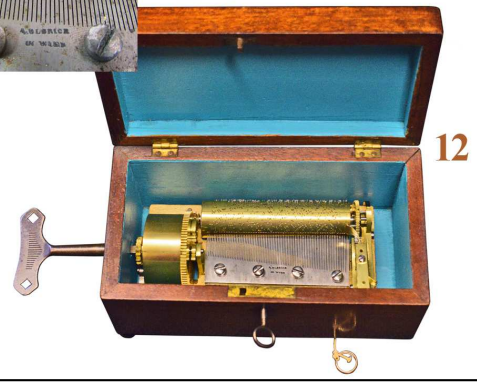
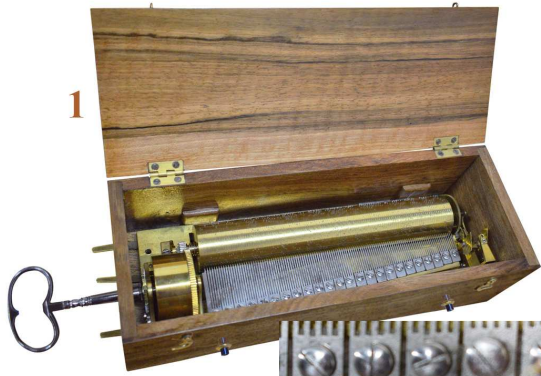
When we reconvened, it was Paul Baker's turn to demonstrate his three organettes. Of all the instruments from his collection he could have brought, or that Anna could have chosen from hers, coincidentally they both picked a Peerless Pneumatic Organ (picture 8), identical but for Anna's being a 'Fairy Musician' and perhaps slightly older. These high quality organettes were capable of fast-acting repetition of musical notes, playing 20-note scales with perforated paper rolls and endless paper bands. The mechanisms were invented by Merritt Gally in the USA. They were made and sold in that country as the 'Bijou Orchestrone'. They both played a variety of paper rolls to entertain us.

Paul continued with an Ariel Automatic Organ (picture 9) housed in a light oak case made by Maxfield & Sons Ltd, London. It played a 20-note scale with perforated paper rolls. He then entertained us with an Ariston Organette, model no. 9 (picture 10), which played a 24-note scale with perforated cardboard discs. It was patented by Paul Ehrlich, Leipzig, in 1887 and was sold originally by Keith Prowse & Co., London.

Finally, Chris Fynes played two of his cylinder musical boxes, both of which he had recently restored and re-cased. One of them is fully described on the middle pages of this magazine. The other was a two-air musical movement by A. Olbrich of Vienna. It has a tiny 10.5 x 2.5cm cylinder with long pins, playing on an 80-tooth comb. After cleaning the movement which was covered in verdigris (picture 11), he mounted the movement in an old tea caddy (picture 12). The tunes are operated typically by pulling a string cord at the base of the movement. One of the airs is the well-known ballad 'I dreamt I dwelt in Marble Halls' from 'The Bohemian Girl', an opera composed by Michael William Balfe.

After a few hours of good company, varied music and copious amounts of cake it was time to go out and face storm Dennis again.

Musical Boxes at Petworth Meeting



A 78 Revolution

by David Evans

As most of us probably know, the disc gramophone was invented by Emile Berliner, a German immigrant living in America, in 1887-1889. Berliner visited his home country in 1889 and by 1890 the German toy manufacturers Kämmer and Reinhardt had secured the rights to manufacture a toy version of the machine. The machine was hand wound by a crank handle. By 1894 Berliner in America was producing a similar machine for domestic consumption. In 1897 Eldridge R Johnson of Camden, New Jersey, had developed a small but reliable clockwork motor for the gramophone, which transformed its performance. Also in 1897, William Barry Owen of the Berliner Gramophone Company arrived in England to promote sales of the new Johnson machine, and helped set up the Gramophone Company in 1898, with offices at 31 Maiden Lane, London. Meanwhile, after a bumpy legal ride, Johnson in America had incorporated the Victor Talking Machine Company on October 3rd 1901.

At this time of course all recordings were made acoustically. Basically, performers stood in front of a recording horn, the sounds mechanically vibrated a stylus that cut a modulated groove in a soft substrate to form the master recording. However, from 1919, J P Maxfield and H C Harrison of the Bell Laboratories (part of American Telegraph & Telephone (AT&T)) were experimenting with electrical methods of recording. They used capacitor¹ microphones, two-stage² amplifiers and balanced armature moving iron recording heads³ to engrave the groove, using electrical power rather than acoustic to provide the recording. This gave a considerable improvement in frequency response – higher treble notes and lower bass notes.

The manufacturing arm of AT&T, Western Electric Company, became the licensed owner of the process. An offer was made to Victor Company in America to extend the licensing, but they rejected the offer, a decision they probably regretted later. The Columbia Phonograph Company, however, accepted and gained a Western Electric license to manufacture records using the new process.

Western Electric sent their first master waxes to the

Pathé factory in New York to be processed. Two Pathé executives decided to share news of the invention and some pressings with Louis Sterling, managing director of Columbia Graphophone Company in London. Sterling was so impressed that he immediately set sail for New York, where he purchased the American Columbia firm and thus acquired the Western Electric license to manufacture electrical recordings. At this point, Victor/Gramophone Company also acquired a license, so the industry giants now could produce the new records.

Columbia and HMV discs first appeared on the market in the summer of 1925. Early Columbia electrical recordings can be identified by a small letter W in a circle, impressed into the shellac.

Whilst HMV/Victor continued with the Western Electric system, Columbia moved to a new process developed by Alan Dower Blumlein in England in 1929, which overcame some of the technical issues, such as high sensitivity to background noise and some distortion.

So now the race was on to develop a means of playing back the new records electrically. The big gramophone manufacturers of course brought out new acoustic machines to play them, such as HMV's re-entrant series – Models 163, 192, 202 etc – and American Victor's similar Orthophonic range, but inevitably these were really a stop-gap.

One of the pioneers of electrical players was the Brunswick-Balke-Collender Company in Chicago. The firm was established in 1845 as a maker of fine furniture and were especially renowned for their pool tables. The firm became involved with record playing machines and records in 1916, when they issued their first vertical cut ('Hill and Dale') discs, but by 1920 they were issuing lateral-cut discs. They soon built up a great collection of international artists in classical and popular music and became one of the premier record labels in both North America and Britain. They also designed and manufactured record playing machines. The first group was of eight models of the Brunswick players. Some featured their specially designed Ultona

soundbox, that could be set to play Pathé vertical-cut records as well as lateral-cut. There was also a version known as 'All-Phonographs-in-One' that could play Edison Diamond Discs as well (Figures 1a, 1b & 1c). On March 1st 1924 Brunswick signed a deal with RCA to supply Radiola radio receivers



Fig 1a: Brunswick Ultona soundbox set up for needle-cut records. The tone arm is telescopic, to set the tracking.



Fig 1b (above): Set up for Pathe discs

Fig 1c (below): Set up for Edison Diamond discs



for incorporation in their range of machines.

At first Brunswick incorporated the Radiola IX^{4,A} receivers into their acoustic machines for their 1924-25 season as well as supplying them to the after-market sales department. For the same season, Victor Talking Machine Company merely supplied some of their Victrolas with a blank panel so that a radio could be installed later. By September 1926, only a year after the introduction of electrical recordings to the market, Brunswick were advertising their latest machine, the Panatrope, which was about to go into production (Figure 2).

**MOST MARVELOUS MUSICAL INVENTION
IN WORLD'S HISTORY**

The BRUNSWICK PANATROPE

utilizes newly discovered electrical processes to bring you music and radio of a beauty hitherto unknown

The Brunswick Panatrope is the world's first purely electrical reproducing musical instrument. The new electrical method of recorded music reproduced on the Panatrope resembles the photographic process so closely that this amazing discovery is often called "music by photography."

THE PANATROPE is the joint achievement of four of the most widely-known institutions in the fields of electricity and acoustics: Radio Corporation of America, General Electric Company, Westinghouse Electric & Manufacturing Company, and The Brunswick-Balke-Collender Company.

Amazes critics

Although perfected less than a year ago, this new reproducing musical instrument has been heard by more than four million persons. When first demonstrated, it was given front-page space by the great metropolitan newspapers as the most important musical development of the age. Critics were no less enthusiastic. Nothing in the whole world of music ever created such profound interest and attention.

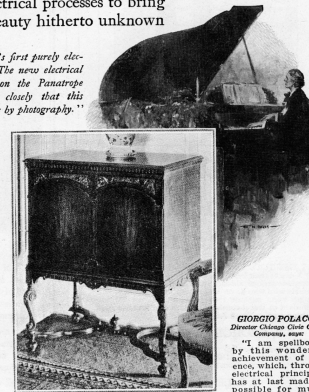
The Brunswick Panatrope may be had either alone or in combination with the Radiola Super-heterodyne. Thus it puts at your finger-tips all recorded music and the programs of radio as well. Operates entirely from the light socket; no batteries or outside wires needed.

Another triumph

Brunswick has also developed another musical instrument, as yet unnamed,* for bringing out the music of the new records. In tone quality and its ability to reproduce the entire musical scale, we believe this instrument represents a very great advance over anything in existence, save the Panatrope. It dispenses with the electrical mechanism of the Panatrope, and its prices are lower, ranging from only \$115 to \$300 (slightly higher west of the Rockies).

Certainly you must hear these wonder instruments. Your musical judgment will confirm the verdict of the critics that there is nothing in the field of musical reproduction equal to them. It is hardly necessary to suggest that before

THE BRUNSWICK-BALKE-COLLENDER CO., General Offices: 623 S. Wabash Ave., Chicago



The Brunswick Panatrope, Model 10. Finished in highly figured walnut. Price \$650. (Slightly higher west of Rockies.)

GIORGIO POLACCO
Director Science Class Opera
Company, Rome
"I am spellbound
by this wonderful
achievement of sci-
ence, which, through
electrical principles,
has at last made it
possible for music
lovers to hear their
favorite artists ab-
solutely as perfectly
as if they were in
their presence."

buying any musical instrument or radio, you hear the Brunswick Panatrope, the Brunswick Panatrope & Radiola and the new Brunswick musical instrument as yet unnamed.* Brunswick dealers will gladly demonstrate these instruments. If there is no Brunswick store near you, write us.

***\$5,000 for a name**

To find a suitable name for the new Brunswick instrument described above, we offer 3 prizes totaling \$5,000 for the best names submitted with slogan not exceeding 10 words describing its music. Write for free booklet giving all details. Address Dept. P-101.

Brunswick
PANATROPES - RADIOLAS - RECORDS

Fig 2: Brunswick advertisement from late 1926

This was billed as "The Most Marvellous Musical Invention in the World's History" and could reproduce the new records 'perfectly'. It was also fitted with an RCA radio, so qualifies as probably the world's first all-electric radio-gram. The electrical components were provided by the Radio Corporation of America (their Radiola radios – one of several models could be included in the package), the General Electric Company and Westinghouse

Mechanical Music World

Electric and Manufacturing Company. A later advertisement, from winter 1927, states that "Last Christmas you could not buy the Panatrope". It also mentioned the \$5,000 available to competition entrants for a suitable name for the latest Brunswick acoustic machine. This was priced at 'only' \$115 to \$300, whereas the Panatrope in its various guises was priced between \$350 - \$1250 – this latter being equal to about \$50,000 (or about £30,000) in today's money.



Figs 3a: Brunswick Panatrope, 1927

The Panatrope illustrated in Figures 3a and 3b is Model PR-138-C with a Radiola 28 8-valve ('tube' in America) top-of-the-range radio and was introduced in 1926 at a price of \$1,100. Its performance is certainly amazing compared with HMV re-entrant machines. It was only a matter of time – actually a month or so – that Victor followed suit with an almost identical specification machine with units from the same manufacturers. Victor produced several models with battery-operated Radiolas that played through their Orthophonic horn, using a driver that could replace the soundbox on the tone arm of the acoustic gramophone. By 1925 they were advertising their competing machine with the Panatrope – the Victor Hyperion (Model 15-1), also with the Radiola 28 and at a similar price. In October 1929 RCA bought the assets of Victor.

Meanwhile, in England, a version of the Panatrope was also available, manufactured under licence by Electrocord of Water Lane, Leeds. This version was produced as a sound system for cinemas and was



Figs 3b: Brunswick Panatrope, 1927

available from 1927. Stanley North, a prominent Bradford dance-band leader, recalled attending a demonstration of the Panatrope at the Mechanics' Institute in 1927. "The Panatrope was a means of reproducing records electrically from the mains." The immediate effect of the machine was to put cinema orchestras out of business. "The Panatrope was a big step forward technically. Usually about 25 Watts was ample output for the average cinema, but the ratio could be stepped up to 50 Watts if necessary, to fill one of the vast halls of that era with sound".^{5,D}

HMV were also working on electrical reproduction, though independently of Victor. They did not advertise an electrical player until the Model 551 that appeared in their 1928 catalogue. This was a console record player only (Figure 4a) that had a jack socket so that you could plug in an external radio. It used a two-stage all-mains amplifier using the new (in 1927) Mullard output triode valve known as the type DO20 driving a moving-coil loudspeaker and using HMV's new No 7 electric soundbox on a conventional goose-neck arm. Compared with the American engineering, it was primitive.



Fig 4a: HMV Model 551, serial number 63

The components were mounted on a wood board ('Breadboard' was the term used for such construction) – see Figure 4b – and hand-wired on a point-to-point basis. Nevertheless, the major components, such as the induction disc motor, were of high quality and the reproduction perhaps a noticeable improvement over even the largest re-entrant models, though some may have disagreed. Figure 4b shows several modern transformers –



Fig 4b: Model 551 Amplifier unit

HMV has the reputation today for having such wound components often going open-circuit, so modern components have to be fitted to allow it to function. This amplifier is now ninety years old, so one has to make allowances!

HMV bought the Marconiphone Company in March 1929, with the encouragement of David Sarnoff of

RCA, thus acquiring some extra radio expertise. HMV's assessment of their purchase was not reassuring. On 6th March 1929 an HMV executive visited the Marconiphone works and reported that development of new models for 1929/30 had barely begun. The manager explained that "though their aim was to produce cheap sets, the output was too small to be competitive and that the company had been forced to reduce their cost by the use of shoddy methods and finishes". The Gramophone Company chairman, Alfred Clark, had been advised to keep the Marconiphone factory in Dagenham as a separate manufacturing unit for "the production of those lines where standards can be lower than those at Hayes"^B. By the autumn of 1929 HMV were also discovering that there were problems with the Marconi-Osram Valve works of which they now shared ownership with GEC. The design of valves made there was some two years behind the latest methods used by Philips/Mullard, Mazda, Cossor etc, so the performance was badly affected. Since Marconiphone radios were designed around their own valves, the performance of the radios was also inferior to that of competitors. The M-OV valve works did redeem themselves to an extent by designing the triode output valve type PX4 used by a number of radiogram manufacturers after its introduction in late 1929.

In their 1930 catalogue, HMV still listed the Model 551, together with the Model 600 "Concert" for concert halls, comprised of separate units for



Fig 5: HMV Model 520 radiogram

flexibility, the Automatic Model 15 – very similar to the huge acoustic Automatic No. 1 but with similar electrical system to the 551, complete with a remote-wired pedestal for operating it. The catalogue also included Model 520 (Fig. 5), a radio-gramophone with medium and long wave tuning and No. 7A (Electric) soundbox.

In January 1930 Harrods wrote to HMV expressing disappointment in their new radio gramophone (presumably Model 520), stating “I think it is general knowledge that the Marconi valve is not very successful, and this fact is proved by the selection of the Mullard valve (the DO20) for your electrical reproducer (Model 551) which is really splendid and worthy of HMV.” In 1931, Alfred Clark wrote to David Sarnoff of RCA “...there is evidence that the higher priced Electrical Gramophone being so much better than the higher priced Mechanical Gramophone, the public show hesitation in investing in lower-priced Mechanical Gramophones in the belief that they may eventually be able to buy lower-priced Electrical Gramophones and, unfortunately, it has not yet been possible to design good low-priced Electrical Gramophones.”

For 1931/32, the HMV catalogue shows that the instruments had gone from strength to strength:

The Model 532 Superhet Ten Autoradiogram (also known as Columbia 640 - as HMV and Columbia had merged by this time, they could market machines using both brand names) had a ten valve circuit using vari-mu⁶ valves and push-pull⁷ PX4s and a Type K autochanger. Price was 80 Gns. The Model 532 Superhet Ten Autoradiogram De Luxe (Still known as Columbia 640) was the same as the standard 532 but in a fancy Art Deco cabinet. Price 95 Gns. Another version, the Model 531 Superhet 10 Autoradiogram (Figure 6) was also similar to Model 532 except not using latest vari-mu valves and no tone control. Price 70 Gns. These all used the PX4 output valves.

Less expensive were Model 523 Superhet Radiogram Seven, the seven valve circuit with vari-mu valves and a single record player, priced at 48 Gns., and Model 501 Transportable Radiogram, a TRF⁸ four valve circuit. Priced at 25 Gns. Finally there were Models 521 & 522 Radiograms, also known as Marconiphone 560. Model 521 had a single player, 522 had a type K autochanger and a TRF five valve circuit. Price – (521) 39 Gns, (522)



Fig 6: HMV Model 531 Autoradiogram

46 Gns. These were released by March 1931, no doubt designed by Marconiphone engineers after an infusion of funds from HMV.

Columbia merged with HMV on 20th April 1931 and the name of the conglomerate became Electrical and Musical Industries – EMI – consisting of the Gramophone Company (HMV, Zonophone Records), Columbia Graphophone Company Ltd (Columbia, Parlophone and Regal records), and the Marconiphone Co Ltd. This resulted in the world’s largest recording organisation, controlling 50 factories in 19 countries and with assets of £6.5 million.

Prior to that, however, Columbia, too, decided in 1929 that they needed to get into radio. Louis Sterling, managing director of Columbia Graphophone, approached Allen Clark of the Plessey Company⁹ to make suitable instruments. For Plessey it was a useful move, as they had lost

Marconiphone's business in 1926, when the firm set up its own manufacturing facility. Bill Heyne of Plessey had laboratory models drawn up, tooled and into production within six weeks, and when they were shown at the Olympia Radio Show, *Wireless World* magazine commented, "The entry of the Columbia Graphophone Co., Ltd., into the radio industry was an event of considerable importance, and the receivers exhibited at Olympia were the subject of much discussion and favourable comment. We have now had an opportunity of testing one of the No. 304 table models, and the results are fully in keeping with the efficient appearance of the layout. There can be no doubt that Columbia sets bear all the marks of the thoroughbred, and the 1930 models can definitely be placed among the best half-dozen makes at present on the market."¹⁰ The No. 304 was a three-stage TRF receiver. One of the new Columbia range was the Electro-Graphophone No. 300 (figure 7) a console cabinet machine which also had a three-stage TRF radio plus a two-stage power amplifier using the latest PX4 valves in push-pull. The machine had a turntable belt-driven from a high-quality universal motor, so that the turntable speed could be easily adjusted. The performance was impressive and powerful. A treble tone control was incorporated.

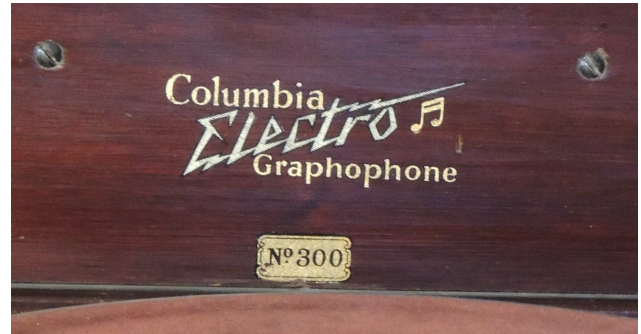


Fig 7b: Columbia logo

It was not, however, just the big companies that ventured into making radiograms. In 1929 the Gambrell Brothers¹¹ in London also entered the market with their Gam-Brell Radio-Novogram, a radiogram (figure 8) with a two-stage TRF radio receiver plus a two-stage audio amplifier and fitted with their patented Novotone device – basically a bass and treble boost network placed between the pickup and the amplifier.

Wireless World magazine commented on it on November 13th 1929:

"..the effect of introducing the Novotone is most striking. On orchestral records it is like switching on the double basses, while the pedal and bass notes of the organ and piano are reproduced with a richness and volume closely approximating to the original.



Fig 7a: Columbia Electro-Graphophone Model 300



Fig 8: The Gam-Brell Radio-Novogram

<p>The Gam-brell 1930-1931 Range includes ALL - ELECTRIC</p> <p>2 Valve D.C. 2 Valve A.C. 3 Valve D.C. 3 Valve A.C. 4 Valve D.C. (Pedestal Model) 4 Valve A.C. (Pedestal Model) 4 Valve D.C. (Table Model) 4 Valve A.C. (Table Model)</p> <p>and the GAM BRELL RADIO-NOVOGRAM FOR D.C. AND A.C.</p> <p>All supplied in Oak or Mahogany Cabinets</p> <p>Stand 106 Olympia Demonstration Room 'R'</p>	<p>The GAM-BRELL RANGE of ALL-ELECTRIC RECEIVERS is the most complete obtainable.</p> <p>A truly wonderful range, and every instru- ment has many excellent selling points.</p> <p>ALL - ELECTRIC AND TROUBLE FREE.</p> <p>VARIO-SELECTIVITY CIRCUITS GIVING HAIR-LINE TO BROAD TUNING AT WILL.</p> <p>NUMEROUS STATIONS TO CHOOSE FROM, MANY RECEIVED WITHOUT AERIAL.</p> <p>HIGHEST STANDARD OF REPRODUCTION.</p> <p>HANDSOME OAK AND MAHOGANY CABINETS OF NEAT DESIGN.</p> <p>STOCKS WILL BE READY BY SEPT. 15th</p> <p><i>Supplies of Illustrated Literature and "Sales-aids" on application.</i></p> <p>GAMBRELL RADIO LTD. 6, BUCKINGHAM STREET, STRAND, LONDON, W.C.2</p>
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Fig 9: Gambrell Advertisement in Wireless & Gramophone Trader of September 1930.

The effect of the scratch filter and the special output circuit for modifying the low note amplification are also clearly demonstrated.

There can be no doubt that anyone who has heard the Novotone demonstrated in this way would from that time onwards cease to be satisfied with gramophone reproduction by ordinary methods.”

Like HMV, Gambrell Brothers opted for the Mullard DO20 power valve as their choice to drive the loudspeaker. The turntable, with universal electric motor, was bought in from Garrard and the radio and amplifier components from a variety of trade suppliers. Gambrells were renowned for their



Fig 10: RCA Victor Radio Electrola Model RE-57. Its microphone can be seen in the left compartment next to the record player.

ingenious radio tuning coils, so no doubt made those themselves. Their advertisement for the forthcoming Radiolympia trade show appeared in 'The Wireless and Gramophone Trader' magazine of September 6th 1930 (Figure 9).

In America, RCA Victor were not to be outdone. For 1930 they fielded a considerable range of machines^C, including the Model RE-57 (figure 10), which not only had a fine sound but also enabled you to record programmes from its radio or from a microphone – but only for a few minutes – on a special soft wax disc and using its magnetic pickup head as a disc cutter! Shades of Thomas Edison’s phonograph – be sure your phonograph will make its own records!

There were of course by now dozens of manufacturers vying for the public’s attention, most of them outside the scope of this article. We may look at one or two more in the future.

Notes

1. A capacitor (or condenser) microphone basically has a fixed metal plate and a second similar attached to a diaphragm which is vibrated by sound waves. When a battery is connected across the plates (through a high-value resistance) no current flows, as they are insulated from each other, but an electrical charge exists between them. The charge is fixed and cannot change, but if one plate vibrates, the voltage across the plates does change, producing an electrical signal that varies in sympathy with the vibrations.
2. A two-stage amplifier has two valves (tubes), one after the other, so that the amplification of each stage is multiplied together.
3. A small coil of wire is suspended between the poles of a magnet. A small piece of iron is also suspended there, so that an alternating voltage applied to the coil varies the magnetic strength, which causes the iron piece to move in sympathy. The record cutter is attached to this iron piece.
4. The Radiola IX was specially designed for the after-sales department. It was based on a square of polished mahogany and only 3 ½" thick in total. The idea was that it could be mounted inside the lid of the gramophone. It had a transducer that could be attached to the tone arm so that the radio played through the gramophone internal horn.
5. At that time, the cinema version of the Panatropé would have been in several units - record player, amplifier, speakers etc. The

author's uncle, the late John Mansfield, a keen musical box collector and friend of several of the more senior members of AMBC, was in the electrical business until his retirement. They owned a Brunswick Panatrope, which they rented out to various venues. He recalled that, in his youth, it was one of his jobs to deliver and set up the machine and described it as a 'beastly thing', as it kept giving him electric shocks!

6. Hitherto radio valves had a fixed amplification factor (known by the Greek letter μ – phonetically 'mu'). Around 1930, valve designers had produced a range in which the μ could be varied by altering the bias voltage. The big advantage in radio design was that the amplification of the receiver could be automatically reduced if a powerful signal was received. In earlier designs the result was distortion in such circumstances.
7. The use of two output valves in 'push-pull' for driving the loudspeaker was found to effectively cancel even-order harmonic distortion compared with a single output valve.
8. TRF, or Tuned Radio Frequency, was a simple type of receiver in which all signals received were amplified by several stages all tuned to the signal's frequency. A much more effective and efficient design was the Supersonic Heterodyne ('Superhet') in which all incoming signals were converted to a single fixed frequency (the Intermediate Frequency, or IF) which could be amplified easily without retuning for every received station. The disadvantage was that it needed more valves and components, so the cost was higher than the TRF.
9. At the outbreak of the First World War a young man called W O Heyne, born in Germany, was interned, even though he had lived in Britain since childhood. He eventually became a good business man and a brilliant production engineer. The war made it difficult for him to get a job but he finally obtained work with a business in Lisson Grove, Marylebone (London) - the Coutsam Piano Action Company. It was in financial difficulties and was bought by a Thomas E Hurst-Hodgson, who soon realised that he must liquidate the company but that Heyne was one of the major assets. He formed a new company to take over Coutsam's machine shop. That company was The Plessey Company Limited, registered with limited liability on 11th December 1917. The shareholders were Heyne, Hurst-Hodgson and two brothers, Raymond and Plessey Parker. In 1921 B G Clark, an American, persuaded

Plessey to manufacture tags and eyelets for his shoe-making business. He was sufficiently impressed to buy shares in the company and arrange for his son, Allen Clark, aged 22, to join it. As it turned out, Allen and Bill Heyne made an ideal partnership. In 1922 Clark Senior learned that Marconi were looking for a firm to manufacture radio sets under contract. Plessey obtained the contract and received an order from Marconi for 500 'Junior' crystal sets, 5,000 'A' crystal sets and 5,000 V2 receivers, a total of just over £30,000 worth, which started Plessey in the radio business.

10. Wireless World magazine, November 27th 1929.
11. In 1894, Gambrell began with the production of scientific equipment for schools and laboratories, such as resistance banks, galvanometers, volt and ampere meters, at the address 17, Giltspur Street, London. In the 1920s Gambrell began making crystal receivers, reception units for radio amateurs and wireless constructors, radios, wavelength meters and components, such as coils. In 1921, the brothers Thomas Edward and Charles Thomas Gambrell were registered in the Manual of Electrical Undertakings and Directory of Officials, as manufacturers of and dealers in electrical instruments and appliances. The address was 76, Victoria Street, London, S.W.1. The factory was at Merton Road, Southfields, London, S.W.18. Later, the company moved to 6 Buckingham Street, London W.C.2. Radios were made from about 1922 to the early 30s. The company introduced the first ever British all-AC mains receiver, the "Baby Grand" in 1926. Gambrell Radio Ltd. was liquidated in 1939. Gambrell continued the production of scientific instruments until after the Second World War.

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Making of Quarters and Chimes

by Revd. William Derham

The Reader will expect that I should say somewhat concerning Quarters and Chimes: but because there is little, but what is purely mechanical in it, I shall say the less, and leave the Reader to his own invention,

The *Quarters* are generally a distinct part from the Clock part, which striketh the Hour.

The *Striking-Wheel* may be the First, Second, or etc Wheel according to your Clock's continuance. Unto which Wheel you may fix the Pinion of Report.

The *Locking-wheel* must be divided (as other Locking-Wheels,) into 4, 8 or more unequal parts, so as to strike the Quarter, and lock at the first Notch; the half-hour, and lock at the second Notch, &c. And in doing this, you may make it to chime the Quarters, or strike them upon two Bells, or more.

'Tis usual for the Pin-wheel, or the Locking-wheel, to unlock the Hour-part in these Clocks; which is easily done by some jogg or latch, at the end of the last Quarter, to lift up the Detents of the Hour-part.

If you would have your Clock strike the Hour, at the Half hour, as well as whole Hour, you must make the Locking wheel of the Hour part double; i. e. it must have two Notches of a sort, to strike 1, 2, 3, 4, &c. twice apiece.

As for *Chimes*, I need say nothing of the Lifting-pieces and Detents, to lock and unlock; nor of the Wheels to bridle the motion of the Barrel. Only you are to observe, that the Barrel must be as long in turning round, as you are in Singing the Tune it is to play. As for the *Chime-Barrel*, it may be made up of certain Barrs, that run athwart it, with a convenient number of holes Punched in them, to put in the Pins, that are to draw each Hammer. By this means you may change the Tune, without changing the Barrel. This is the way of the *Royal Exchange Clock* in London, and of others. In this case, the pins or nuts which draw the Hammers must hang down from the Bar, some more, some less, and: some stand upright in the Bar: the reason whereof is, to play the time of the Tune rightly. For the distance of each of these Bars, may be a Semi-brief, or &c. of which hereafter.

But the most usual way is, to have the Pins that draw the Hammers, fixed on the Barrel. For the placing of which Pins you may make use of the Musical Notes, or proceed by way of Changes on Bells, viz 1, 2, 3, 4, &c. The first being far the better way, I shall speak of that chiefly, especially because the latter will fall in to be explained with it.

And first, you are to observe what is the Compass of your

Tune, or how many Notes of Bells there are from the highest to the lowest: and accordingly you must divide your Barrel from end to end. Thus in the examples following, each of those Tunes are 8 notes in compass; and accordingly the Barrel is divided 8 into parts. These Divisions are struck round the Barrel, opposite to which are the Hammer-tails.

I speak here, as if there was only one Hammer to each Bell, that the Reader may more clearly apprehend what I am explaining. But when two Notes of the fame found come together in a Tune, there must be two Hammers to that Bell, to strike it. So that if in all the Tunes you intend to Chime, of 8 notes compass, there should happen be such double notes on every Bell instead of 8, you must have 16 Hammers: and accordingly you must divide your Barrel, and strike 16 strokes round it opposite to each Hammer-tail. Thus much for dividing your Barrel from end to end.

In the next place, you are to divide it (round about) into as many divisions, as there are musical Barrs, Semibriefs, Minums, &c. in your Tune. Thus the 100th Psalm-tune hath 20 Semi-briefs; the Song-tune following, hath 24 Barrs of triple time: and accordingly their Barrels are divided. Each division therefore of the 100th Psalm Barrel is a Semibrief, and of the song-tune 'tis three crotchets. And therefore the intermediate Spaces serve for the shorter notes: as, one third of a division, is a Crochet, in the Song tune. One half a division, is a Minum and one quarter, a Crotchet, in the Psalm tune. Thus the first note in the 100th Psalm, is a Semibrief, and accordingly on the Barrel, 'tis a whole division from 5 to 5. The second is a Minum and therefore 6 is but a half a division from 5; and so of the rest. And so *also* for the Song tune, which is shorter time: the two first notes being Quavers, are distant from one another, and from the third pin, but half a third part of one of the divisions. But the next pins (of the bell 3, 3) being Crotchets, are distant so many third parts of a division. And the next Pin (of the bell 1) being a Minum, is distant from the following pin (4) two thirds of a division.

From what hath been said, you may conceive the surface of a chime-barrel be represented in the Tables following, as stretcheth out at length: or (to speak plainer,) that if you wrap either these Tables round a Barrel, the Dots in the Table, will shew the places of the Pins to be set on the Barrel.

You may observe in the Tables, that from the end of each Table to the beginning, is the distance of two, or near two divisions: which is for a Pause, between the end of the Tune, and its beginning to Chime again, I need not say,

that the Dots running about the Tables, are the places of the Pins that play the Tune.

If you would have your Chimes compleat indeed, you ought to have a set of Bells, to the Gamut notes ; so as that each Bell having the true sound of *Sol, La, Mi, Fa*, you may play any Tune, with its Flats and Sharps. Nay, you may by these means, play both the Bass and Treble, with one barrel.

If any thing going before appears gibberish, I can't help it, unless I should here teach the skill of Music too.

As to setting a Tune upon the Chime barrel from the number of Bells, viz, 1, 2, 3, 4, I shall here give you a specimen thereof.

Such Command o're my Fate, in numbers.

775, 3, 3, 1, 4, 5, 6, 4, 4, 2.

4, 3, 2, 3, 4, 6, 3, 5, 7, 7, 7.!

5, 6, 8, 8, 4, 4, 4; 3, 5, 4.

6, 5, 7, 5, 3; 41, 3, 5, 5, 5.

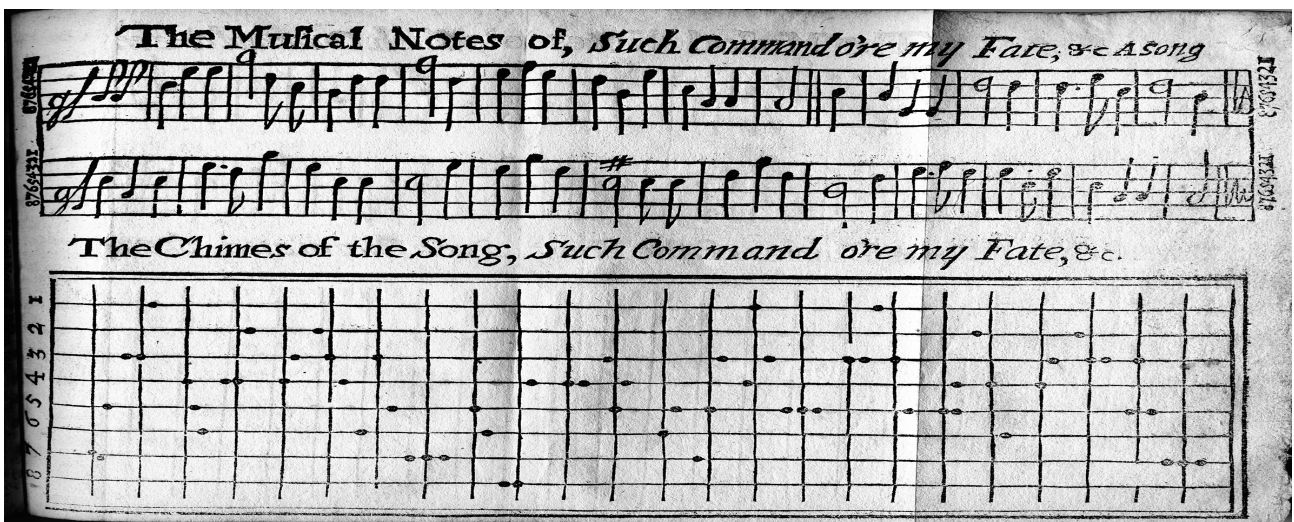
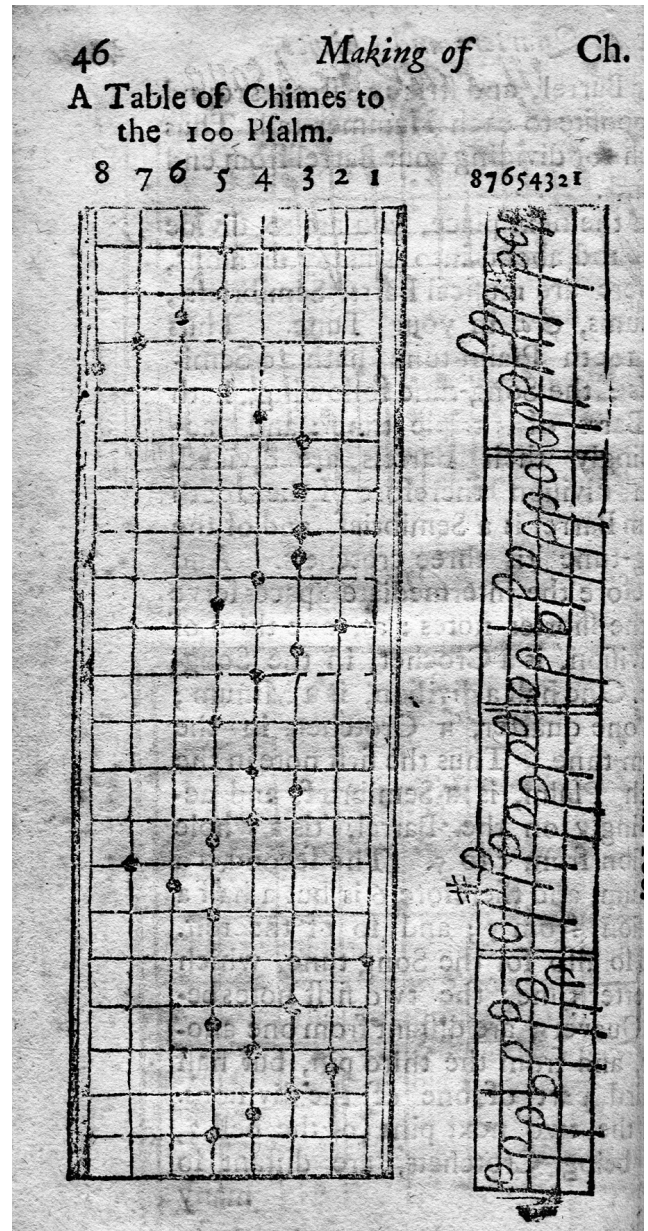
3, 3, 1, 3, 5. 554, 2, 4, 6.

4, 3; 23, 3; 53, 5, 7, 7, 7.

Note, In these numbers, a Comma [,] signifies the note before it, to be a Crotchet. A prick'd Comma or Semi-colon [;] denoteth a prick'd Crotchet. And a period [.] is a Minum. Where no punctuation is, those Notes are Quavers.

I shall only add further, that by setting the Names of your Bells at the head of any Tune (as is done in the Tables before) you may easily transfer that Tune, to your Chime-barrel, without any great skill in Musick. But observe, that each line in the Musick is three notes distant; i.e. there is a Note between each line, as well as upon it: as is manifest by inspecting the Tables.

(from 'The Artificial Clock-Maker' by Revd. William Derham M.A., 2nd Edition, dated 1700.)



Boxing Clever - an appreciation of some UK Automata Collection Boxes

By David Soulsby

The collection box has been a longtime method of raising cash for deserving causes, whether shaken by helpers in church or by charity campaigners in the High street. Also most museums in the UK do not charge an entry fee and have to rely on the contributions from their patrons to supplement their limited budget. Fundraisers traditionally installed fixed Perspex boxes with slots, into which visitors could donate coins or notes. Some modified the methods by which money could be collected in order to attract people to part with their spare change. The Roll-a-Coin boxes or Money-spinners became very popular in reception areas and shopping malls. The coins dropped into a transparent dome, appear to defy gravity as they spiral around in a vortex eventually dropping into the collection dish at the bottom (Photo 1). The



Photo 1: Roll a Coin donation box

concept that the donor should enjoy their generosity in some small way has been promoted in the UK by the inclusion of automata with coin-op mechanisms. A number of these have been produced as one-off commissions by well-known automata artists and usually have amusing themes that celebrate a connection to their sponsoring establishments or good causes. Some are more successful than others in persuading customers to part with their money. They have higher initial investment and maintenance costs than plain perspex boxes, but these can be outweighed by attracting more cash because of their popularity and increased usage. I contacted five UK automata artists to find out more information on the collection boxes that they had designed and built and travelled to see some of them



Photo 2: Automaton at Foundling Museum, London

in action.

Keith Newstead needs no introduction to enthusiasts; he has been building between 8 and 10 automata a year for over thirty years and is arguably the most prolific creator of collection boxes in the UK. He hails from Falmouth, Cornwall, birthplace of the *Cabaret Mechanical Theatre* and modern day automata.

One of Keith's many boxes that I went to see is located at the *Foundling Museum* in Brunswick Square, London. Known as the *Hallelujah* box (Photos 2, 3), it features two children sitting in a room, holding violins. They have a dog at their feet and the room exhibits a number of portraits hung on the wall behind them. Dropping in your donation causes the lights above the portraits to come on and the children to sway as they play their instruments. The sound they produce is a tortured rendition of



Photo 3: "Oh - Hallelujah!" when the music stops

Handel's Hallelujah Chorus (the museum includes an internationally acclaimed collection of material relating to Handel and his contemporaries). The people in two of the pictures above cover their ears at the noise, while the dog barks and howls. Finally as the duet finishes the upper portrait figure pronounces with relief "Oh-Hallelujah!".

A second Donation box that I found amusing was the *Moby Dick* automaton taking pride of place in the *Elstree Museum* located at Borehamwood. The museum highlights its connections with the film studios nearby. Keith's automaton incorporates the spirit of the John Houston 1956 epic film made at the studios. A galleon is shown on top of a giant wave, while a smaller boat holding the infamous Captain Ahab is being rowed by two of his trusty crew. The craft rides on top of the famous white whale tethered by Ahab, through moving waves populated by scavenging seagulls. Philip Sainton's film score accompanies the scene which closes as a tentacle rises from the foam with the final "Thank you" sign.



Photos 4 & 5: Elstree Museum's Moby Dick collection box and original sketch





Photo 6: The Flying Scotsman train

One of Keith's most successful donation creations entitled *The Flying Scotsman* was commissioned by the Rotary society in Inverness. Located in a local mall it raised £5000 in the first year of operation. It

symbolises the celebrated train of the title with the whole scenario designed in the style of Roland Emmett. (Photos 6, 7, 8). A notice indicates "make a donation to start the train". When this is done, the

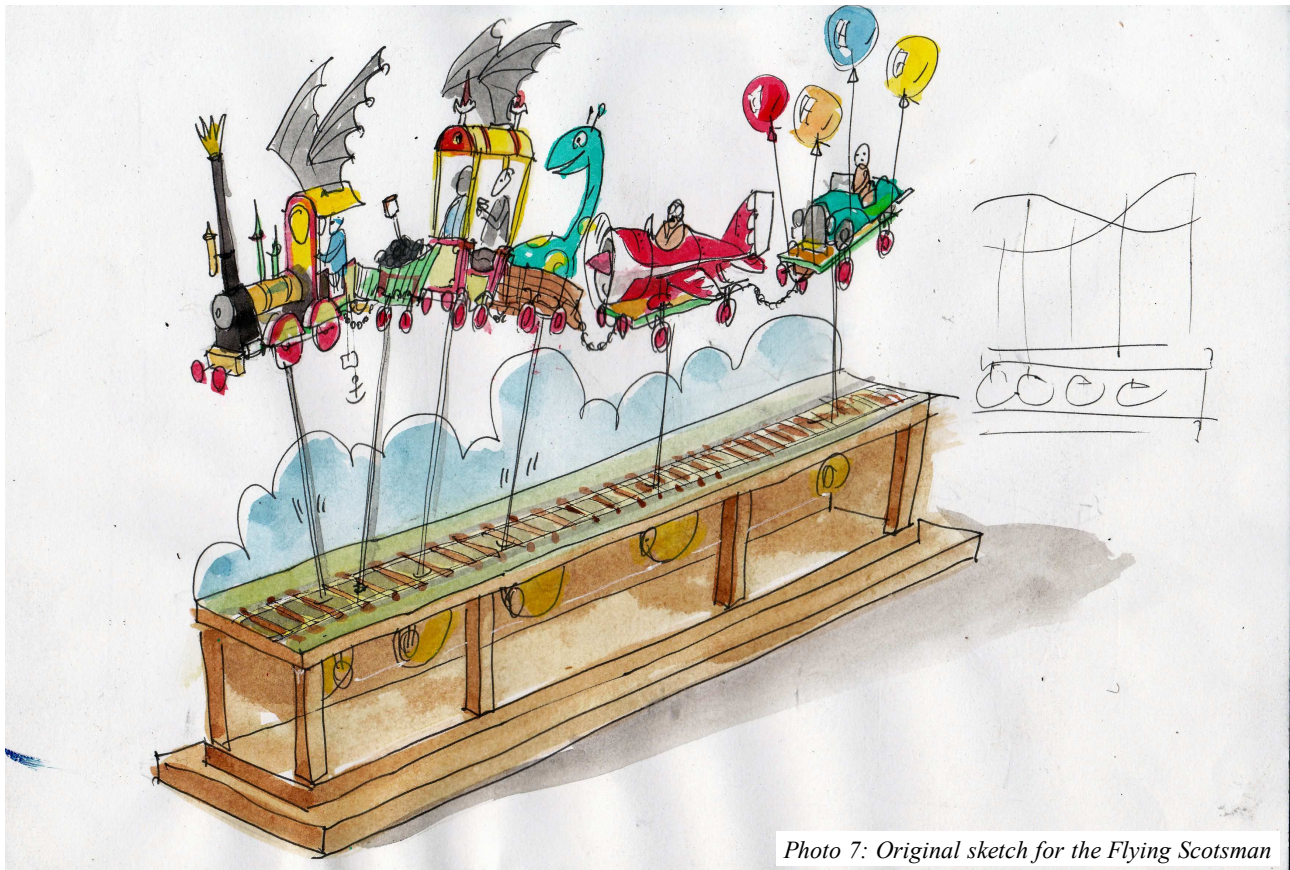


Photo 7: Original sketch for the Flying Scotsman

driver releases the brake and the wheels begin to turn. The intricately built carriages bob up and down simulating movement along the track. Passengers include a lady knitting while her companion drinks a cup of tea. Also enjoying their ride are a moustachioed driver in a yellow Rolls-Royce, a pilot in a single seater plane and even a grinning Loch Ness monster, with a twirling tail. The amount of animation is incredible and it is easy to see why the exhibit has been such a money-spinner.



Photo 8: The Flying Scotsman in its show case

Lucy Jean Green is an artist who specialises in creating kinetic art and paper sculpture at a small studio in Mytholmyroyd, West Yorkshire. She creates sculptures and delicate automata by hand-cutting paper and using brass mechanisms. As part of her involvement in a National Trust project to conserve wildlife in the UK, Lucy created some automata collection boxes. They were simple but effective ways of raising money for the project.

The first *The Bee Protector* (Photo 9) was dedicated to collect money to be used for feeding bees over Winter. The box contains a group of flowers, one of which slowly begins to open when a coin is introduced in the slot, a bee is revealed inside gathering pollen. The flowers are of paper and the bee modelled in clay. The second box was *The Tree Protector* (Photo 10) in which a white bird perched on a branch bows its head and moves one wing across its body as if acknowledging the donation. The bird is constructed from fabric and the tree created from brown paper. The boxes,



Photo 9: National Trust project by Lucy Green, The Bee Protector



Photo 10: The Tree Protector, also by Lucy Green

presented at an exhibition in 2014, have QR codes on the front which when scanned on a mobile phone take you to a website with further details about the appeal and the option to make further donations. More of Lucy's more modern work can be seen at www.Nameandcolour.co.uk.

Tim Hunkin is renowned for his humorous automata which can be viewed in his *Under the Pier* arcade on Southwold pier as well as his *Novelty*

Mechanical Music World

Automation venue near Holborn, London. His own inimitable style has been brought to the design and building of several interesting collection boxes. One of these is located in the Reception area at *Guys' Hospital* (Photos 11,12).

It comprises an automaton of a nurse, instantly recognisable as a Hunkin creation, attempting to administer medicine to an apprehensive patient lying in bed. The nurse is continuously rotating, with a metal cup in her hand that passes over the nervous victim. The object of the game is to roll a coin down



Photo 11: Tim Hunkin Collection Box at Guys Hospital

a chute into the nurse's cup, as she spins past. If you are successful, she pauses over the man's head, and tips your contribution into his open mouth. His expression changes to one of pleasure and with rosy cheeks, the patient sits up in bed, (achieved by the head rotating and showing the opposite side). There is a button on the front of the display to reduce the speed of the turn. Even so I had expended £6 before I succeeded in getting any of my coins into the cup, which is of course the exact purpose of Tim's machine – to increase donations.

In the *Pitt Rivers Anthropology Museum* in Oxford I found another of Tim's collection boxes (Photo 13). Housed inside a glass show case are eight wooden figures, cartoon representations of famous anthropologists associated with the museum, including its founder General Pitt Rivers. Each of them has an exhibit tag tied to them with their names and brief bio. The mechanism has been



Photo 12: close-up of the patient

completely built from recycled materials as described in Photo 14.

When a visitor approaches the collection box, the group raise their arms, their eyes glow and they point accusingly as if demanding attention and a contribution. After a coin has been dropped into the copper collecting dish, the anthropologists bow their heads in unison as if to inspect the donation. The case blends so well with the others containing weird and wonderful exhibits, and in the dim light of the



Photo 13: Tim Hunkin Automaton in the Pitt Rivers Museum

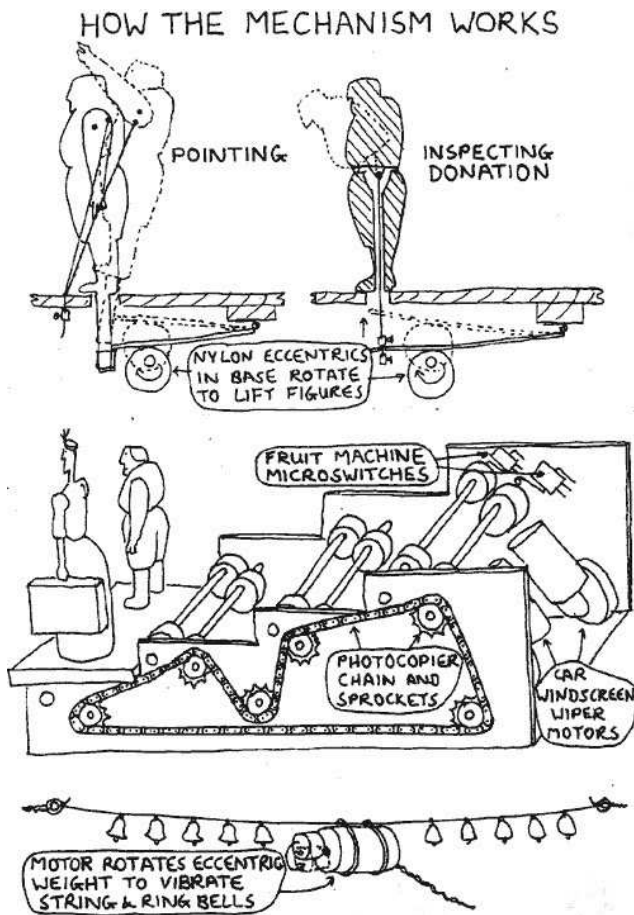


Photo 14: Concept drawing of the Hunkin Donation Box

museum it is a real shock when it bursts into life.

Another well-known creative artist is Carlos Zapata who has been making automata since the late 1990's, including a number of collection boxes. Originally from Colombia he too lives in Cornwall, where the renaissance of modern day automata began. A fine example of one of these stands over 3 feet tall in the entrance hall of the *Gloucester Museum* (Photos 15, 16). A Victorian gentlemen and his son are visiting a dinosaur skeleton in the museum, the boy points up as the dinosaur roars and begins to rear up. Two hidden figures at the side of the display can be seen pulling the strings like a marionette. The full range of Carlos' automata can be seen on his website www.carloszapataautomata.co.uk.

One collection box which has stood the test of time, I found in *Southampton Art Gallery* and it has been "making money" for the gallery for nearly 35 years. It is a beautifully carved face which comes to life when a coin is launched into the box. Its eyes roll,



Photos 15 & 16: Carlos Zapata automaton in Gloucester Museum



hair moves and finally after a beaming smile, it opens its mouth and sticks out its tongue (Photos 17 - 19). It has been constructed by Jan Zalud who is an acclaimed woodcarver and automata artist. Examples of his fine body of work can be seen at www.janzalud.co.uk.

Zalud was the resident carver at the Little Angel Theatre in London, and is now working freelance, including doing work for the Royal Shakespeare Company.



Photos 17, 18 & 19: Collection box in Southampton Art Gallery. Made by Jan Zalud of Levenshulme, Manchester, it is beautifully carved and has operated reliably for the last thirty-five years!

This is an example of a box remaining in operation for a prolonged period of time with minimal maintenance, while more complex automata may require some replacement of moving parts. Certainly the automaton boxes draw attention from visitors more than conventional perspex ones. Some, like Tim Hunkin's, are effectively 'games', with an addictive aspect to leverage increased donations. Whether, in general, they make more or less income than the plain ones is a matter for conjecture. However there can be no debate that their commission has led to the production of a wide variety of special, ingenious and amusing automata. To many, this may well be regarded as benefit enough.



Another Changeable Cylinder Prototype

By Bill Wineburgh

I read with great interest the article by David Evans in the Winter 2019/2010, Issue 19, of “Mechanical Music World” about the L’Épée experimental changeable cylinder movement. The similarities to and differences from a musical box I recently restored are quite amazing and I would like to share them with you.

Jaccard / Cuendet / Abrahams Prototype

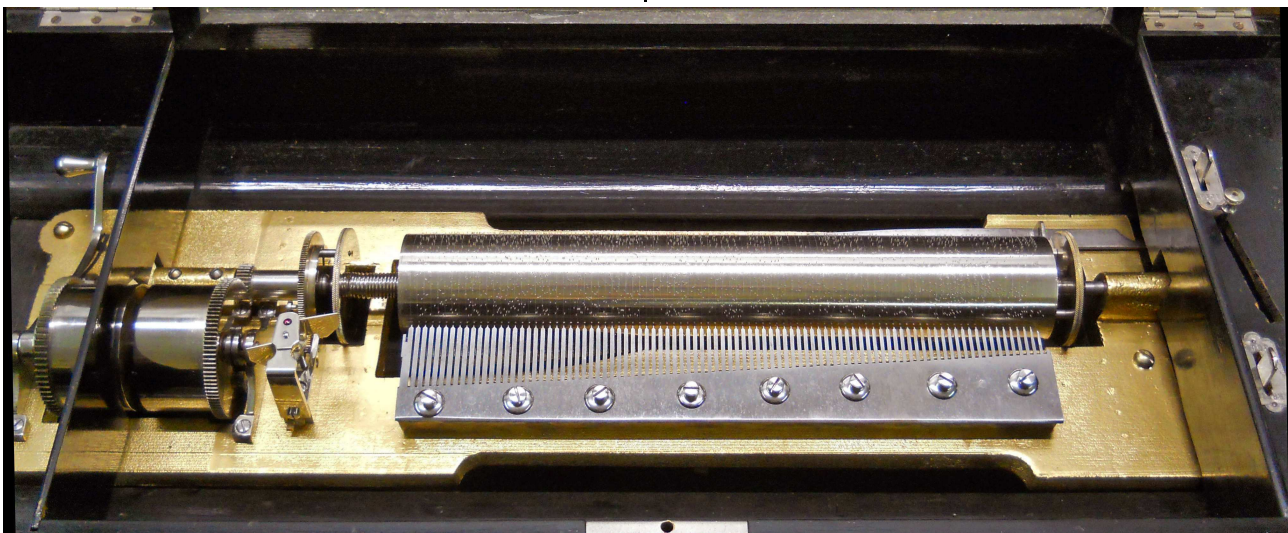
The piece I have has a grain painted case with transfer borders to look like inlaid wood trim and colour transfer decorations on the lid and front to look like inlays. The case design is quite like those by B H Abrahams, the London agent for Jules Cuendet. It has a late tune sheet with typewritten tune names for two of three changeable cylinders. The tune cards are the “terrace at right” as in Card#



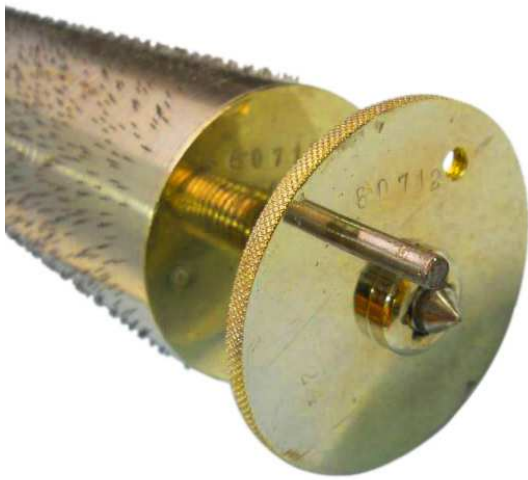
6 in H.A.V. Bulleid’s “Tune Sheets” that is used by Jules Cuendet in his catalogue. The tune sheet is marked in the lower left “Lith. Picard-Lion Geneve” and “DEPOSEÉ” in the lower right. It has three changeable cylinders 13 inches in length and 2-1/8 inches in diameter. Two of the cylinders, which are numbered 60702 and 60712, have accompanying tune sheets. The third cylinder is numbered 60704 and has no accompanying tune sheet. The bedplate is forged with “Jaccard” on the underside and it has a lot of holes that have been filled in where it may have once been prepared to use for another set-up. The comb has 93 teeth (92 playing) and a gamme number on the bass lead is ‘1766’, referring to the comb’s tuning, and the comb base is marked to



The case



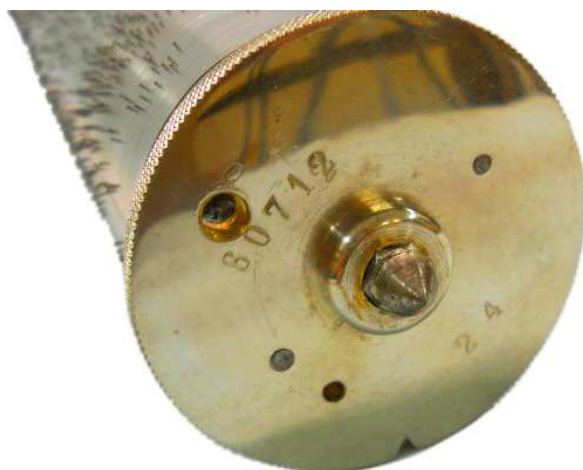
The movement of the Jaccard box



Left (drive) end of cylinder 60712

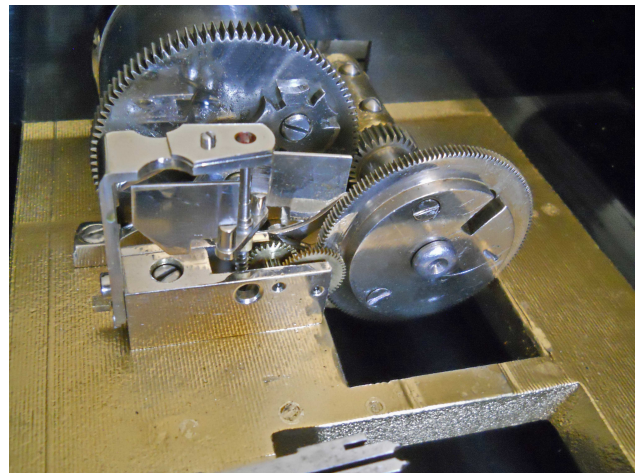
exclude the highest treble tooth.

The cylinder drive and locking mechanisms are also unique and match patents by Eugène Félix Jaccard of Ste Croix, Switzerland. The German patent is No. 42511, dated February 22, 1888 and the US patent is No. 382,879, dated May 15, 1888. Illustrations from these patents accompany this article. The cylinder drive mechanism uses an indented groove in the plate that is driven by a double spring barrel and governor control mechanism. The accompanying cylinders have a pin extending from the left end of the cylinder that fits into the groove. At the tune's end, the comb teeth are aligned with the break in the pinning, allowing the user to change the cylinder without damage to the cylinder pins. Changing the cylinders demands some caution as there are no "handles" on the cylinder ends with which to lift the cylinder as there are on later interchangeable musical boxes such as those by Mermod Frères.



Right end of cylinder 60712

The tail stock holder has a round steel bar stock indented on the left end to marry with a pointed pin on the cylinder tail stock. The steel bar is spring tensioned within an iron housing that is part of the cast bedplate. The right end of the steel stock is bored to hold a steel pin that can be rotated towards the front of the mechanism to release the cylinder tail stock. The top of the pin has a screwed-on knurled cap that can be removed when removing the start/stop and change/repeat cover. There are no numbers or other marks anywhere on the bedplate or works to help identify it further. It is not clear who manufactured this interesting movement. The casting and patent for the change mechanism are Jaccard's. The tune sheets are Cuendet's and the case is a typical Abrahams design.



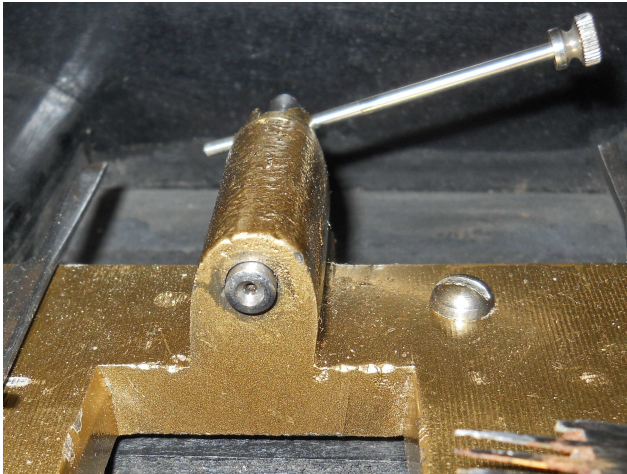
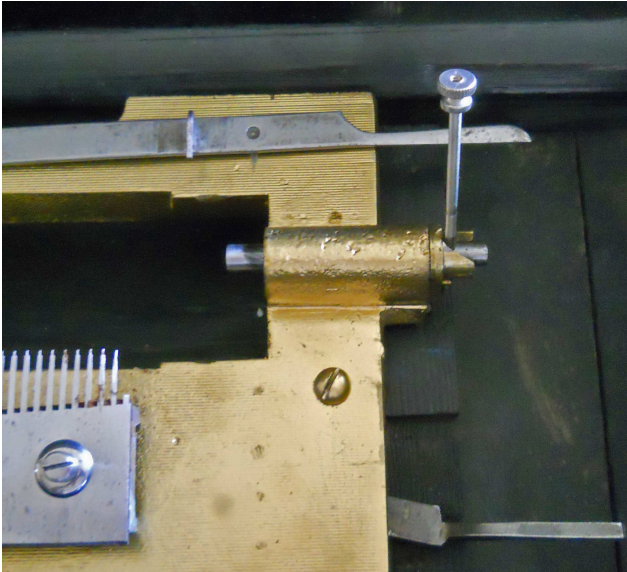
The cylinder drive notch

L'Épée Prototype

James Yates Johnson's patent is dated October 14, 1887, about four months earlier than Jaccard's German patent. Johnson describes the cylinder drive mechanism as using a drive bar attached to the face of the gear plate at the left end of the cylinder. The associated cylinders then have a matching indent that fits over the drive bar. The tail stock mechanism holds the cylinder in place with a steel shaft enclosed in a cast housing that is attached to the right end of the bedplate with hold-down screws. The steel shaft is held with steel locating pin that is held in place by a rotating steel plate.

How They Compare

Thus, the differences between the L'Épée prototype described by Evans and the piece described in this article lie in both the cylinder drive mechanism and in the tail stock design. The drive mechanism is reversed from one to the other, and the tail stock in



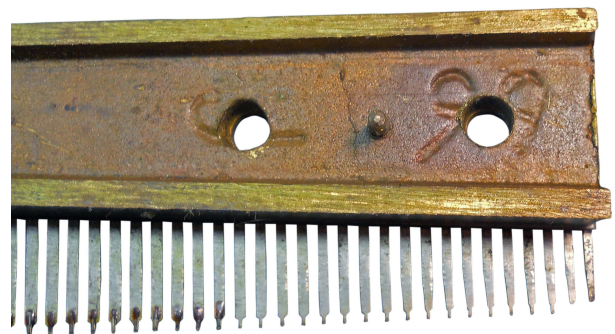
The 'tailstock' arrangements



'Jaccard' on the cast bedplate

the Jaccard design adds the internal tension spring to better hold the cylinder in place and a steel shaft to release the cylinder from above the fall board. I note that both designs use a typical snail cam on the right end of the cylinder and a coil spring on the left end of the cylinder shaft to help steady the cylinder on its shaft.

At the time these patents and prototypes were made, the German disc musical box manufacturing was cutting severely into cylinder box sales. As a result, the Swiss and French cylinder box manufacturers were struggling to compete. One way to do that was to add more music to the fixed number of tunes on a pinned cylinder. This was done in several ways. One method was to either make the distance between the tooth tips further apart to allow more pins to be placed between them and thus more tunes to be pinned on a cylinder, or to use only every other tooth in a comb by clipping off the tip of alternate teeth. Another method was to pin two tunes in a single rotation, thus doubling the number of (albeit shorter) tunes on a cylinder. Fat cylinders were also employed (having a larger diameter) that



Marking beneath the comb

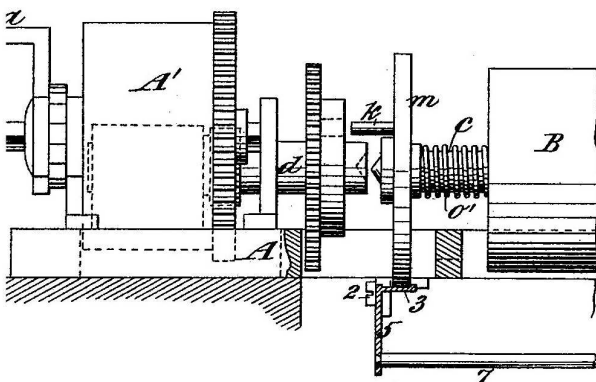
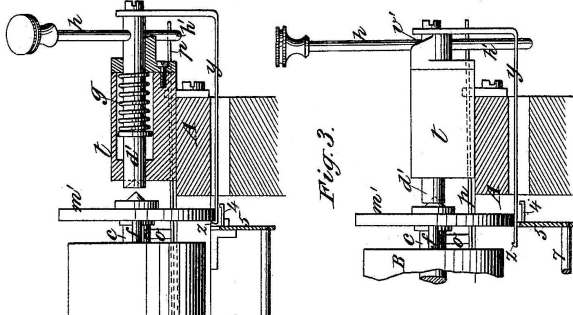


Comb tuning marks

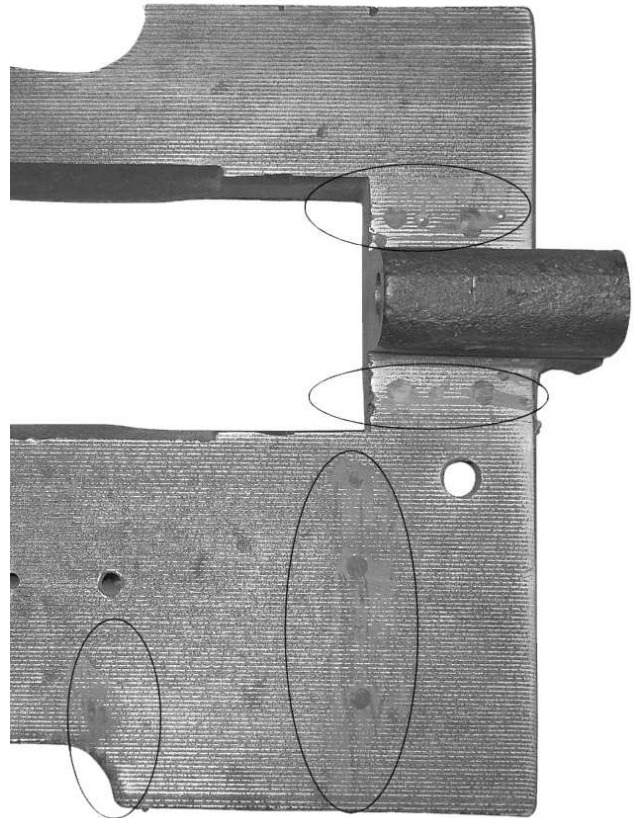
would allow for a longer program or for two tunes of more normal length in one rotation. The revolver box provided a very complicated and expensive way to do this as well. Further, and appropriate to this article, providing separate additional cylinders was also tried, using either changeable or interchangeable cylinders.

I suspect that competition among the cylinder box makers was fast and furious and that new ideas spread quickly among them. That might account for the similarities between the L'Épée and Jaccard designs. I will leave it up to the scholars among our collecting field to take this idea further.

(No Model.)
 E. F. JACCARD.
 MUSIC BOX.
 No. 382,879. Patented May 15, 1888.
 4 Sheets—Sheet 2.



Cuendet-pattern tune sheet. Note the type-written tune titles.



Showing where screw holes have been filled

Bill has uploaded two videos on to YouTube of his restored Jaccard box playing. They can be accessed by going to:

<https://www.youtube.com/watch?v=OsqURW0xCv w&feature=youtu.be>

<https://www.youtube.com/watch?v=vYuY8eZEJro&feature=youtu.be>

Black Forest Barrel Organ Clock



Picture 1: The mahogany case

The clock illustrated is a kind that was manufactured in some numbers in the Black Forest of south-west Germany adjacent to the French border. The largest town is Freiburg. The area was well-known for its cuckoo and trumpeter clocks since the early 18th Century and orchestrons in the 19th. Orde-Hume[#] remarks "While *Flotenuhr* were made in large quantities around the period 1820-70, the organ mechanism itself was concentrated on to the exclusion of the clock, and was refined into a superb musical interpreter". This organ clock (Picture 1) dates from about 1840. Its 36-key movement plays on 26 stopped pipes and 10 open ones, the rank being mitred to fit just below the hood. The mahogany case was probably made for it after the movement was shipped to America. The clock movement is a typical Black Forest design with wood plates, striking the hours upon a bell and sitting between the main frame plates of the organ. As can be seen (picture 2), the two bass pipes are placed horizontally above the plates. The weight-driven drive train for the organ barrel is fitted with double-acting cranks that operate the feeders (Picture 4).

This clock has had a chequered career. Having been imported into America when new, it experienced the Northridge, California, earthquake of January 17th 1994. The quake killed sixty people and injured 9,000 in the Sylmar and Sherman Oaks areas of LA as well as causing widespread severe damage. The clock apparently fell over and was quite badly damaged, costing \$7,000 to repair, according to a Los Angeles Times newspaper article of September 21st 1994. The dial, of alabaster, was shattered and a new one was made of thin marble. The French type enamel chapters are original, according to an appraisal carried out in 1988.

The label on the barrel is rather hard to make out, but the



Picture 2: Organ clock movement



Picture 3: The end of the barrel

following is evident:

146 Work - Musical Pieces

1. All^o Mode^{lo} Aus Freisch(ütz). (Allegro from Der Freischütz Weber, 1821)
 2. Rondo Russo. (Saverio Mercadante (1795-1870): Flute Concerto in E minor Op.57, 3rd movement - Rondo Russo.)
 3. And^{te} Rob le Diable. (Meyerbeer. 1st performed in Paris 1830)
 4. All^o ? Allegro from ?
 5. Taglione Walzer*
 6. Taglione Walzer*
 7. Glocken Galope. (possibly Canthal, A.M., Op 81, Glocken Galop after Daniel Auber's Des Teufels Antheil (1843). Joseph Labitsky (1803 – 1890) also composed a tune with this title.)
 8. Polka
- * Both Johann Strauss (Op. 110) and Joseph Lanner wrote dances in honour of the ballerina Marie Taglioni, who toured Europe in 1839 to great acclaim.
- # Orde-Hume, A.W.J.G., The Musical Clock, 1995.



Picture 4: The feeder crank arrangements

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Aims and Objectives:

- To promote the enjoyment of mechanical music in all its forms.
- To provide opportunities of social interaction to members through meetings and outings of musical and other historical interest.
- To establish formal links and working relationships with other national and international organisations in the field of mechanical music.
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- To reach out to the public and foster a wider interest in mechanical music.

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UK price: £10 + P&P with comparable European and overseas costs to be negotiated.

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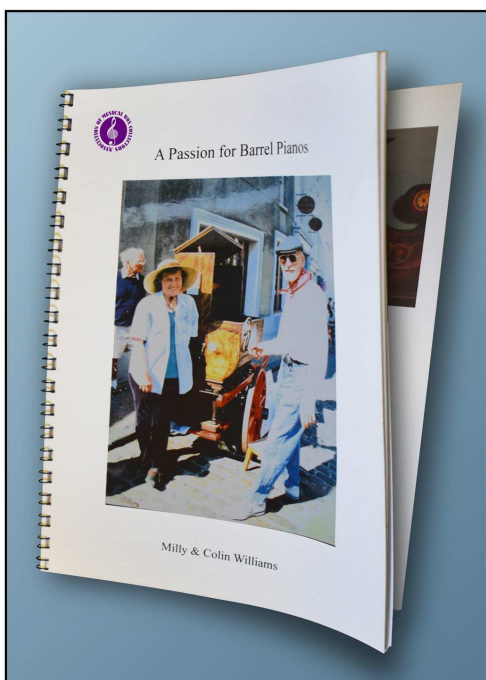
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