

W. H. PRIESS.
 APPARATUS FOR USE IN MAKING CONDENSERS.
 APPLICATION FILED APR. 3, 1920.

1,404,793.

Patented Jan. 31, 1922.

2 SHEETS—SHEET 1.

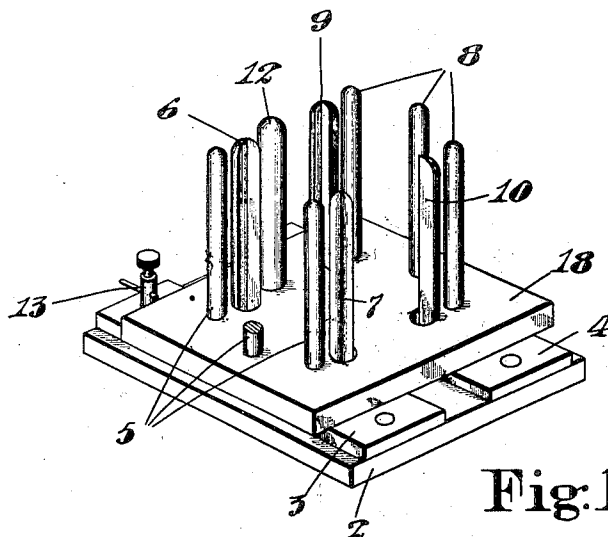


Fig. 1.

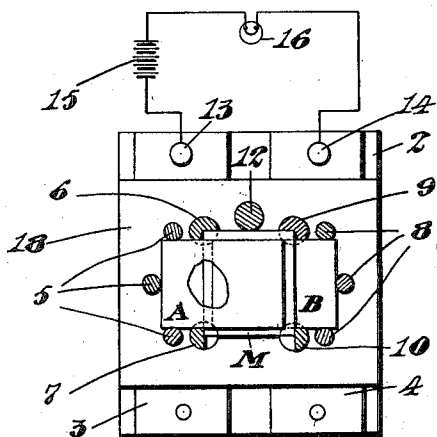


Fig. 2.

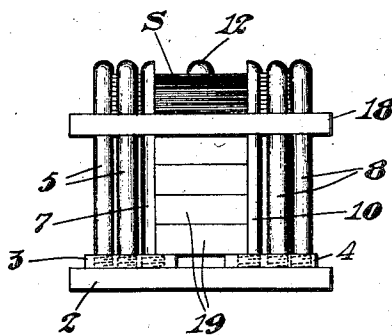


Fig. 3.

INVENTOR
 William H. Priess

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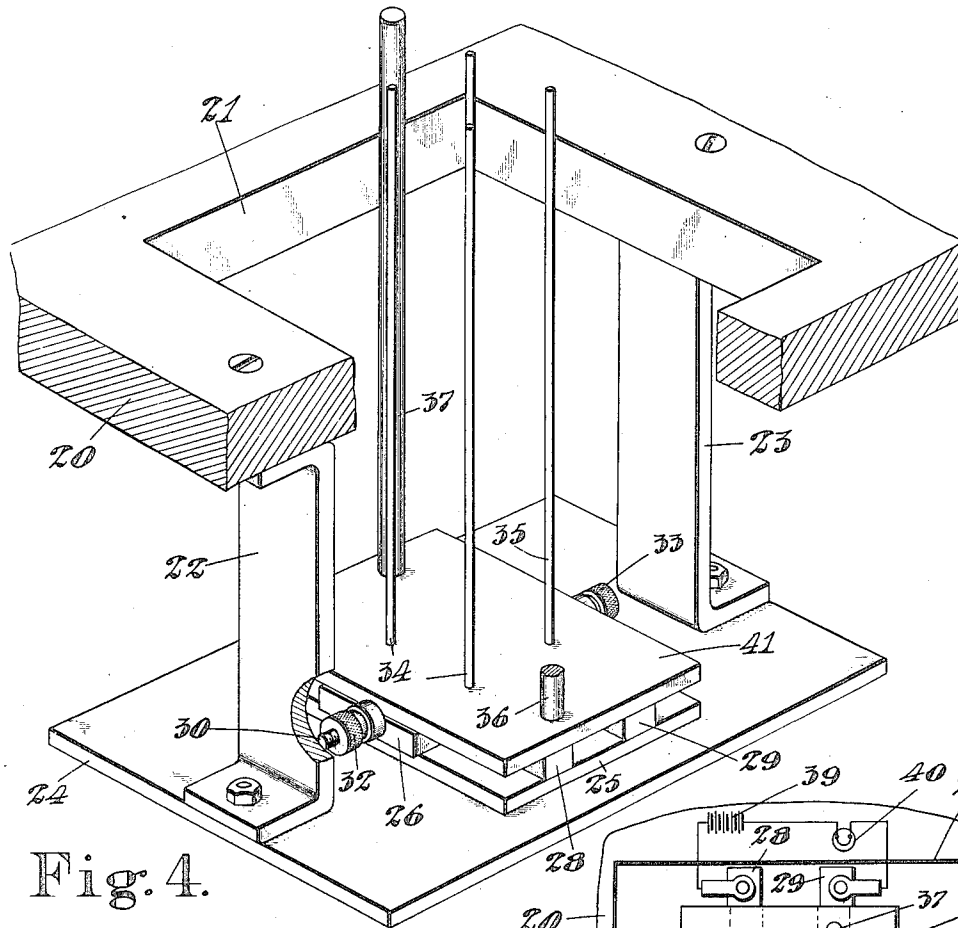


Fig. 4.

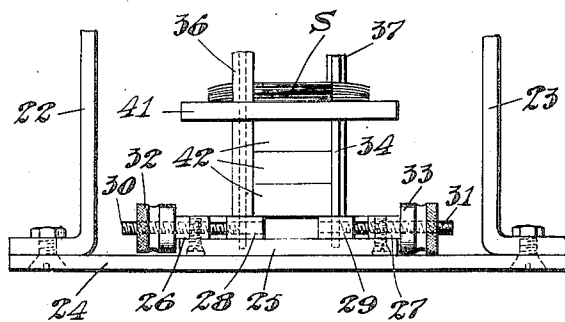
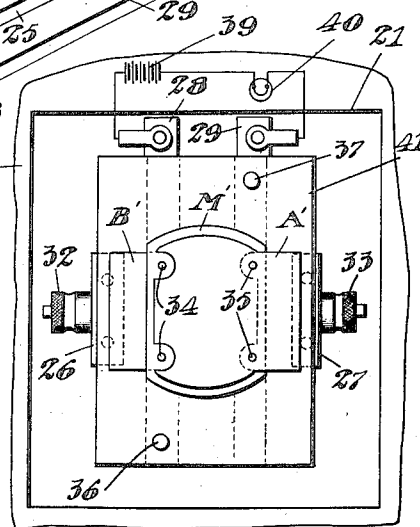


Fig. 5.



INVENTOR.

Fig. 6. William H. Priess

UNITED STATES PATENT OFFICE.

WILLIAM H. PRIESS, OF NEW YORK, N. Y., ASSIGNOR TO WIRELESS SPECIALTY APPARATUS COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF NEW YORK.

APPARATUS FOR USE IN MAKING CONDENSERS.

1,404,793.

Specification of Letters Patent.

Patented Jan. 31, 1922.

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To all whom it may concern:

Be it known that I, WILLIAM H. PRIESS, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain Improvements in Apparatus for Use in Making Condensers, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention relates to apparatus for use in the manufacture of electrical condensers. One of the first steps in the usual process of building a condenser consists in assembling alternate sheets of conducting and dielectric materials, the sheets being coated with a suitable adhesive material such as wax, varnish or the like, to secure them together. In the better class of condensers mica is used for the dielectric material and the conducting material usually consists of tin foil. The assembling of the condenser is a hand operation usually performed by girls, and in order to facilitate the proper building of the stack it has been proposed heretofore to provide an apparatus having gaging devices to facilitate the proper positioning of the condenser elements.

The present invention has for its chief object to improve and perfect apparatus of this character with a view especially to increasing the speed with which the assembling operation can be performed.

The nature of the invention will be readily understood from the following description when read in connection with the accompanying drawings and the novel features will be particularly pointed out in the appended claims.

Referring now to the drawings,

Figure 1 is an angular view of an apparatus embodying the invention in one of its preferred forms;

Fig. 2 is a plan view, partly in cross section, of the apparatus shown in Fig. 1 with blocks in position;

Fig. 3 is a front elevation of the apparatus shown in Fig. 1;

Fig. 4 is an angular view of another embodiment of the invention;

Fig. 5 is a front elevation of the lower

part of the apparatus shown in Fig. 4 with blocks in position; and

Fig. 6 is a plan view of the apparatus shown in Figs. 4 and 5.

Referring first to Figs. 1, 2 and 3, the apparatus there shown comprises a base 2, preferably made of some insulating material such, for instance, as vulcanite, wood, or the like, and having two spaced metal bars 3 and 4 secured to its upper surface. The bar 3 supports a series of small upright metal posts or pins 5 and also two larger upright pins designated at 6 and 7, respectively, while the bar 4 supports metal pins 8, 9 and 10, corresponding respectively to the pins 5, 6 and 7. Between the pins 6 and 9 is another pin 12 supported in the base 2.

It will be seen from an inspection of Fig. 2 that the posts 6 and 9 are notched or grooved longitudinally to receive the rear corners of the mica sheets M while the front posts 7 and 10 are faced off to serve as guides for the opposite edges of these sheets. The pins 5 cooperate with the pins 6 and 7 to position the ends of the sheets A of tin foil that project at the left-hand side of the condenser stack, while the pins 8, 9 and 10 cooperate in a similar manner to position the ends of the opposite sets of sheets B of foil. It will be understood that the sheets A and B of tin foil are so short that they do not overlap each other at points outside of the mica stack. In other words, the sheets of foil are separated by the sheets M of mica at all points where otherwise they would contact with each other.

The bars 3 and 4 are provided with binding posts 13 and 14 to which a signal circuit is connected, this circuit including a suitable source of current 15 and an electric lamp or other signal device 16. Normally this circuit is open due to the fact that the two metal bars 3 and 4, and the metal pins supported thereby, are insulated from each other by the base 2. Consequently, during the assembling of the condenser, so long as a good mica sheet is inserted between each pair of conducting elements A and B, the signal circuit will be kept open. If, however, an operator should fail to insert a mica sheet between two ad-

jacent sheets of foil or if a defective mica is positioned the circuit would then be closed through the stack and the positioning pins. The lighting of the lamp 16 caused by the energizing of the signal circuit would immediately warn the operator that a mistake had been made in assembling the condenser. The pins, therefore, serve both as guides or stops to assist the operative in properly positioning the elements of the condenser while she is performing the assembling operation and they also serve as terminals for the signal circuit contacting with the two sets of conducting elements A and B of the condenser stack so that the circuit will be closed upon any failure of the operative properly to assemble mica films between the sheets of foil.

It is desirable for convenience in baking, and also for convenience in other operations in certain types of condensers, to build a tall condenser stack and then bake this stack as a unit. In other condensers the sheets of mica and tin foil are accurately counted, certain labels or end pieces are assembled with the elements, and this assembly of parts forming a unit is spaced in the stack from the next adjacent assembly of a similar character by a sheet of insulating material such as bakelite, dielecto, or fish paper. In other cases the stack is simply assembled as one tall uniform stack without separators, and after the baking operation the stack is split up into units of the desired height.

I have observed that an operator in assembling such a condenser stack performs the stacking or assembling operation much more rapidly while working at a level near the upper ends of the pins than at lower levels. This apparently is due partly to the fact that in working at lower levels it is necessary to reach a greater distance in placing the elements and also to the fact that the pins interfere with the positioning of the elements adjacent to the base of the apparatus. According to the present invention the building stand or assembling apparatus is provided with a platform of insulating material which is adjustable vertically and which forms the support for the stack that is being assembled. By properly adjusting the platform, therefore, an operator is enabled to work at all times at a level near the upper ends of the pins. In other words, by this arrangement the operator is enabled to keep the plane of the top of the stack at the level at which she can work most advantageously, thus effecting a very substantial saving of time as well as a saving in material that otherwise would be damaged in positioning the elements at the base of the pins. This platform is shown in the drawings at 18, and Fig. 3 illustrates the condenser stack S supported on the platform. For the purpose of adjusting the height of

the platform, it is supported by a series of removable wooden blocks 19, placed one above the other upon plates 3 and 4, each of these blocks being of a suitable size to slide freely between the pins 7 and 10. Obviously, however, many other methods of adjusting the platform may be employed. When the assembling of a stack is begun the platform will be supported at a level only slightly below the tops of the pins since it is more convenient for the operative to place the sheets of material in the proper relationship to the pins if he can work at this level. As the building of the stack progresses and its height consequently increases, the operative removes the blocks 19, one at a time, thus lowering the entire stack step by step so that the top of the stack is always at a level close to the upper ends of the pins.

It is considered preferable to have the pins extend through holes in the platform rather than to have the platform of the proper size to slide between the pins, since the platform thus gives lateral support to the pins and prevents them from being bent. After the stack has been built up to the desired height it is removed from between the pins preparatory to heating or baking.

The building stand above described is designed to rest on a table or other convenient support which preferably should be of such a height that the operative can conveniently place the sheets of mica and tin foil into the space between the tops of the pins. Figs. 4, 5 and 6 show a construction that may conveniently be used to support the building stand at the desired elevation. In these figures 20 designates a table having a rectangular hole 21 cut therethrough. Secured to the lower face of the table 20 at opposite sides of the opening 21 are two hangers 22 and 23, respectively, to the lower ends of which is bolted a horizontal plate 24. This plate forms the support for the building stand.

The building stand shown in Figs. 4, 5 and 6 is of the same general construction as that shown in Figs. 1 and 2, but is arranged for the assembly of a magneto type of condenser and has provision for adjustment which is not present in the form above described. This stand comprises an insulating base 25, to the opposite sides of which are secured two metal pieces 26 and 27, respectively. Two spaced metal bars 28 and 29, respectively, rest on the upper surface of the base and extend the entire length of the base. These bars may be adjusted toward and from each other by means of screws 30 and 31 which pass through the blocks 26 and 27 and are threaded in the bars 28 and 29. Thumb nuts 32 and 33 are mounted on the respective screws and engaging blocks 26 and 27, provide a convenient means for effecting the adjustment of the

bars. The two bars 28 and 29 are each drilled to receive a pair of small metal pins which project through the bars and into holes drilled in the base 25. The pins mounted in the bar 28 are designated at 34 and those in the opposite bar at 35. These bars and the base may also be drilled in a similar manner to receive additional pins of a larger size designated at 36 and 37, respectively. After the pins are mounted in their holes they are clamped by turning up the thumb nuts 32 and 33, whereby the pins are clamped by relative movement between the base 25 and bars 28 and 29. The sheets of tin foil A' and B', Fig. 6, have holes corresponding to the size of and receiving the rods 35 and 34, respectively, punched in them near their tab ends, while the opposite ends of these sheets are cut away so that there is a margin between the adjacent opposite pins and the edges of the foil. Each sheet A' is assembled on the pins 35 with the pins passing through the small holes punched in it, these pins serving to accurately locate the sheet with respect to the dielectric sheet M' which are also provided with holes receiving pins 34 and 35 whereby they are properly centered and positioned. The sheets B' are assembled on the pins 34 which likewise serve to locate these sheets accurately with respect to the mica dielectrics M'.

A signal circuit including a battery 39 and an electric lamp 40, Fig. 6, is connected with the bars 28 and 29 in the same way that the signal circuit is connected with the corresponding parts of the stand shown in Figs. 1, 2 and 3, so that if an operative fails to place a sheet of mica between two superposed sheets of tin foil or places a defective sheet, thus forming a short circuit in the condenser, that fact will be indicated at once by the lighting of the lamp 40.

This construction also includes an insulating platform 41, slidably mounted on pins 34, 35, 36 and 37 which project toward aperture 21 and supported in a convenient position relative to the table and aperture 21 by a series of wooden blocks 42, resting on bars 28 and 29 between pins 34 and 35 and pins 36 and 37, Fig. 5, so that it can be adjusted vertically, in the same manner that the platform 18 is adjusted. Several platforms identical with that indicated at 41 are provided so that the condenser stack may be split up into sections of the desired height to increase its mechanical rigidity during the stacking and baking processes. After the building operation has been completed the nuts 32 and 33 are loosened thus loosening the pins 34 and 35 from the base. The whole stack, including the pins 34 and 35 and the various platforms 41, is lifted from the building stand and placed in a baking stand. The rods 36 and 37 are em-

ployed chiefly to increase the mechanical rigidity of the stack, by bracing platform 41 which in turn braces the rods 34 and 35 which project through holes in the platform, and when the stack has been moved from the building stand these rods, or other rods which are substituted for them, cooperate with the series of platforms and the other parts of the building stand to form a very rigid structure.

It will readily be appreciated that the spacing of the pins 34 and 35 will vary with different styles and designs of condensers, and the construction here provided is of advantage in accommodating a variety of such styles and designs. That is, the bars 28 and 29 may be adjusted toward or from each other, as above described, and they may be provided with a series of holes (not illustrated) spaced longitudinally therealong so that the pins may be located at practically any desired distance apart. The base piece 25 may be drilled to accommodate the pins in their various positions of adjustment. The platforms 41 similarly may be drilled to accommodate a variety of spacings of the pins, or a separate set of platforms may be used for the different spacings, as desired.

While in the constructions above specifically described two sets of pins are arranged to engage, respectively, the ends of the opposite sets of conducting elements of the condenser stack, it is obvious that one pin could be used for each terminal of the signal circuit, or that these terminals could be given some other form than posts or pins. It will also be seen that in the construction shown in Figs. 1, 2 and 3 the pins 5 and 8 can be dispensed with and the sheets A and B of foil could be located or positioned by pins entering holes punched in these sheets in the same general way that the condenser elements are located in the construction shown in Figs. 4, 5 and 6, and that many changes could be made in the details of construction of the stand without departing from the spirit or scope of this invention.

What is claimed as new is:

1. In apparatus of the character described, means for positioning condenser elements while they are assembled to form a condenser and a platform adjustable longitudinally of said positioning means for supporting said elements during the building operation.

2. In apparatus of the character described, a base, a plurality of pins for positioning the elements of a condenser during building and projecting vertically from said base, and a condenser building platform adjustably mounted relatively to the upper portions of said pins and laterally bracing the same.

3. An apparatus for use in assembling condensers, comprising a series of vertical pins serving as positioning guides for the

elements of a condenser during the assembly of the condenser, means for supporting said pins, and a platform adjustable vertically of said pins and supporting the pins laterally, 5 said platform serving as a support on which to assemble the condenser.

4. An apparatus for use in assembling condensers, comprising a plurality of vertical pins serving as positioning guides for 10 the elements of a condenser while said elements are being assembled to form a condenser stack, supporting means for said pins enabling them to be adjusted relatively to each other, and a vertically adjustable platform cooperating with said pins to support 15 the condenser elements during said assembling operation.

5. An apparatus for use in assembling condensers comprising devices for positioning 20 the condenser elements during the assembly of said elements to form a condenser stack, and means supporting said positioning devices for adjustment relatively to each other.

6. An apparatus for use in assembling condensers, comprising a series of vertical pins 25 serving as positioning guides for the elements of a condenser during the assembly of said elements to form a condenser stack, means for supporting said pins, a platform cooperating with said pins to support the 30 condenser stack, and a series of removable blocks supporting said platform, whereby the height of the platform may be adjusted by removing or inserting one or more of said 35 blocks.

7. An apparatus for use in assembling condensers, comprising a series of vertical pins 40 serving as positioning guides for the elements of a condenser during the assembly of said elements to form a condenser stack, two bars supporting, respectively, the pins that engage the opposite sets of conducting 45 elements of the stack, and supporting means for said bars enabling them to be adjusted toward and from each other.

8. An apparatus of the character described, comprising a table having an aperture in the top thereof, a plate supported 50 below said top and in substantial alinement with said aperture, and an assembling stand for condensers resting on said plate and projecting through said aperture.

9. In apparatus of the character described, a base, bars relatively movably mounted on 55 said base, positioning pins for condenser elements removably extending through said

bars and into said base, and means for relatively adjusting said base and bars for clamping said pins in position.

10. An apparatus for use in assembling 60 condensers, comprising two pins forming positioning guides, respectively, for the opposite sets of conducting elements of a condenser while said elements are being assembled to form a condenser stack, two bars 65 supporting said pins, respectively, in spaced relationship, means for adjusting said bars toward and from each other, a base of insulating material supporting said bars, and a signal circuit connected with said bars and 70 for which said bars and the pins supported thereby form terminals.

11. In apparatus of the character described, conductive pins insulated from each other for positioning the elements of a condenser during the building of a stack, a platform insulated from said pins and adjustably 75 mounted relatively thereto, and an electric signaling device in circuit with said pins.

12. In apparatus of the character described, conductive pins insulated from each other for positioning the elements of a condenser during building, bars in which said pins are removably inserted, means for adjusting said bars to lock said pins in position, a platform on which the stack is built 80 and a signaling device in circuit with said pins.

13. In apparatus of the character described, devices for positioning condenser 90 elements during assembly of the condenser and means for adjustably maintaining said devices in different positions of adjustment.

14. In apparatus of the character described, vertical pins serving as positioning 95 means for the elements of a condenser, a base, bars removably mounted on said base and supporting said pins and means engaging said bars for adjustably maintaining them in various positions of adjustment. 100

15. In apparatus of the character described, a table having an aperture in the top thereof, a frame supported below said table and aperture and an assembling stand 105 for condensers mounted on said frame below the table and projecting towards said aperture and comprising an adjustable platform adapted to be positioned relatively to said table.

In testimony whereof I have signed my name to this specification. 110

WILLIAM H. PRIESS.