

The No-Key Clock, Arthur F. Poole and the Mountain State Electrical Company.

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Part I

Summary:

Arthur F. Poole is best known today for his highly successful battery operated clocks, built starting in the late 1920's by the Morse Chain Company and later by Barr. However, his interest in time and timekeepers dates back to before the turn of the 20th century and this was not his first clock venture.

This article examines Poole's first mass produced clock, the No-Key, built by the Mountain State Electrical (MSE) Company of Wheeling WV and later in Ohio. In Part I of this article the history of the MSE Co., A.F. Poole and his Patents for the No-Key clock will be examined. Part II will concentrate on existing examples of the West Virginia and Ohio No-Key production.

Acknowledgements:

This article could not have been produced without the generous help and support of both Mr. Rick Thomes and Dr. Elizabeth Denny (great granddaughter of A.F. Poole). Mr. Thomes has been collecting information on the serial numbers and style variations at his website rareclock.org for some time now and was kind enough to share it and his thoughts on the No-Key clock during the writing of this article. Dr. Denny has been researching A.F. Poole's life and patents. Her information on his patents led directly to the discovery of his relationship to both the No-Key clock and Mountain State Electrical companies. Additionally, thanks to Glenn White for his research on MSE.

Introduction:

The early years of the last century, before the advent of the Synchronous A.C. motor and well-controlled line frequency was a period of great experimentation in coupling electricity to powering clocks. Numerous inventors formed companies to exploit this power source. A.F. Poole was among the group that sought to popularize this new product. However, few were truly successful in building a widely accepted clock and today little of their histories remain intact. This article will attempt to recreate the No-Key story.

Background:

In collecting sometimes one's interest get attracted in an unexpected direction. While at a Regional in 2005, I happened upon an unassuming little clock among a table full of more common, but eye-catching Electrics. Attached to the clock was a note with the following lengthy quote from Mr. James Gibb's book "*Buckeye Horology*". (The most complete published description of the No-Key clock company and its history thus far).

"In 1911 Mr. D. M. Dorsey of Mount Vernon, Ohio, Inherited several coal mines near Ten Mile, West Virginia. Mr. Dorsey spent some time in Wheeling

investigating his inheritance and while there met the manufacturer of the No-Key Clock of Wheeling. He traded one of his coal mines to Mountain State Electrical Company for the patent rights, dies, jigs, tools, fixtures, partly completed clocks and a sizeable amount of raw materials, valued at \$62,000.00.

Mr. Dorsey moved his new company to Mount Vernon, Ohio, where he formed a partnership with Mr. George Owens, a local jeweler. By late fall of 1912, several hundred clocks had been manufactured and George Owens, the sales manager of the new clock company, started out to sell their production.

His first stop was Coshocton, Ohio, where he was unable to sell for cash but was able to put on consignment his merchandise in the leading jewelry store. His next stop was Zanesville, Ohio. There he met the same resistance and ended up by consigning his second order.

Mr. Owens then followed the Muskingham River to Marietta, where he consigned more clocks, moving down the Ohio River and making stops at river towns. He landed at Cincinnati where he consigned the remainder of the 1912 production of the No-Key Clock. There were a few of these clocks sold and in the early part of 1913; there was a great flood in Ohio. Unfortunately, most of the clocks out on consignment were destroyed by the flood and the company found itself bankrupt.

The following year a high-pressure salesman from Chicago, whom we will call Mr. X because no real identity was ever disclosed, offered to reorganize the clock company and guaranteed to produce and market the No-Key Clocks for a 51% interest in the bankrupt partnership. Mr. X journeyed to Lodi, Ohio, where he interested the newly formed Chamber of Commerce to provide a building for the new clock company. He called on the leading merchants of Lodi and sold them about \$10,000 worth of stock. With this money in hand, he opened an account in Ashland, Ohio, bank, established his credit, and borrowed \$25,000 for the company, depositing the patents and good names of the stockholders of Lodi as collateral. Clock Machinery was purchased and installed in the new factory, but never paid for.

Mr. X's operation took about six months and the grand opening day was announced. The men from Mount Vernon who thought they owned 49% of the stock planned to visit Lodi for the great event. The stockholders of Lodi organized a picnic for the infamous day.

Several days before the opening, Mr. X failed to appear at the factory where he was making the final adjustments to production line machinery. Upon inquiry of his landlady to find out if he were ill, she disclosed that he had not inhabited his room the previous night. The remainder of the day was spent in query of the whereabouts of Mr. X. A check on the Ashland bank disclosed that practically all the money had been withdrawn from the No-Key Clock Company account by the president and general manager, Mr. X.

The No-Key Clock Company was again bankrupt. The two stockholders from Mount Vernon gave up the entire project as a miserable failure and were fortunate that they were not held liable for Mr. X's operation. "Quote from James A. Beam 1.

Who would not want to own a clock with such an interesting story!

There is a little more to Mr. Gibb's account that was not included on the original note as found on the clock; *"The new clock made at Mt. Vernon (Ohio) had the same frame, same size electro-magnet, and same base. The switching mechanism on the Mt. Vernon clock was the only apparent change made."* **1**

From Mr. Gibb's account we know that "several hundred" clocks were produced in No-Key's new location of Mt. Vernon, Ohio. (Through existing examples we know that there were also clocks produced in West Virginia). Additionally he mentions that some "tweaking" of the production line/product occurred after the initial move to Ohio. From existing examples of clocks produced at both the Wheeling WV and Mt Vernon we have an idea of what was changed. There were Patents on the design that were initially acquired by Mr. Dorsey and later used as partial collateral for the reorganization in Ohio. The floods in Ohio occurred over a three day period 25-27th of March 1913. This period effectively ended production of the clocks in Ohio that had begun in 1911-1912. The assumption in reading Mr. Gibb's account is that production in West Virginia started sometime before 1911.

During the remainder of this article the following questions will be addressed; why was Mountain State Electrical involved in the manufacturing of the No-Key? Who designed and applied for the Patent(s) held by the company (traded to Mr. Dorsey)? What changes were made in the design after the move to Ohio?

No-Key Clock Patents

Part of the excitement of collecting is when all the pieces fall together and you experience the "ah ha" moment. Such was the case while researching a master clock in my collection built by Arthur F. Poole on the NAWCC website (an excellent source of information both for the repair of clocks and watches and research). On their website a listing of Poole's patents appeared in a message posted by Dr. Denny **2**.

Her listing showed he had filed four patents while a resident of Wheeling WV. Looking these patent numbers up at the United States Patent and Trademark Office website revealed that patent number 868,696 was for the No-Key clock design! It was applied for on January 24, 1906 and granted on October 27, 1907. Another patent # 868,581 filed in Santa Barbara, California February 10, 1904 and granted on October 15, 1907 is for a general system of rewinding clocks using an earlier form of the No-Key style armature and contact/switch system.



Photo used with permission of Dr. Elizabeth Denny

Figure 1, Arthur F. Poole (seated) taken in November 1914, with his 8 year-old son Arthur Barnard Poole (left), 5 year-old Daughter Barbara (right) and 4 year-old son John (on his lap).

Arthur F. Poole

The basis of the following biography of A.F. Poole was related by Dr. Denny 5.

Arthur French Poole was born in Cumberland MD on August 21st 1872 to A.A. Poole, a watchmaker and optician. The family moved to Washington, PA in 1878 where Arthur attended school, entering Washington and Jefferson College there in 1888 and attending until 1891 when he returned to work at his father's store.

He entered Leland Stanford Junior College in Palo Alto CA in 1894 and graduated with an A.B. degree in astronomy in 1896. During his time at school he had an opportunity to work at Mt. Hamilton Observatory there (which had, in 1888, installed the "most powerful" telescope in the world at James Lick's request – Author's note). In 1896-1897 Poole was at work in Allegheny, PA as a Draftsman with J.A. Brashear making Astronomical instruments. (The Brashear firm worked on the Mt. Hamilton observatory installation – Author's note).

In 1898, while again living in Washington Pennsylvania, he applied for and was granted August 22nd 1899 his first patent 631,511. The invention was an electric master-clock that employed mercury in a tube filled with Nitrogen to deliver an impulse from a Master clock to a set of Slave Dials. A Washington and Jefferson college yearbook from 1926 states, *"In 1897 he left the Brashear factory to work on a clock system of his own invention"*.

From 1900 to 1904 Poole was in Wheeling West Virginia patenting improvements to party line phones and signaling systems for MSE. At this time two further Electric Clock patents (708,253 and 834,995) were filled by Poole on September 7th 1901 and December 6th 1900 respectively, and were granted on September 2nd 1902 and November 6th 1906. Again these designs used mercury switches to send time and synchronizing signals to Slave dials. During part of 1904 Poole traveled to Santa Barbara, CA caring for his Father, who had retired there due to poor health. Here he filed patent 868,581, February 10, 1904 for a winding system, which has already been described above.

Resided in Wheeling WV again from 1904-1912 he submitted and was granted the patent for the "No-Key" design, (and likely began building No-Key clocks at MSE plant in Wheeling ~1905-7 – Author's note).

An obituary run in the Ithaca Journal, April 27, 1934 states that in 1904, after returning from his marriage to Maryline Barnard in Ventura, California: "He (A.F. Poole) joined Mountain State Electrical Company at Wheeling, W. Va., where he aided in the development of automatic telephones." ⁴ The obituary suggests that he stayed in Wheeling until 1912 when A.F. Poole moved to Chicago to work with the Wahl Company, and later Remington Typewriter Company, on attachments for typewriters and improvements to the Wahl Eversharp mechanical pencil. ⁵

Mountain State Electrical (MSE) Company

A History of Wheeling, written in 1902, contains the following quotation. *"The Mountain State Electrical Company was organized in September, 1900, with officers as follows: President, Frank B. Hall; vice-president, F. B. Jones; secretary, John F. Frasher; and treasurer, Henry F.B. McLain. The firm supplies all kinds of electrical appliances, does contracting and armature winding, and furnishes general electrical supplies."* ³

Entries in City Directories of Wheeling, list the company from 1901 until 1909:

1901/1902, First Listing in the city directory

F.B Hall, President

F.B. Jones, V. President

J.F. Frasher, Secretary

HFB McLain, Treasurer

Located at 55 12th Street in Wheeling.

Primary business was a manufacturer and distributor of telephone and electrical equipment - Hall cable terminals and standard cable clips.

1904/1905, Listed at 911-915 Market Street in Wheeling

1907/1909, last listing in the directory

Frank B. Hall, Pres.

H.C Handlin, VP

*F.M. Ferguson, Sec. and Treas.
John F. Frasher, Manager*

After this time the entries for MSE cease in the City Directories. **6**

A search through all of Arthur F. Poole's ~111 patents, as collected by Dr. Denny, showed that three were filed jointly in 1901 - 1902 with Frank B. Hall the President of Mountain State Electrical. The numbers are; 810,345 Telephone party-line system, 810,346 Party-line signaling system and 810,335 Telephone party-line system.

From his patent filings with Hall and the description of MSE doing "contracting and armature winding" it is clear the Arthur F. Poole would be well connected to the company to approach them with a clock building proposal and that they would be receptive. It is interesting that Poole's name is not associated with the company officers nor does it appear on surviving clocks. This fact suggests that it was MSE owned and was manufacturing the No-Key, perhaps with Poole in a technical position and receiving a royalty. Either way, James Gibbs account indicates that it was MSE that traded the patents and the "inventor" is not mentioned.

The No-Key Patent Drawings and Clock Operation:

At this point I'd like to discuss the theory of operation of the No-Key for those unfamiliar with its operation. This will also allow the differences occurring in the production models to be more fully appreciated later. The operation of the clock will be illustrated using Arthur F. Poole's patent drawings.

With the advent of the "dry cell" battery in the 1880's (and before that time with earth batteries and wet-cells) there had been a desire to couple them to clocks and either use electricity directly for the impulsing the pendulum or for rewinding a spring or weight. The No-Key clock design adopted the latter course, which led to a more traditional clock mechanism with an intermittently re-settable weight driving the minute arbor. **Refer to Upper Half of Figure 2.** This shows a conventional time train driven directly by the re-settable weight (#32) mounted coaxially on the minute arbor and retained in position by a ratchet and wheel (#30 and #34). At intervals when the weight descends to a preset point, contacts are closed, current flows through the coils and the armature is drawn in between the two electromagnet poles. This movement is communicated through a linkage to the weight which is restored to the fully wound position. Refer to **Lower Half of Figure 2.** The linkage (#49 and #50) to the re-settable weight (#32) is shown in the figure. It is clear to see that if the yoke (#48) is moved to the right by the pin (#43) centered in it, then the driving weight will be lifted. The falling of the weight powers the clock for about 5 minutes, and then the process is repeated. **Refer to Figure 3** for side elevation of armature, yoke and pin. When the contacts close, the armature swings the pin away from viewer carrying with it the yoke and lifting driving weight. Likewise, **Refer to Figure 6** for the rear elevation showing Electromagnets 12 & 13, Armature 40, Roller 53 and Cam 52.

There are several advantages to this system. The driving power to the clock train is relatively unaffected by the battery voltage so there is very little interference with the clock's timekeeping. The force of the weight while descending is multiplied by a cam/lever system so that the contacts are closed quite forcefully. It should be noted that this style of mechanical-electrical contact was used in the telephone patents issued to A.F. Poole with Frank B. Hall in 1901-02. **Refer to Figure 4** for plan view of the contact arrangement.

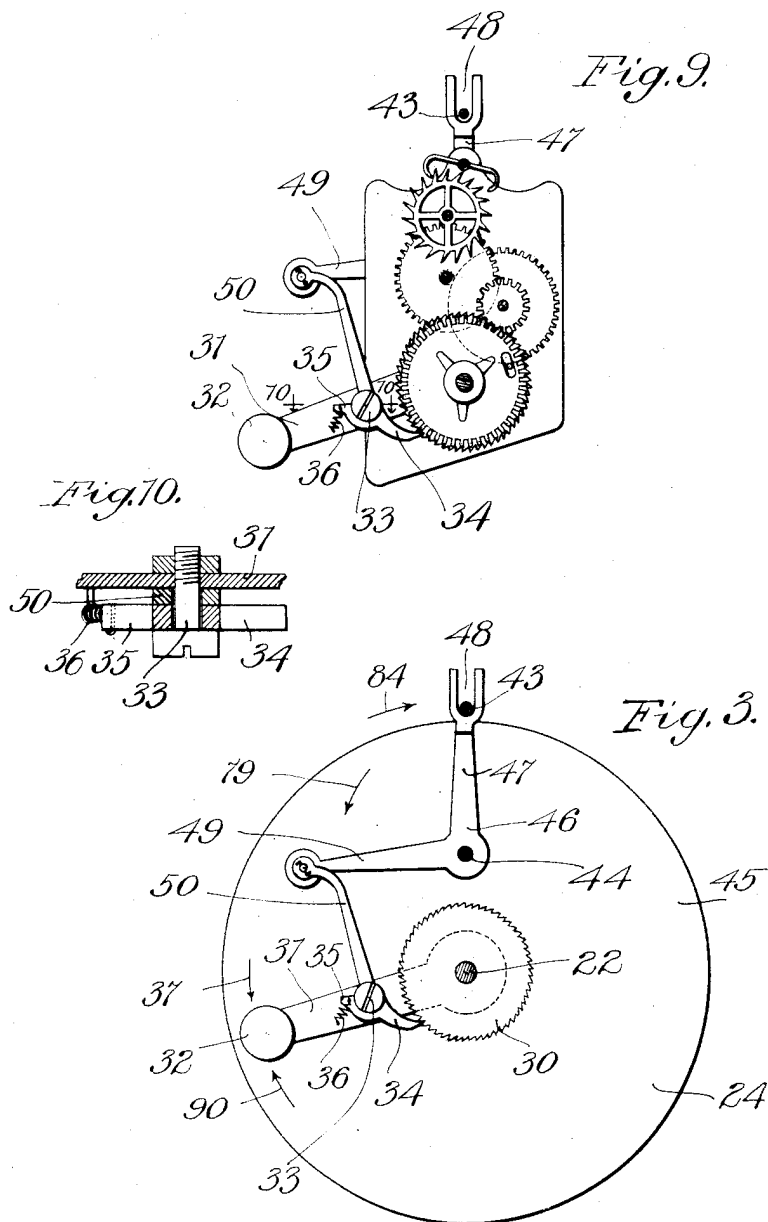


Figure 2, Detail from Patent 868,696 showing Time Train and Driving Weight Linkage. Note Pin #43 and Yoke #48.

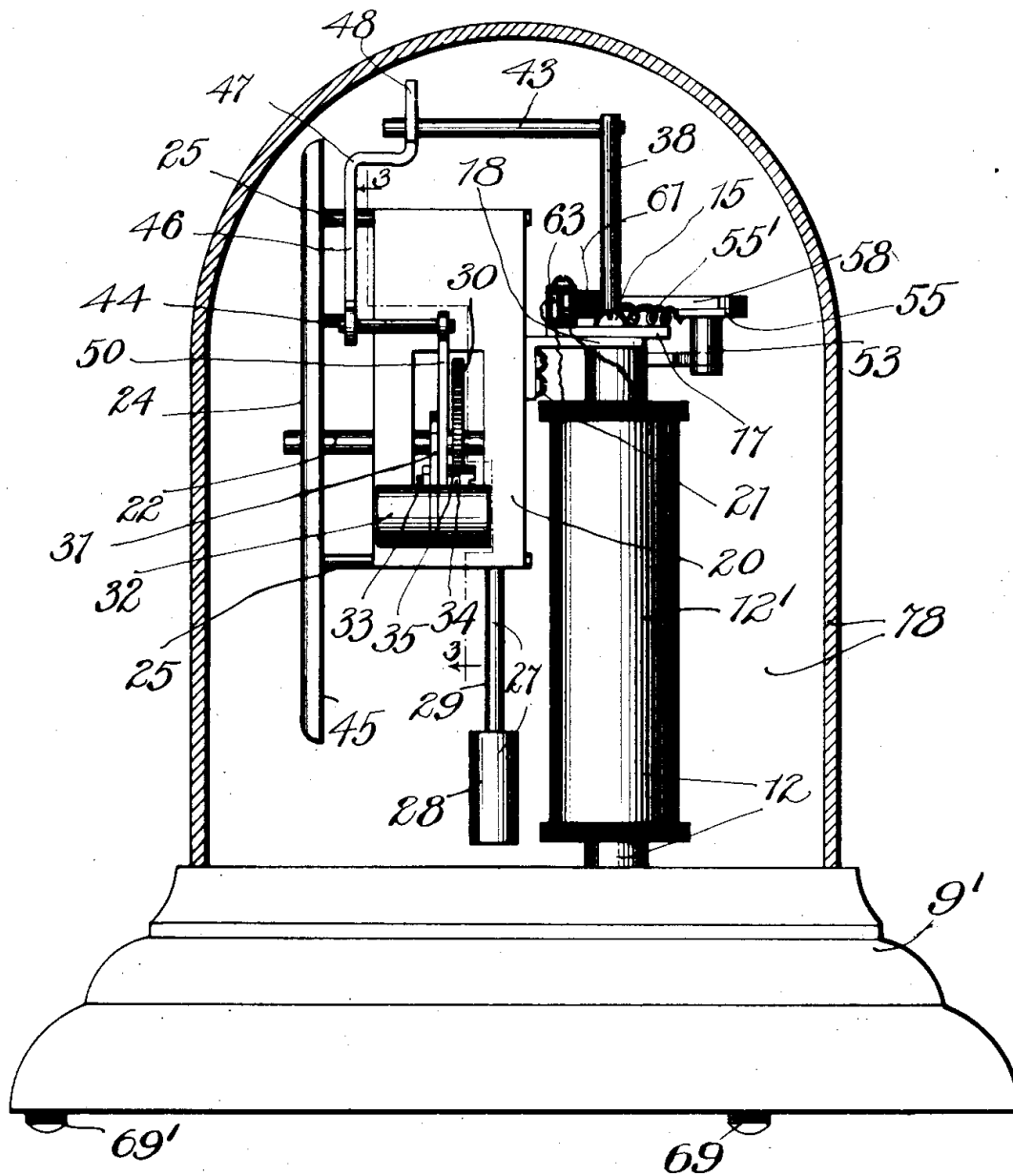


Figure 3, Patent #868,696 Drawing of No-Key clock side elevation.

Figure 4 shows Rod (#38) connected to the Armature (#40 shown in two positions as a dashed outline). As the driving weight descends, the Yoke and Pin (#48 and #43, shown in **Figure 3**) cause the Rod #38 to rotate counter-clockwise carrying the Armature and Cam surface (#52) with it. Roller #54

descends Cam Surface #52 causing linkage (#55, 57 and 60) to bear against contacts (#61 and 62).

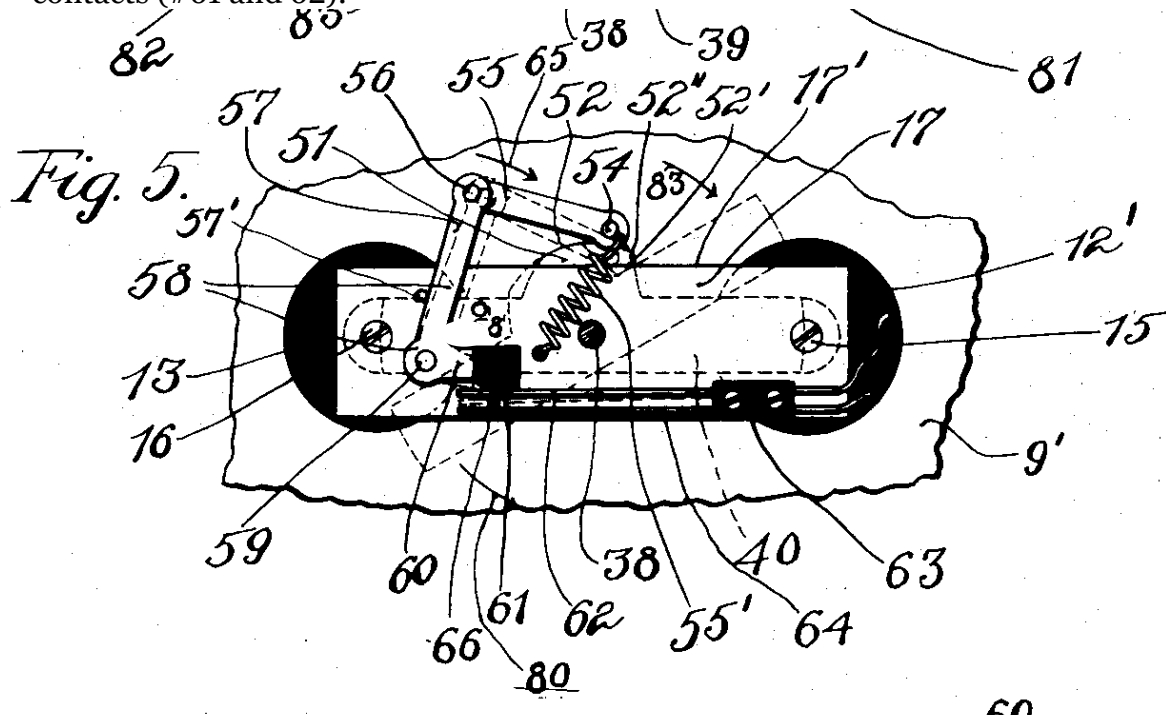


Figure 4, Detail from patent #868,696 showing Armature and Contact arrangement in plan view.

The contact closure energizes the coils and draws armature into position directly between the poles (the horizontal dashed outline in the patent drawing). This rotates Rod (#38) clockwise and re-sets the driving weight through Yoke, Pin and Linkage shown in **Figure 2** and lifts the roller to higher portion on the cam surface, thus opening the contacts. The reset position is shown more clearly in **Figure 5**.

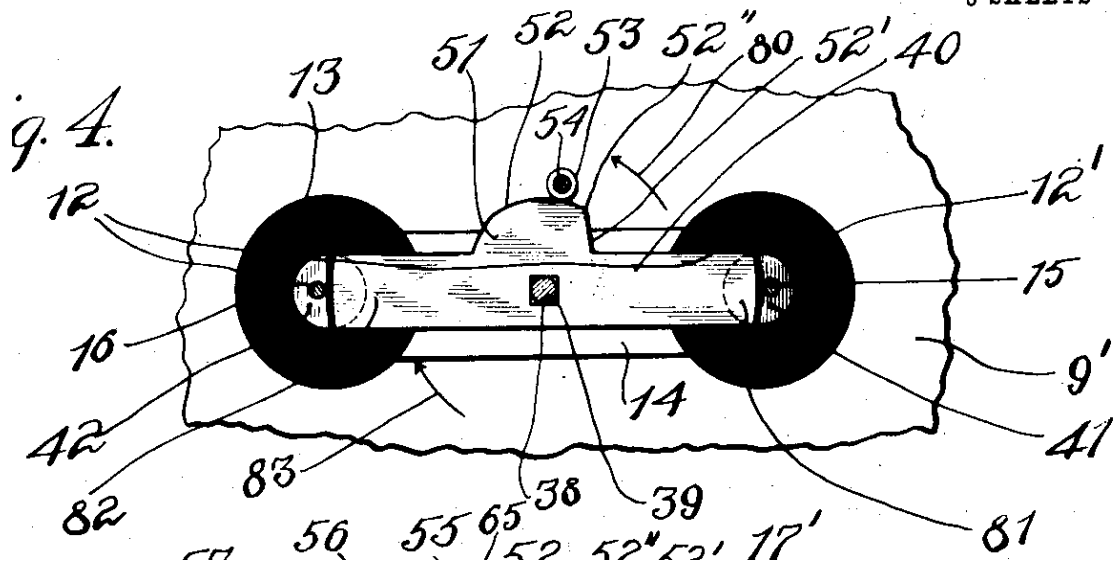


Figure 5, Detail from patent #868,696 showing Armature in reset position with Roller #54 raised by Cam surface #52 and so opening contacts (not shown).

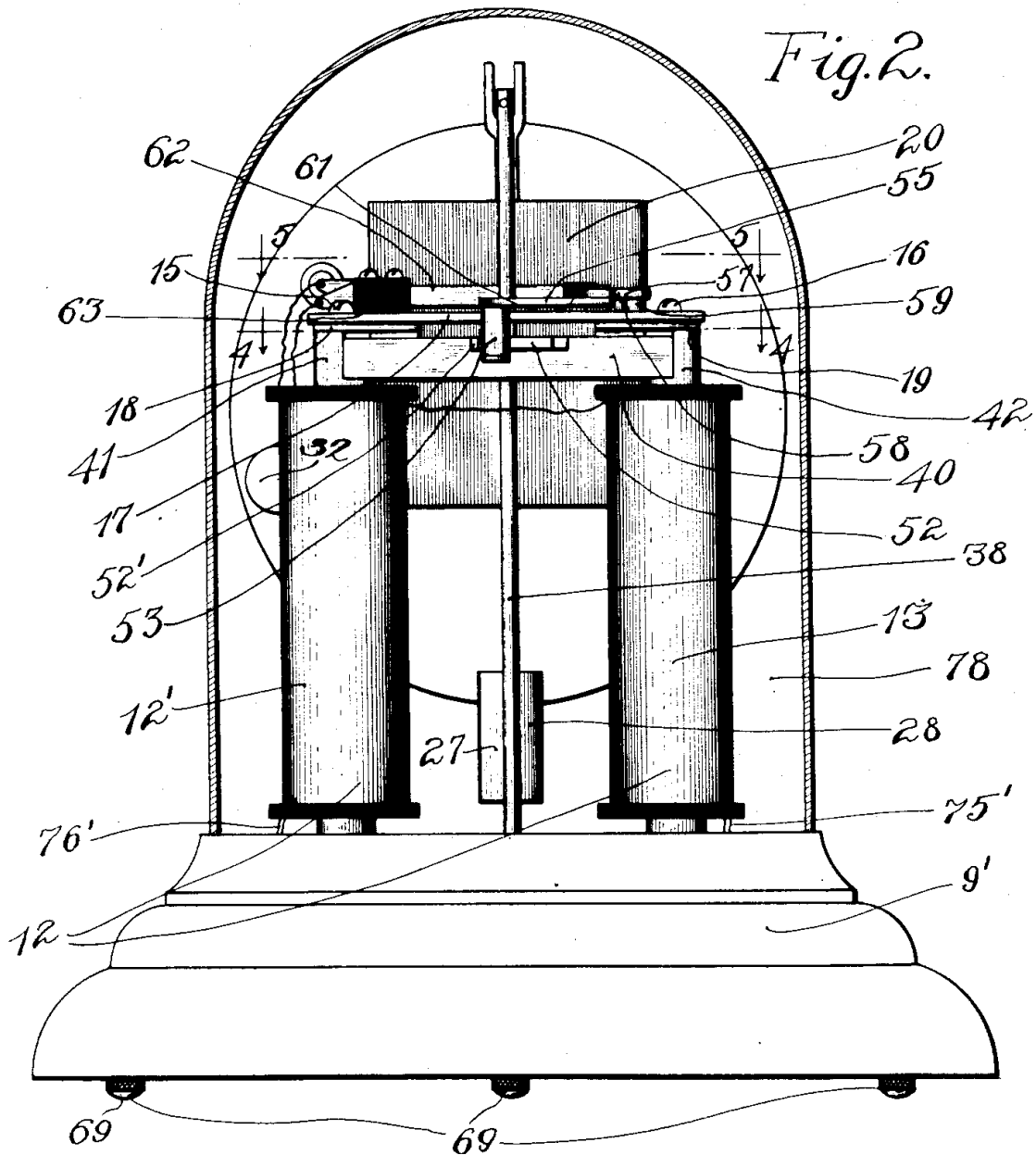


Figure 6, Detail from Patent #868,696 showing Armature, Yoke, Pin and Contacts. Note that originally there was to be a box (#20) surrounding the movement.

Part II of this article will continue with an examination of existing clocks produced by MSE in West Virginia and then after the company relocation to Ohio.

Bibliography

1 *Buckeye Horology, A review of Ohio Clock and Watch Makers by James W. Gibbs F.R.S.A., F.N.A.W.C.C. The Art Crafters Press, Columbia, Pennsylvania, 1971. (Quoted from James A. Beam)*

2 *NAWCC Message Board, Posted by Dr Elizabeth Denny June 17, 2003.* Note: Dr. Denny furnished the primary reference material on these patents as:

- United States House of Representatives, Annual Report of the Commissioner of Patents, Washington, DC: U.S. Government Printing Office, 1899 through 1919
- United States Department of the Interior, Index of Patents Issued from the United States Patent Office, Washington, DC: Government Printing Office, 1920 through 1924
- United States Department of Commerce, Index of Patents Issued from the United States Patent Office, Washington, DC: Government Printing Office, 925 through 1938

3 *History of Wheeling City and Ohio County, West Virginia and Representative Citizens, by Hon. Gibson Lamb Cranmer, 1902.*
Typed by Carol Taylor Lanza. Pages 839-840 found during an online search

4 Ithaca Journal, April 27, 1934, page 5. "A.F. Poole, 63, Scientist and Inventor, Dead."

5 *Private correspondence with Dr Elizabeth Denny, 2006*

6 *The Callin City Directories of Wheeling 1901-1909, Research by Glenn White.*

Part II

Existing No-Key Clock Examples

MSE (Wheeling West Virginia) Clocks

Part I of this article examined the patents, MSE Company and the inventor of the No-Key clock, A. F. Poole. Part II will look at existing examples and try to draw some conclusions.

While searching the web for information on the No-Keys, I happened upon Rick Thomes website rareclock.org. On his site Mr. Thomes had been compiling a serial number list of existing No-Key clocks and their features. These data along with additional clocks seen up for sale etc. on the web furnished the source material for this section.

There are examples of West Virginia clocks, built by MSE, with serial numbers from 169 up to 200₃ (this clock's serial number is stamped with the subscript "3") known to the author. All these clocks are of one basic design that closely follows the patent drawings, especially when compared to the Ohio Clocks that followed.

With the bezel removed, the dial of a West Virginia No-Key S/N 200₃ shows a patent date of June 5th 1905. Refer to **Figure 7**. This patent is not for the clock, but rather refers to patent number 791,503 issued for the "Process of Printing upon Pyroxylin (Celluloid – Author's note) Materials", by Richard E. Roehm and assigned to Whitehead and Hoag the printers of the dial, whose names proceed the date on the dial. So the earliest production date must be after this time.

The other reference to a Patent on the dial is the just below the No-Key logo and states "Patent Applied For". This reference to a singular patent application would seem to be to the first patent for a general system of rewinding clocks using an earlier form of the No-Key style armature and contact/switch system. It was filed on February 10, 1904 and granted on October 15, 1907. (The actual No-key patent was filled January 24, 1906 and granted on October 27, 1907.)

This indicates a manufacturing starting date (at least the dial printing) after June 5th 1905 but very likely before the second patent application on January 24, 1906. Otherwise the dial would read, "Patents Applied For" rather than "Patent Applied For". Most certainly the date was before either of the Patents were granted in 1907. The Trade Mark reference to the name No-Key has not been traced as of yet.



Photo used with permission of Rick Thomes

Figure 7, Showing Wheeling, WV No-Key Dial S/N 200₃.

The following figures have the individual design features highlighted to emphasize the changes. Refer back to **Figures 3-6 in Part I** for comparison to the patent drawings. **Figure 8** shows the basic MSE No-Key clock with “over-slung” winding (that is the Pin and Yoke that lift the weight are above the dial), mechanical contacts and serialization. All WV clocks known to the author have these features. Most of the WV clocks have paper or cloth coverings over the coils (Except S/N 226), whereas all Ohio clocks seen have brass tubes protecting the windings. Additionally, the bottom flange on the base is not rolled in early clocks (S/N 226 is an exception) making it “flimsy” when handled. Later clocks have a stiffer rolled edge.

At least two surface finishes were used, natural colored brass and an “arts and crafts” looking copper. The copper finishes appear to be clustered around S/N 600.

In Mr. Gibb’s book “Buckeye Horology” **1**, he noted that the contacts were an area of change in the clocks built after the move to Ohio in 1912. There are photos of both WV and Ohio clocks included in the book, but the quality is too poor to reproduce here. The photo of the WV clock appears to show a model very much like the one illustrated in **Figures 9-11** with the double-blade contacts mounted in the same position on the contact plate (left side as viewed from the rear) as is shown in the patent drawings. All of the WV clocks examined in preparation of this article have the same style contacts except for S/N 200₃.

Refer to Figure 11.

Serial Number 200₃. The clock is so different from the other WV clocks seen that it raises the question, is it a production clock at all? There are at least three main differences; the contacts are of a single-blade design and mounted on the right side of the contact plate, the winding is “under-slung” and the armature is made up of laminations incorporating the cam surface. Plus the coils are covered with brass tubes. These features and the fact that the last digit of the serial number looks like it was added to the original 3 digit number lead to the conclusion that this clock was put together at a later date.

Serial Numbers and styles from known WV clocks:

- S/N 169; Brass finish, Bottom not Rolled, Black cloth coil covering.
- S/N 226; Brass finish, Bottom Rolled, Brass coil covering.
- S/N499; Brass finish, Bottom not Rolled, Black cloth coil covering.
- S/N 575, 590 & 606; Copper finish, Bottom not Rolled, Black cloth coil covering.
- S/N 806; Features not known.
- S/N 919; Brass finish, Bottom Rolled, Cloth coil covers
- S/N1188; Features not known.
- S/N 200₃; Brass finish, Bottom Rolled, Brass coil covers. This clock is the only one to have the blade contacts reversed. Serial number appears altered from 200 by the addition of a 3. **Refer to illustration Figure 11.**

From the above data, excluding serial number 200₃, it is reasonable to conclude that the WV production was roughly 1200 clocks if all serial number blocks were completed. This seems high given the small number of clocks that come up for sale.



Photo from Author's collection

Figure 8, example from Wheeling West Virginia s/n 590

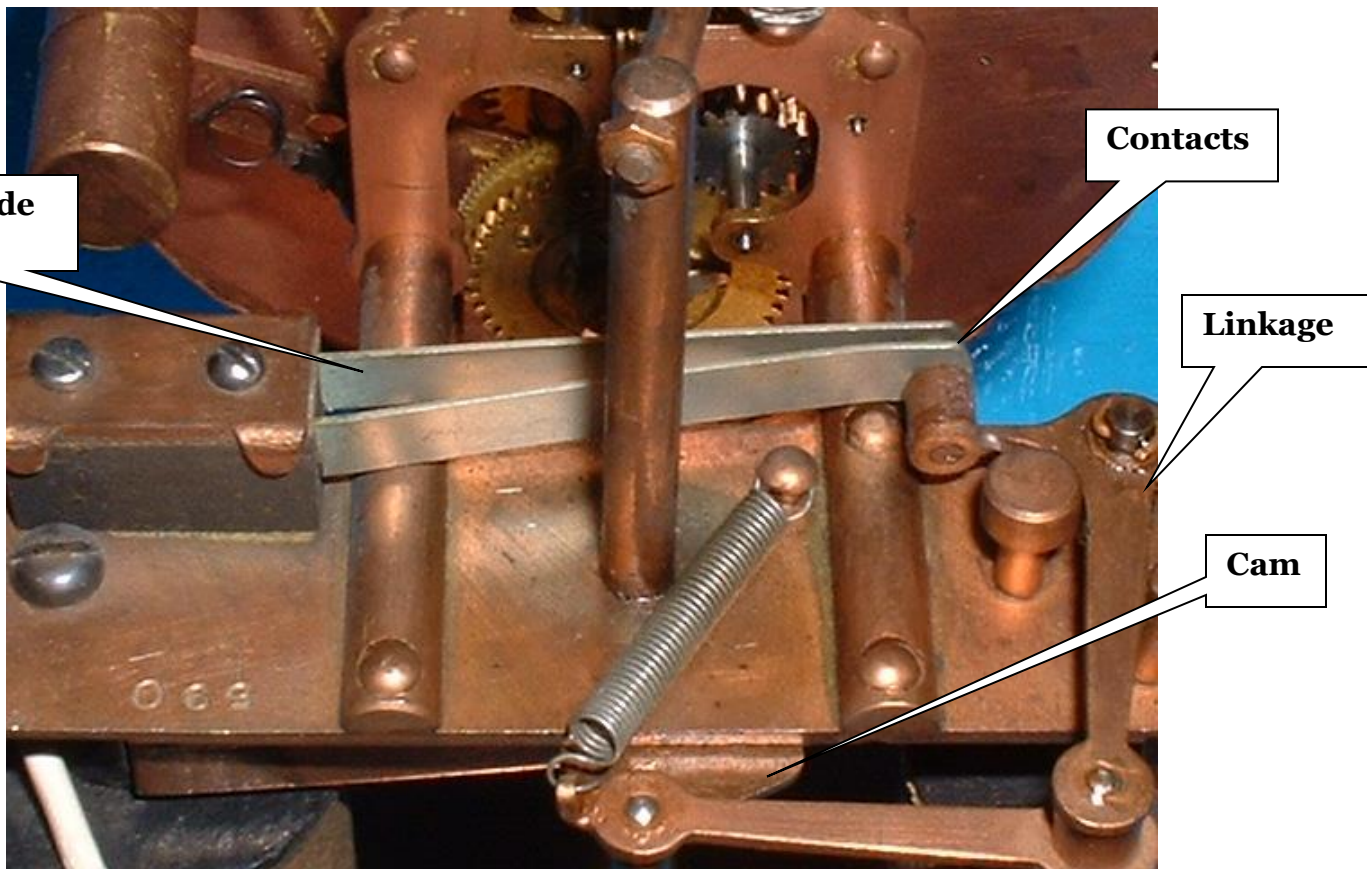


Photo from Author's collection

Figure 9, Production Clock #590 Wheeling, West Virginia. Notice contacts made mechanically by means of a cam and linkage to the armature as in patent drawings.

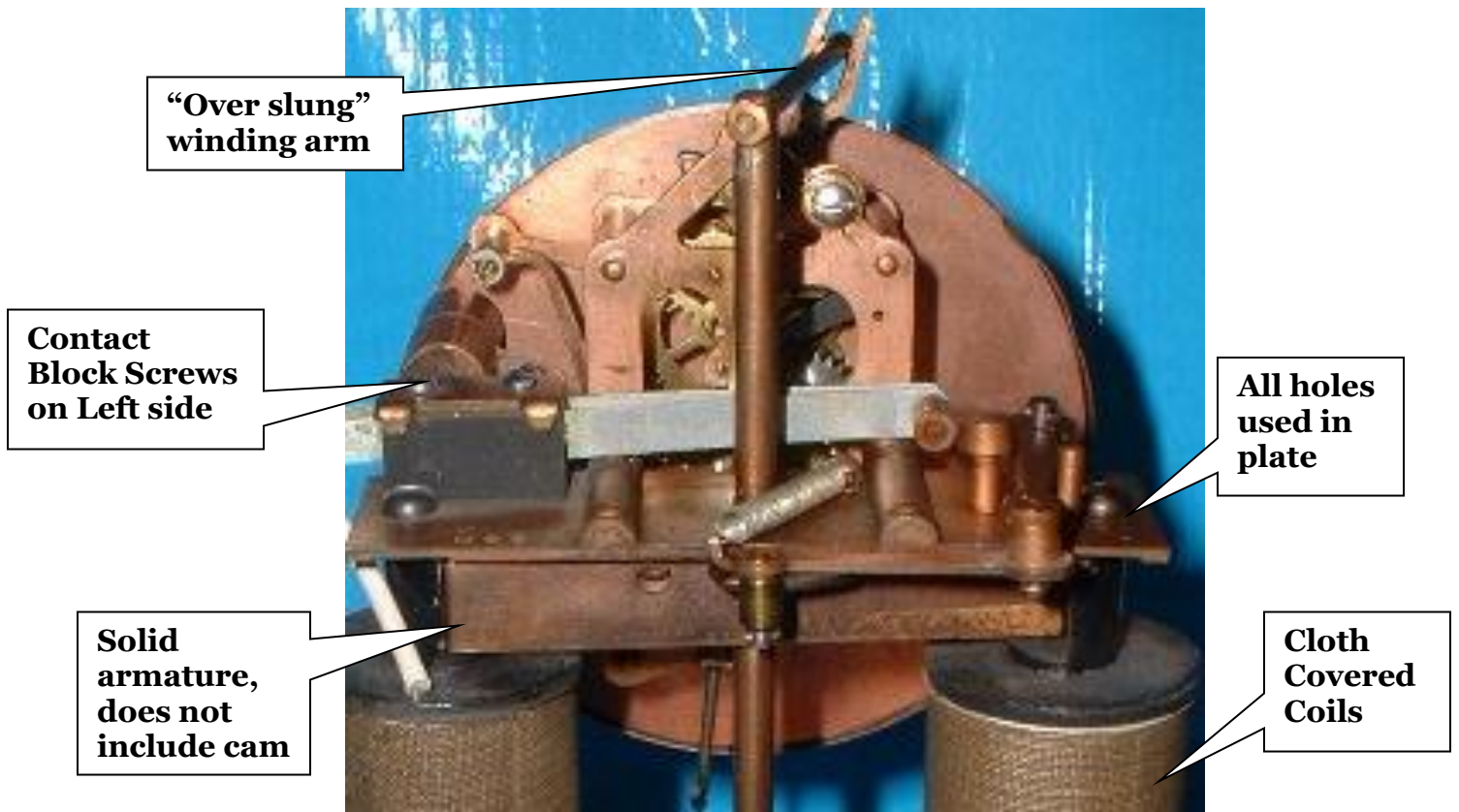


Photo from Author's collection

Figure 10, Production Clock Wheeling West Virginia, #590 – wider view. Shown in fully wound position.

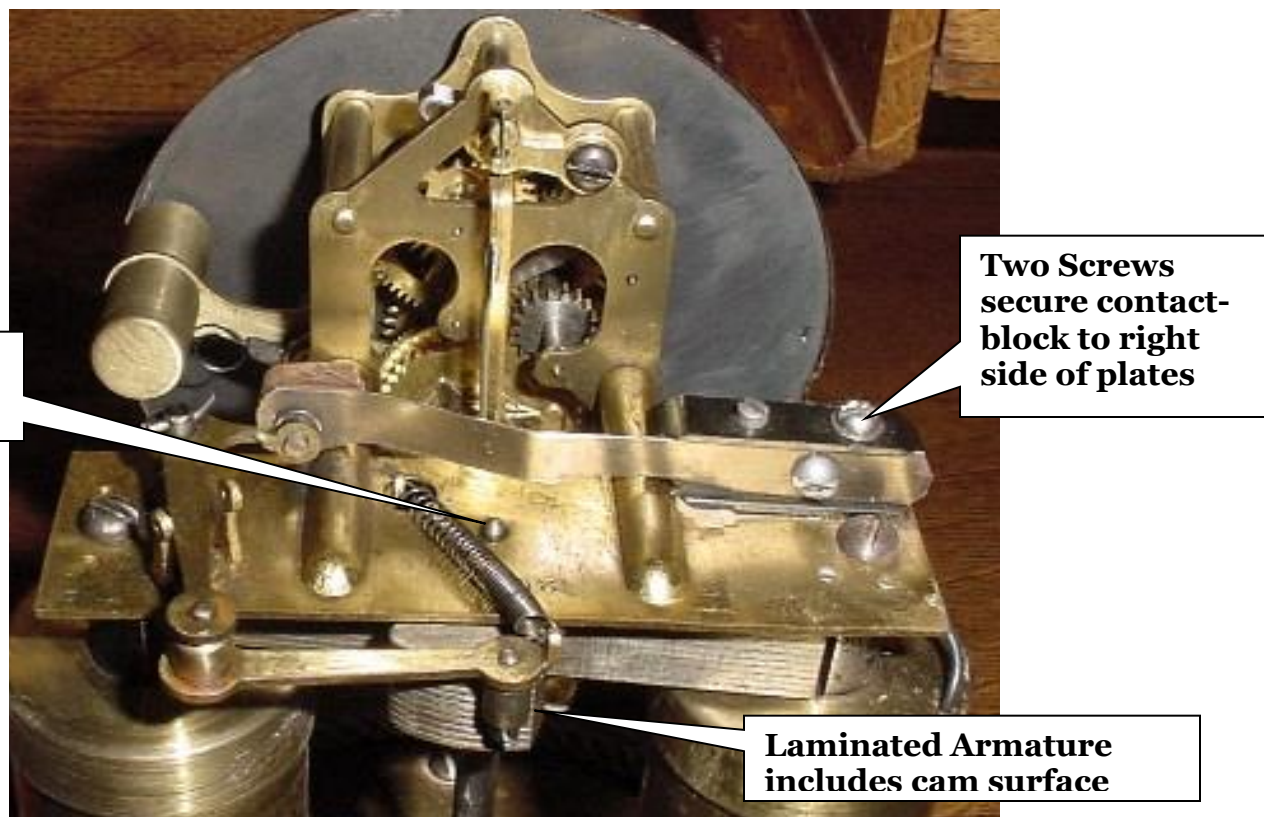


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Figure 11, Prototype or Post-Production? Serial number 2003 looks to be 200 and then a later and smaller 3 stamped. Dial marked Wheeling, West Virginia. Contact Plate “flipped over” with unusual Laminated Armature

Ohio Clocks

Production began in Ohio, according to Mr. Gibbs, with “*fixtures, partly completed clocks and a sizeable amount of raw materials* “. “By late fall of 1912, several hundred clocks had been manufactured “...1. It seems reasonable then that there would be examples of WV style clocks built initially in Ohio and indeed one was observed during preparation of this article differing from a WV example only in that the dial was not marked “MSE” and it was not serialized.

All the rest of the Ohio examples observed (3 samples) show some form of improvement consisting of at least a Mercury switch replacing the old mechanical contacts along with a certain amount of reuse of the existing older parts. The clock pictured in **Figure 12**, has the minimum of changes, in this case just removal of the contacts, cam and linkages. The plates have been plugged in an attempt at neatness and a Mercury switch added to the “over-slung” winding mechanism. The new Mercury Switch wiring is simply run up through one of the empty screw holes in the contact plate.

Others, **Refer To Figure 13** have added components to better accommodate the Mercury Switch design while still using the old WV contact

plates. Some were “over-slung” winding (Refer to Figure 12) while others were “under-slung” (Refer to Figures 13 & 14) with a separate arbor carrying the mercury switch.

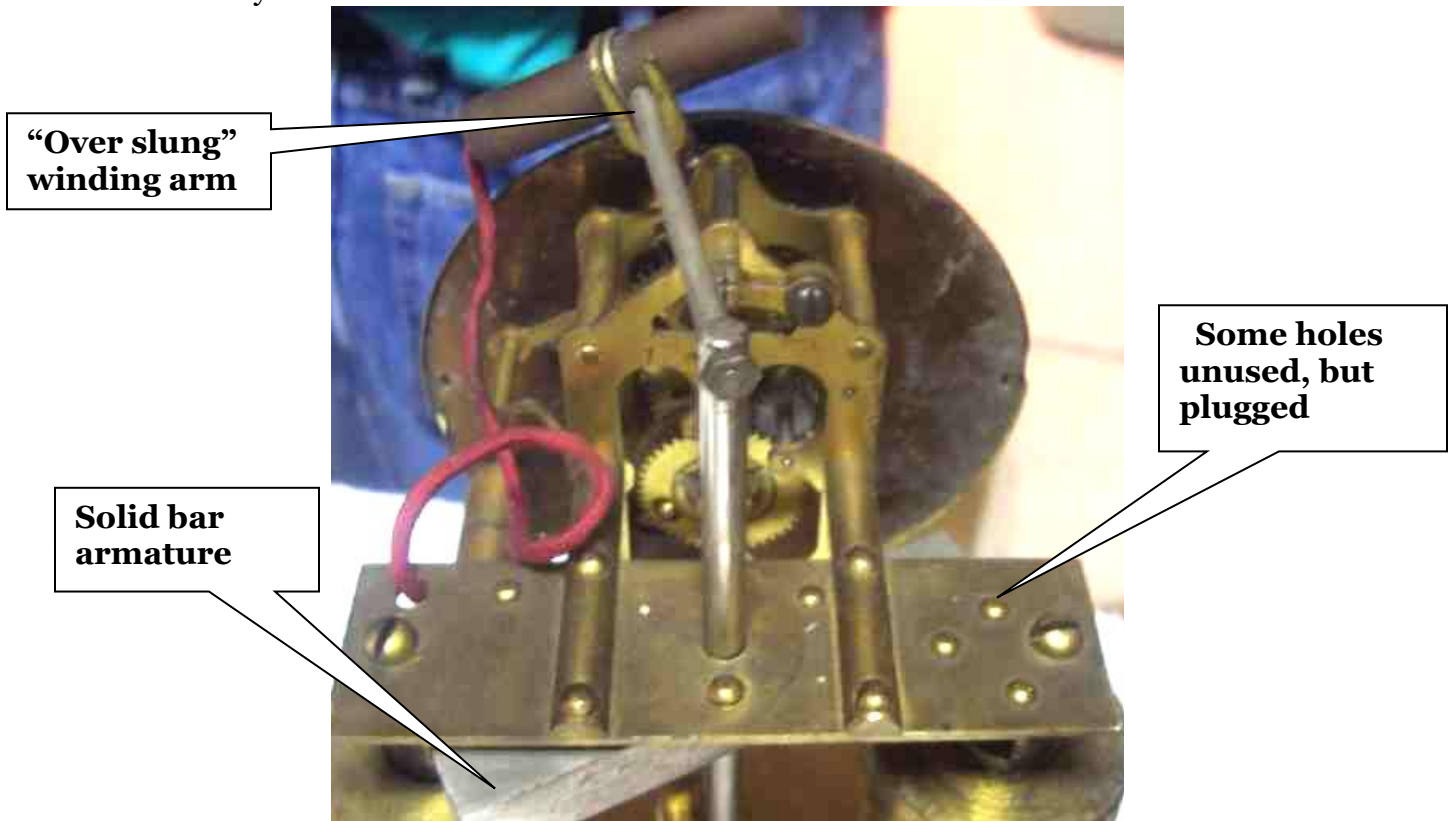


Figure 12, Ohio clock, no S/N, Early Plates and Armature. Mercury switch substituted for Blade contacts.

The mercury switch idea was not new to clocks at this time (and had been used by others) but had in fact been included in Poole's first patent, granted in 1899, for an improved master clock. So, it could well be that Poole participated as a “consultant” or in some other way in the redesign effort going on in Ohio. Or maybe the redesign was started or conceived in WV and “cut in” to production after the move.

Oddly, none of the Ohio clocks observed has the new manufacturing location or newly granted and acquired patents printed on their dials only the MSE information is removed. In addition, none of the Ohio clocks seen have serial numbers.

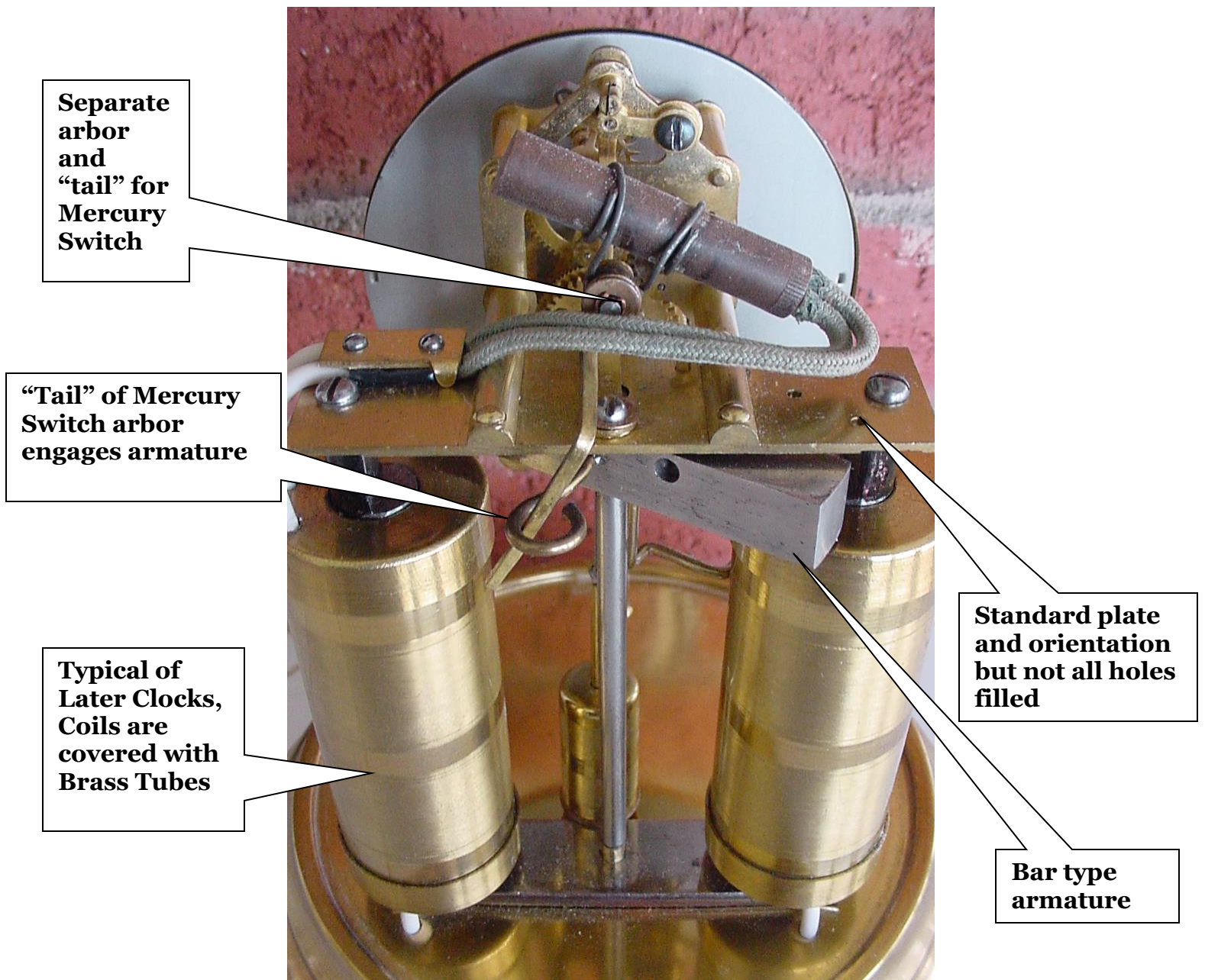
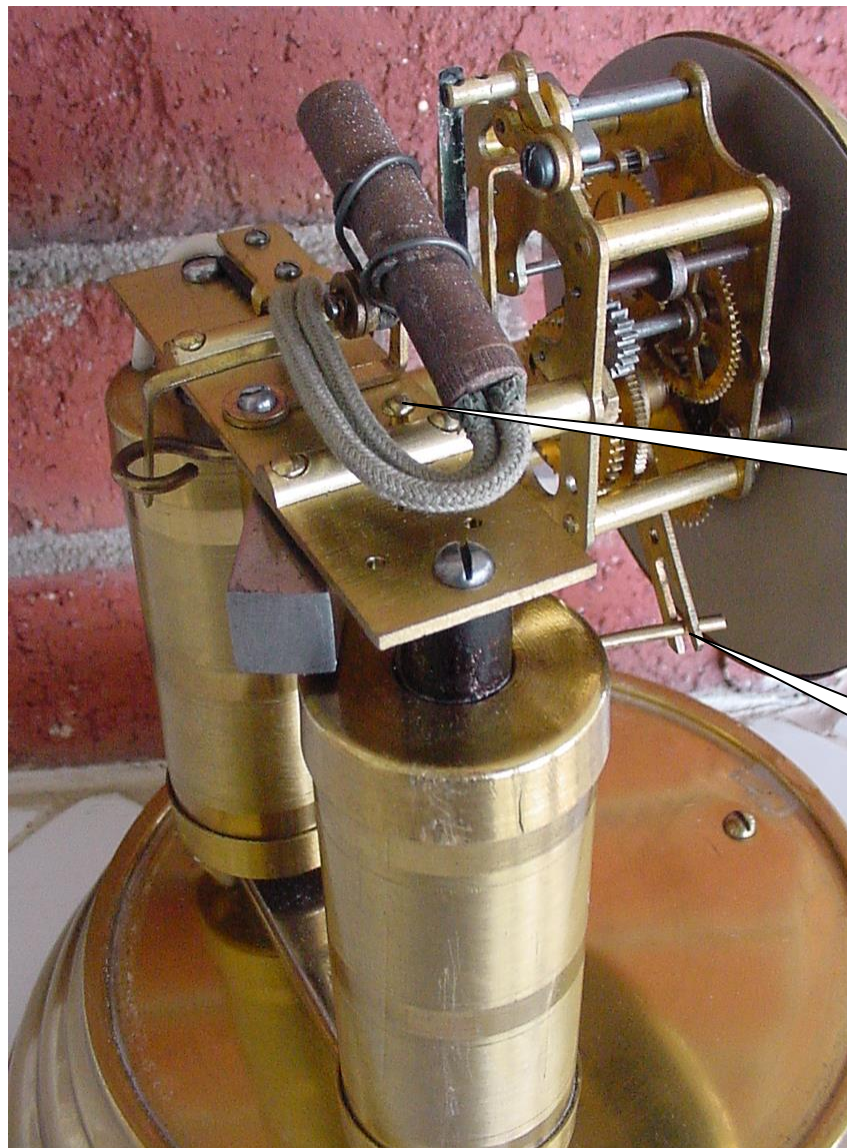


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Figure 13, Ohio clock. Early Plates and Armature, also with Mercury Switch.



**Unused
components**

**“Under-slung”
Winding Arm**

Photo used with permission of Rick Thomes

Figure 14, Ohio Clock, Showing additional detail of Mercury Switch mounting.

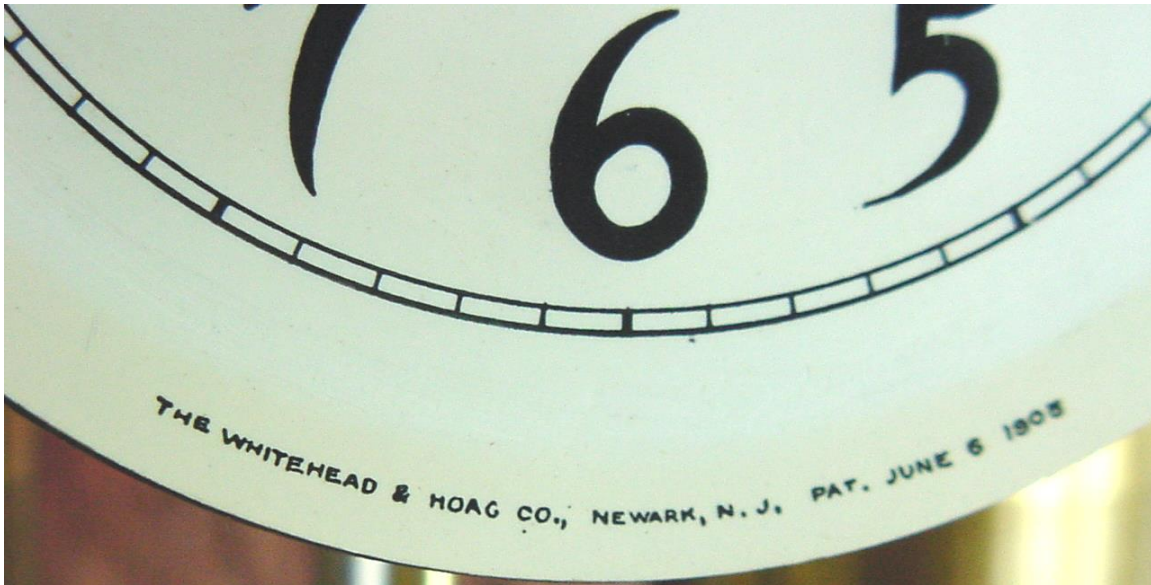


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Figure 15, Showing “Ohio” Dial from clock in Figure 13 and 14 with “MSE” reference removed.

Conclusions

One of the main questions of interest remaining is, how many clocks were built? We have a serial number range from WV of up to ~1200 plus the statement in Mr. Gibb’s book that several hundred were built in Ohio (and most of them destroyed). Some clocks may have been built up from spare parts left behind from the Ohio bankruptcy. (Refer to **Figure 12**; s/n 200₃ which is built up with the contact plate carrying the contacts flipped left to right. Also, contacts on this clock look to be handmade and fitted.) Suffice to say that any No-Key clock is rarely found these days with the Ohio clocks being the scarcest. There are 14 clocks total documented in this article with 10 of these being WV clocks. So a rough estimate is that 2 ½ times as many WV as Ohio clocks survive. If we guess at the Ohio survival (after the flood) as being in the 100 clock region, that supports a WV production estimate of only 250 or so clocks. This estimate raises the question of whether or not all serial number blocks in WV were completed. Only additional information from owners of these clocks can help to clarify this question.

There is a strong possibility that some older clocks were modified or re-assembled to make them more reliable during a service event. One clock S/N 226 stands out as the only clock under serial number ~600 to have the bottom edge of the base rolled and brass coil covers fitted. This again might indicate factory repair/upgrade or that clocks did not come out of manufacturing in a strictly sequential order.

There were a good many experiments carried out in production mostly in Ohio, where you see a mixture of reliability enhancements centered on replacing the mechanical contacts with a Mercury switch. S/n 200₃ is the only clock to have

a laminated, armature (maybe only as a prototype) with the cam surface formed in. This is an “advanced” feature probably adopted to maximize battery power and also allowed the part to be built up with cam surface in one piece and then riveted together. This required tooling to be purchased for the stamping operation and might have been part of the redesign effort in Ohio but perhaps fitted to a WV clock that was part of the purchase but not sold.

The fascinating personal story of the No-Key clock as told in Mr. Gibb’s book was the initial inspiration for this research. My intention with this article was to present additional information to what already available in an effort to interest other members in this overlooked but important American foray into mass-produced electric clocks. All of this is just the “tip of the iceberg” for much information remains to complete the No-Key story, information that can only be supplied by the N.A.W.C.C membership. I would ask those of you with information to share on the No-Key, A.F. Poole or MSE to please contact me at richfhatch@hotmail.com.

About the author.

Sometimes the “thank you” for a gift is a long time in coming.

When I was a boy, growing up in San Diego, there was an elderly man, George Kerrigan, who lived around the corner from my parent’s house. He used to “tinker” in the basement and he didn’t mind if a kid (quietly) watched him work. He always had a variety of items in for repair. So I spent many after school, afternoon hours with him, watching, learning, how things are fixed and how things are made. Anything that his kids or grandkids brought him was fair game for repair. After he had cataract surgery, he even made his own contact lenses on a 10” Southbend lathe! While it seemed that he could do just about anything, his actual training was as a watchmaker, a trade he learned after returning from WWI. I learned to respect his skills and training and those of the watchmaking craft.

While I was in college, I heard that he had died and contacted his estate hoping to obtain a small memento. Well, I ended up buying all of his clock and watch making tools! Learning how to use those tools has given me a lifetime worth of learning and enjoyment while actually educating me in my chosen profession (Medical Devices). It all happened because of your patience, thank you Mr. Kerrigan!

Bibliography

1 *Buckeye Horology, A review of Ohio Clock and Watch Makers by James W. Gibbs F.R.S.A., F.N.A.W.C.C. The Art Crafters Press, Columbia, Pennsylvania, 1971. (Quoted from James A. Beam)*