

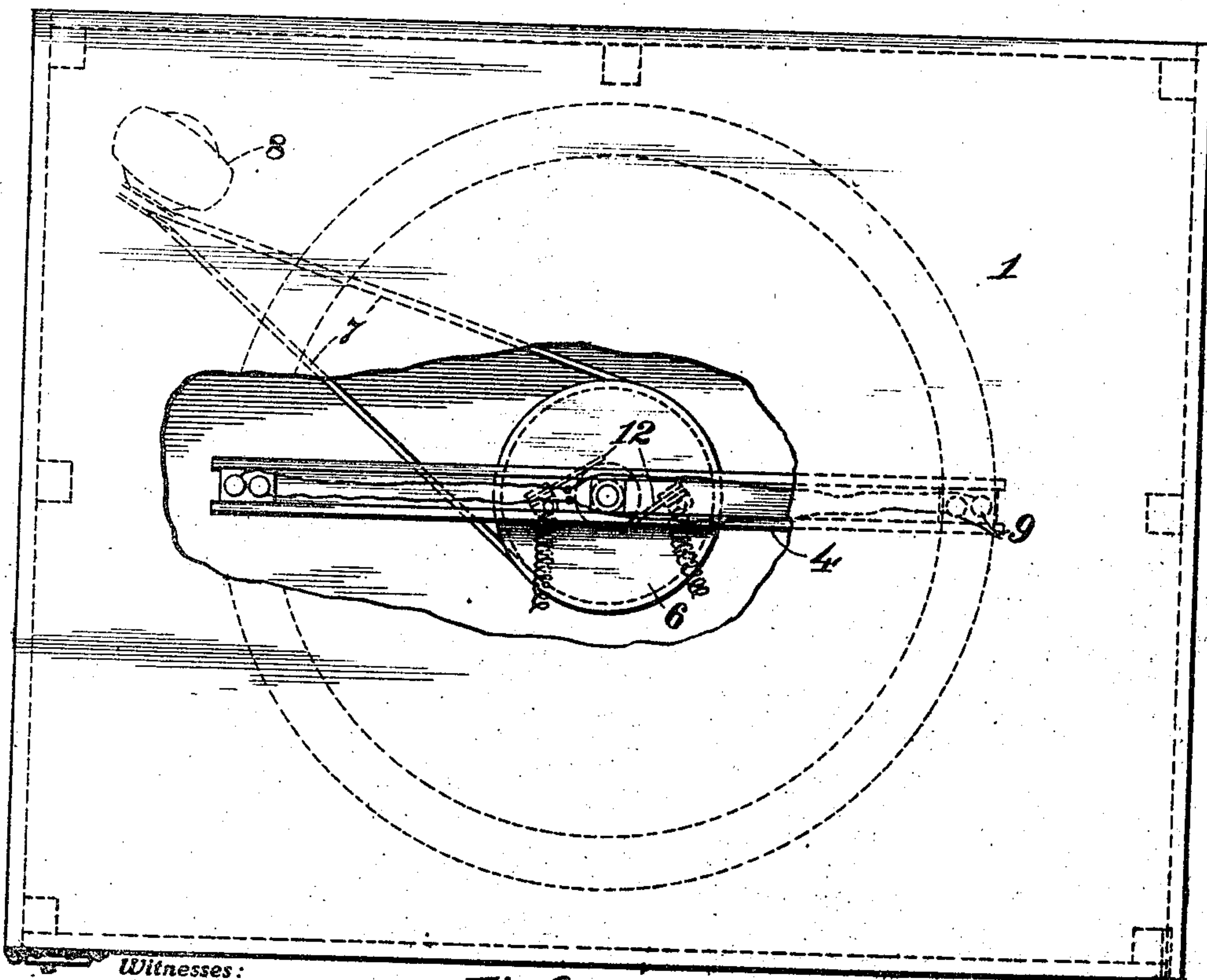
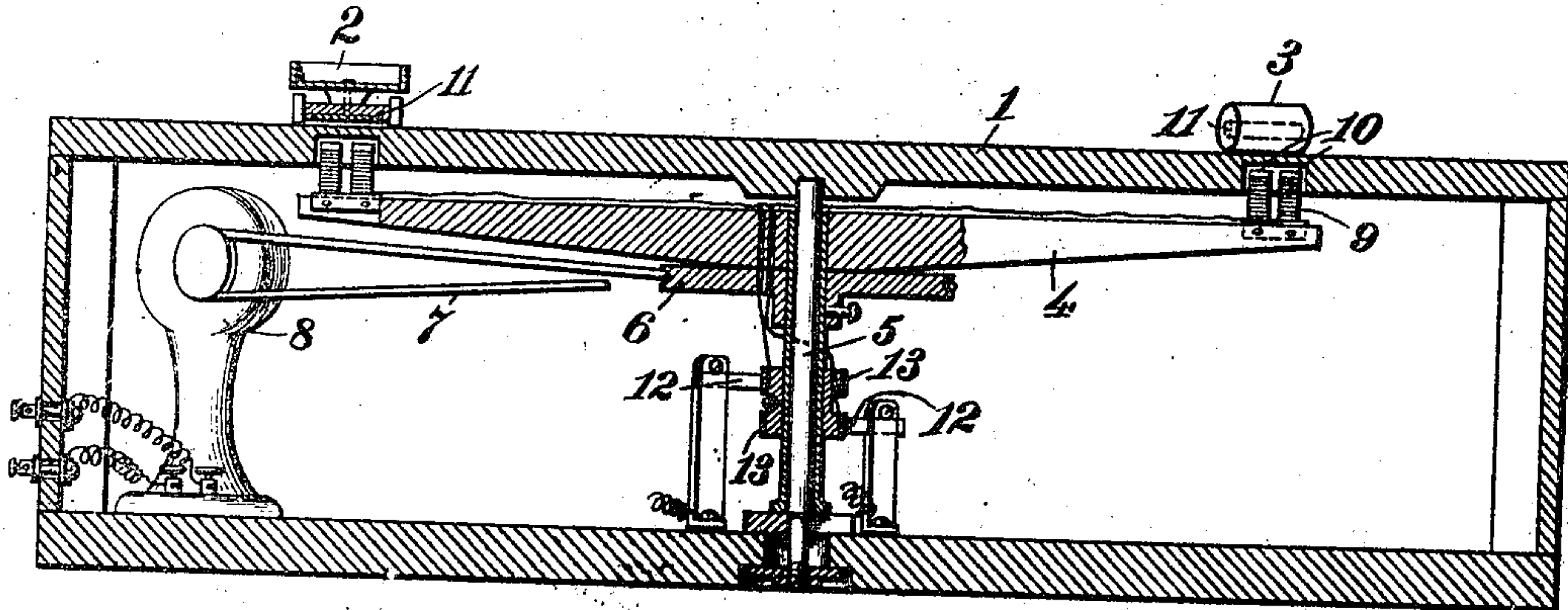
W. A. HARVEY.
ELECTROMAGNETIC DISPLAY APPARATUS.
APPLICATION FILED MAY 13, 1906.

981,646.

Patented Jan. 17, 1911.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

Fig. 2.

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3 SHEETS—SHEET 2.

Fig. 3.

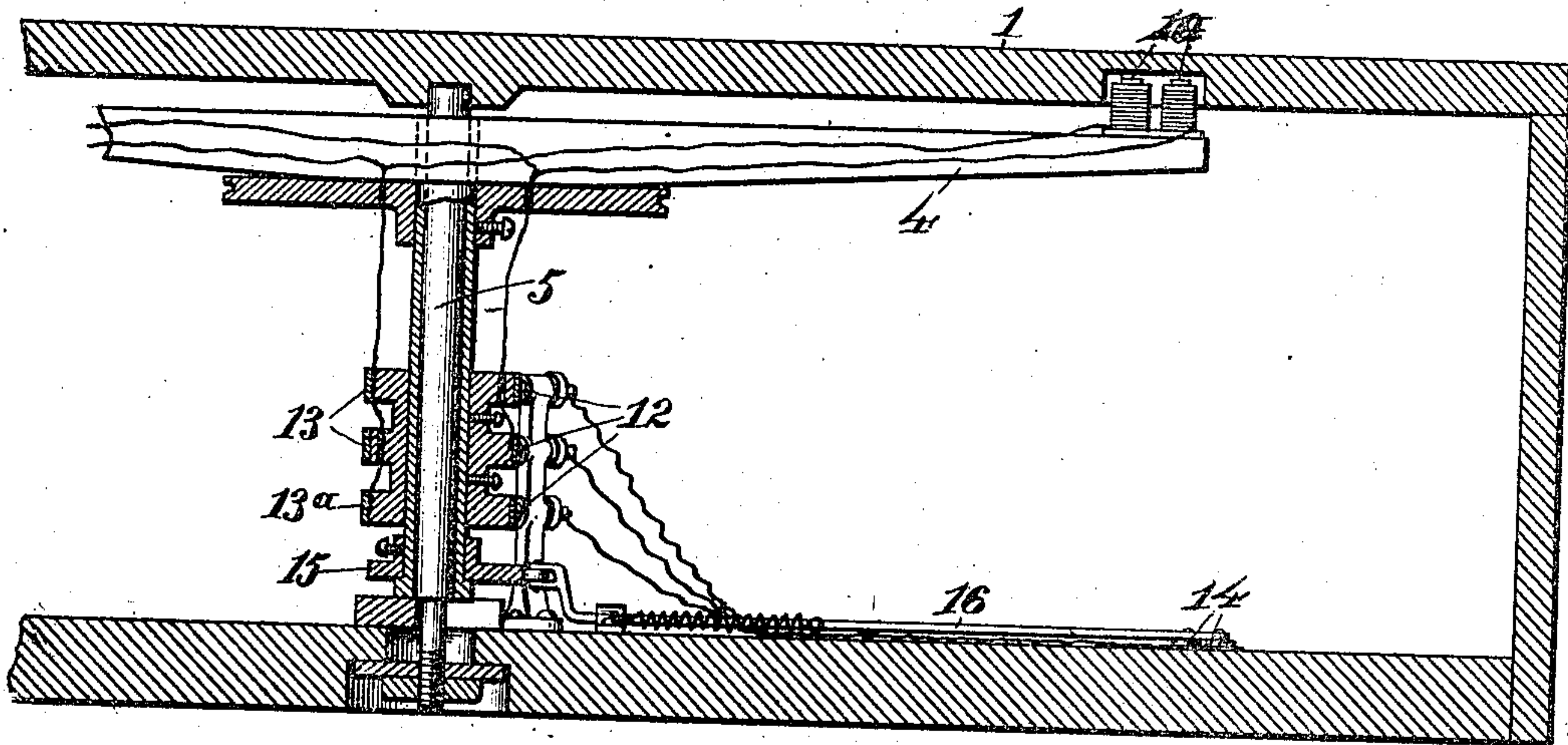


Fig. 4.

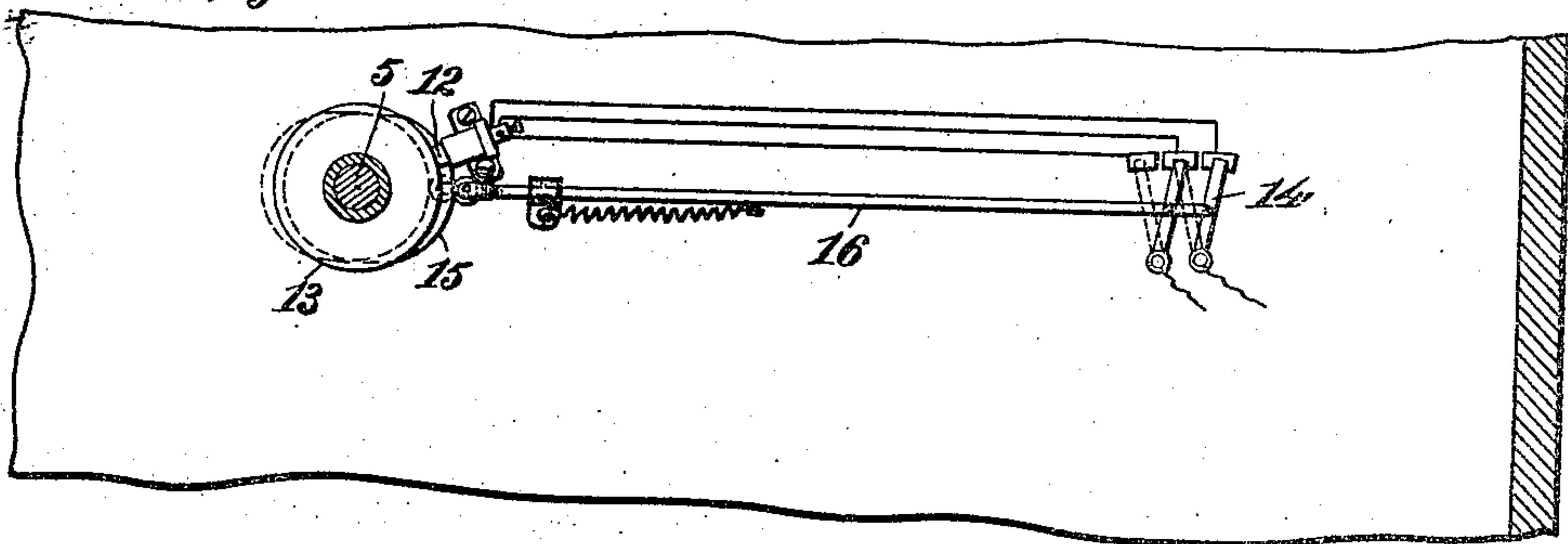


Fig. 5.

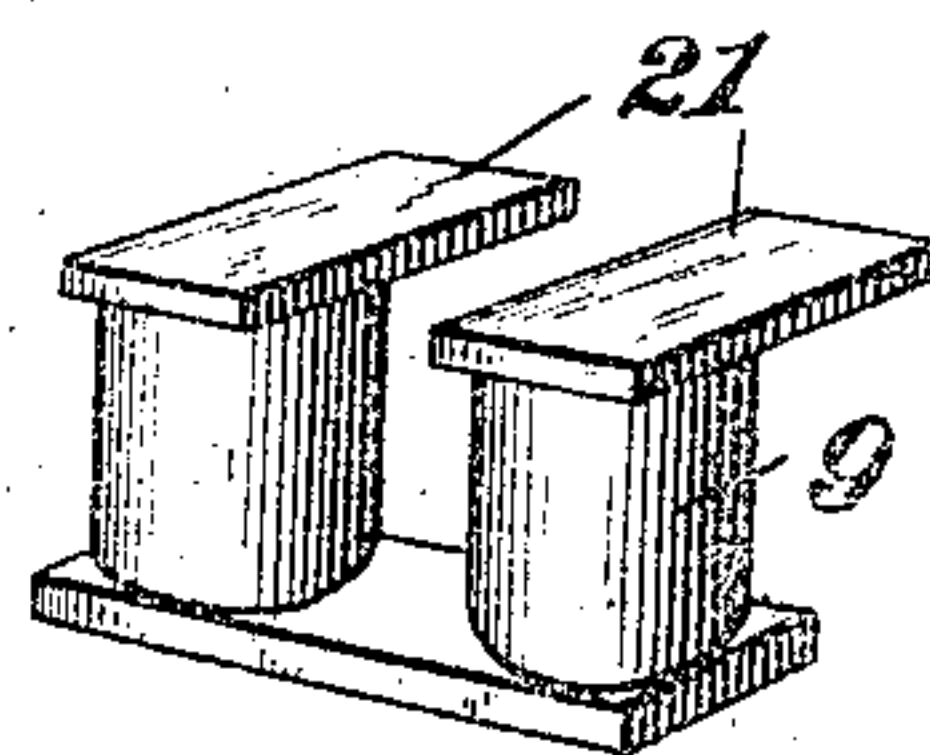
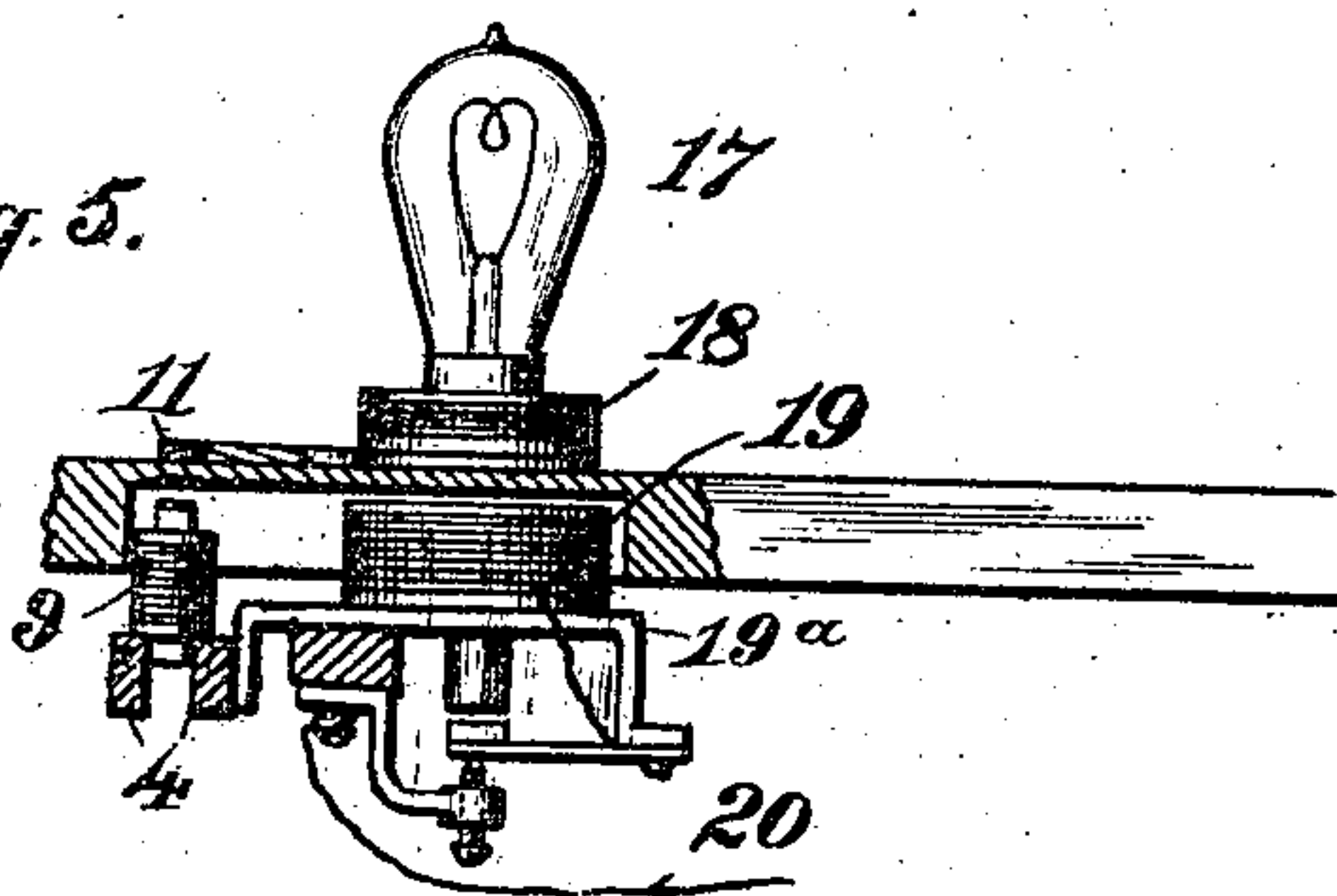


Fig. 6.

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3 SHEETS—SHEET 3.

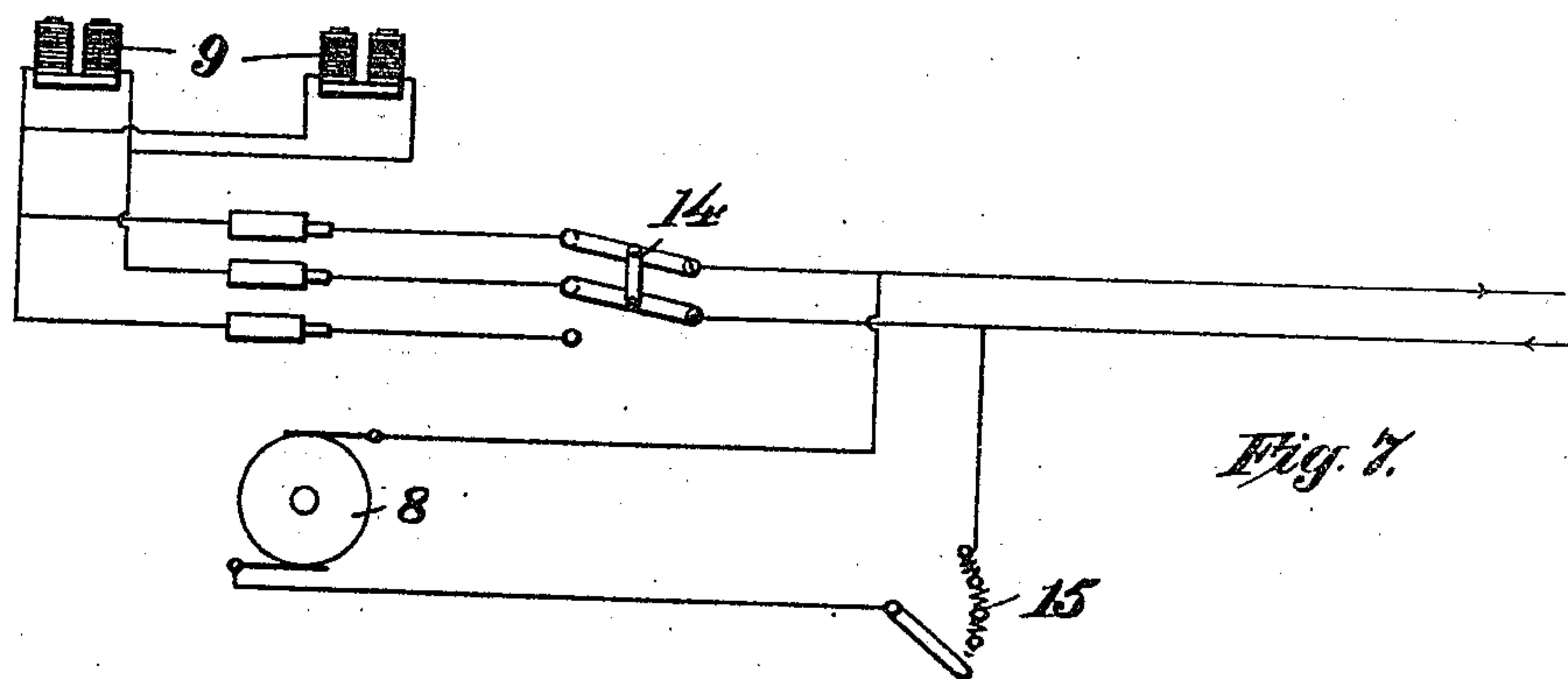


Fig. 7.

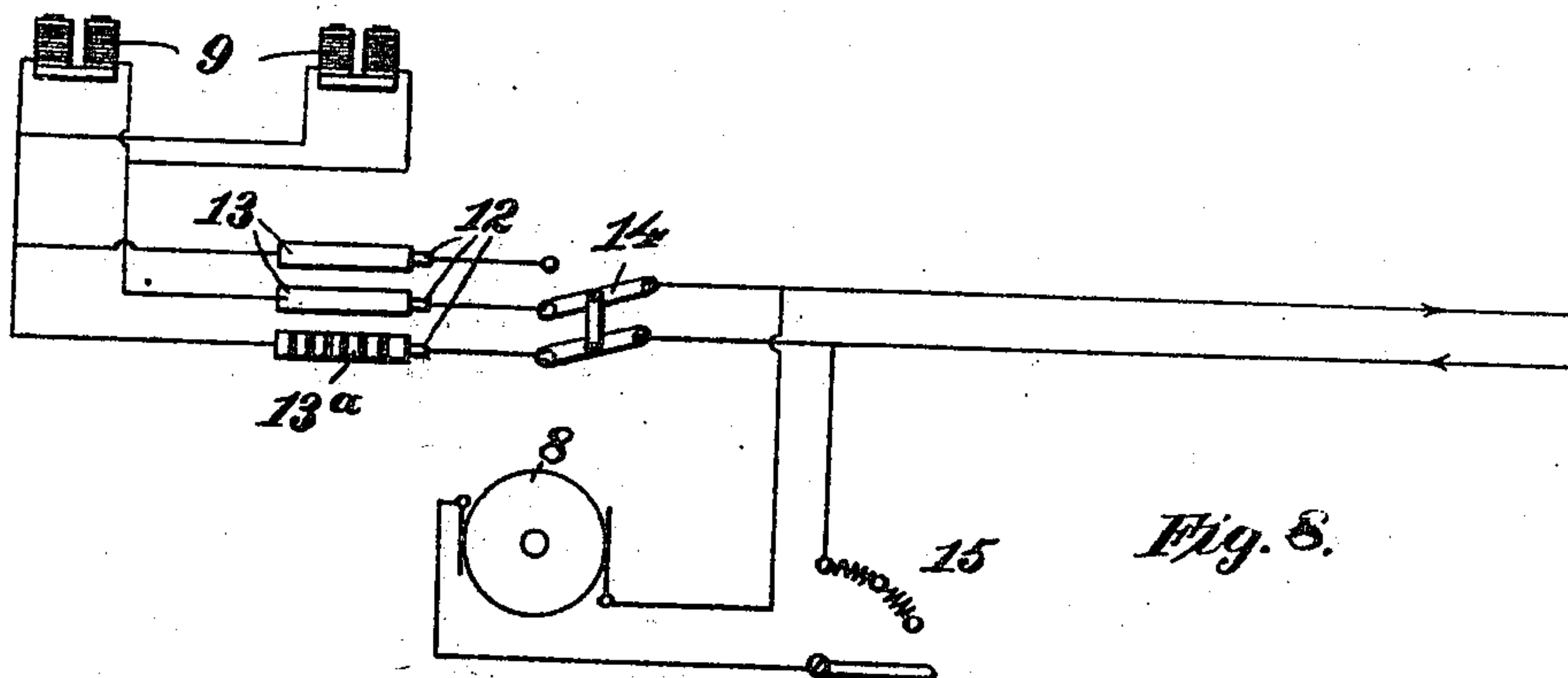


Fig. 8.

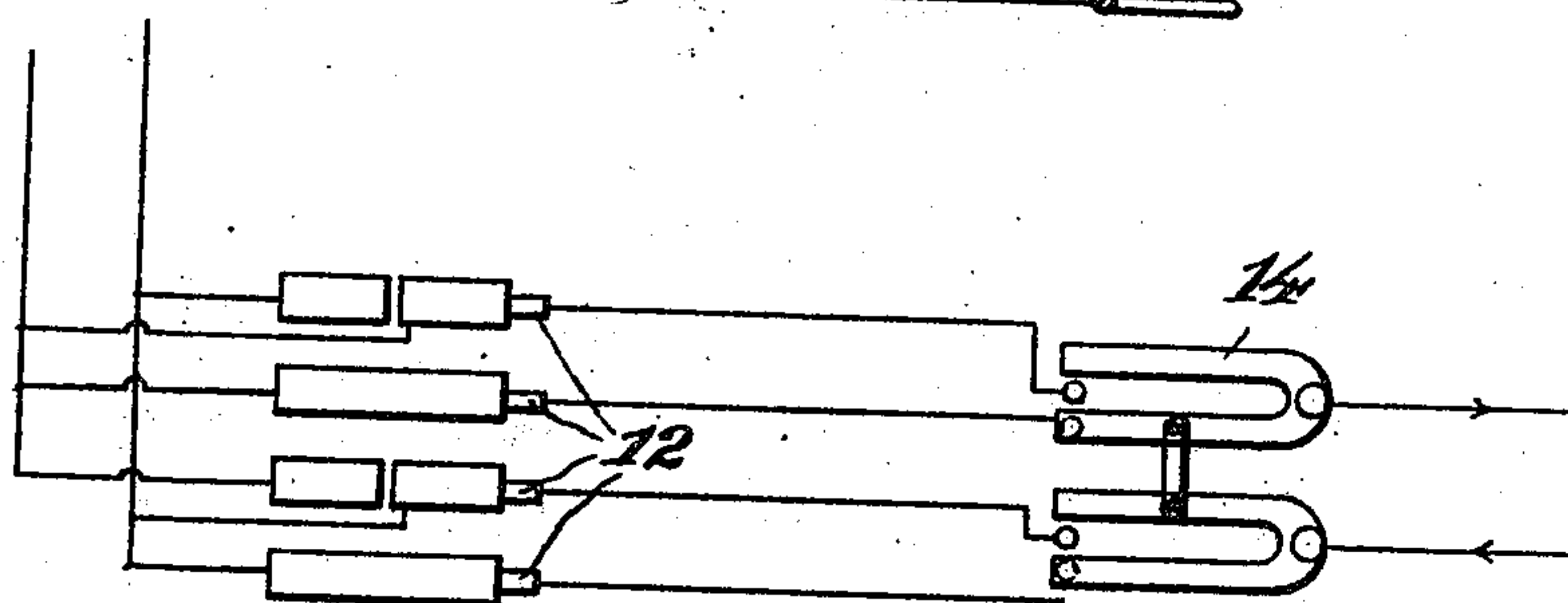


Fig. 9.

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UNITED STATES PATENT OFFICE.

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ELECTROMAGNETIC DISPLAY APPARATUS.

981,646.

Specification of Letters Patent. Patented Jan. 17, 1911.

Application filed May 13, 1905. Serial No. 260,323.

To all whom it may concern:

Be it known that I, WILLIAM A. HARVEY, a citizen of the United States, residing in Scranton, in the county of Lackawanna and State of Pennsylvania, have invented certain new and useful Improvements in Electromagnetic Display Apparatus, of which the following is a specification.

This invention relates to a device to be used for the purpose of displaying goods, wares or merchandise or for attracting attention for advertising purposes and particularly to an apparatus embodying in its structure, a plane or other diaphragm either horizontal, inclined or vertical upon or against which an article or a receptacle for goods may be placed or upon which it may be made to move in a manner to progress over the diaphragm in any desired path or in a manner to merely change its positions without progressing or to execute both said movements or a combination thereof; these ends being attained by the construction, arrangement, setting or manipulation of suitable electromagnetic means maintained in fixed or traveling relation to the opposite side of the diaphragm and having means for maintaining interrupting changing polarity or otherwise determining the magnetism thereof so as to correspondingly affect the article on the surface of the diaphragm.

My invention will be fully understood upon reference to the accompanying drawings, in which:

Figures 1 and 2 are a vertical transverse section and a plan view with a part of the diaphragm broken away showing one embodiment of my invention suitable for introduction into a store window or other similar place. Figs. 3 and 4 are views corresponding to Figs. 1 and 2 showing collectors for supplying constant and interrupted current to the magnet, and a switch with mechanical means for intermittently shifting the same whereby the current supply to the magnet is constant or intermittent at different portions of the revolution of the electromagnetic device; Fig. 5 is a detail view of a means for controlling the movement of an illuminated object and at the same time inducing therein, a current that will cause the illumination; Fig. 6 is a detail view of means for increasing the area of the magnetic field of the device for inducing motion in the object to be controlled; Figs. 7, 8 and 9 are schematic views of electric circuits,

commutators and controlling switches whereby the phases or magnetic conditions in the electromagnetic controlling devices are determined.

The fundamental idea of my invention is to have objects move or travel on a surface without having the means which causes their movement or travel apparent to the observer thereby arresting the attention by exciting the curiosity. In Figs. 1 and 2, I have shown a rectangular floor or diaphragm 1 upon which are placed the articles whose movements it is desired to control, such as, for instance, a wheeled receptacle 2, for merchandise, or an article of merchandise 3 of a form that is adapted to roll or move, such, for instance, as a spool of cotton, a cigar or other object. Beneath the floor provided by the diaphragm 1 is a rotary support mounted upon a vertical axle 5 and receiving motion through a pulley 6 and belt 7 from electric motor 8. The rotating support 4 is provided with electromagnets 9, which, to bring them into closer controlling relation with the article on the surface, are made to work in the grooves or channels 10. To subject the receptacle or other object to the influence of the magnets, it is provided with an armature 11, and in order that the course or direction of the object may be determined by keeping the axis of its wheels or the axis upon which it rolls normal to the line of travel, both poles of the magnets are presented in attractive relation to said armature and in a position to cause the armature and through it the article which it controls, by remaining in parallelism with the poles, to assume the position which insures the proper direction in the travel of the object. In the form shown in Fig. 1, the magnets and the armatures are all in a position radial to the shaft 5 on which the rotary support is mounted. The magnets 9 are energized by a current received through brushes 12 and rings 13.

With relations established as above described between the electromagnetic device and the object to be controlled, it is obvious that the object will follow the magnet in any given case and by determining the course of the said magnet, the object may be made to travel in a circular path or in a serpentine path. By rendering the magnetism intermittent, the object may be made to move a certain distance and permitted to rest, and thereafter moved again. In order

to accomplish this last named result, the collecting rings and brushes may be increased in number as shown in Figs. 3 and 4 wherein an additional ring 13^a is provided and is intended to be constructed, as illustrated in Fig. 8, broken so as to interrupt the current. A switch 14 having two arms with three contact points will supply a constant current to the magnets when on two of the contacts and an intermittent current when moved onto the other two contacts. A cam 15, Figs. 3 and 4, operating through a rod 16 may be arranged to shift the switch intermittently so as to render still more complex the motions of the object on the surface and thus further excite the curiosity of the observer. As shown in Fig. 7, a switch 14 may be utilized for simply reversing the current through the magnets 9 which will produce still another result where the object on the surface carries a permanent magnet with its own polarity so that when the polarity of the magnets 9 is changed, the permanent magnet on the surface will be caused to rotate to bring poles of opposite sign into position over the poles of the magnet 9. By repeating this reversing motion, the turning motion of the object on the surface may be continued at will and the object thus caused to rotate on its vertical axis as well as travel, thus giving opportunity to further vary the nature of the object on the surface and permit its being made in the form of a figure imitating a living creature or creatures which can be made to waltz as well as to progress. By utilizing the system of rings and switches shown in Fig. 9, the reversing as well, as the intermittent effect may be combined so that the current is intermittent in whichever direction it flows.

15 represents a stopping and starting switch having a suitable rheostat for controlling the operation of the device.

While I have shown the path of travel to be circular in Figs. 1 and 2, it is to be understood that I do not limit my invention to any specific path of travel for the electrically controlled device.

According to Fig. 5, the object to be moved over the surface may be provided with an electric lamp 17, current for which is supplied from the secondary coil 18 preferably mounted on a non-conducting as well as non-magnetic base 18^a, and having traction armature 11 under the influence of traction magnet 9, on support 4, while said coil 18 remains in inductive relation to a primary coil 19 carried by a bracket 19^a on the rotary support 4. If the current in the primary coil 19 is alternating, the circuit

may be continuous, but if the current is direct, an interrupter 20, is provided.

According to Fig. 6, the magnetic field of the magnets 9 may be increased in area by providing pole pieces 21 so that when the magnet passes under an object standing on the surface, it will be better adapted to pick up the object.

While I have illustrated several applications of my invention, I desire it understood that I do not limit myself to these specific uses as it is obvious that the objects could be made to move not only over a horizontal surface as shown but over an inclined surface or even a vertical surface, such, for instance, as a vertical cylinder, the object being made to travel in any path assumed by the magnet 9, but this being in turn determined at will by suitable mechanical means. I also desire it understood that the motion imparted to the objects may be greatly varied by utilizing the repelling effect of the magnet on a permanent magnet which has like poles presented to the controlling magnet as well as the attractive force of the controlling magnet exerted on unlike poles of the object to be controlled or upon a soft iron armature.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. The combination of a diaphragm having a surface over which an object may be moved, and an electro-magnetic means mounted on the side of the diaphragm opposite to said surface and having means for controlling its polarity.

2. In an electro-magnetic device of the character described, the combination of the diaphragm, the electrically controlled device thereon, the controlling electro-magnet beneath the diaphragm, means for traversing said magnet and means for reversing the polarity of said magnet.

3. In an electro-magnetic device of the character described, the combination of the diaphragm, an object adapted to move over the surface of said diaphragm, and carrying a magnetic part having a definite polarity, and an electro-magnet located on the other side of said diaphragm and having means for causing it to travel and also for changing its polarity.

The foregoing specification signed at Scranton, Pennsylvania, this ninth day of May, 1905.

WILLIAM A. HARVEY.

In presence of—

C. A. BATTENBERG,
H. J. BLACKWOOD.