

P. THOMAS.
 APPARATUS FOR MAKING CONDENSERS.
 APPLICATION FILED MAY 27, 1916.

1,384,498.

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Fig. 3.

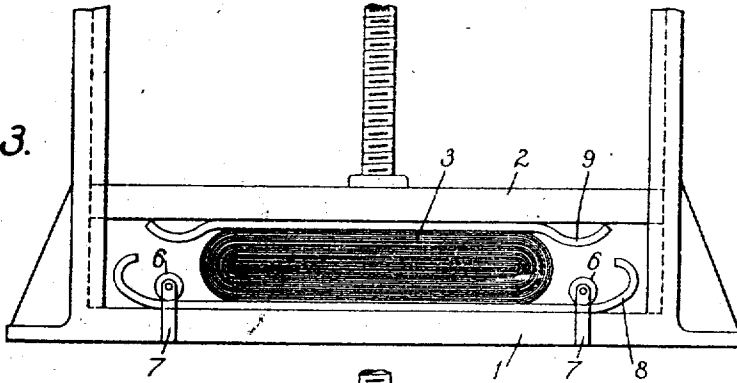


Fig. 2.

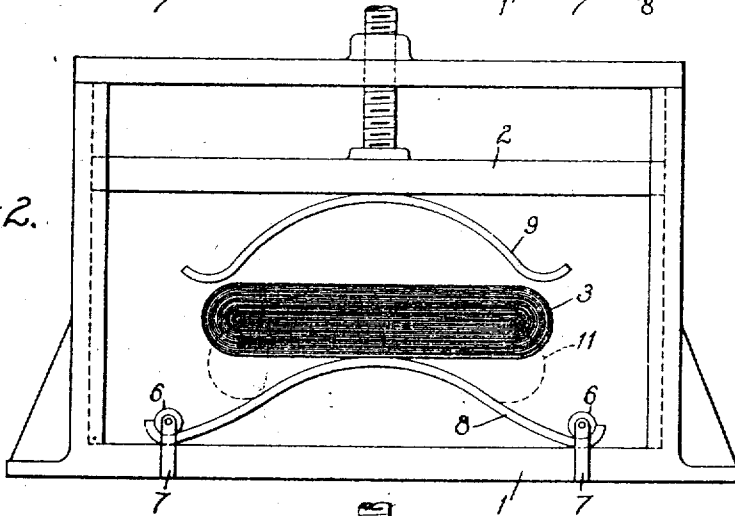
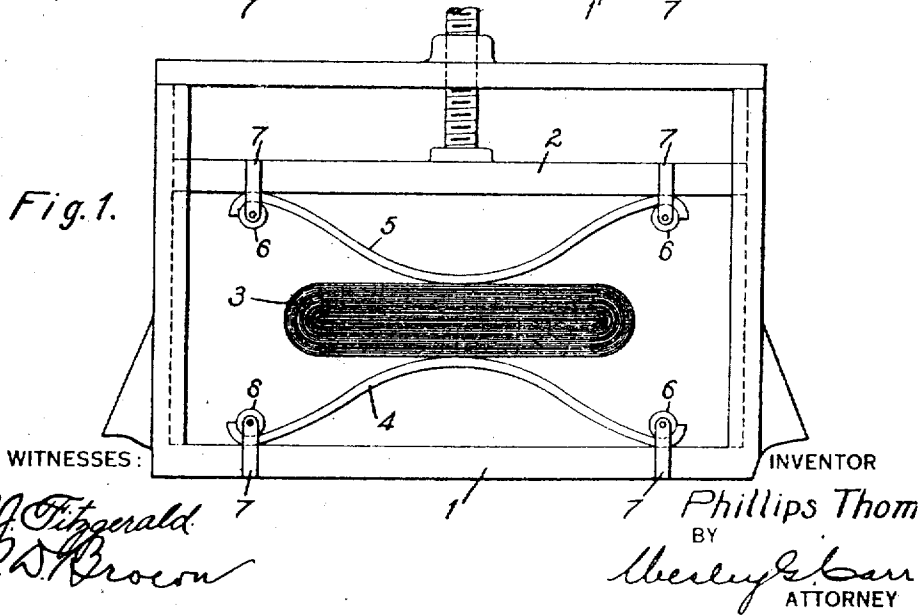


Fig. 1.



UNITED STATES PATENT OFFICE.

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APPARATUS FOR MAKING CONDENSERS.

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Specification of Letters Patent.

Patented July 12, 1921.

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To all whom it may concern:

Be it known that I, PHILLIPS THOMAS, a citizen of the United States, and a resident of Edgewood Park, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Apparatus for Making Condensers, of which the following is a specification.

My invention relates to the manufacture of electric condensers of the wound type and other articles composed of compressed laminations, and it has for one of its objects to provide a simple and effective method of compressing such objects evenly and without wrinkling or distortion.

Another object of my invention is to provide a press for progressively applying pressure to the articles produced in the course of the above-indicated method.

In the accompanying drawing, Figure 1 is a side elevational view of a press constructed in accordance with my invention and shown in engagement with a condenser of the wound type. Fig. 2 is a side elevational view showing a modified form of press, and Fig. 3 is a side elevational view of the press shown in Fig. 2, showing the relative positions of the platens and the pressure-applying springs at the final stage of the pressing operation.

The wound-type condenser, consisting of alternate strips of a conductor and a dielectric material wound together and compressed, may be manufactured cheaply on a commercial scale but is subject to the disadvantage that considerable electrical leakage and variation in capacity are likely to occur in condensers which are pressed between flat platens in the usual manner, because some of the turns are likely to wrinkle, forming weakened or broken spots. It is a primary purpose of my present invention to compress condensers of this type in such manner that wrinkling is entirely avoided and the condenser thereby rendered uniform and durable.

In carrying out my present method, alternate strips of a conductor, such as tin foil, and an absorbent material, such as paper, are placed together and wound upon a suitable mandrel. The mandrel is then removed and the roll of material is impregnated in a suitable dielectric substance, such as paraffin, halogenated wax or the like. The impregnated roll, which should be somewhat flat-

tened, either by winding upon a flat mandrel or by a preliminary compression, is then compressed between pressure members which are so arranged as to apply pressure progressively to the condenser, the progressive application of pressure resulting in smoothing out any wrinkles that may tend to form within the condenser and producing a uniform structure.

The progressive application of pressure referred to above may be accomplished in several ways, two of which are illustrated in the accompanying drawing, to Fig. 1 of which reference may now be had. A press comprising a stationary platen 1 and a movable platen 2 is shown in position to compress a condenser 3, pressure being applied from the platens 1 and 2 to the condenser through oppositely curved resilient pressure-transmitting members 4 and 5 which are preferably formed of sheet metal and which are carried respectively by the platens 1 and 2. The attachment between the spring members 4 and 5 and their respective platens should be such that the spring members may move somewhat with respect to the platens as they are straightened during the pressing operation. As shown, such a means of attachment for each spring pressure member is afforded by a pair of rollers 6 which are carried in bearings 7 secured to the adjacent platen.

In the operation of the press which I have just described, the spring members 4 and 5 first engage the condenser 3 along its central longitudinal line, as shown in Fig. 1. As the platen 2 is lowered, the members 4 and 5 are flattened to press the condenser with a progressive rolling movement from the center line outward toward the edges of the condenser. This combined rolling and pressing action serves to iron out any wrinkles that may tend to form within the body of the condenser.

An alternative modification of the above-described press is shown in Fig. 2, in which the platens 1 and 2 carry spring-pressure members 8 and 9, respectively, the pressure members 9 and 10 being curved in the same direction so as to be substantially parallel. The spring member 9 is attached to the platen 1 by means of rollers 6, as in the press shown in Fig. 1, while the spring member 10 is welded or otherwise rigidly attached, at its center, to the platen 2.

In the operation of this form of press, the loosely wound roll 3 is first placed upon the lower and upwardly curved spring-pressure member 9. The downward movement of the platen 2 first serves to bend the condenser 3 into the curved form shown in dotted lines at 11, Fig. 2. The downward movement of the platen 2 being continued, the spring members 9 and 10 are flattened to thereby straighten the condenser and bring it to the form shown in Fig. 3. The straightening of the condenser during this stage of the pressing operation progresses from the center line outwardly toward the edges, and the effect of this action in preventing wrinkling of the condenser layers is the same as in the press shown in Fig. 1.

The apparatus which I have shown and described is intended to be merely illustrative, it being understood that other forms of apparatus may be readily devised for carrying out my method, which broadly comprises the progressive application of pressure to a rolled object for the purpose of compacting it in an even and unwrinkled manner. Since my invention may be thus variously modified without departing from its scope, it is to be understood that no limitations are to be imposed thereon except such as are indicated in the appended claims.

I claim as my invention:

1. A press comprising a pair of platens adapted to cooperate to compress an object between them and a curved, resilient pressure-transmitting member attached to each of the said platens and adapted to progressively engage the said object.

2. A press comprising a pair of platens adapted to cooperate to compress an object between them and a pair of oppositely curved, resilient pressure-transmitting members severally carried by the said platens and adapted to engage the said object centrally and thereafter to progressively exert pressure upon the said object outwardly toward its edges.

3. A press comprising a pair of relatively movable platens and resilient members in partial engagement with the platens and adapted to be flattened thereagainst by en-

gagement with an interposed object and to successively, and with increasing force, compress increasing areas of the object from its center to its side edges.

4. A press comprising a pair of relatively movable platens, bowed resilient members having partial engagement with the platens and adapted to engage an interposed body centrally and to thereafter progressively exert pressure upon opposite sides of the body outwardly from its center toward its side edges as the members are flattened against the platens.

5. A press comprising relatively movable platens and a bowed resilient member having portions adjacent to its edges slidably mounted upon one of the platens and its intermediate portions spaced therefrom.

6. A press comprising relatively movable platens, a bowed resilient member having portions adjacent to its edges slidably mounted upon one of the platens and its intermediate portions spaced therefrom and a second bowed resilient member carried by the other platen and cooperating with the first bowed member.

7. A press comprising a pair of relatively movable platens and a resilient member in partial engagement with one of the platens and adapted to be flattened thereagainst by engagement with an interposed object and to successively, and with increasing force, compress increasing areas of the object from its center to its side edges.

8. A press comprising a pair of relatively movable platens and a yielding plate member having portions adjacent to its edges permanently in engagement with the face of one of the platens and laterally movable thereon and having its intermediate portions normally spaced from said platen face by amounts varying from zero at its edges to a maximum at its middle portion and being movable to close said space when subjected to face pressure.

In testimony whereof, I have hereunto subscribed my name this 17th day of May, 1916.

PHILLIPS THOMAS.