

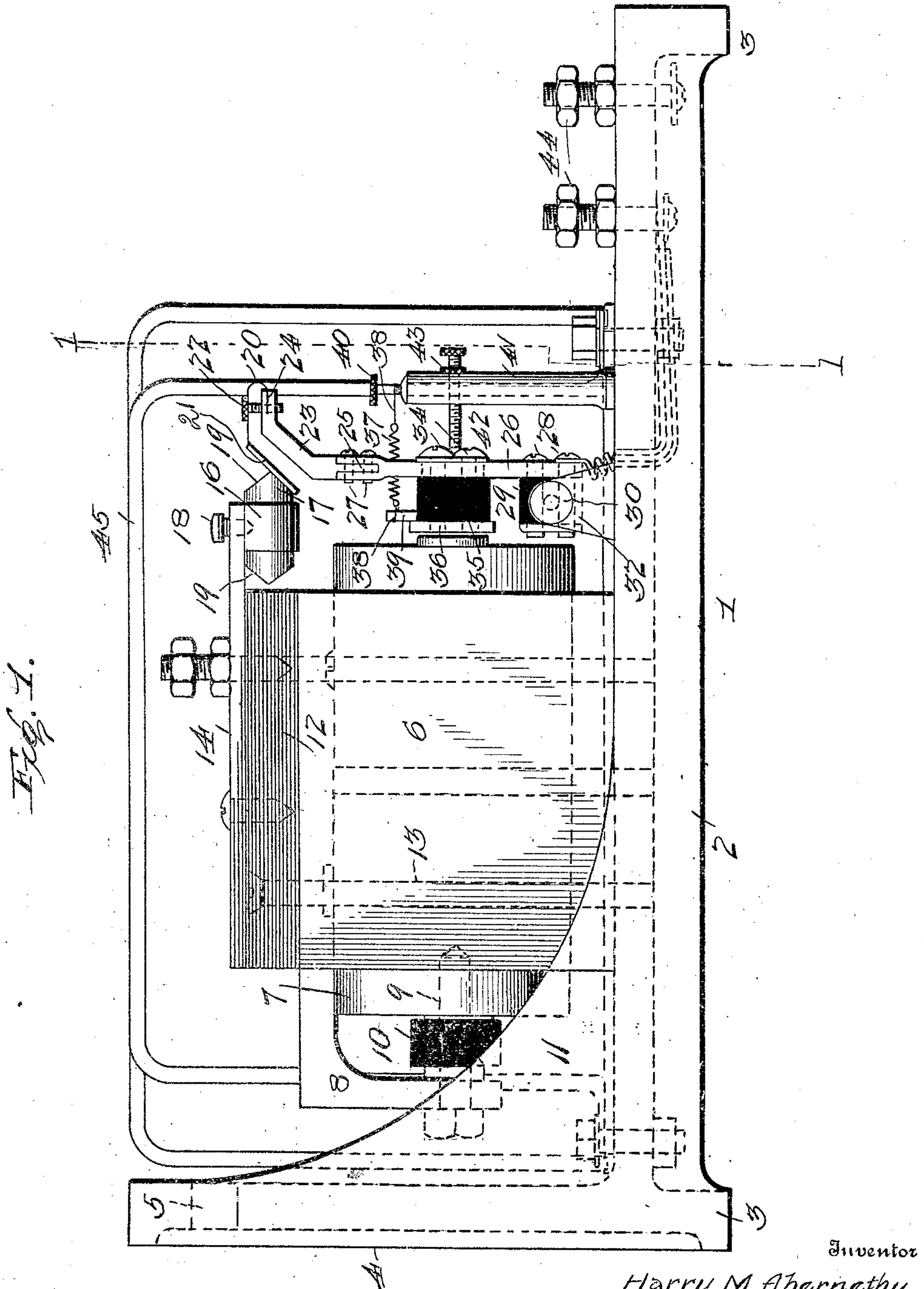
No. 829,905.

PATENTED AUG. 28, 1906.

H. M. ABERNETHY.
ELECTRICAL RELAY.

APPLICATION FILED JULY 8, 1905.

4 SHEETS—SHEET 1.



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4 SHEETS—SHEET 2.

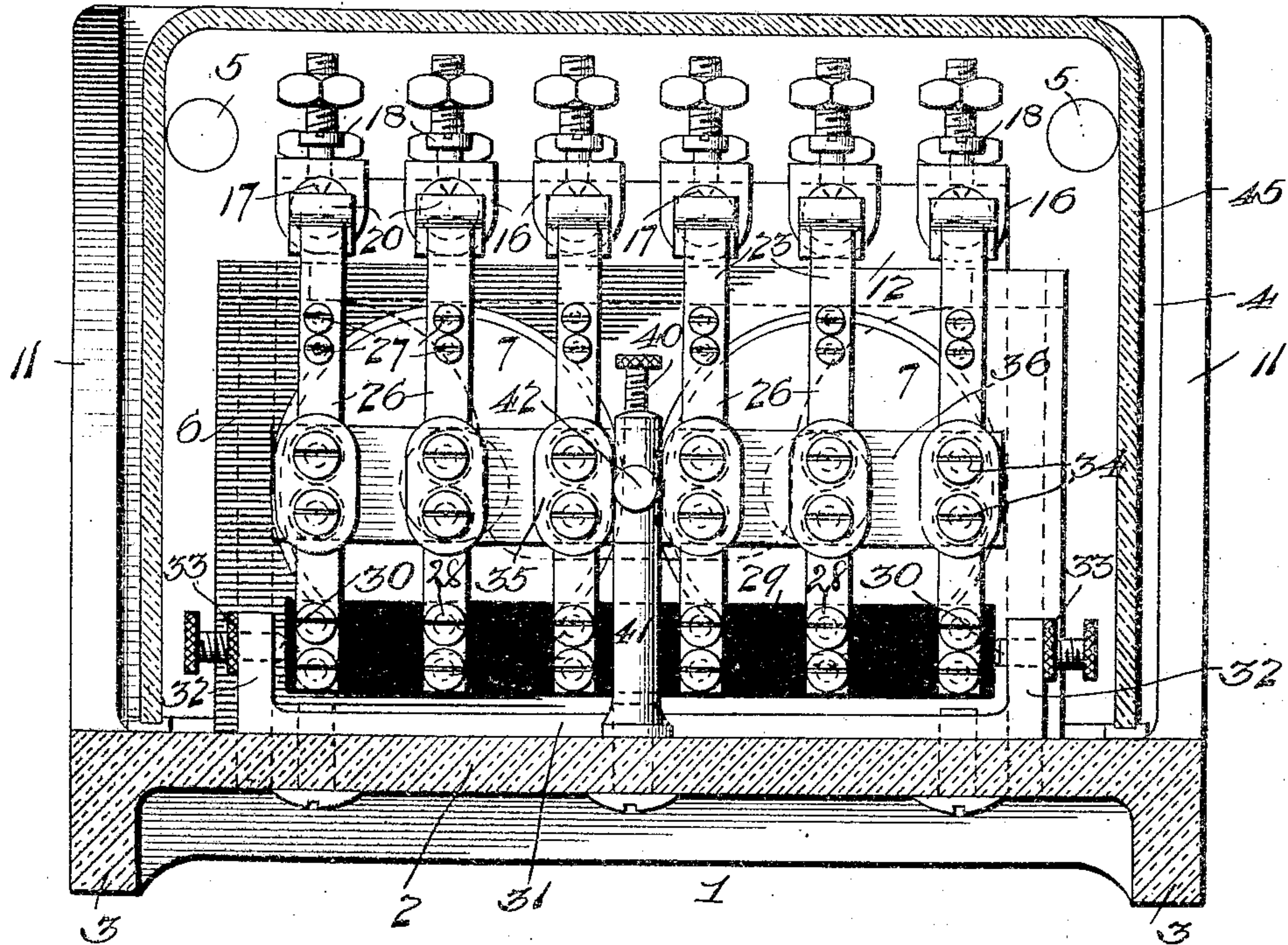
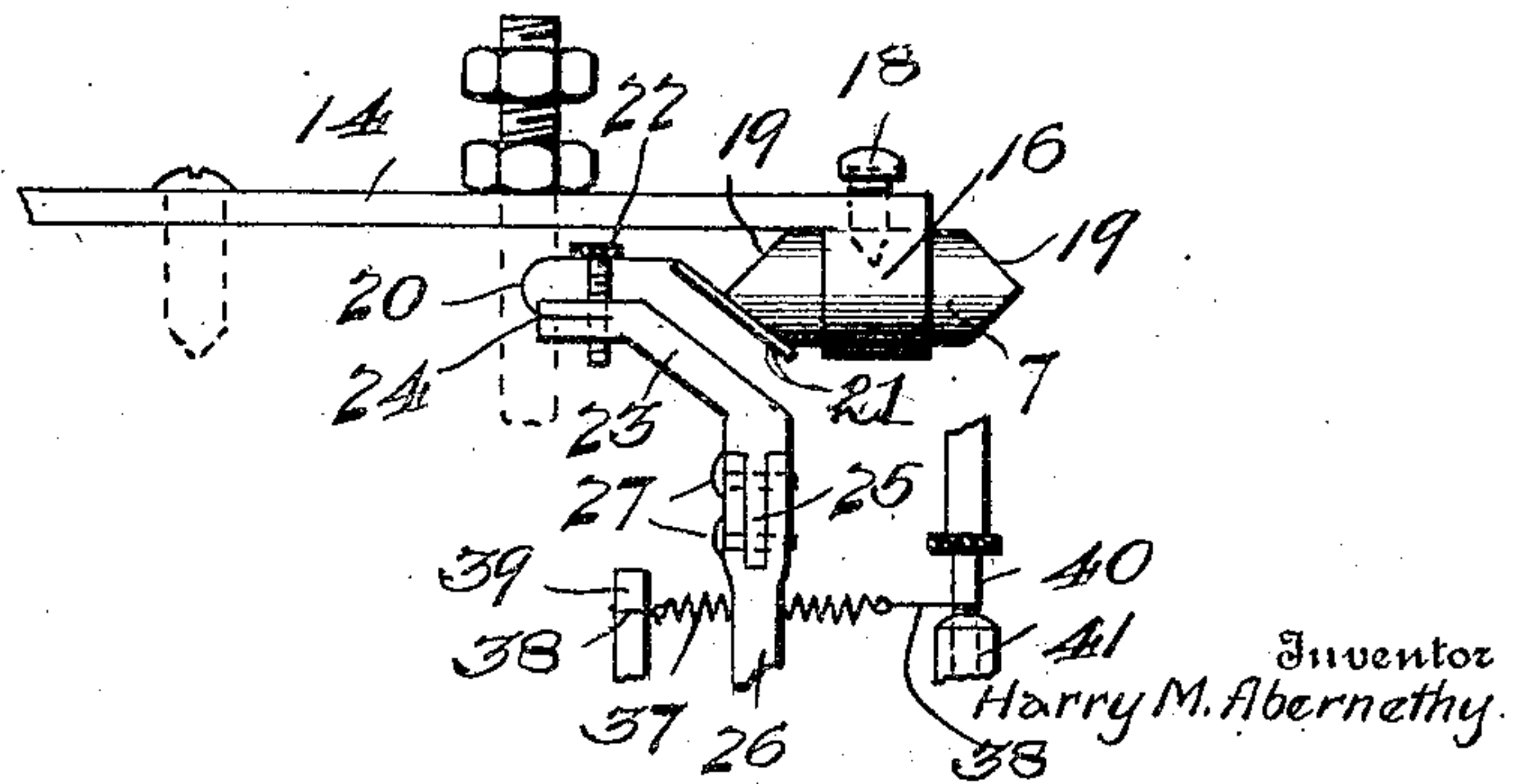


Fig. 3.

Fig. 2.



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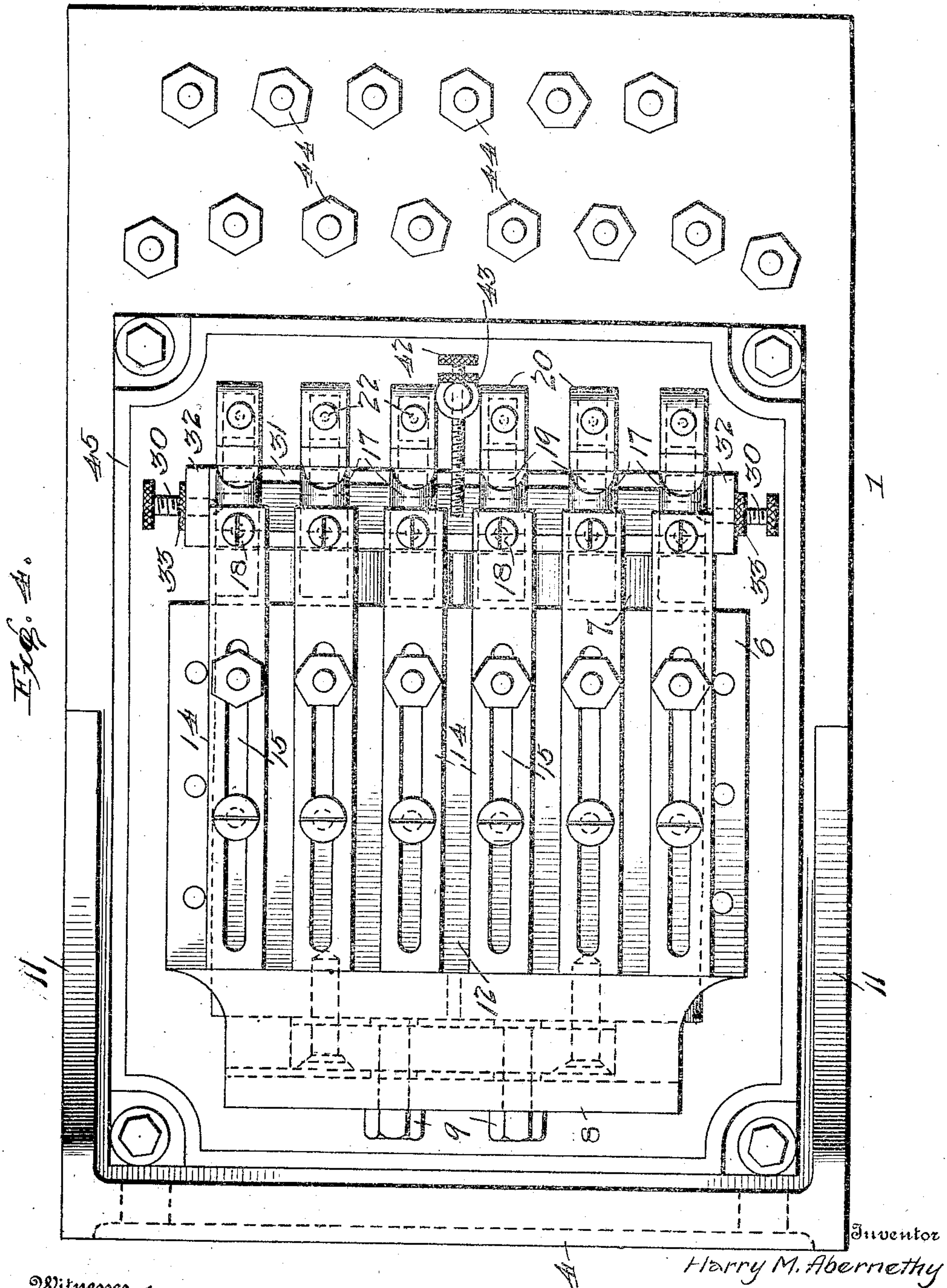
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4 SHEETS—SHEET 3.



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4 SHEETS—SHEET 4.

Fig. 5.

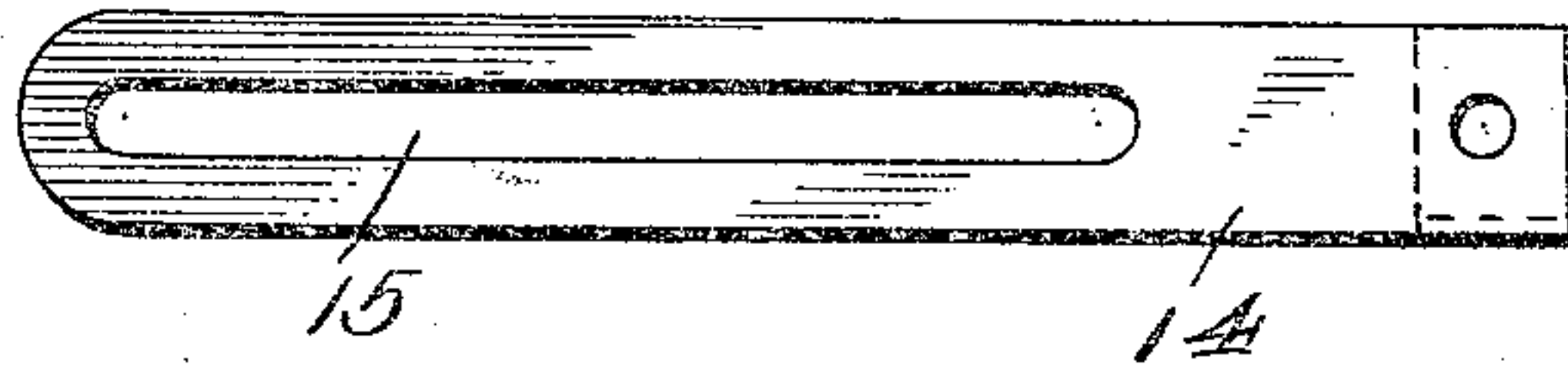


Fig. 6.

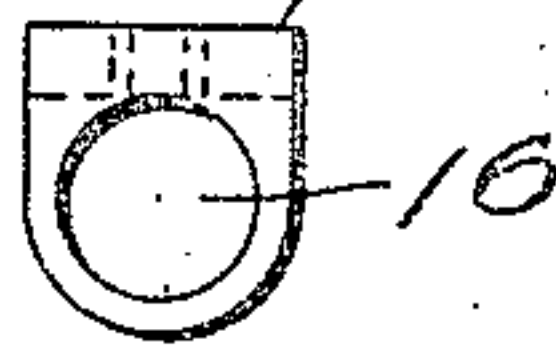


Fig. 7.

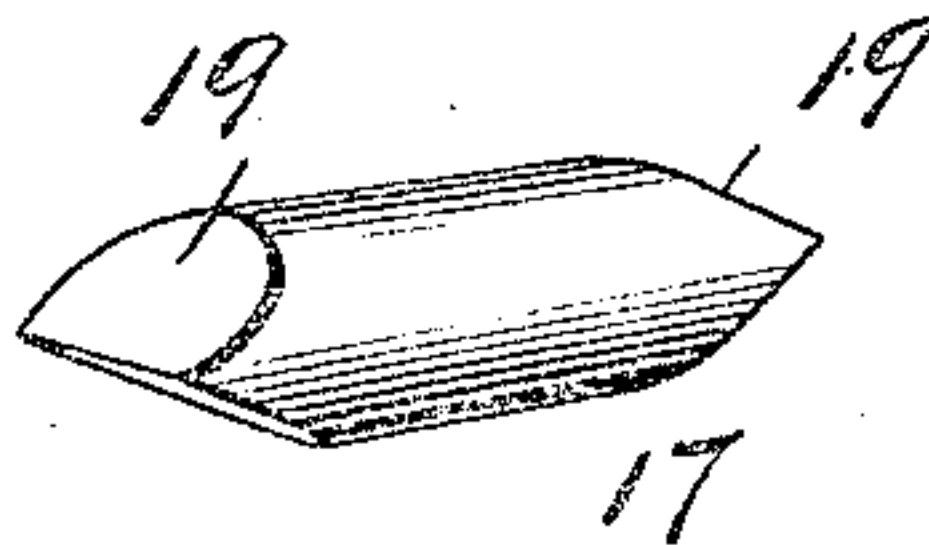


Fig. 8.

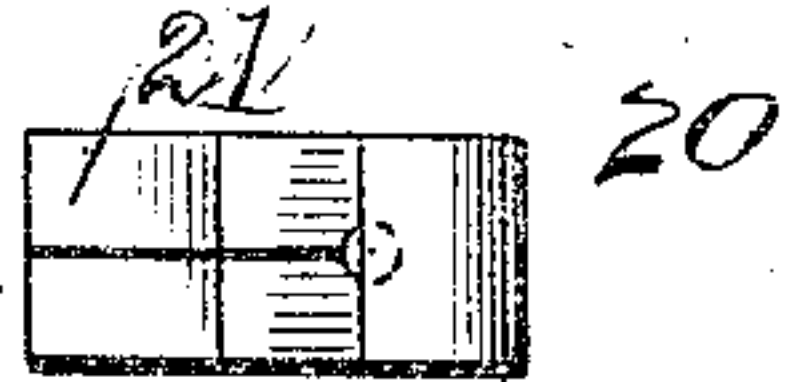


Fig. 9.

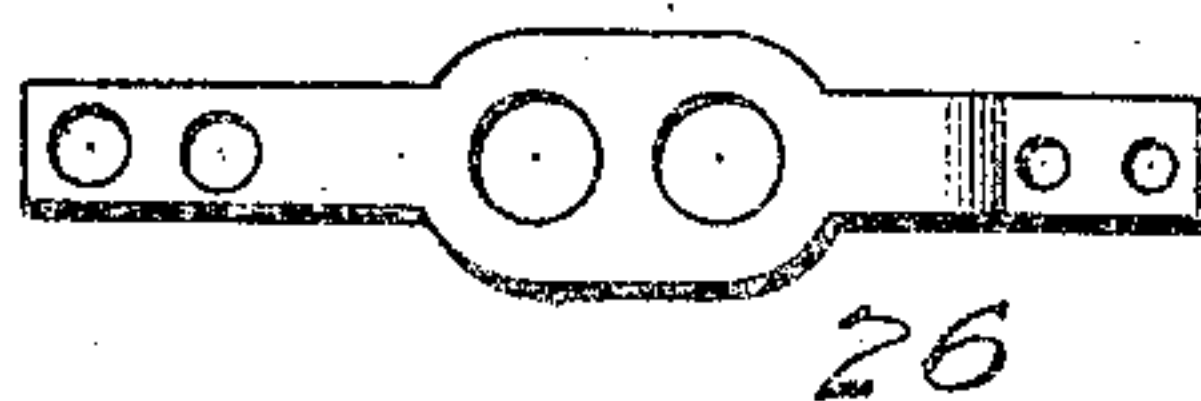
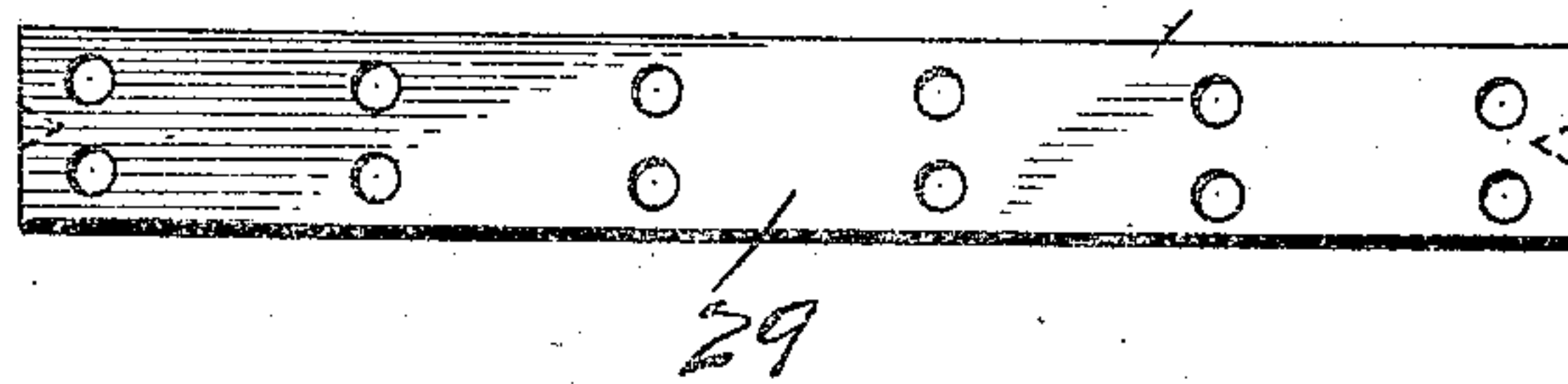


Fig. 10.



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UNITED STATES PATENT OFFICE.

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ELECTRICAL RELAY.

No. 829,905.

Specification of Letters Patent.

Patented Aug. 28, 1906.

Application filed July 8, 1905. Serial No. 268,864.

To all whom it may concern:

Be it known that I, HARRY M. ABERNETHY, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented new and useful Improvements in Electrical Relays, of which the following is a specification.

This invention relates to reversible-contact electrical relays; and one of the principal objects of the same is to provide an apparatus of this character in which the contact may be reversed in any of the lines from front to back without interfering with the other lines or circuits passing through the relay.

Another object is to provide a silver-plated reversible carbon contact-point and a split-spring platinum contact which will be reliable and efficient in use and which will always insure a proper operation under varying conditions.

Another object is to provide a multiple relay with means whereby any desirable number of lines may be provided with front or back contacts and which may either be supported upon a horizontal base or be suspended from a vertical wall or support without derangement of the working parts.

These and other objects are attained by means of the construction illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a multiple relay made in accordance with this invention and showing one of the contacts adjusted for completing a front circuit. Fig. 2 is a detail side view showing the contact-points adjusted for making a back contact. Fig. 3 is a vertical sectional view on the line 1-1, Fig. 1. Fig. 4 is a plan view of the relay as a whole. Fig. 5 is a plan view of the adjustable carbon-holder. Fig. 6 is an end view of the same. Fig. 7 is a perspective view of the double-pointed contact-carbon. Fig. 8 is a detail side view of the platinum contact-holder. Fig. 9 is a detail plan view of the armature-bar. Fig. 10 is a similar view of the armature-shaft.

Referring to the accompanying drawings for a more particular description of my invention, the numeral 1 designates the base or support for the working parts of the apparatus, said base being made of porcelain or other non-conducting or insulating material. This base consists of a horizontal tablet 2,

supported upon feet 3 at the corners and provided with a vertical bracket portion 4 at the back, said bracket portion having an aperture 5 therein, by means of which the apparatus may be supported from a vertical wall without derangement of the parts. Rising from the horizontal tablet 2 is an integral block or support 6 for the electromagnets 7, said block being provided with parallel longitudinal bores or apertures within which the magnets are supported. Depending from the rear upper end of the block 5 is a bracket 8, and the electromagnets are supported at their rear ends upon screws 9, passing through the bracket 8 and through an insulating-block 10. At the sides and at the rear of the base 1 are the curved braces 11, which connect the horizontal tablet 2 with the bracket portion 4. Secured on top of the block 6 is an insulating plate or block 12, made to conform in size and shape to the top of the support 6 and to which it is secured by a series of conductor-bolts 13. The carbon-holder 14 consists of a metal bar provided with a slot 15, through which the holder is secured in place on top of the block 12. At its front end the carbon-holder has a bearing-sleeve 16, in which the silver-plated carbon point 17 is secured by a set-screw 18. It will be understood that any desired number of the carbon-holders may be used on the apparatus, in the present instance six being shown, and since they are identical in construction a description of one will serve as a description for all. The carbon point consists of a round piece of carbon having its opposite ends beveled, as at 19, and the entire carbon is plated with silver to increase the durability of the carbon-points and at the same time insure smooth wearing-surfaces. The platinum contact-points each consist of a split spring 20, having an inclined portion to which the platinum plate 21 is secured. The opposite curved end of the spring 20 is connected by a set-screw 22 to a reversible contact-holder 23. This contact-holder is split at 24, and the spring 20 is held in the slit by the set-screw 22. A flat shank 25 on the lower end of the holder 23 is fitted in a slot at the upper end of the armature-bar 26 and held in place by two screws 27. At its lower end the armature-bar 29 is connected by screws 28 to an insulated shaft 29, and the ends of the shaft 29 are

pivoted to rock on pointed set-screws 30, mounted in a support 31, having end bearing-lugs 32. The set-screws 30 are provided with lock-nuts 33, by means of which the screws are held against rotation when adjusted. The armature-bar 26 is enlarged near its longitudinal center and provided with two screw-holes for the screws 34, the latter passing through the armature-bar, through an insulator-block 35, and through the armature 36.

The throw of the armature is adjusted and regulated by means of a spring 37, connected to the ends of which are short silk threads 38, one of said threads being attached to a bar 39, secured to the armature, and the other thread being connected to an adjusting-pin 40, mounted to turn in a post 41, rising from the base of the apparatus. An adjusting-screw 42, provided with a lock-nut 43, is mounted in the post 41, and the screw 42 is adjusted to limit the outward throw of the armature, while the tension of the spring 37 may be adjusted by the pin 40 to hold the armature away from the magnet and in contact with the end of the screw 42. Binding-posts 44 are passed through the base 2, and a glass cover 45 is bolted at the corners to inclose the operative parts of the apparatus. To change the contact-points from front to back in any of the circuits, the contact-holder 23 is detached from the armature-bar 26 and reversed in position, as shown in Fig. 2, and the carbon-holder 14 is adjusted outward, so that the rear end of the carbon point will be adjacent to the platinum contact.

From the foregoing it will be obvious that any number of contacts may be utilized and that each contact is capable of quick adjustment from back to front. The split-spring platinum-holder insures contact with the carbon point under varying conditions, and the contact is made by a sliding movement. The silver-plated carbon point has four contact-surfaces and may be inverted as well as adjusted from end to end. The carbon point may also be adjusted to the required distance from the platinum contact by means of the set screw 18.

Various changes in form and details of construction may be resorted to without departing from the spirit or scope of my invention.

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

1. In a multiple relay, a reversible carbon point, means for adjusting the same, a reversible platinum contact, and means for adjusting said platinum contact.

2. In a relay, a carbon point reversely beveled at each end thereof, means for re-

versing and inverting said carbon point, a reversible platinum point, and means for adjusting the platinum point with respect to the carbon point.

3. In a relay, a carbon point reversely beveled at each end, a platinum contact mounted on a spring, means for reversing the position of the platinum contact and means for adjusting the carbon point to either position of the platinum contact.

4. In a relay, a double-ended carbon point mounted in an adjustable holder, a platinum contact mounted on a split spring, a reversible holder for said spring, an armature-bar carrying an armature and connected to a pivoted shaft, and means for limiting the throw of the armature.

5. In a relay, a reversible carbon point, a reversible platinum contact, an armature, electromagnets, a spring connected by a filament to the armature, a filament at the opposite end of the spring, and an adjusting-pin for adjusting the tension of the spring, substantially as described.

6. A multiple relay comprising an insulated base or bracket, an integral block rising from the base, electromagnets extending through openings in said block, an integral arm depending from the rear end of said block for the screws to support the magnets, and an integral bracket at the rear end of said base provided with an aperture for suspending the base from a vertical support, substantially as described.

7. In a multiple relay, a base or support, a series of carbon-holders each provided with a sleeve or bearing, a double-ended carbon point mounted in each of the sleeves, a series of reversible platinum contacts, each mounted on a split spring, and means for adjusting the carbon-holders independently to a position to make a front or back contact, substantially as described.

8. In a multiple relay, a base or support, a series of adjustable double-ended contact-points, a series of reversible platinum points, and means for independently adjusting the carbon points and platinum contacts to front and back contacts, substantially as described.

9. In a multiple relay, a base or support, series of double-ended carbon points, a series of adjustable holders therefor, a series of platinum contacts each mounted upon a split spring, electromagnets, an armature, and an insulated spring for adjusting the throw of the armature.

HARRY M. ABERNETHY

In presence of—

M. MILLARD,

H. D. ABERNETHY.