

The Model T Ignition Coil

Part 3: Chronology of the Ford/K-W Coil Unit

By Trent E. Boggess and Ronald Patterson

“Specified the name FORD to be burned in script on the side of box.”
Joseph Galamb, “Record of Changes for T-5845 Coil Unit Assembly,” March 19, 1919

Knowledgeable Model T owners are aware that many different variations of the Ford/K-W ignition coils exists. Indeed, there may be no other Model T part for which so many different examples can be found. So many changes were made to these coil units that it is difficult to list them all, let alone find examples of each. Fortunately, it is now possible to roughly date particular Model T coils. Once the production of coils began in-house, Ford, following its standard practice for other Model T parts, began keeping detailed records regarding the design and components of the coil unit assembly. This information has survived to the present day in the form of “Record of Changes Cards,” often times referred to as “Releases,” in the collections of the Research Center at the Henry Ford Museum and Greenfield Village. These documents have allowed us to construct a chronicle of the variations of Model T coils as they were built by the Ford Motor Company.

Before embarking on the design history of the Ford/K-W Model T coil, a word of caution is in order. The ignition coils that were supplied as regular equipment for Model T Fords after 1914 and Fordson tractors were manufactured by three different companies: K-W Ignition, Kokomo Electric and Ford Motor. This chronicle describes the coils as they were built by Ford. There is evidence that K-W Ignition Company did not always change the design of its coils so as to exactly duplicate those made in the Ford factories. Indeed, coils exist with features that the “Releases” would indicate were never made by Ford. An educated guess is that the “Releases” identify the features of Ford-built coils, and that coils that differ from these designs were built by K-W who probably followed in (or may have led) Ford practice. What follows is our best attempt to categorize and illustrate the features of different Model T ignition coils and to approximately date their use on the Model T Ford.

1913 K-W Ignition Company Coil

The logical starting point for the chronicle of the Ford/K-W coil unit is the K-W Ignition Company’s coil of early 1913. This unit resembles the later brass top units with some significant differ-

ences. First the outside dimensions of the coil unit are somewhat larger than the later standardized coils. Second the placement of the contacts is different. The two front side contacts are lower than on the later coils and the bottom contact is located to the rear of the coil rather than the center. (See Photo 1.) Finally, the metal top is also distinguishably different. The metal top is made of a flat sheet

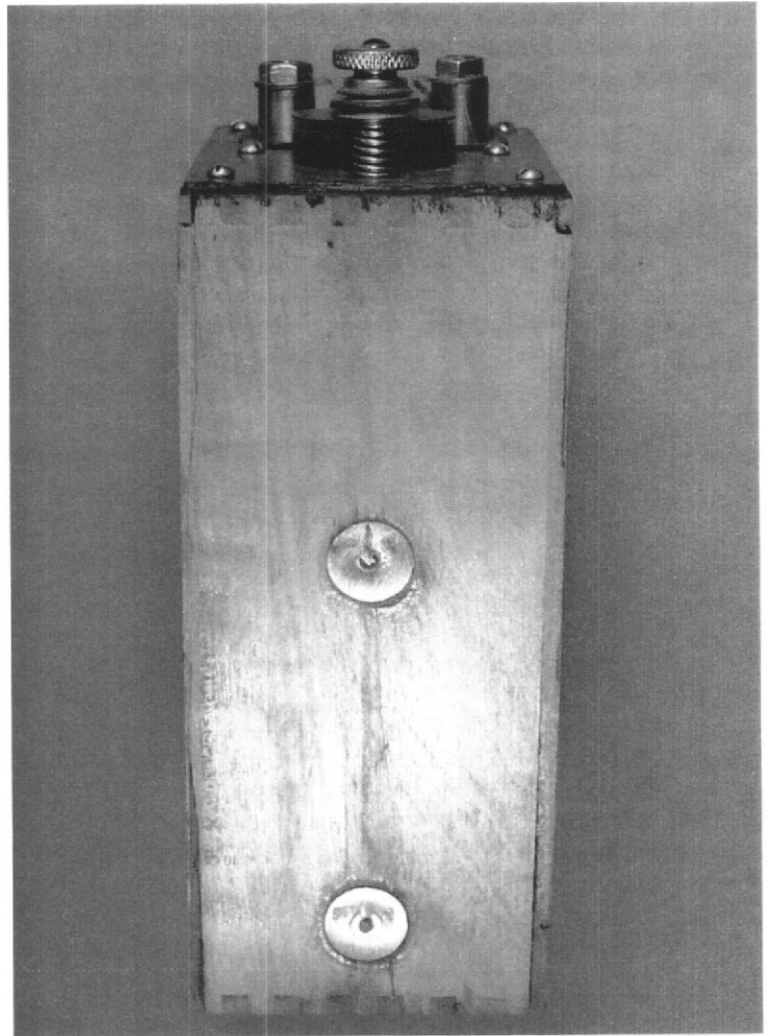


Photo 1: A K-W coil used in late 1912 and early 1913. The wood box is thicker and the contacts are in different locations as compared to its later counterparts. Note the knurled brass thumbnut that adjusts the gap between the points.

of brass held to the top of the wood box by six brass round head screws. On examples in good condition, the metal tops appear to have a black anodized finish, rather than natural brass color. The coils use the standard design K-W points that can be readily replaced with new production points. (See Photo 2.)

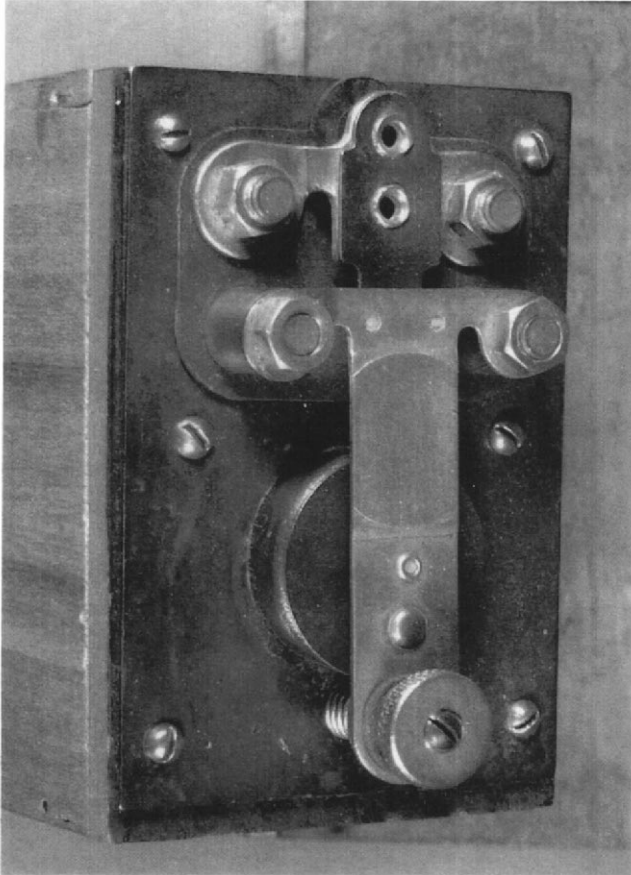


Photo 2: Close-up view of the top of the late 1912/early 1913 K-W coil. Note the flat brass top on this coil with a dull black finish. The thumbnut that adjusts the gap between the points is made of brass and does not use a lock nut to keep the gap setting fixed. Instead, the mounting stud is split and spread to provide resistance to keep the adjusting nut from turning on its own.

The 1913-15 K-W and Ford Brass Top Coil

The redesign of the K-W coil unit in conjunction with the Ford engineers during April and May of 1913 resulted in the standard design brass top coil. Initially, these coils were supplied solely by K-W Ignition, although Heinze made some coil units that conformed to the standard size and contact placement pattern and were interchangeable with the K-W coils in the later metal coil boxes. (See Photos 3 and 4.) Sometime

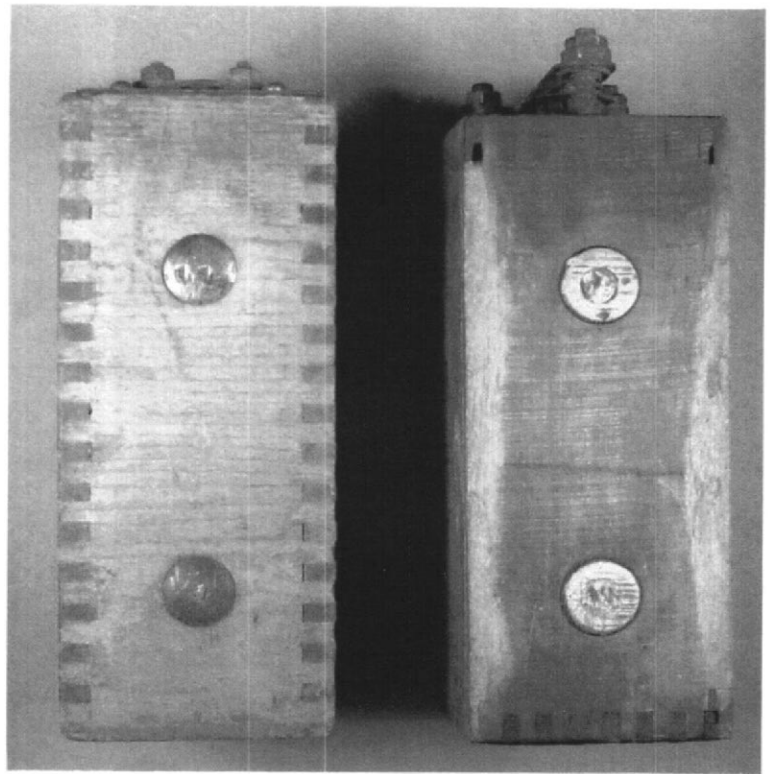
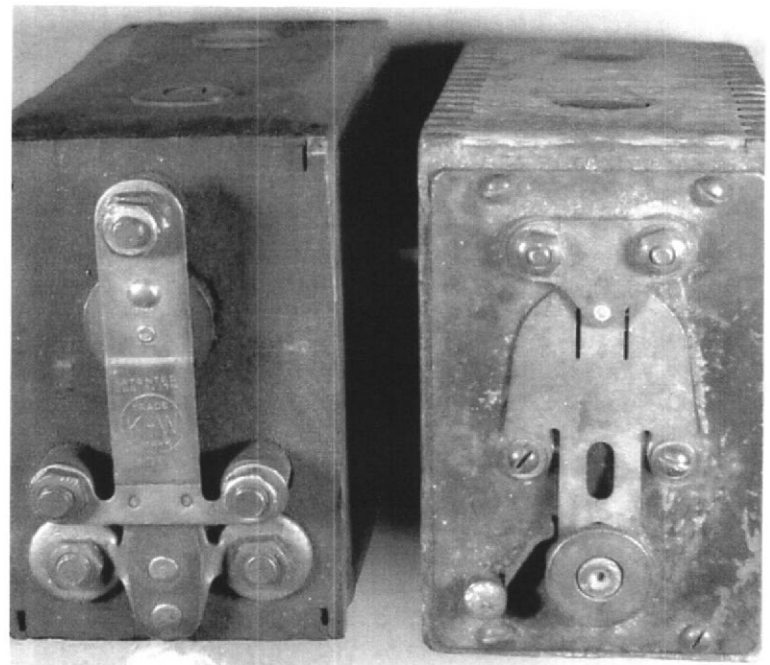


Photo 3 (Above): A 1913-14 Heinze coil (left) compared to a standard Ford/K-W coil. These Heinze coils were manufactured to the standard size as the Ford/K-W design and the placement of the contacts on the side and top are identical with the Ford/K-W design. These Heinze coils will fit perfectly in a standard Model T metal coil box.

Photo 4 (Below): Top view of a 1913-14 Heinze coil (right) compared to a standard Ford/K-W coil. While the size and contact location of the Heinze coil was the same as on the Ford/K-W coils, these coils used the standard late Heinze coil points.



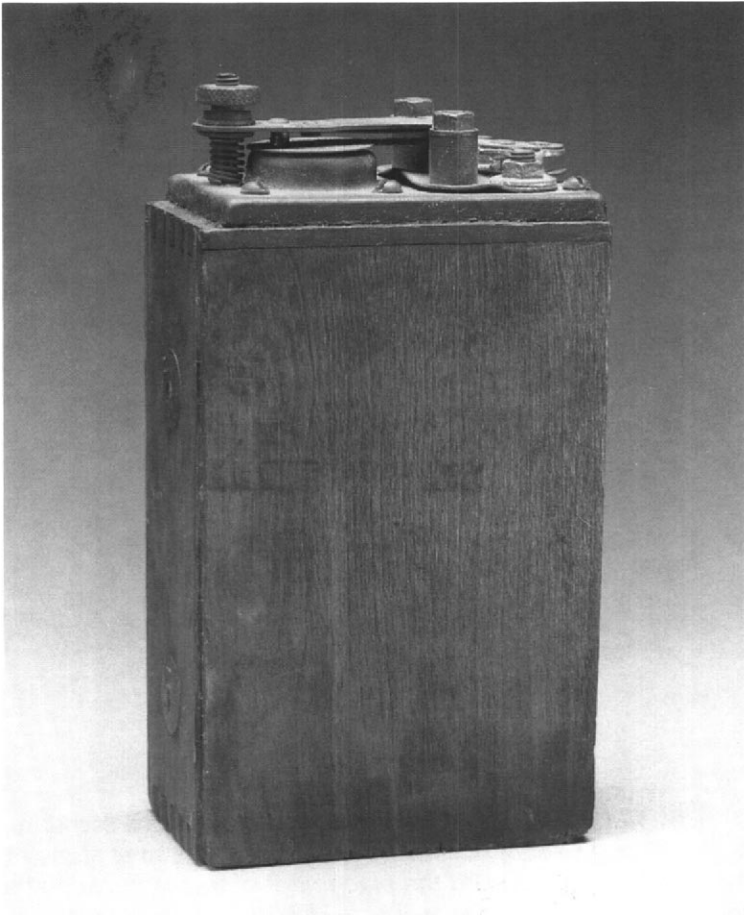


Photo 5: *Left-hand side of a late 1913 to late 1915 Ford or K-W coil. This side of these coils is held to the four adjacent sides by glue.*

around the month of May 1914 the Ford Motor Company set up its own coil manufacturing department at the Highland Park factory. The coils that Ford produced there appear to match those produced by K-W at that time.

The coils produced from mid-1913 until about November 1915 differ from later brass top coils in several key respects. The construction of the wood coil unit box was such that the two largest sides were made simply as flat pieces of wood, and glued or nailed to the other four sides of the box. The left side (from the driver's position) was glued to the top, bottom, front and rear sides while the right side was nailed to the other four pieces with brads. Ford specifications called for the use of ten brads to hold this side to the rest of the box. (See Photos 5 and 6.)

The Ford engineering documents refer to the brass top on these coils as the 'Vibrator Base.' Initially it was made from sheet brass. Beginning in October of 1914 the brass tops were dipped in lacquer, supposedly to prevent, or at least to slow the tarnishing of the surface of the brass. Most original brass top coils found today have tops that

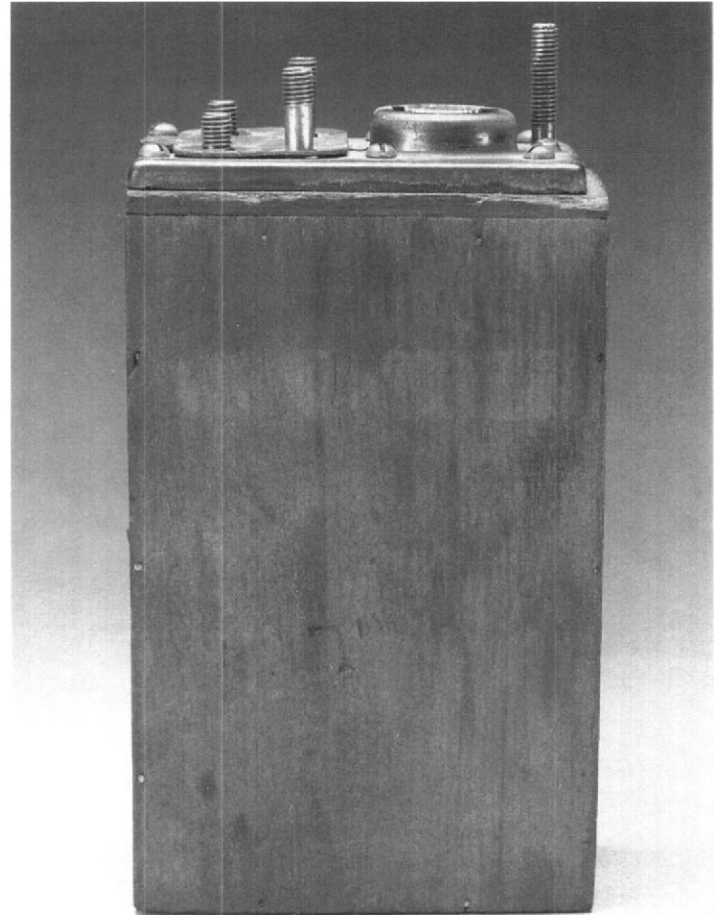


Photo 6: *Right-hand side of a late 1913 to late 1915 Ford or K-W coil. This is referred to as a "10 brad coil" because of the ten brads that hold this side to the four adjacent sides of the coil.*

are so severely tarnished that they appear almost black in color. But under protected surfaces, such as the insulator under the vibrator spring mount or on the underside of the base itself when it is removed from the coil, the natural brass can be seen. (See Photo 7)

Some brass tops appear to have a black anodized finish like the 1913 K-W coils units. (See Photo 8) There is no reference to this anodizing process in the Ford engineering documents. Since coils with this type of top frequently have features that were not used by Ford, it appears that these coils may have been made by K-W Ignition. The brass tops on both the Ford and the K-W coils produced during this era were held onto the wood boxes by six brass (or brass plated) round head wood screws.

The hardware that attached the points to the coil was made completely of brass. This includes all the nuts, the spools or collars that supported the upper point bridge at its two rear mounting points, and even the spring under the bridge adjustment nut. The bridge adjustment nut was also initially a

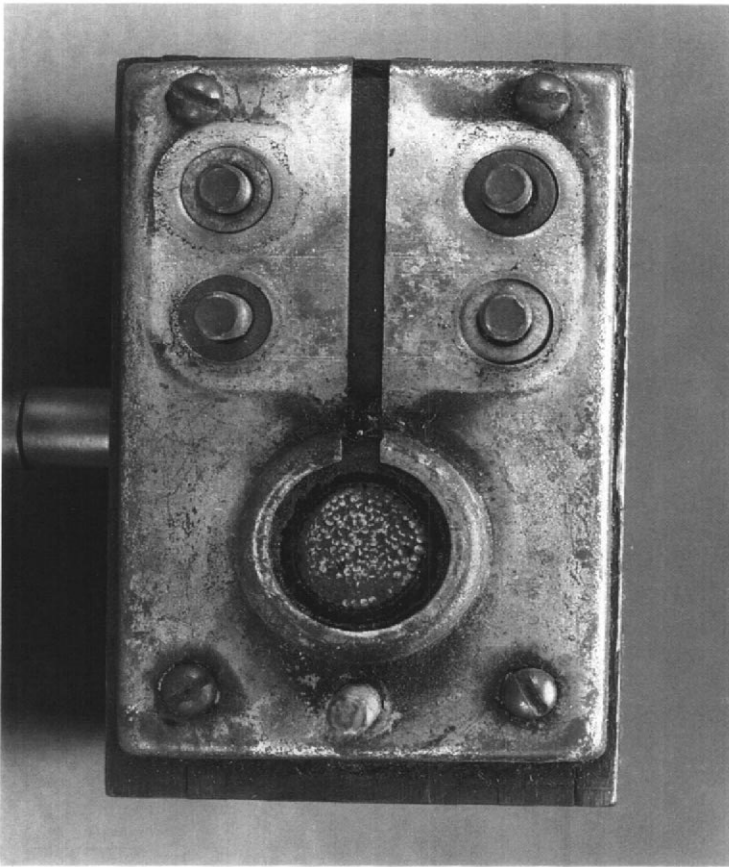


Photo 7: Overhead view of a brass top coil with the coil point mounting hardware insulator removed to show the bright brass finish underneath. Most, but not all, brass top coils are so tarnished as to appear almost black in color.

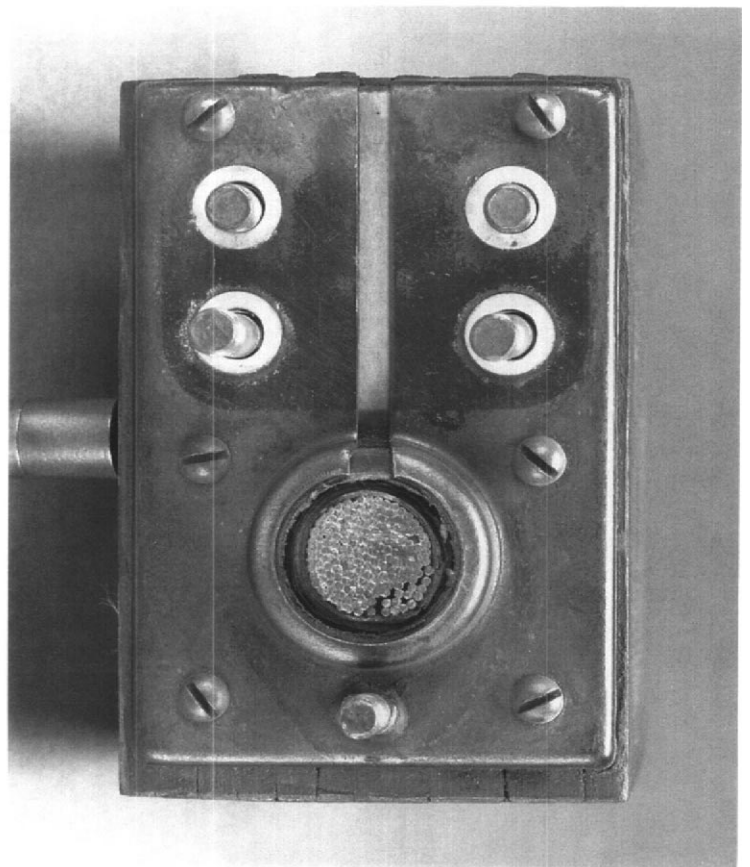


Photo 8: Overhead view of what is believed to be a coil made by K-W Ignition between 1916 and 1918. The brass tops on these coils have a black anodized finish that is clearly visible even when the coil point mounting insulator is removed.

brass thumb nut (See Photos 1 and 2 for views of a brass thumbnut), identical with the brass thumb nuts that held the commutator, high tension spark plug, and magneto wires to the coil boxes. The first bridge support collars, or spools, were simply brass

cylinders. Beginning in June of 1914 Ford began making them as spools where the top and bottom were 1/16" larger in diameter than the middle section of the spool.' (See third spool from left in Photo 9.)

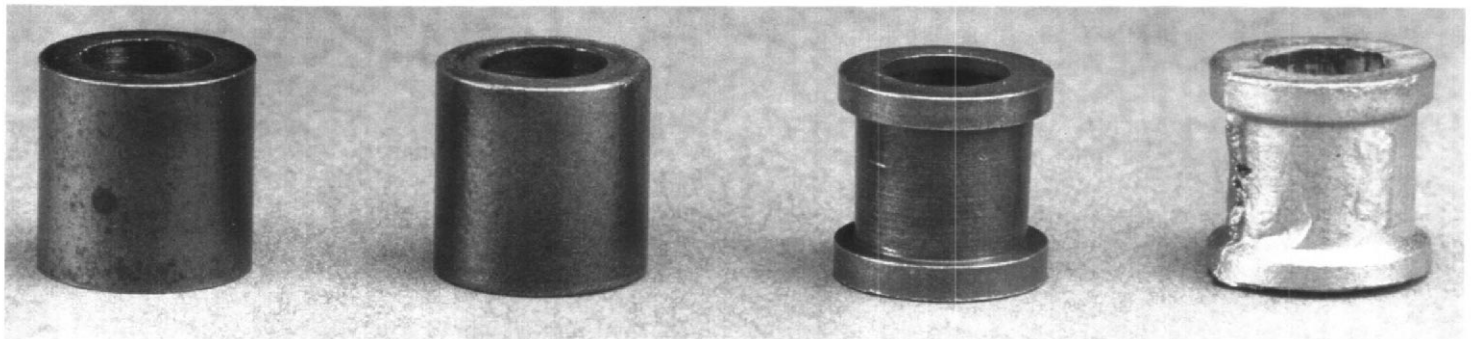


Photo 9: Photograph showing some of the different point bridge support collars or spools that were used on the Ford/K-W coils. The left spool is a simple brass cylinder. In 1914 Ford began turning the center sections of the collars it was making 1/16" smaller in diameter, making them true spools (note the third collar to the right). The second spool to the right is made of steel and was used from about mid 1917 to 1925 on Ford produced coils. The K-W Ignition Company may have continued to use the simple brass cylinders well after Ford changed to copper plated steel. The far right spool is made of die cast aluminum and was used from late 1925 through 1927.

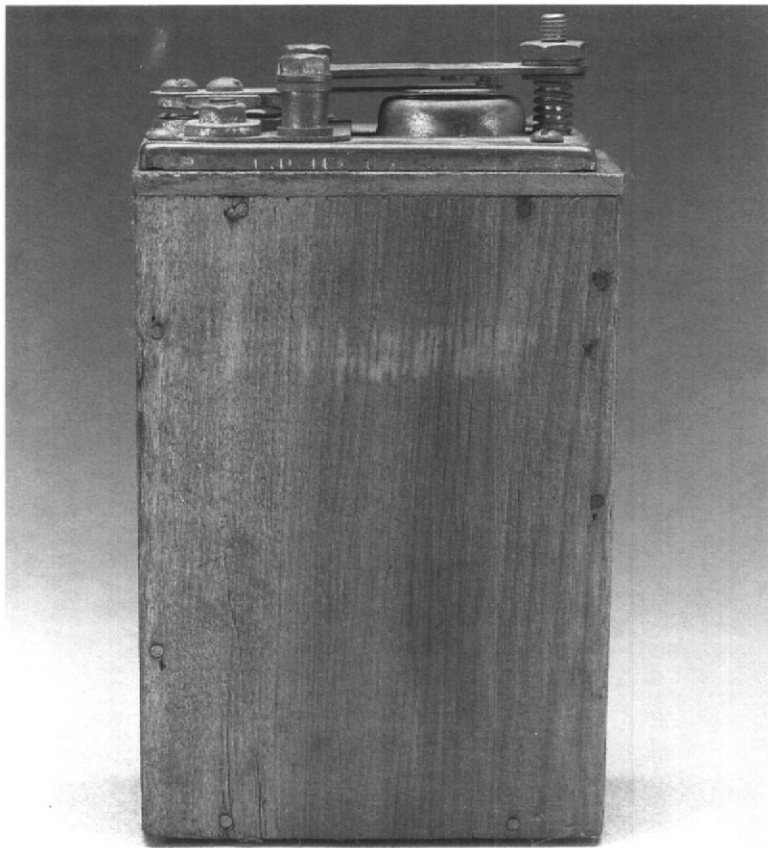


Photo 10: *View of the right-hand side of a coil made sometime between March 1915 and November 1915.*

This is referred to as the "8 brad coil" because the removable door side of the coil is held on with eight, really nine in this case-brads.

Ford began making minor changes to the exterior design of its coils in March and May of 1915. These changes reduced the amount of material used in assembly of a coil and reduced costs. First, on March 20, 1915, the Ford engineers reduced the number of brads holding the removable door to the box from ten to eight. Now, two brads were used along each side of the door, instead of three along each of the two long sides. (See Photo 10.) In May, the two center screw holes in the brass top were eliminated and the number of brass round head screws used was reduced from six to four. (See Photo 11.) The internal parts of each coil were sealed against moisture by a black insulating, tar-like compound. Ford factory documents refer to this substance as "Ford Hydrolene." On April 26, 1915 the specifications for this compound were changed to require a minimum melting temperature of two-hundred degrees Fahrenheit.

The 1916-1917 Brass Top Coils

Ford made a major change in the design of the wood box used on the individual coils units in

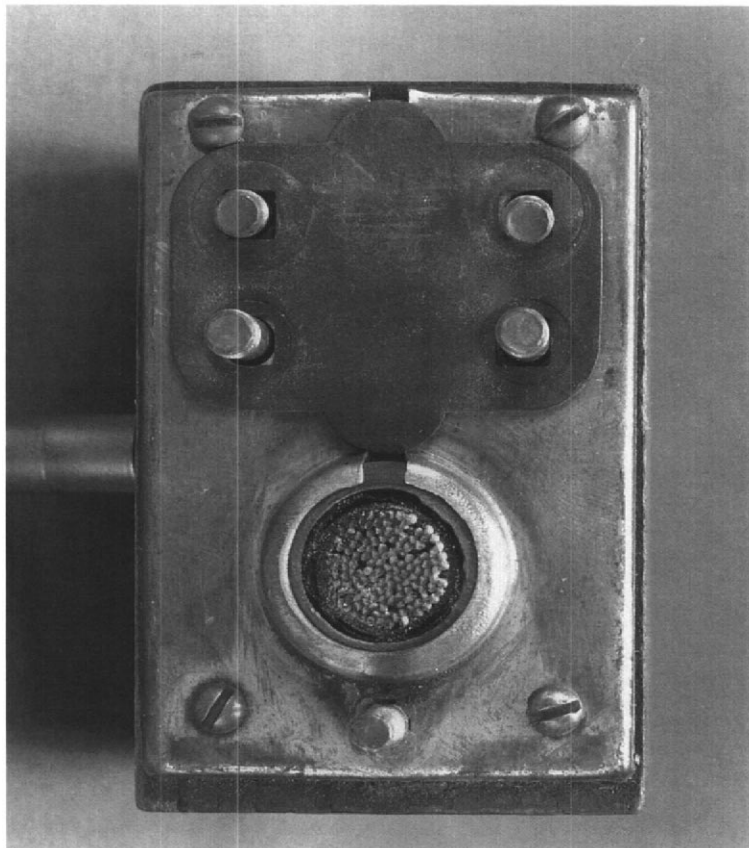


Photo 11: *Overhead view of a four-screw coil. Ford eliminated the two center screws in the tops of its brass top coils beginning in May of 1915. Evidence suggests that K-W continued to use six screws to attach the tops of its brass top coils after Ford changed to four.*

November of 1915. The wood box was redesigned so that the two large sides would be held in place by tongues and grooves. The removable door would also be held in place with tongues and grooves at the top and sides, but the bottom edge was now secured with just two brads. This tongue and groove design for the wood box would set the pattern for the balance of Model T production.³ (See Photos 12 and 13.)

While the Ford and K-W coil units produced during this time period were interchangeable, they were not identical. Brass top coil units can be found which use the tongue and groove box, but which also use six brass round head screws to hold the brass top to the wood box. It is believed that these coils were made by K-W Ignition. However, it is not clear if K-W adopted the new design of wood box before the change from six screws to four, or if K-W continued to use six screws after Ford changed from six to four and both firms had changed to the tongue and groove box.

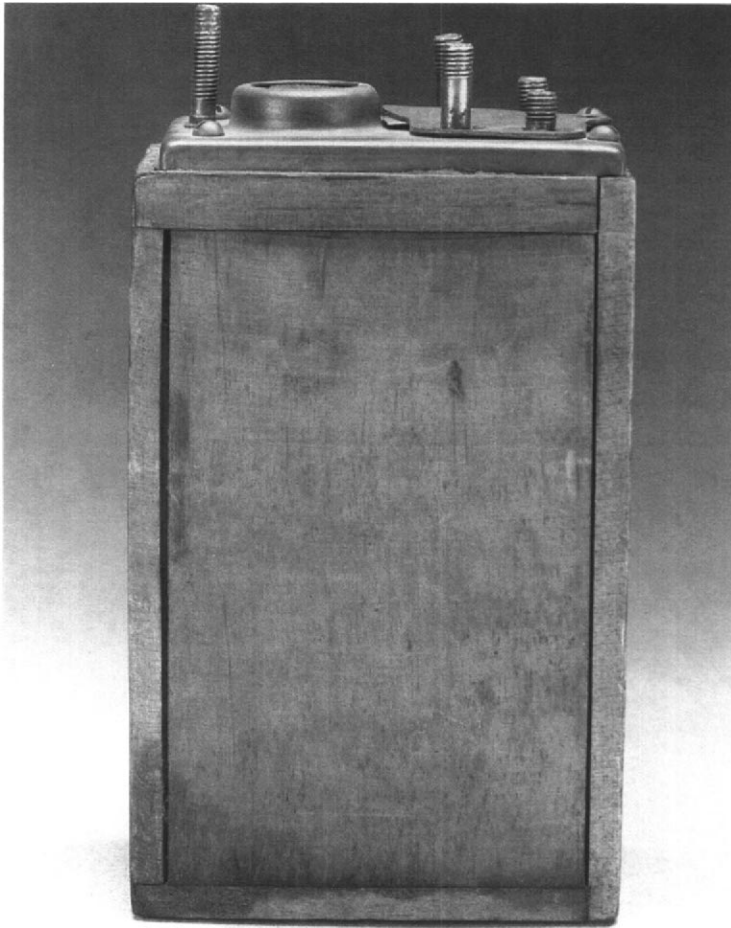


Photo 12: *The typical Ford brass top coil of 1916-1917. These coils have brass tops held on with four screws but the wood box is of the tongue and groove design.*

The 1917-1919 Wood Top Coils

With the entry of the United States into World War I and the demands that the war effort placed on certain strategic raw materials, including brass, Ford Motor Company had to change its manufacturing designs to conserve on these materials. This caused a major redesign of the coil unit in June of 1917. The brass top was removed and the coil points were now mounted directly on the wood top. (See Photos 14 and 15.) With the brass top removed, Ford engineers specified that the wood top was to be painted with a black, insulating paint. Steel hex nuts were substituted for brass, and the brass thumb nut was replaced by a stamped steel nut, 7/16" across the flats. The two collars that support the upper point bridge were changed from brass spools to copper-plated steel cylinders. These coils, like their earlier counterparts, are unmarked as to their manufacturer.⁴

At about the same time that the coils changed from brass tops to wood tops, the lower vibrator base was changed as well. Originally these bases had been made from brass, but on May 8, 1917 the

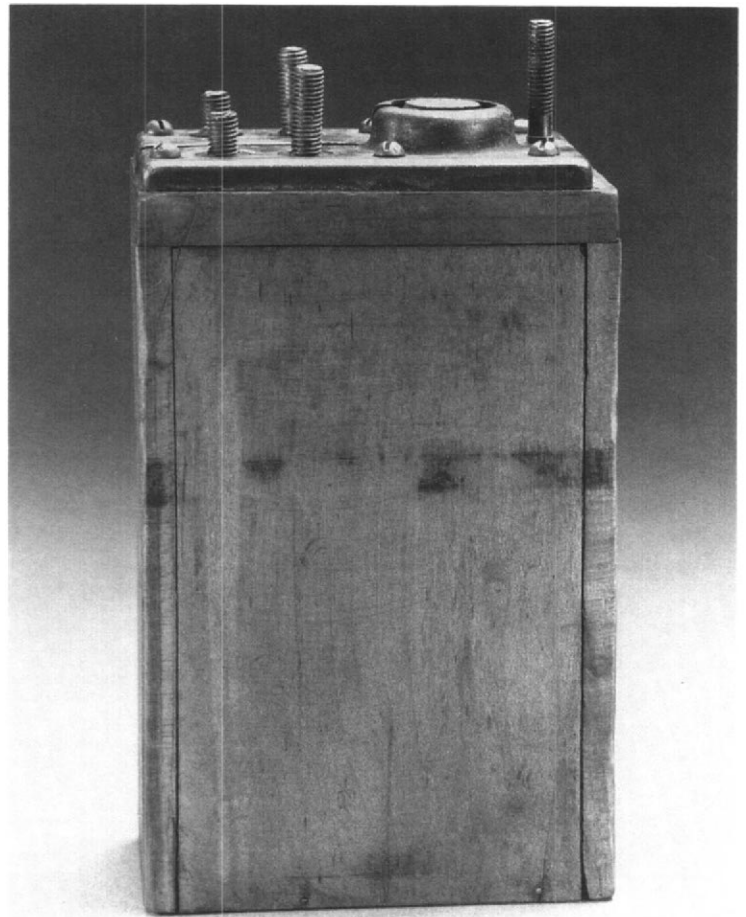


Photo 13: *This coil differs from the one shown in Photo 12 in that its brass top has a black anodized finish and it is held on with six screws. It is believed that this style of coil was manufactured by K-W because there is no reference to the use of an anodized finish and the tongue and groove box came into use at Ford after the change from six to four screws holding the brass top to the coil.*

base was changed from brass to steel. Then, a month later, a second change was made. The pad on which the vibrator contact spring was mounted was changed in shape from rectangular to an arrowhead shape. This change was made by the Ford engineers to accommodate the new design of the spring steel vibrator and for convenience in manufacturing. (See Photo 16.)

The 1916-1918 Fiber Case Coils

During July of 1916 the Ford Motor Company began production of one of the most unique designs of ignition coils used on the Model T. These coils are distinguishable by their box, which is made from a fiber composition. (See Photo 17 and 18.) Ford Motor Company records refer to this coil as the "Die Cast" design. Purportedly, the case was made of wheat gluten with an asbestos binder. The fiber case coil is completely interchangeable with the standard wood-boxed K-W/Ford design. It appears

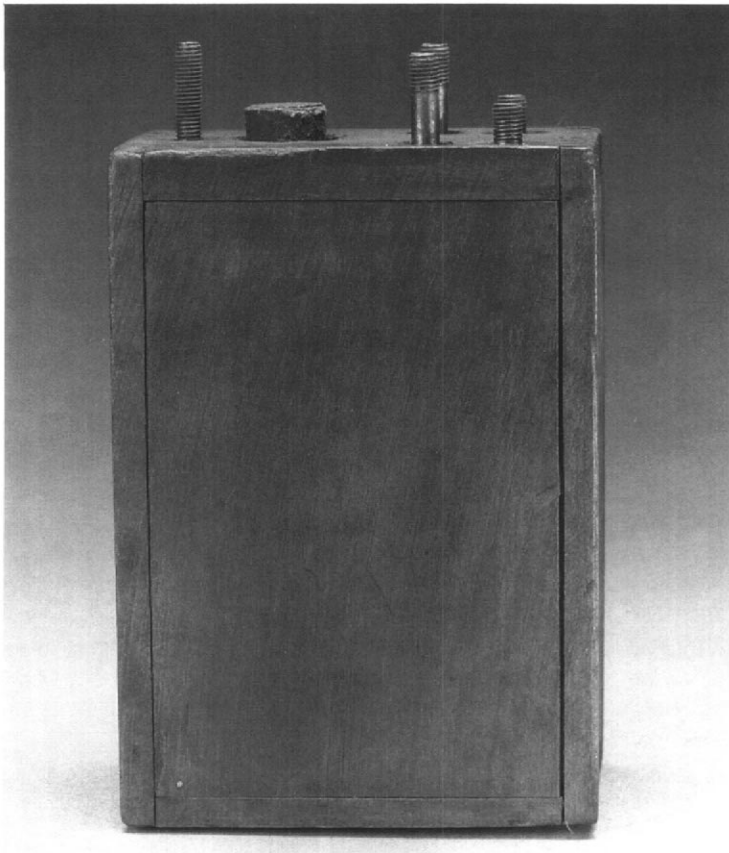


Photo 14: *The wood top coil used from mid-1917 until the spring of 1919. There is no Ford script on this coil.*

to have been an attempt to reduce the cost of manufacturing the coil by making the coil unit box in one operation instead of an assembly. Note that the point bridge support collars are cast into the top of the box in order to simplify design and reduce costs. (See Photo 19.) Records indicate that only the Ford Motor Company made this style of coil. The door on the right-hand side of the box was a sepa-

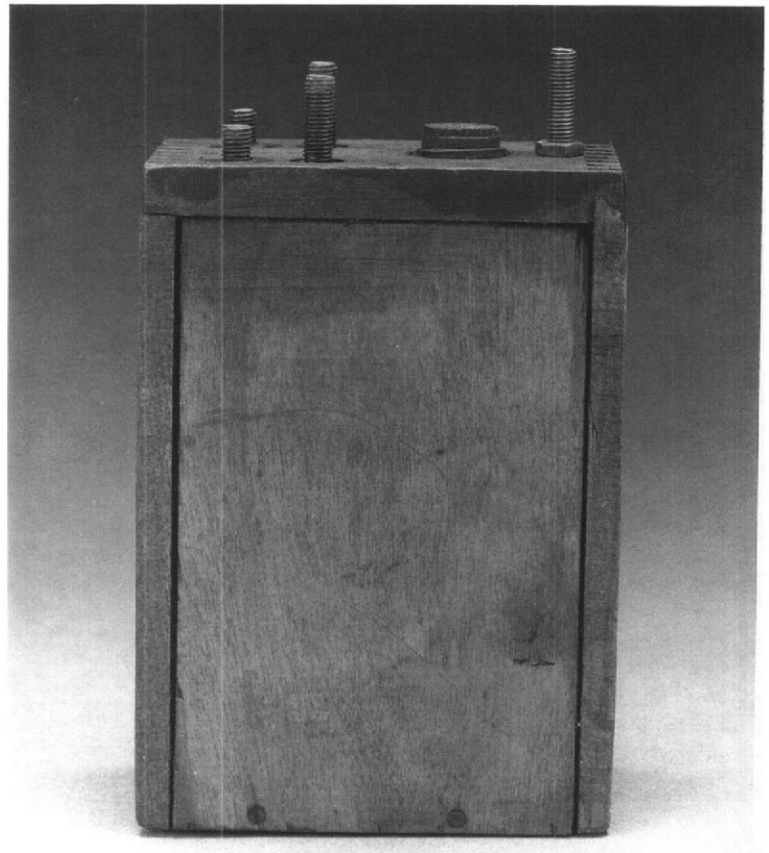


Photo 15: *Right-hand side of a 1917-19 wood top coil. The removable door is held in place with two brads at the bottom. The removable door on the 1916-17 brass top coils was attached in the same manner. The point mounting studs differ on this coil from the previous one, with the threads running the entire length of the studs. It appears that this was characteristic of K-W manufactured coils. Ford's mounting studs have threads that extend only about half the length of the stud. This is because Ford made its mounting studs using the "Cold Heading" process, while K-W used automatic screw machines to make the studs.*

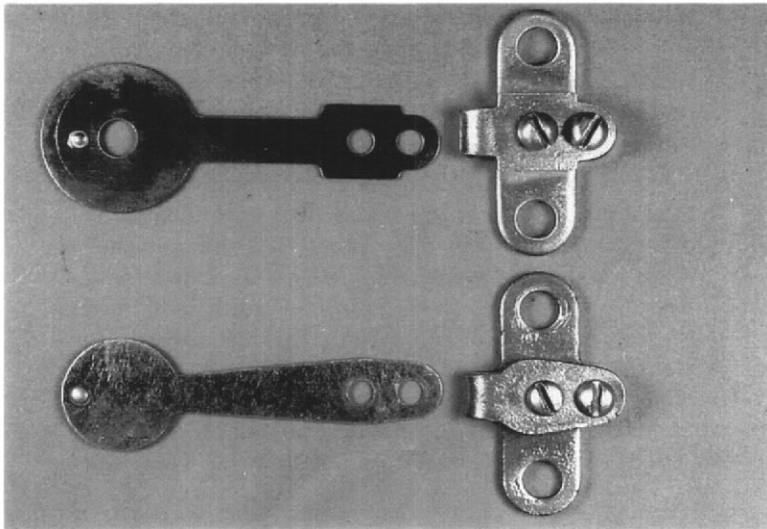


Photo 16: *View of the two vibrator spring mounting bases. The upper one was used prior to June 6, 1917, and the lower one with the arrowhead-shaped base was used after that date.*

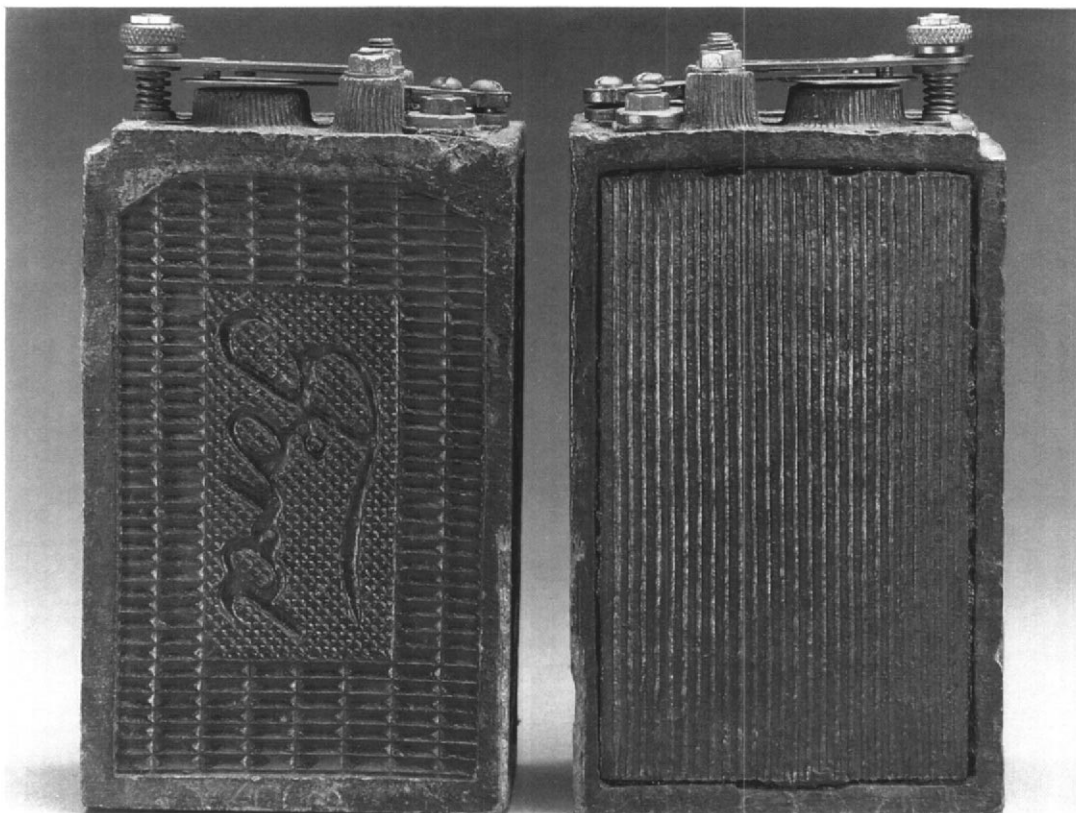


Photo 17 (top): Left-and right-hand views of the 1916-18 fiber case coils produced by the Ford Motor Company. The grooved surface in the right hand side is the "removable" door. The door is made of a plastic-like black material and is held in place by the Ford Hydrolene or insulating compound used inside the coil.

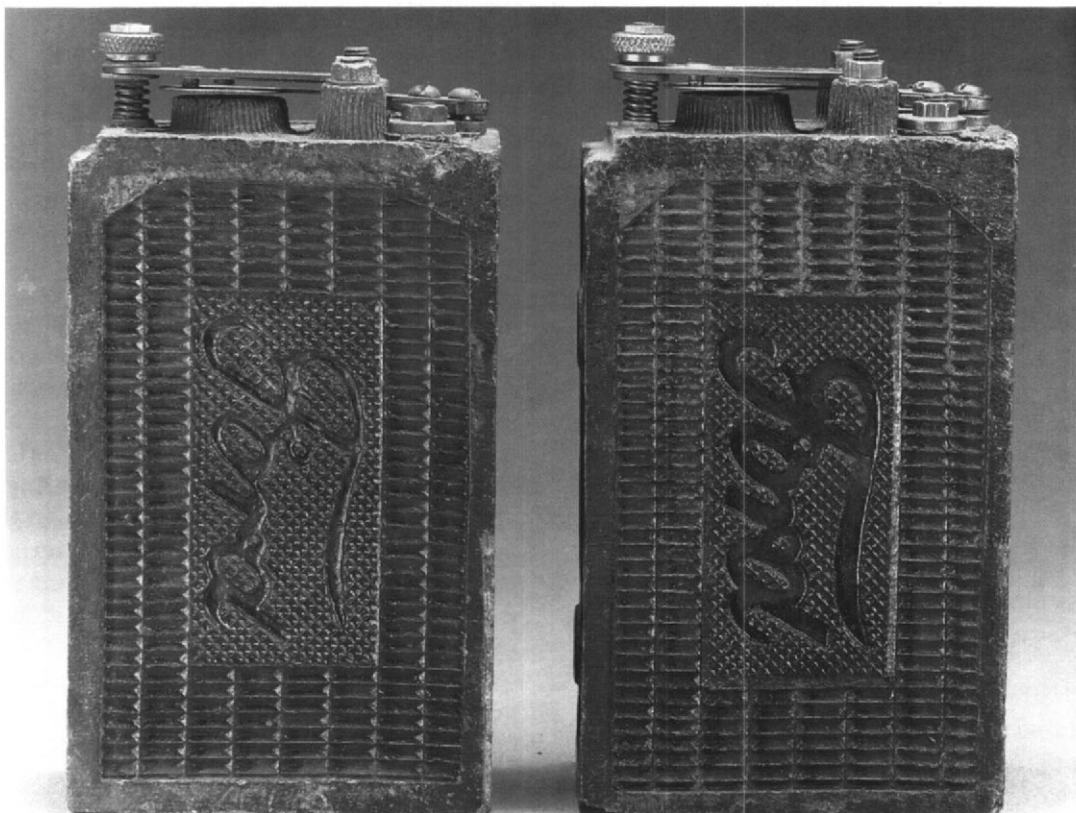


Photo 18 (bottom): Two fiber case coils that differ slightly in outside appearance around the Ford script

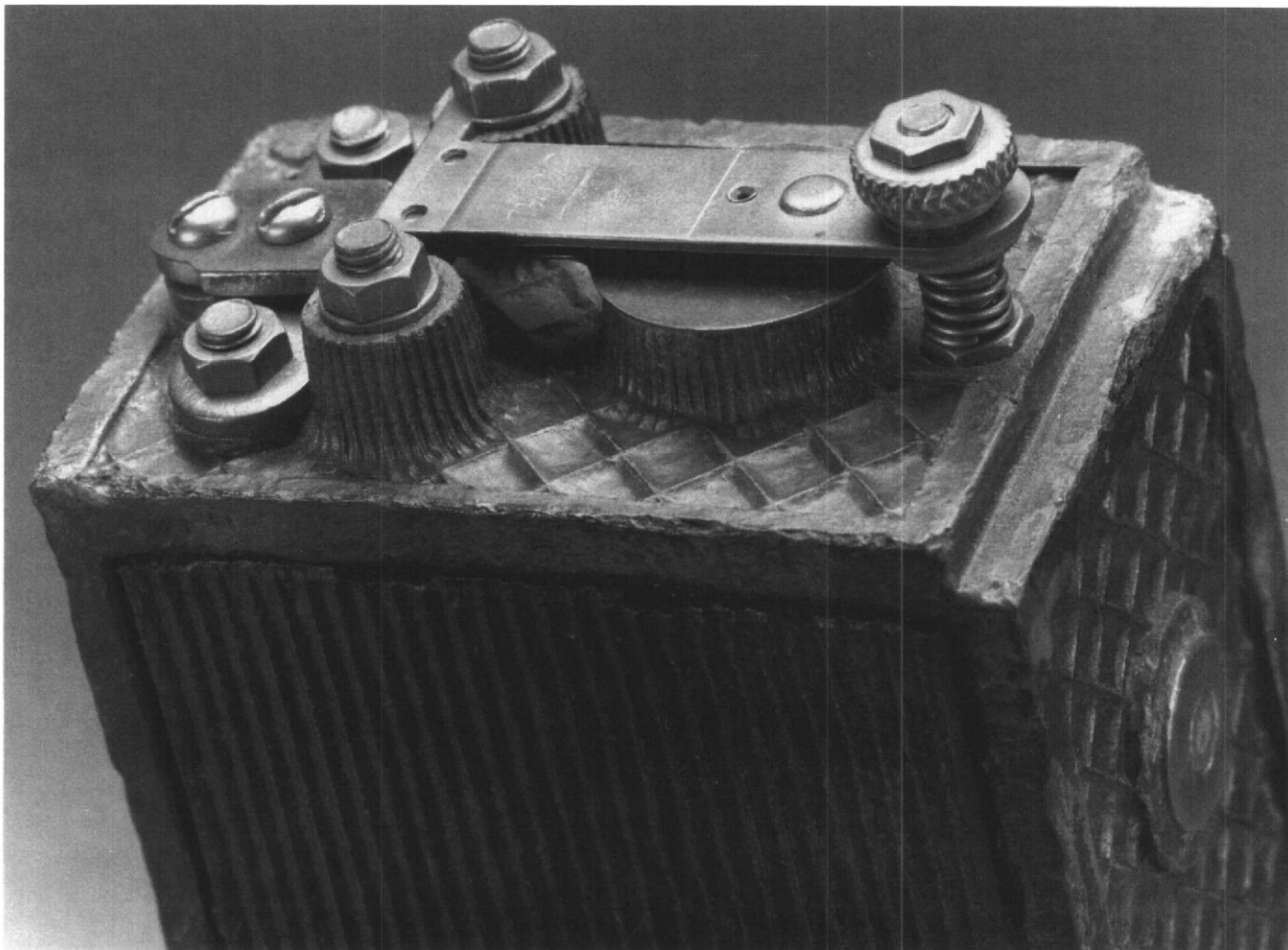


Photo 19: Top view of a 1916-18 fiber case coil showing how the contact bridge support collars were cast into the top of the box. Note the brass thumbnut that adjusts the point gap. This same thumbnut was used on the coil box terminals that extended through the dash of a Model T.

rate casting made from a black plastic-like material. When the internal parts of the coil were assembled and the interior filled with hot, molten Ford Hydrolene, the door was pressed into place and held by the Hydrolene after it had cooled.

The die cast design coils appear to suffer from dimensional stability problems. Either because of heat or because of moisture, the dimensions of these boxes appear to change over time. While this was also a problem with the wood-boxed coils, it appears to be a much greater problem with the fiber case coils.

For whatever reason, the fiber case coils were not considered to be a success by Ford. On March 2, 1918 the engineering records indicate that the use of the die cast design of the box was discontinued. Thereafter Ford, like K-W, made only wood-boxed coils.⁵

1919-1923 Ford Script Coils

During 1919 two changes occurred in the design of the coil unit that distinguish these coils from those produced before. First, on March 19, 1919 the

Ford engineers specified that the name "Ford" in script was to be branded into the left-hand side of the coil unit box.' (See Photo 20). A number of coil units have also been observed with the Ford script stamped into the removable door on the right-hand side of the box; however, the engineering records are silent on this practice. It is possible that coils with the stamped script on the door were supplied to Ford by Kokomo Electric (Kingston). It is also possible that these coils are simply a manufacturing aberration. (See Photo 21.)

The second change was to the base to which the vibrator armature spring was attached. In November 1919 the base was completely redesigned. The "grub screw" that Williams had hidden in his original design was eliminated and the new base was a simple steel stamping to which the spring was still attached with two small screws. Henceforth the tension on the vibrator armature spring would be adjusted by either tapping on the rear edge of the base with a small hammer, or by prying up against the rear edge with a screwdriver. (See Photo 22.)

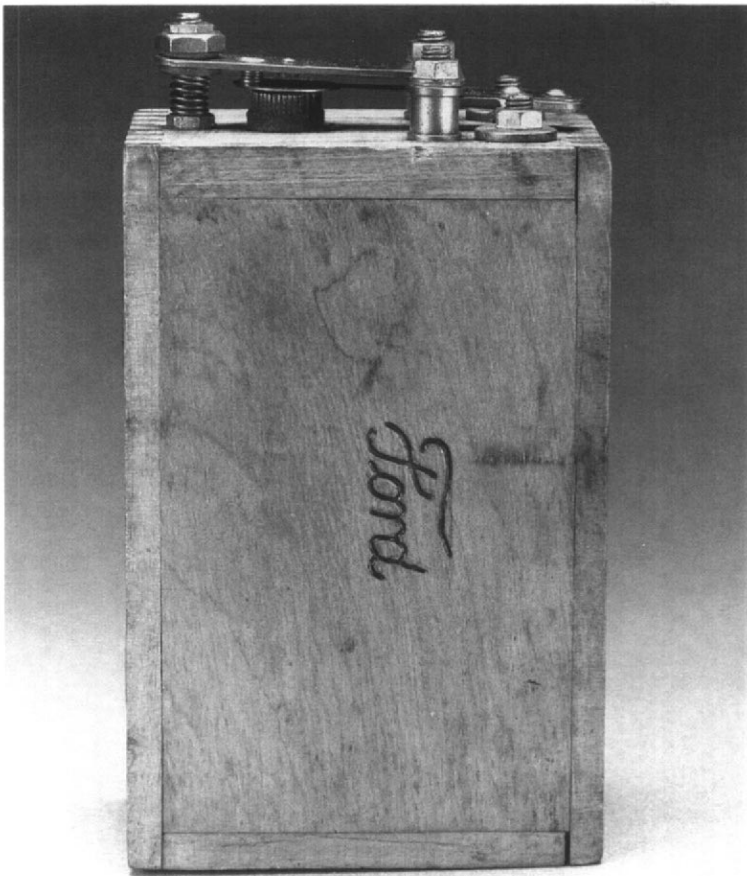


Photo 20: A typical 1919-23 wood box coil with Ford script burned into the left-hand side. The contact bridge support collars are probably not correct for a coil of this era.

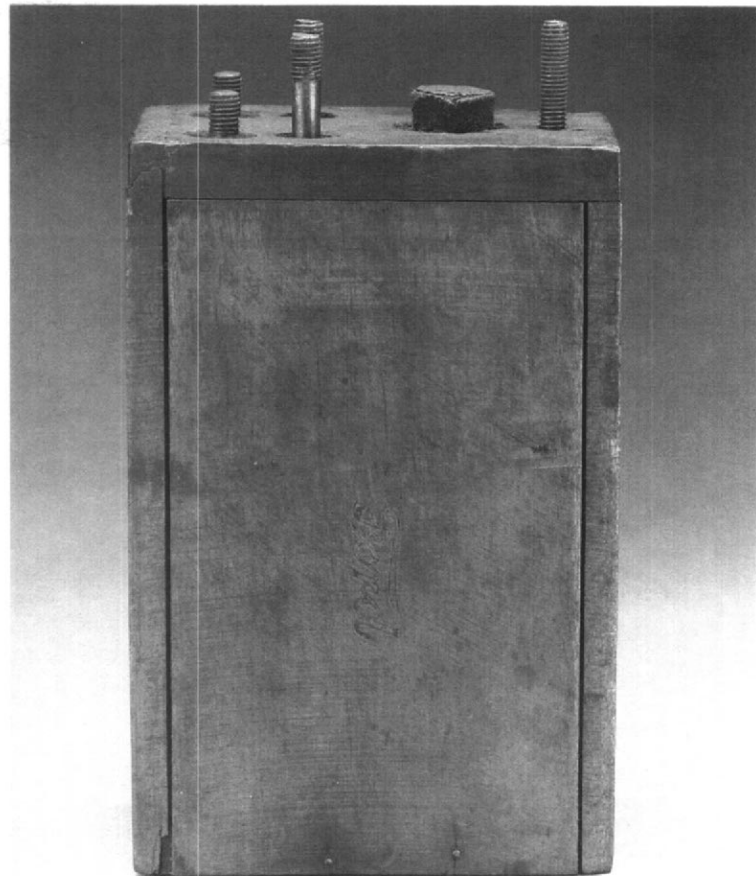


Photo 21: A coil with Ford script engraved into the removable door on the right-hand side. No mention of this practice has been found so far in the engineering records at the Research Center.

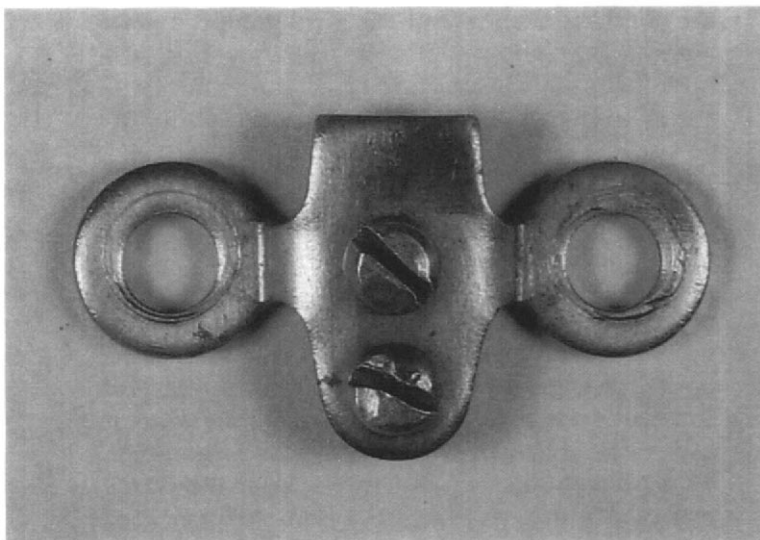


Photo 22: Beginning in 1919 the vibrator contact spring (also known as the vibrator armature) base was changed. Williams' grub screw design was replaced with a simple steel stamping. Hereafter, vibrator spring tension on Model T coils would be adjusted with a small hammer instead of a small screwdriver.

The Tractor Units

The Fordson tractor introduced during 1917 used the same basic ignition system, including a magneto, as the Model T. However, the operating conditions of the tractor were much harsher than those of a typical Model T car or truck. The engine

of the Fordson was expected to operate at high speed for long time periods. Since the coil box was attached to the left-hand side of Fordson's cylinder head, it and the four coil units were subjected to the high temperatures at which the tractor usually operated.



Photo 23: Special coil units for the Fordson tractor were marked "Tractor units" from 1920 to 1922. These coils differed from regular Model T production in that they used a larger condenser and the melting point of the insulating compound (Ford Hydrolene) was higher than the standard material used in Ford cars and trucks.

To compensate for these conditions, Ford introduced a special coil unit for the tractor in late 1919 or early 1920. This coil used a special condenser inside the coil and a set of heavy-duty points fitted with larger contacts than those used as standard equipment on the Model T. In addition, the specifications for the insulating compound inside the coil were changed to a much higher melting point in order to withstand the higher operating temperatures in the tractor environment. To distinguish this coil from its regular Model T counterpart, these coils were labeled with the words "Tractor Unit" stamped into the wood on the backside of the coil. (See Photo 23.)

Producing two different coil units, one for Model T cars and trucks and one for the Fordson tractor, was against Ford's practice of simplicity and standardization. During September of 1922 the regular Model T coil was upgraded to the same standards as the Fordson tractor coil. The words "Tractor Unit" were removed from the coils used on

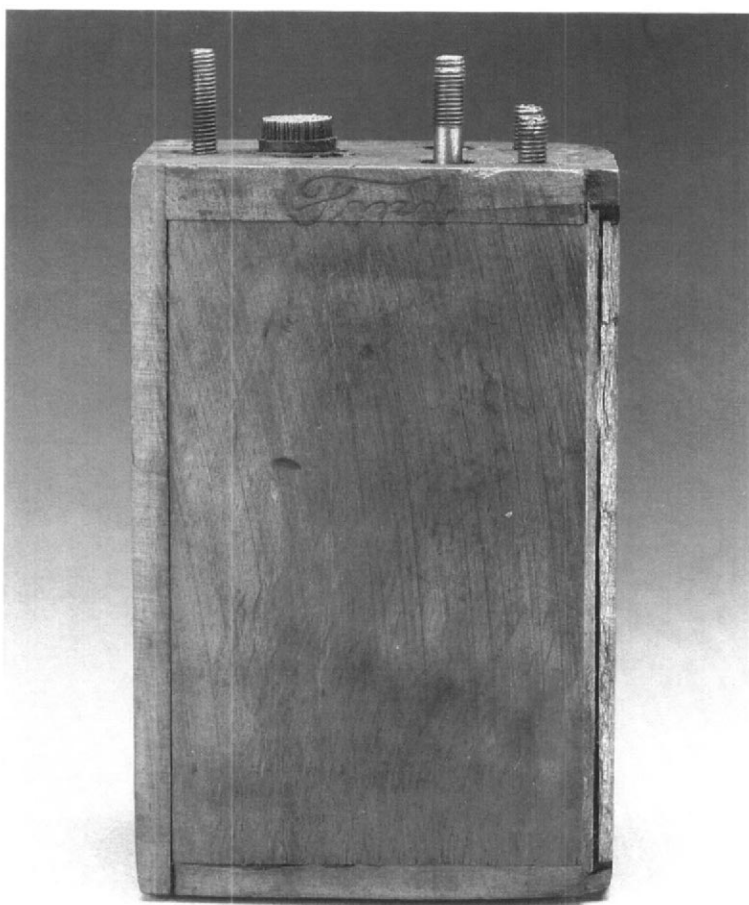


Photo 24: Standard Ford/K-W coil used from 1923 on had the Ford script rolled into the top of the wood box on the left-hand side

the Fordson tractor and all Ford-produced coils manufactured after September 1922 could be used interchangeably between the tractor and the car.⁶

1923-1927 Coils

During the last four years of Model T production, several additional changes in the coil units were made that distinguish them from their earlier counterparts. On February 28, 1923 the Ford engineers specified that the name and location of the name "Ford" in script be changed. It was moved from the middle of the left, or stationary side, of the box to the edge of the top stationary side of the box. Instead of the name being burned into the wood, it was to be rolled in with a die.' (See Photo 24.) Transitional coils from this time period have been observed which still have the Ford script burned into the left side of the box and that also have the Ford script rolled into the top of the box. (See Photo 25.)

In early April of 1923 Ford introduced an alternative design for the wood coil unit box. Ford engineering records refer to this as T-6793-A2 and indicate that the parts of this box were to be pro-



Photo 25: A few coils have been observed with both the Ford script burned into the side and rolled into the top of the left-hand side of the box. Evidently these were transition units built during the changeover from the earlier to the later style.

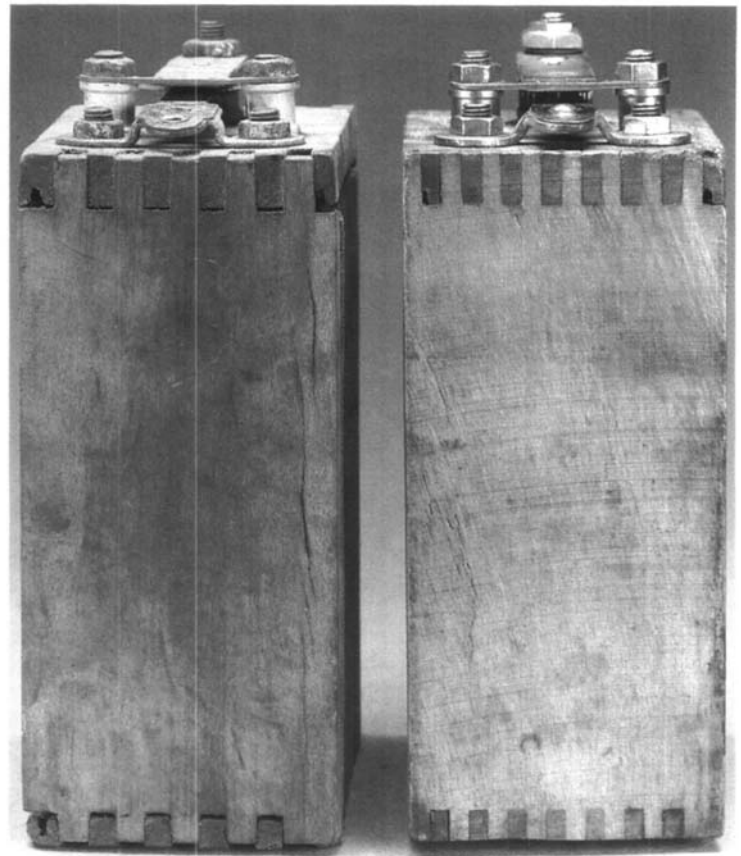


Photo 26: Comparison of the two designs of wood boxes used from April 1923 and later. The T-6393-A2 design (left) has fewer and wider fingers in the joints than the T-6393-A1 design (right). The A2 design was made only at Ford.

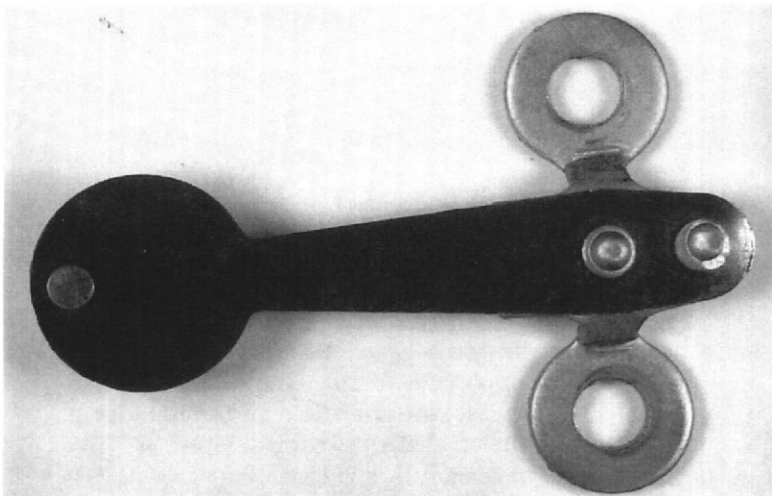


Photo 27: Beginning in mid-April 1924 the vibrator contact spring base was redesigned. The two mounting screws were replaced by riveting the vibrator spring directly to the base. Thereafter, both the base and the spring would have to be replaced as a unit.

duced in-house at Ford. It is distinguishable from the T-6793-A1 design wood coil unit box by the width and number of fingers in the joints between the top, bottom, front and rear sides. These wooden fingers are substantially wider in the A2 design and consequently there are only 11 fingers in the joints

as opposed to 16 fingers in the joints of the A1 design. (See Photo 26.)

Early in 1924 the vibrator spring base was redesigned a final time. The two small screws that attached the vibrator spring to its base were finally eliminated and the spring was permanently riveted

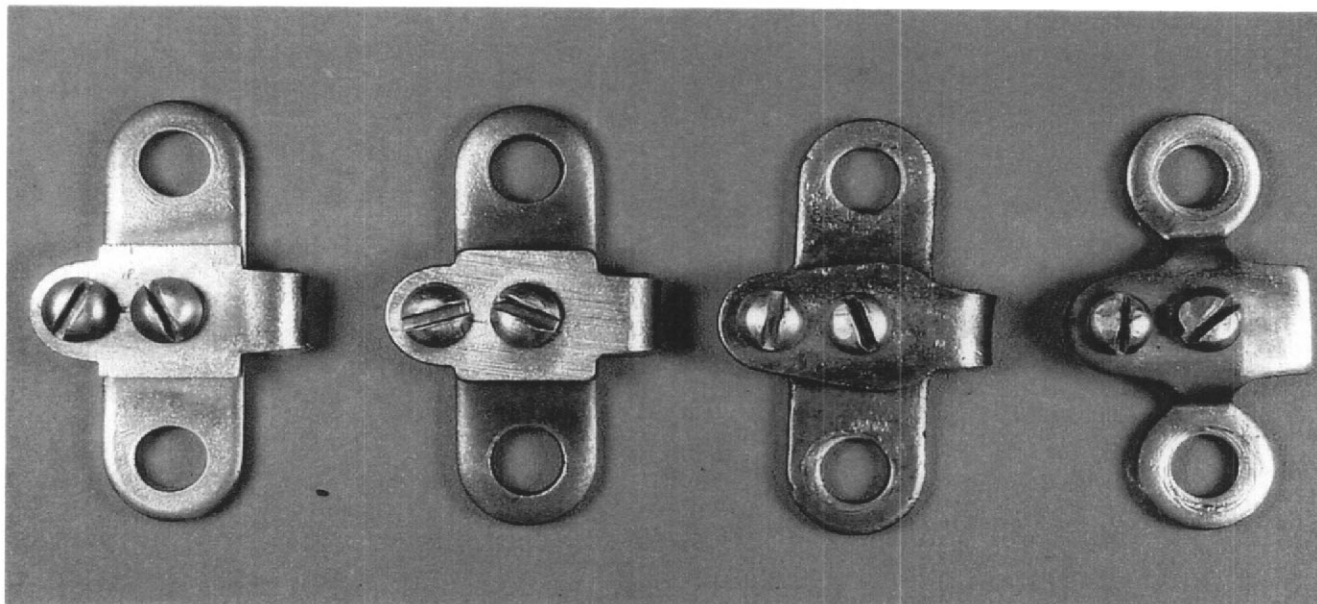
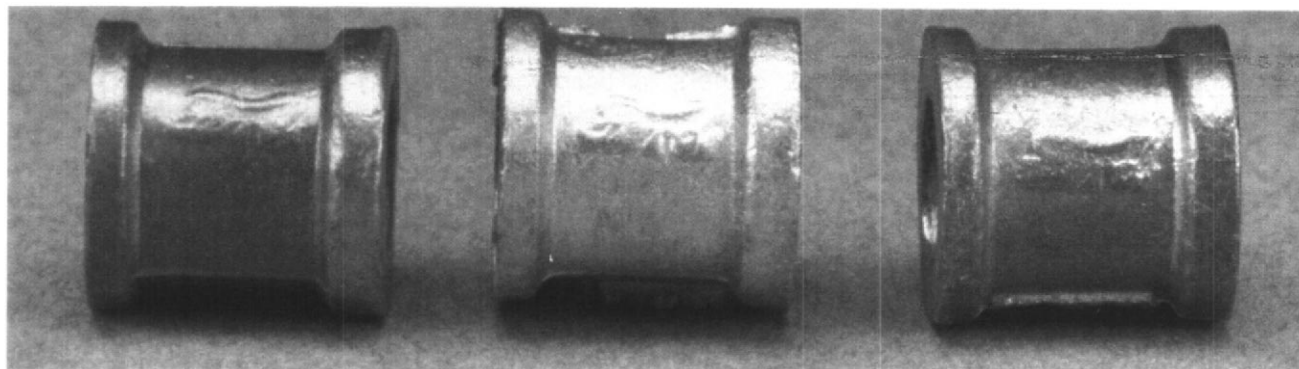


Photo 28: *A comparison of the different vibrator contact spring bases used from 1913 to 1924. From left to right: All brass grub screw base used 1973-1917. Steel grub screw base with rectangular pad for contact spring used May-June 1917. Steel grub screw base with arrowhead-shaped pad for contact spring used June 1917 to November 1919. Stamped steel base without grub screw used November 1919 to August 1924.*

Photo 29: *Close-up view of the die cast aluminum upper bridge support collar or spool used from April 1926 forward.*



to the spring. Beginning in mid-April the new combination vibrator spring and base assembly was put into "experimental manufacture," a term Ford used to describe preliminary or pilot production of a part based on a new or different design. Four months later the old style was completely eliminated from production.⁹ (See Photos 27 and 28.)

A notable change in the coil point mounting hardware took place on April 23, 1926. During the early 1920s Ford had experimented with making a number of parts for the Model T out of die cast aluminum. The Ford engineers concluded that the upper point bridge support collars could be produced using this process. Consequently, they were changed from copper-plated steel cylinders to aluminum spools. Several minor variations in these spools have been observed. This may be due to

either variations in the die casting moulds, or to different sources of supply. (See Photo 29.)

Other Model T Coils

A number of variations of regular production Model T coils have been observed for which no explanation has been found. One of these is the Ford "C" coil. This coil is marked on the removable door side of the coil with the capital letter "C." The name Ford in script stamped into the same door is sometimes observed on these coils as well. The exact meaning of the letter "C" marking is unknown. We have speculated that it may refer to coils made in Canada. (See Photos 30 and 31.)

By the mid-teens a tremendous demand for replacement Model T coils had arisen. Replacement, or after market coils were supplied to auto-

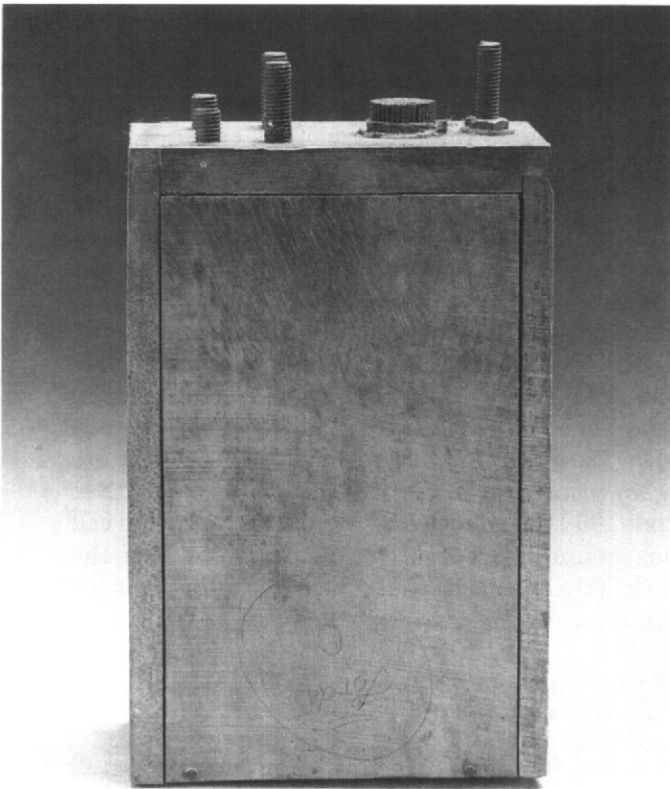


Photo 30: A Model T coil marked with Ford script and the letter "C"

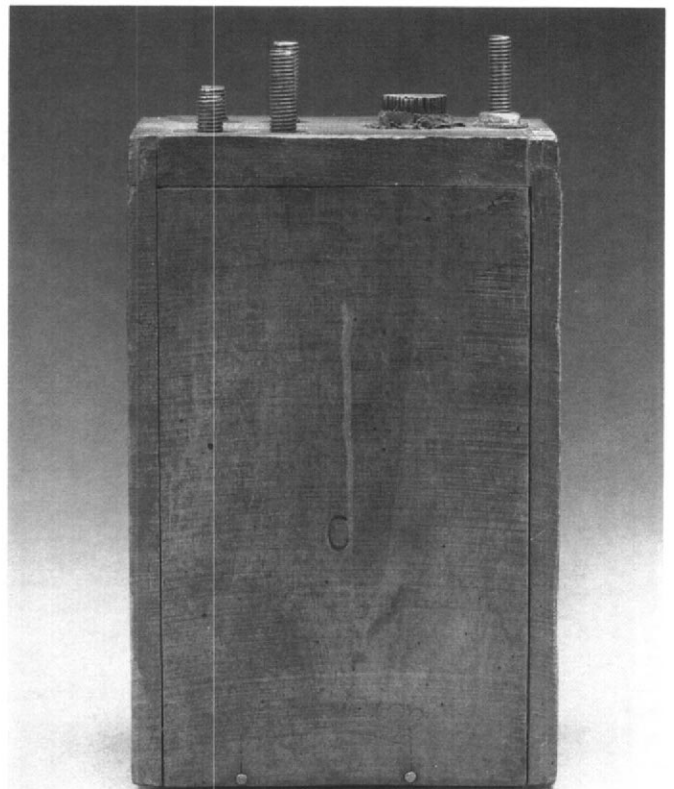


Photo 31: Another Model T coil simply marked with the letter "C." The significance of the letter "C" is not certain, but we suspect it may designate coils made for Ford of Canada by K-W Ignition.

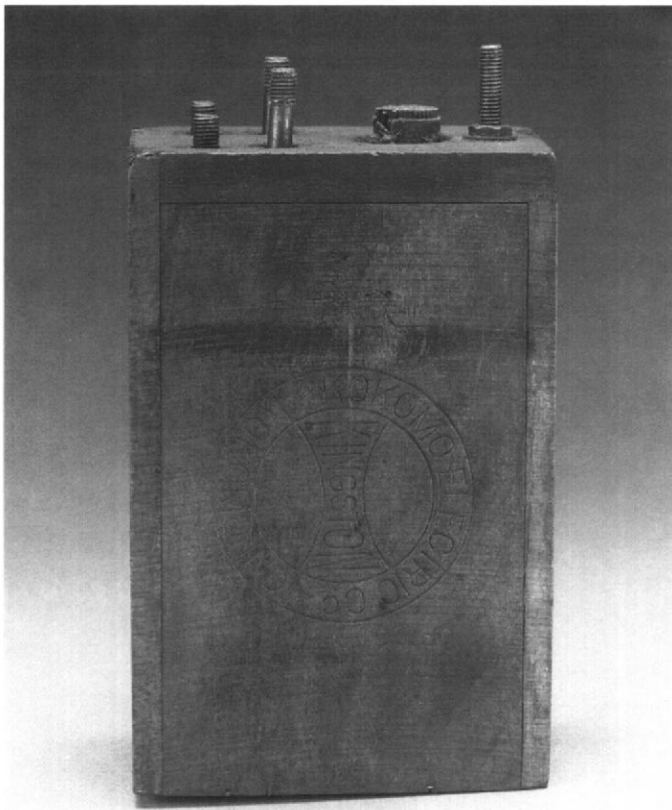


Photo 33: Another Kokomo Electric Company coil, this one also marked with the trademark "Kingston."
Kingston also supplied coils made under the Williams patent to Ford for use in new Model Ts.

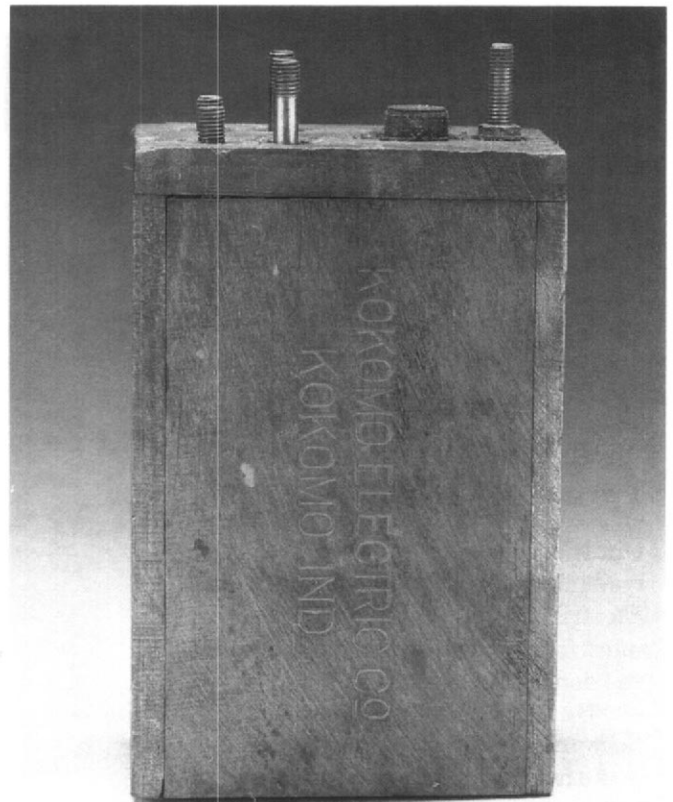


Photo 32: A Kokomo Electric Company coil marked in block letters



Photo 34: A K-W coil marked with the company's logo for supply to the aftermarket retail trade

motive jobbers and retailers by a number of different manufacturers. One of these suppliers to the retail trade was Kokomo Electric Company, makers of the Kingston coil. Kokomo Electric Company coils marked its coils by stamping its name into the removeable door of the coil. Two variations have so far been observed. On the first type, the name "Kokomo Electric Co Kokomo Ind" is stamped in block letter in two rows on the door of the coil. (See Photo 32.) On the second type the Kingston trademark with the legend "Kokomo Electric Co Kokomo Ind" surrounding it in a circle is found stamped into the door. (See Photo 33.)

By far the largest supplier of aftermarket coils to the retail trade was the K-W Ignition Company itself. Over the years K-W changed the way it marked its coils several times. The dating of these markings is only vaguely understood. Some early re-

placement K-W coils have the legend "Manufactured by The K-W Ignition Corp, Cleveland, Ohio, USA" printed on the left side of the coil unit. (See Photo 34.) Other early K-W units have a simpler trademark burned into the back of the coil. On these coils the legend reads "Genuine K-W Made in U.S.A" with the letters K-W enclosed in a circle. Which marking came first is unclear. Nevertheless, the circle K-W brand set the pattern for marking K-W coils for the balance of wood box coil production. After the end of World War II, the coils marked K-W have the same legend as the previous coils with the marks burned in, but the markings are again printed in ink on the back of the coil. (See Photo 36.) Frequently the month and year the coil was manufactured will be found printed on the back of these coils as well. The dates observed have run from 1946 to a few dated as late as 1973. □

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Photo 35: Three differently marked K-W coils. These coils were supplied to the aftermarket retail trade for Model T parts in the millions. Note that the studs used to attach the points to the top of the coil are threaded from top to bottom. This is characteristic of coils manufactured by K-W Ignition Co.

