J. R. JESSE.

VARIABLE SELF INDUCTANCE COIL.

APPLICATION FILED DEC. 7, 1909.

966,555.

Patented Aug. 9, 1910.

4 SHEETS—SHEET 1.

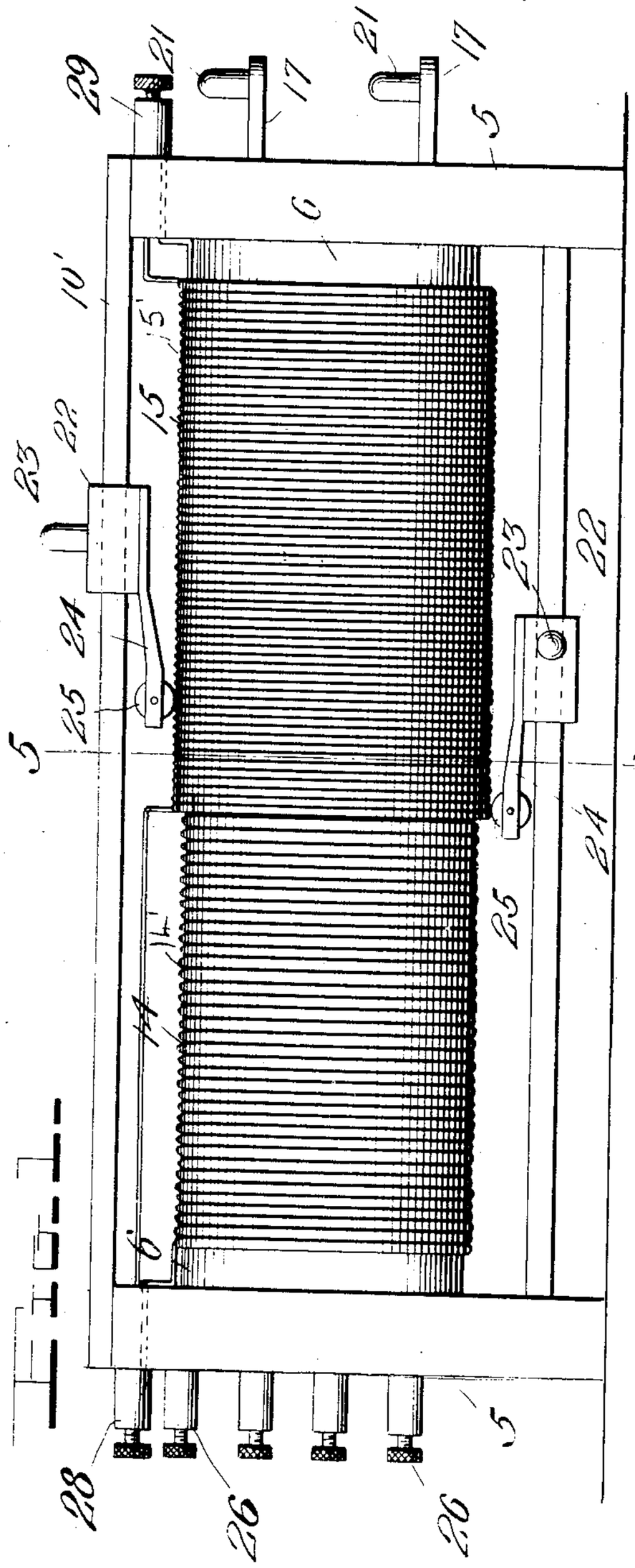

FIG. 1.

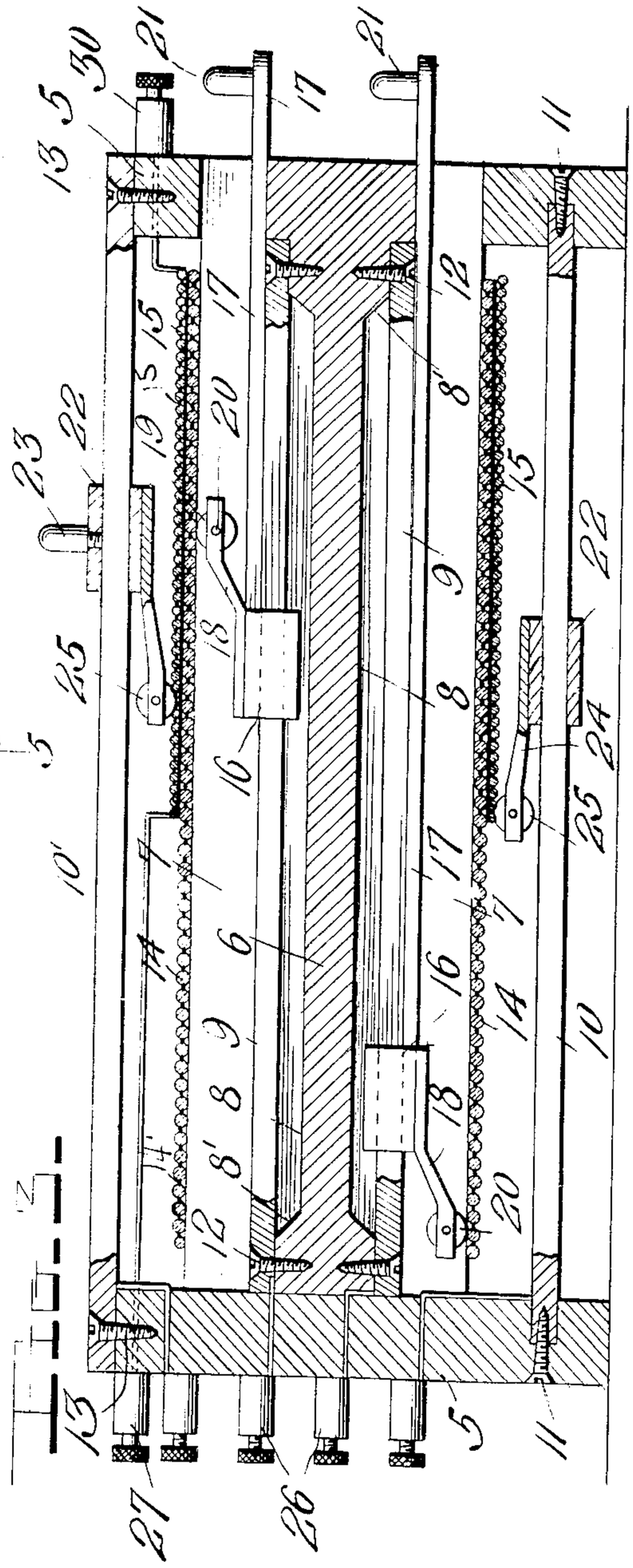

FIG. 2.

Witnesses
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4 SHEETS—SHEET 2.

FIG. 1.

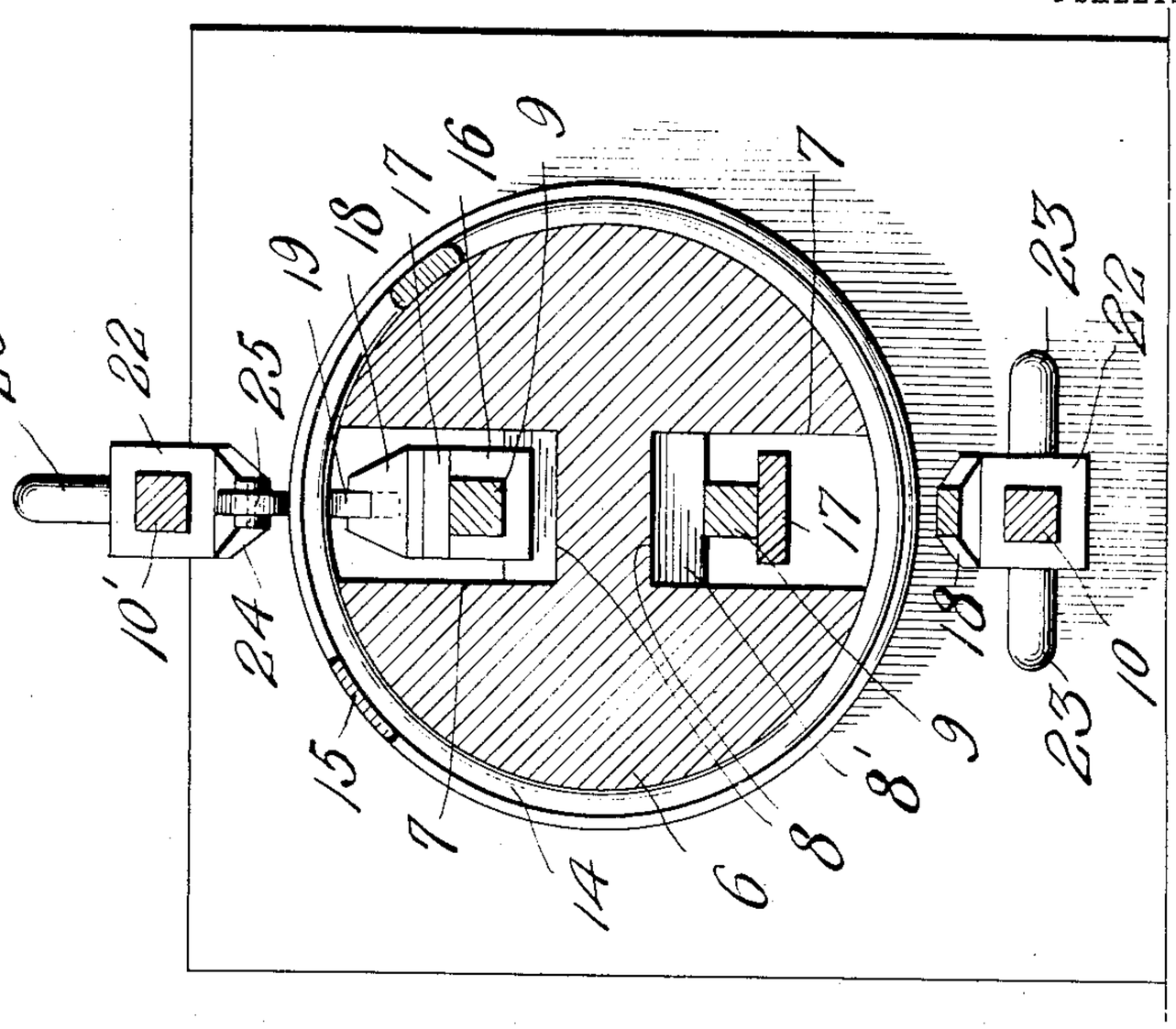
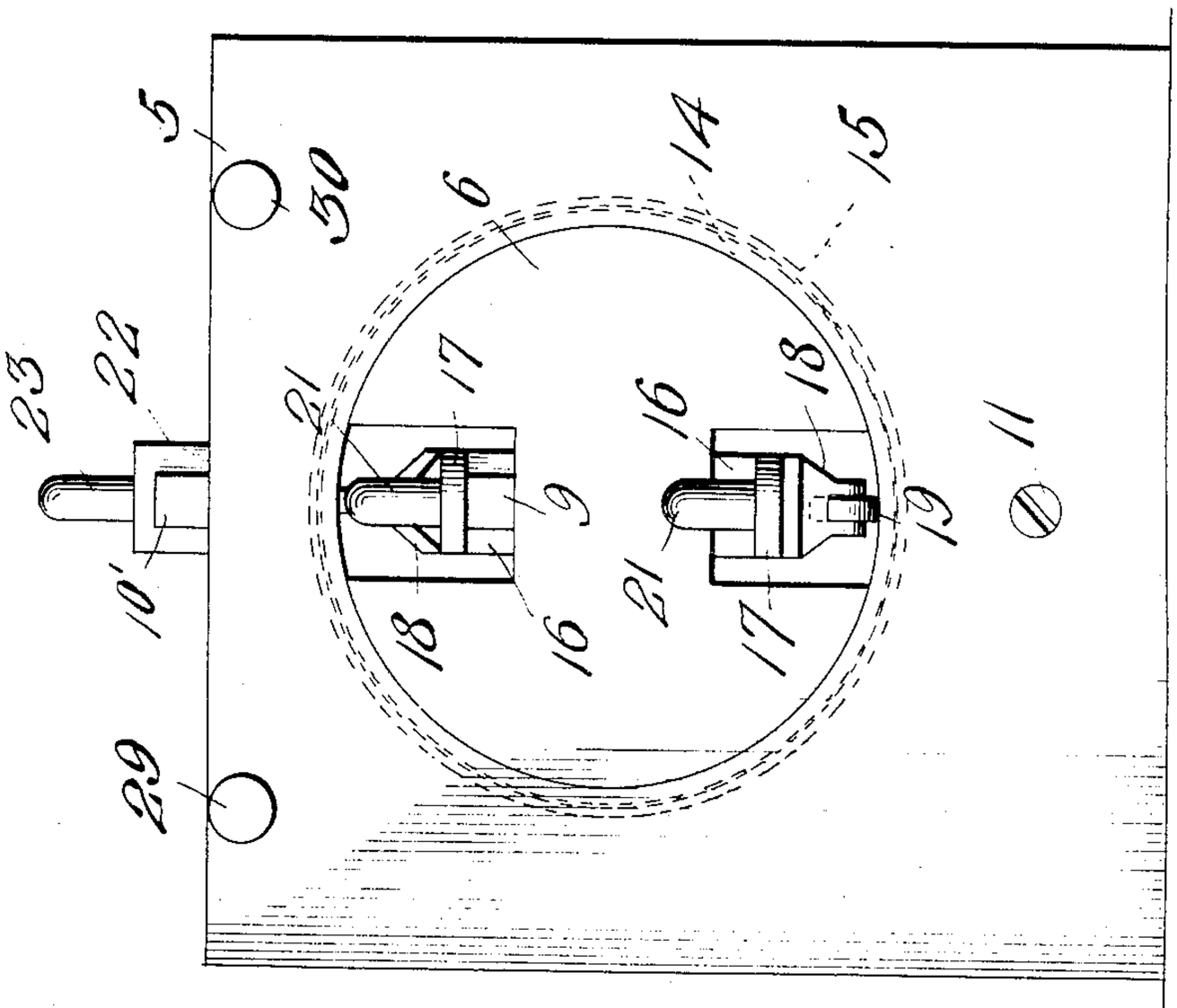


FIG. 2.



Witnesses

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4 SHEETS—SHEET 3.

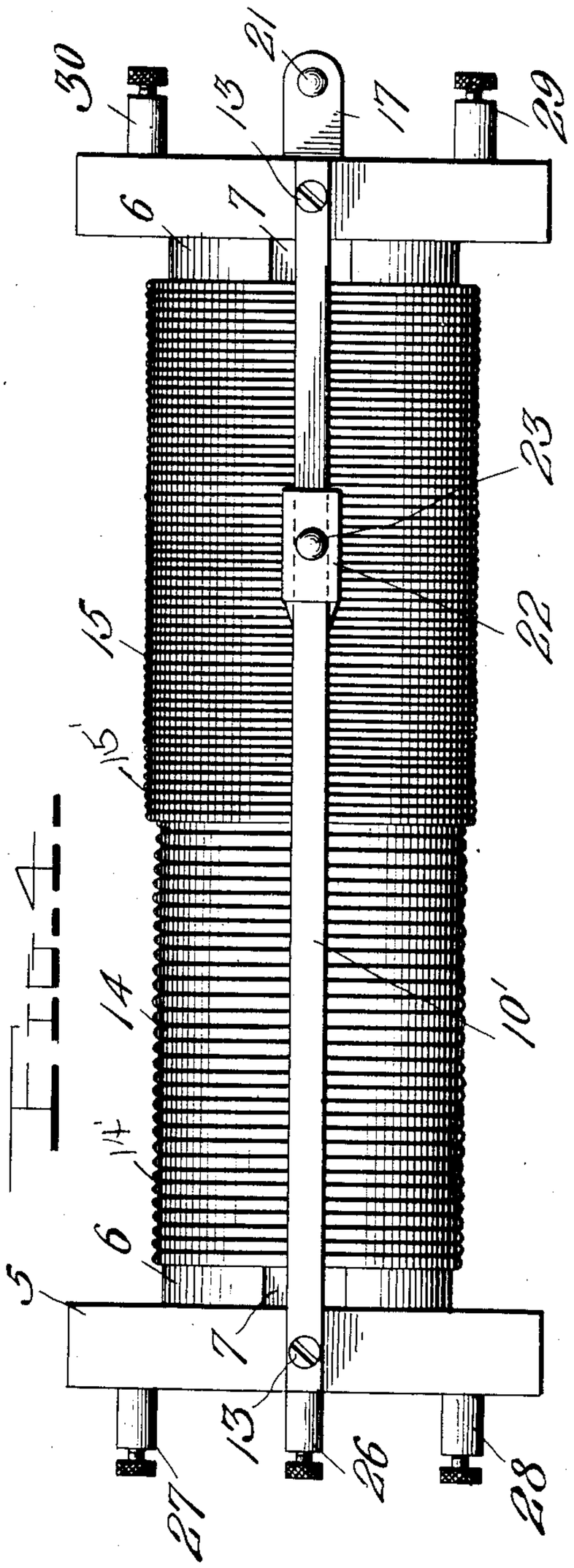

FIG. 4.

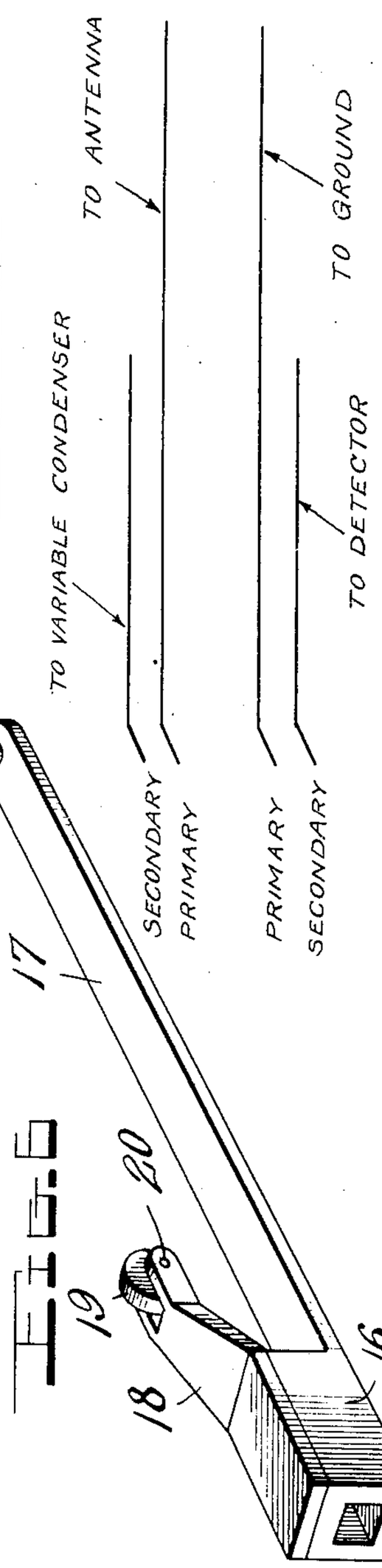

FIG. 7.

FIG. 6.

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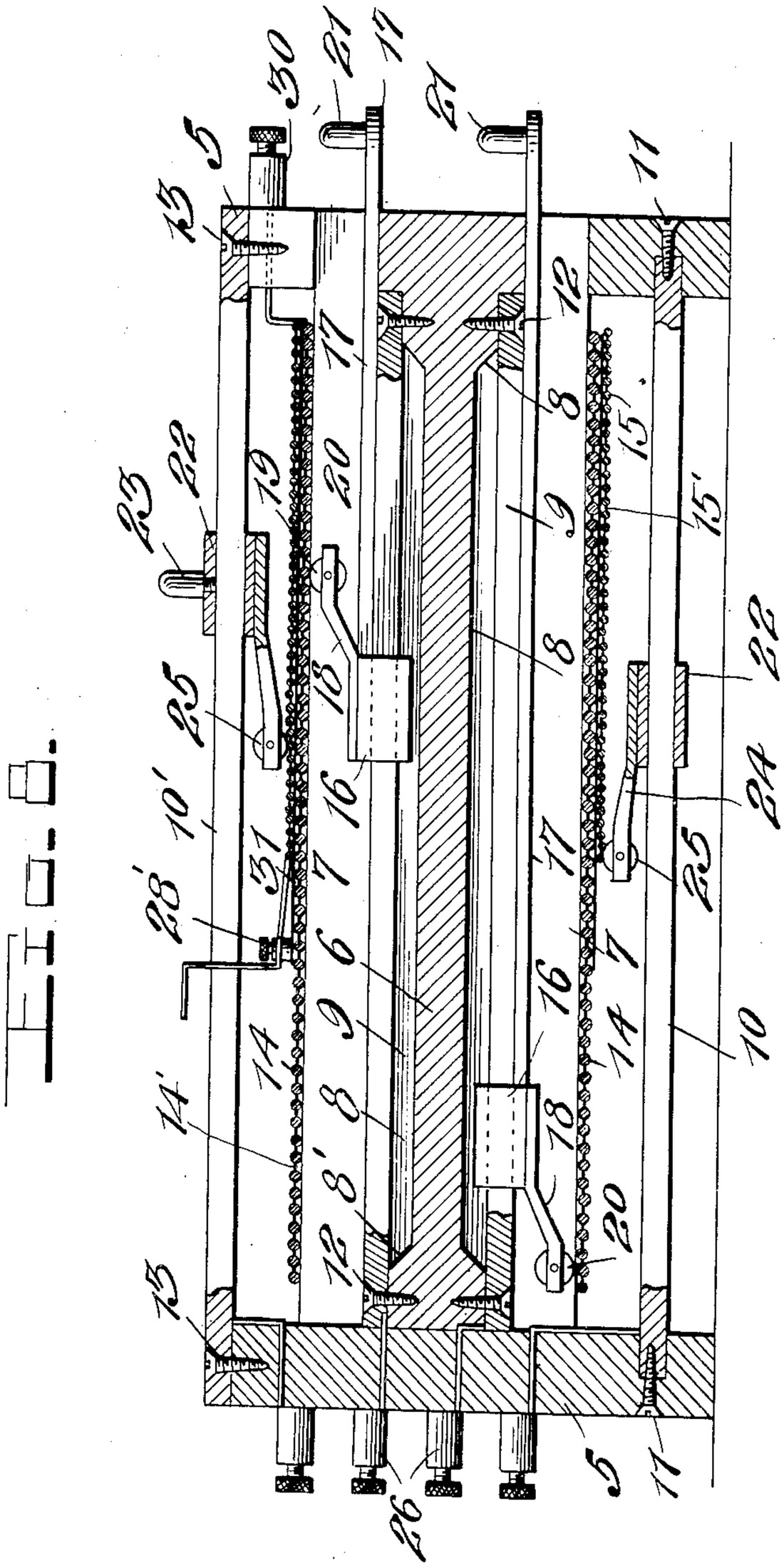
4 SHEETS—SHEET 4.

FIG. 4.



Witnesses

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UNITED STATES PATENT OFFICE.

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VARIABLE SELF-INDUCTANCE COIL.

966,555. Specification of Letters Patent. Patented Aug. 9, 1910.

Application filed December 7, 1909. Serial No. 531,836.

To all whom it may concern:

Be it known that I, JOSEPH R. JESSE, a citizen of the United States, residing at Birmingham, in the county of Jefferson and State of Alabama, have invented certain new and useful Improvements in Variable Self-Inductance Coils, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to certain new and useful improvements in variable self inductance coils of that character commonly used in wireless telegraphy.

The primary object of my invention is to produce a self inductance coil adapted for tuning between stations, whereby the extraneous or undesired signals may be shut out of the electric circuit, and those signals which it is desired to transmit thereby accentuated.

Another object is to provide a coil of the above character of simple construction, easily operated and whereby two stations may be placed in "tune" and the efficiency of the transmitting instruments materially increased.

With these and other objects in view, the invention consists of the novel features of construction and the combination and arrangements of parts hereinafter fully described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a variable self inductance coil constructed in accordance with the present invention; Fig. 2 is an end elevation thereof; Fig. 3 is a longitudinal section taken on the line 3—3 of Fig. 2; Fig. 4 is a top plan view; Fig. 5 is a transverse section taken on the line 5—5 in Fig. 3; Fig. 6 is a detail perspective view of one of the sliding contacts; Fig. 7 is a diagrammatic view showing the connections of the primary and secondary coils and Fig. 8 is a longitudinal section illustrating a slightly modified construction of the coil.

Referring to the drawings 5, 5 indicate the two end members of a supporting frame in which the core 6 is centrally mounted. This core would preferably be cylindrical in form, although it will be obvious that it may be constructed in any desired cross sectional form. Longitudinal grooves or recesses 7 are provided in the core 6 at diametrically opposite points. Extending from a point adjacent to each end of the core the grooves 7 are increased in depth, as shown at 8, the ends thereof being beveled to the base of the grooves 7, as shown at 8′. Seated within the grooves 7 and secured to the opposite ends of the core are the rectangular rods or bars 9 preferably formed of brass or other suitable metallic conducting material. A similar bar 10 has its ends disposed in the frame members 5 and is secured therein by means of the screws 11. Similar screws 12 also secure the bars 9 within the core. Another of the rectangular bars 10′ is disposed upon the upper edge of the end members 5 and is secured thereto by means of the screws 13. These bars are disposed in vertical alinement and it will be understood that they also may be of other cross sectional form than that shown in the drawings.

The primary wire coil 14 is wrapped around the core 6 and extends from end to end thereof between the frame members. Between each coil of the wire a silk cord 14′ heavy enough to insure perfect insulation is disposed. This cord, however, is not large enough to extend beyond the periphery of the wire coil. A secondary wire coil 15 is wrapped about the primary coil and extends from one end thereof to the center of the same. A silk cord 15′ is also disposed between the coils of wire comprising the secondary coil 15 and is arranged in a similar manner to that above set forth. These wires may be of any size which may be found most convenient and acceptable for the purposes in view.

Slidably mounted upon the longitudinal bars 9 secured within the core 6 are the primary contacts 16. These contacts are identical in form and construction and each comprises a rectangular tubular member which has integrally formed therewith a bar or arm 17 extending upon the bars 9 and beyond the end of the grooves or recesses 7. A resilient plate 18 is secured to each of the tubular members 16 and is angularly bent, as clearly shown in Fig. 3. These spring metal plates extend in opposite directions toward each end of the coil and their extremities are bifurcated to receive the rollers 19 which are rotatably mounted upon the transverse pins 20. The periphery of these rollers is yieldingly held by means of the plate 18 in contact with the inner surface of the primary coil 14. The outer ends of the bars or arms 17 have secured thereto the studs or pins 21 by means of which they may be conveniently grasped by the operator and

moved to slide the contact members 16 upon the bars 9. These members extend into the inner longitudinal grooves 8 so that the contact rollers 19 will have engagement with the primary coil at any point throughout its length. Similar sliding contacts 22 are likewise mounted upon the rods 10 and 10′ These members are not provided with the arms 17 but have secured directly thereto the handle members 23 by means of which the contacts may be manipulated over the secondary coil. The spring plates 24 of these contacts extend in the same direction and the contact rollers 25 are mounted in their outer ends in a manner similar to the rollers 19 of the contact members 16. Between the primary and secondary wire coils, a thin layer of insulation is disposed. This layer of insulation would preferably be about .01 of an inch thick, although this thickness is capable of considerable variation and it will be understood that I reserve the right to employ any insulating material and of any thickness which may be found desirable.

Binding posts 26 are secured in one end of the supporting frame and are adapted to receive the wire or wires having connection to the rods or bars upon which the sliding contacts are mounted. These wires are suitably connected to various instruments of the transmitting mechanism and to the ground from which the source of electromotive force is obtained. The secondary coil is connected to the variable condenser of the detector. In wireless telegraphy a detector is employed which detects and magnifies the signals in order that the receiving mechanism will be able to correctly reproduce them. There are various kinds of detectors, the most prominent of which are the silicon, electrolytic, and Ferron, and my improved coil is capable of use with any of the various forms of detectors. The primary coil is connected to the antenna which usually consists of one or more strands of wire through which the electric waves are received and transmitted. In some instances these wires are used for both sending and receiving the messages and in such instances are termed antennæ. My improved coil may also be used in connection with either form of this receiving member. The current is conducted to the primary coil from the ground or other suitable source of electric current supply.

In the operation of the device, when the contacts are arranged upon their respective coils, as shown in Fig. 3, wherein it will be noted that the contact rollers 25 are disposed between the rollers 19, the greatest effect in the detector circuit will be obtained. If the secondary contacts 25 are now moved away from the center of the coil between the contacts 19, and adjacent to the outer end of the secondary coil, the amount of electric current flowing through the secondary wire coils between the contacts 25 would be considerably lessened and in this manner the undesired signals may be made very faint, while at the same time the desired signals will be loud enough to be distinctly heard by the operator when transmitted to the receiving instrument. The primary circuit is first adjusted by moving the contacts 19 until the signals have the greatest intensity, and the contacts 25 are then moved upon the secondary coil to cut out the extraneous sounds or undesired signals which would confuse and render the message uncertain if transmitted into the receiver. As the sliding contacts 19 may be moved the entire length of the primary coil, the intensity of the desired signals may be varied without interrupting the detector circuit.

From the foregoing it will be seen that I have provided a variable inductance coil for use in the receiving of messages by wireless telegraphy, whereby the extraneous sounds may be eliminated and the desired message accentuated in intensity before it is transmitted to the receiving instrument. In this manner the great degree of uncertainty which has heretofore existed in the operation of instruments for this purpose, is entirely obviated and the operator will have no difficulty whatever in deciphering the message. While I have shown and described what I believe to be the preferred embodiment of my invention, it will be obvious that the same may be widely varied in its form, proportion and details of construction without departing from the essential features or sacrificing any of the advantages thereof.

Upon each of the end members 5 the terminals 27, 28 and 29, 30, respectively, are secured. The terminals 27 and 29 are connected to the primary coil while the terminals 28 and 30 are connected to the secondary coil. It will be obvious, however, that the positions of these winding terminals upon the end supports 5 may be reversed to facilitate the winding of the coils.

In Fig. 8 I have illustrated a slightly modified construction of my improved coil wherein it will be noted that a thin layer of insulation 31 which is disposed between the primary and secondary coils is extended upon the primary coil beyond the secondary coil. Upon this insulation a binding post 28′ is arranged. This binding post may be formed integrally with the insulation layer or may comprise a separate element and be fastened thereon in any desired manner. To this binding post the wire of the secondary coil is secured and extends therefrom to the detector. This modified construction is preferably employed when the secondary coil is only partially wound upon the primary coil. If the secondary coil is arranged upon the primary coil for substantially the entire length of the latter, the secondary coil would

preferably be connected to the binding post or terminal 28 as shown in the preferred construction of the invention. It will, however, be understood that these terminals may also be arranged in any desired manner within the scope of my invention.

Having thus described the invention what is claimed is:

1. A variable self-inductance coil comprising a primary coil, a secondary coil arranged upon the primary coil and insulated therefrom, contacts longitudinally movable within the primary coil for adjustable engagement therewith, and contacts adjustably engaged with the secondary coil, substantially as and for the purpose set forth.

2. A variable self inductance coil comprising a frame, a core mounted in said frame having longitudinal grooves therein, a bar secured in the ends of the frame above and below said core, a primary coil disposed upon said core, the turns of said coil being insulated from each other, a secondary coil wrapped upon said primary coil and insulated therefrom, sliding contacts disposed on said bars and engaged with said secondary coil, said contacts being adapted for sliding adjustment on the coil to vary the amount of current passing therethrough, and sliding contacts disposed within said core having adjustable engagement with the primary coil, whereby the inductance of said coil may be varied as desired, substantially as and for the purpose set forth.

3. A variable self inductance coil comprising a supporting frame, a core mounted in said frame having diametrically opposed longitudinal grooves, a primary coil disposed upon said core between its ends, a secondary coil wrapped upon said primary coil extending from one end of the primary coil to its center, said coils being insulated from each other, each of the turns of each of said coils having insulating material therebetween, bars secured in the ends of said frame, sliding contacts on said bars having yielding engagement with said secondary coil, said contact members being movable toward and from each other on the coil to vary the amount of electric current flowing therethrough, and contacts slidably disposed within the grooves in said core having adjustable yielding engagement upon the primary coil, the contacts engaging with said secondary coil being adjustable with relation to the primary contacts, whereby the inductance of the coil may be varied, substantially as and for the purpose set forth.

4. A variable self inductance coil comprising spaced end members, a core supported in said end members having oppositely disposed longitudinal grooves, said grooves increasing in depth inwardly from their ends, a bar secured in each of said grooves, a bar secured to said end members above and below the core, a primary coil disposed upon said core, a secondary coil wrapped about said primary coil and extending inwardly from one end of the primary coil to the center thereof, said coils being insulated from each other, a sleeve slidable on each of said bars, a contact member carried by each of said sleeves yieldingly held in engagement with the primary and secondary coils, the contact members engaging with said coils being adjustable with relation to each other to vary the active turns of the coils, the contacts engaging with the secondary coil being movable thereupon between the primary contacts and out of the active zone of the primary coil, whereby the inductance of the coil may be varied, substantially as and for the purpose set forth.

5. A variable self inductance coil comprising a frame, a core supported in said frame having oppositely disposed longitudinal grooves therein, rectangular longitudinal bars secured in said grooves, similar bars secured in the frame above and below said core, said bars being in vertical alinement, a primary coil disposed upon said core, a secondary coil wrapped about said primary coil and extending substantially one-half the length thereof, said coils being insulated from each other, insulating material disposed between each turn of each of the coils, rectangular sleeves slidably disposed on said bars, a spring metal plate secured to each of said sleeves, a contact roller mounted in the outer end of each of said plates engaging with the primary and secondary coils, the spring metal plates of the secondary contacts extending in the same direction, the plates of the primary contacts extending in opposite directions, an arm integrally formed with the sleeves of said primary contacts extending beyond the end of the core, whereby said contacts may be moved, said secondary contacts being adapted for adjustment upon the coil, whereby the active coils of the secondary coil may be disposed within or beyond the active zone of the primary coil between the contacts thereof to vary the inductance of said coil, substantially as and for the purpose set forth.

6. A variable self-inductance coil comprising a primary coil, the turns of said coil being insulated from each other, a secondary coil wound upon the primary coil and insulated therefrom the turns of the secondary coil being insulated from each other, adjustable contacts engaging the inner surface of the primary coil, and adjustable contacts engaging with the outer surface of the secondary coil, substantially as and for the purpose set forth.

7. A variable self-inductance coil comprising primary and secondary coils, the turns of each of said coils being insulated

from each other, adjustable contacts engaging with the inner surface of the primary coil, adjustable contacts engaging with the outer surface of the secondary coil, and means for independently moving said contacts, substantially as and for the purpose set forth.

8. A variable self-inductance coil comprising a core, a primary coil disposed upon said core having its turns insulated from each other, a secondary coil wound upon the primary coil and insulated therefrom, contacts slidably mounted in the core for adjustable engagement with the turns of the primary coil, and contacts adjustably disposed in engagement with the primary coil substantially as and for the purpose set forth.

9. A variable self-inductance coil comprising a core, a primary coil disposed upon said core having its turns insulated from each other, a secondary coil wound upon the primary coil and having its turns insulated from each other, insulation between the coils, contacts longitudinally movable in the core adapted for adjustable engagement upon the inner surface of the primary coil, and adjustable contacts disposed in engagement upon the secondary coil, and means for adjusting the contacts on each of said coils with relation to each other, substantially as and for the purpose set forth.

10. A variable self-inductance coil comprising a core having longitudinal grooves therein, a primary coil disposed on said core, a secondary coil wound upon the primary coil and insulated therefrom, contacts slidable in the grooves of the core for adjustable engagement upon the inner surface of the primary coil and contacts slidably supported for adjustable engagement upon the secondary coil, substantially as and for the purpose set forth.

11. A variable self-inductance coil comprising a core, a primary coil disposed upon the core having its turns insulated from each other, a secondary coil wound upon the primary coil and insulated therefrom, the turns of said secondary coil being also insulated from each other, and a plurality of independently movable contacts arranged in the same vertical plane for adjustable engagement upon the turns of said coils, substantially as and for the purpose set forth.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

JOSEPH RAY JESSE.

Witnesses:
J. W. Moore,
S. F. Leslie.