

S. G. READ.
ELECTRIC SWITCH.
APPLICATION FILED JAN. 26, 1908.

914,878.

Patented Mar. 9, 1909.
2 SHEETS--SHEET 1.

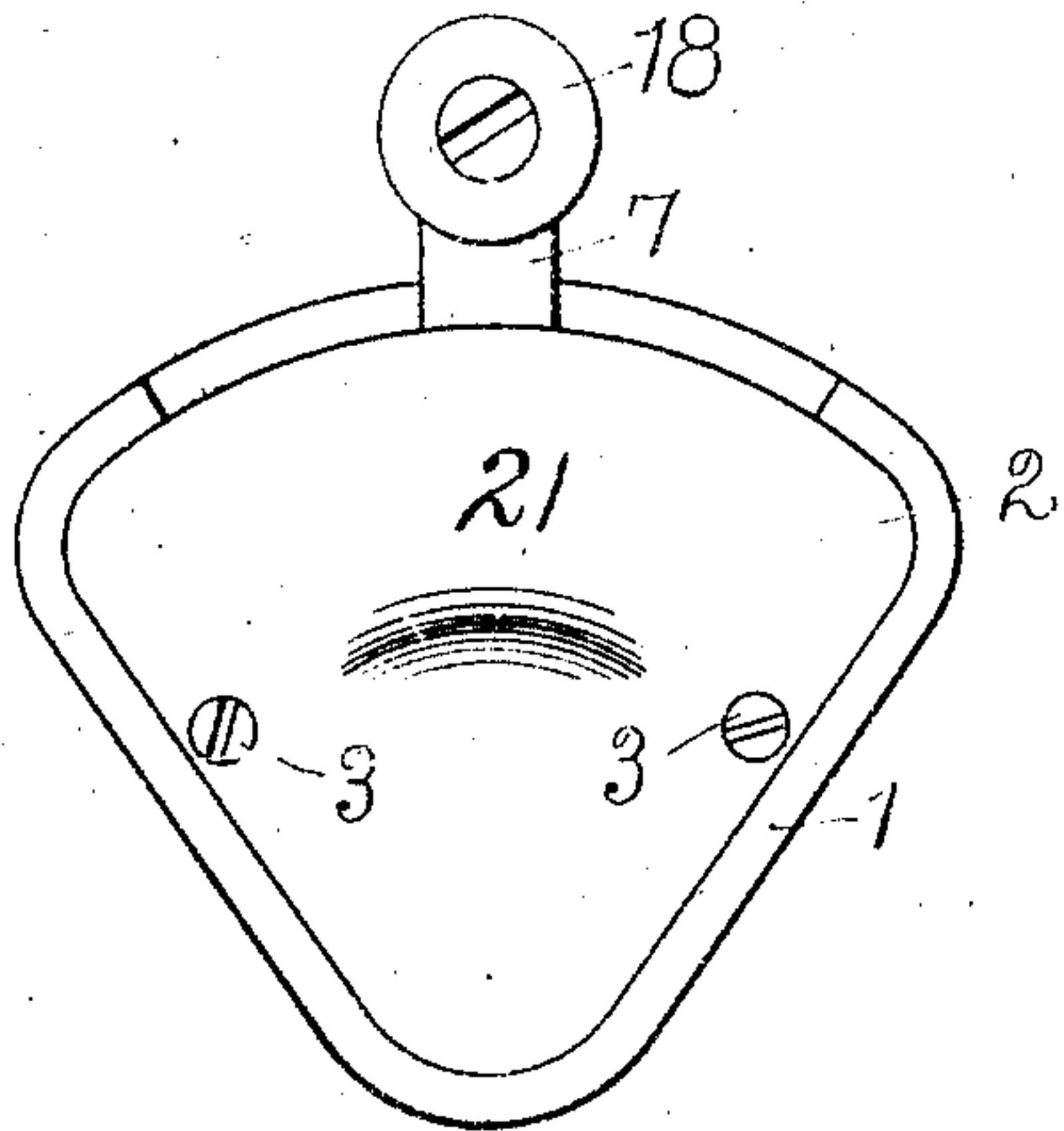


FIG. 1.

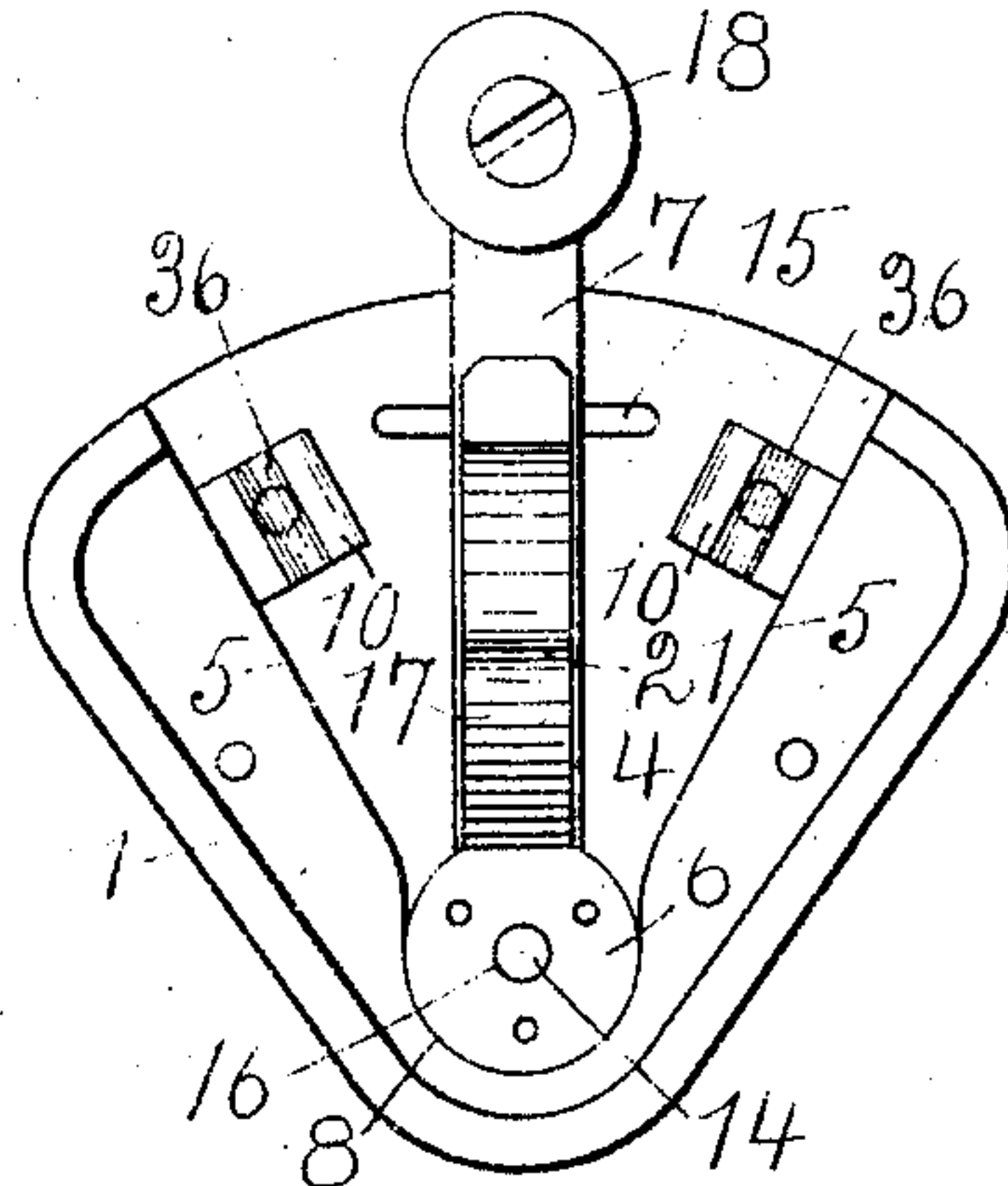


FIG. 2.

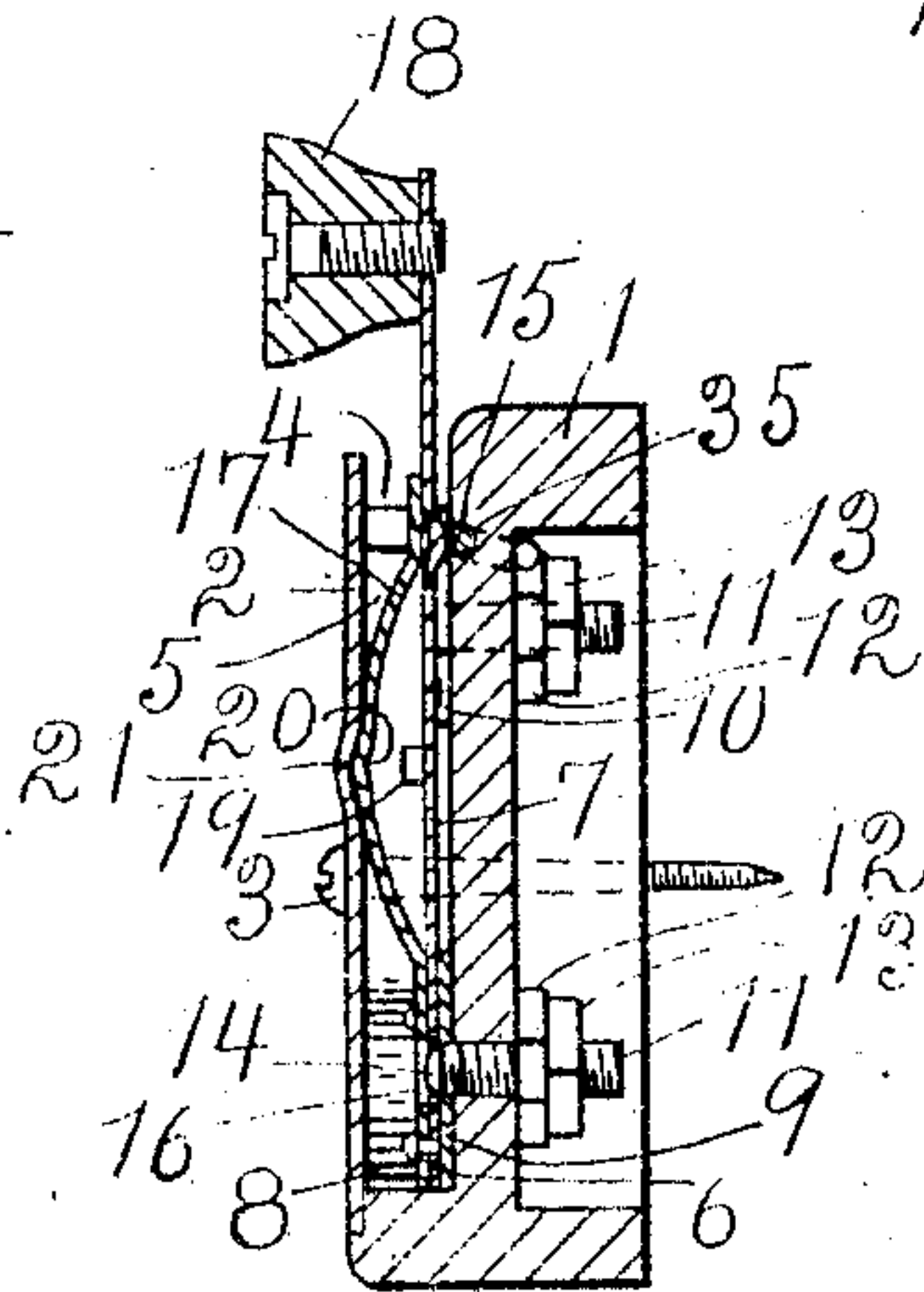


FIG. 3.

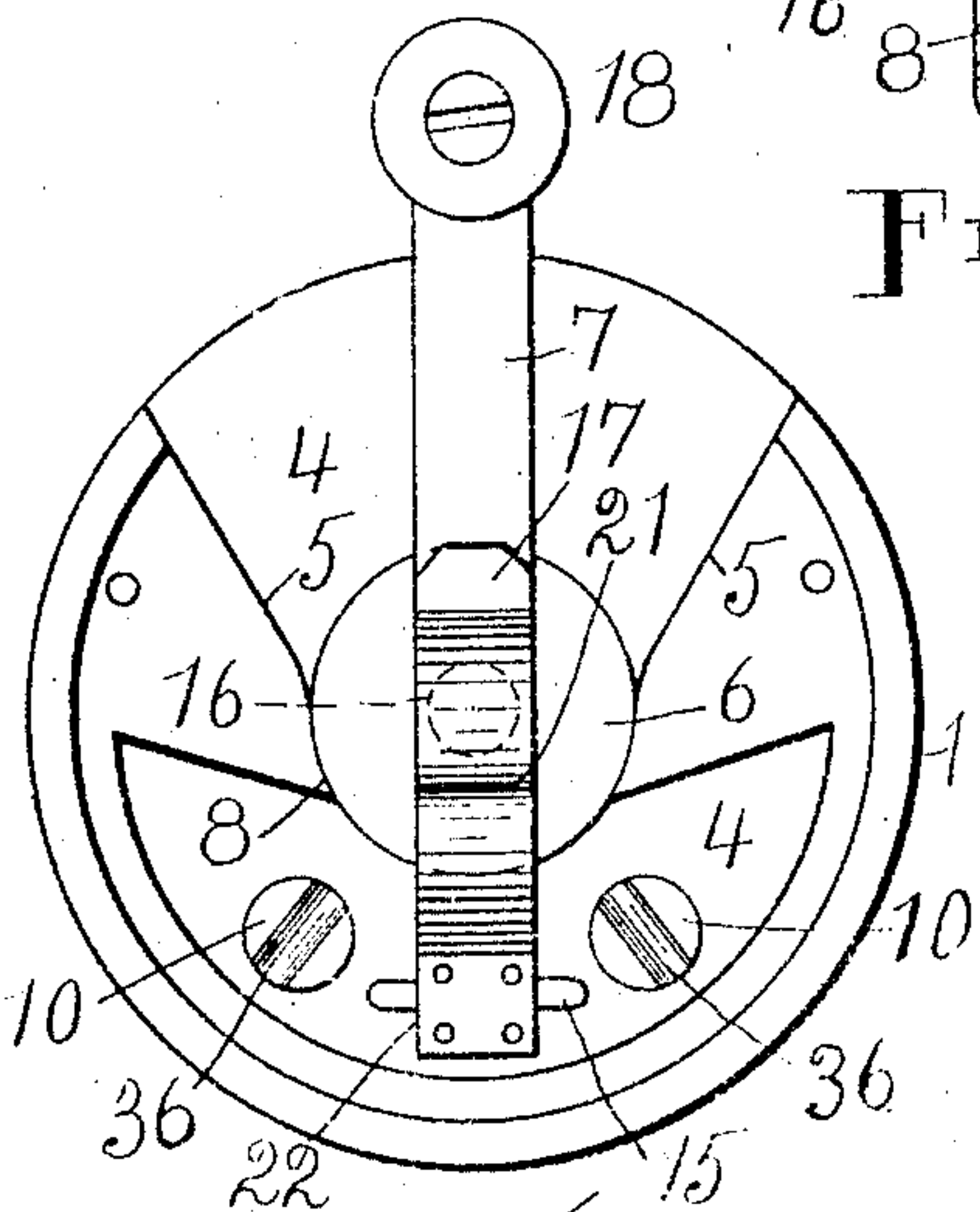


FIG. 4.

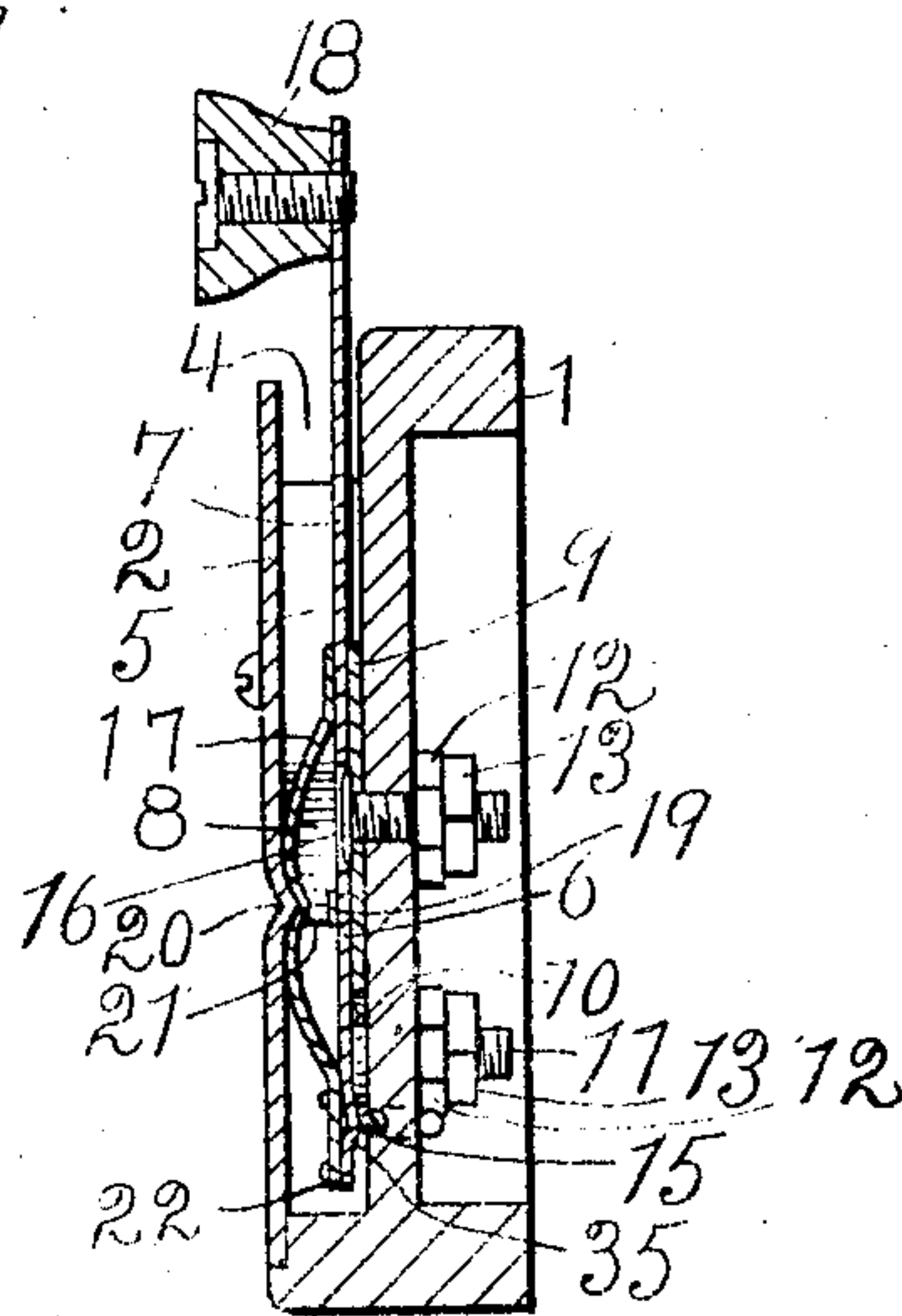


FIG. 5.

WITNESSES

A. C. Fairbanks.
J. M. Sterne

INVENTOR

Stacey G. Read,

BY

Webster & Co.
ATTORNEYS

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2 SHEETS—SHEET 2.

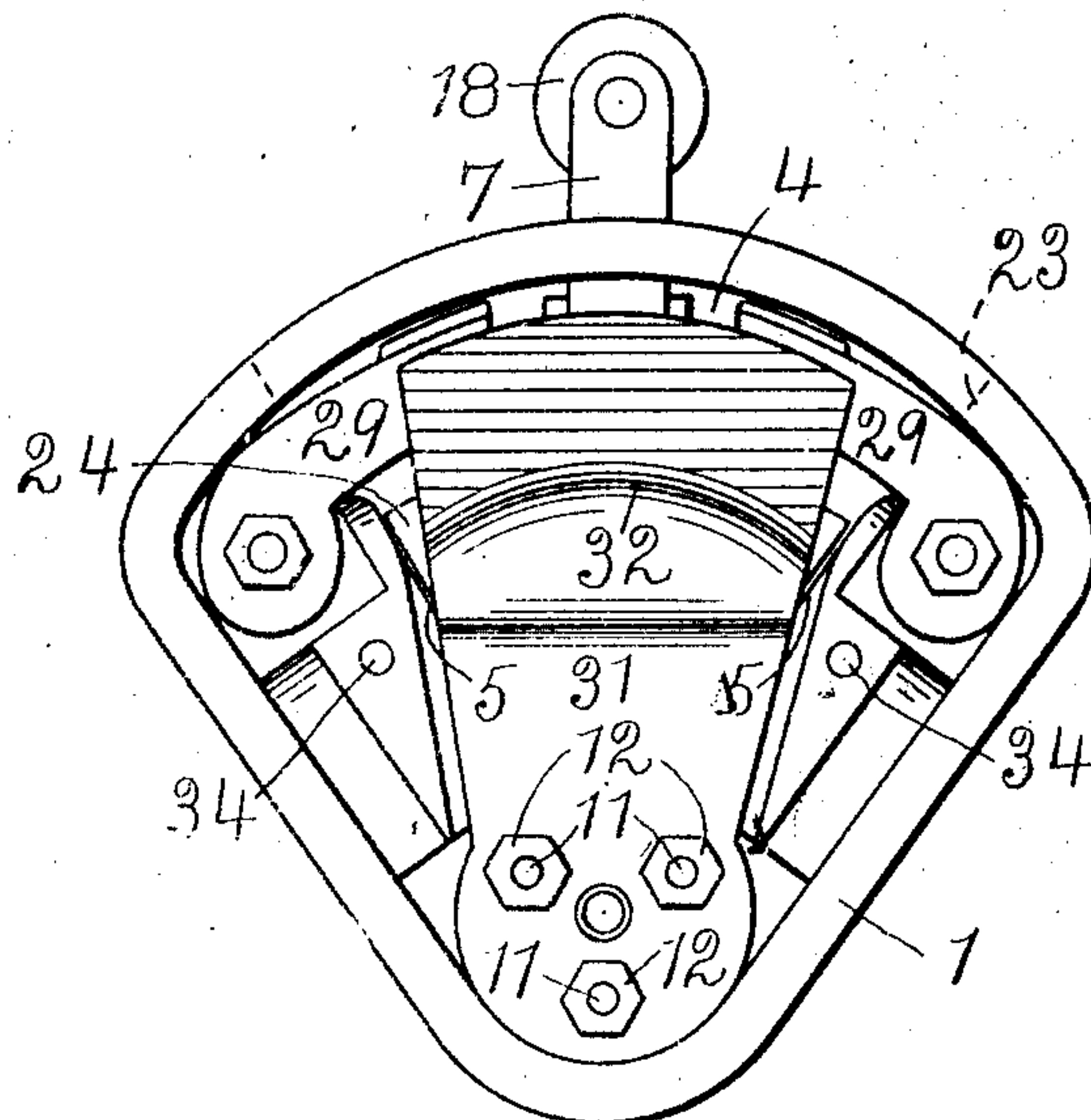


FIG. 6.

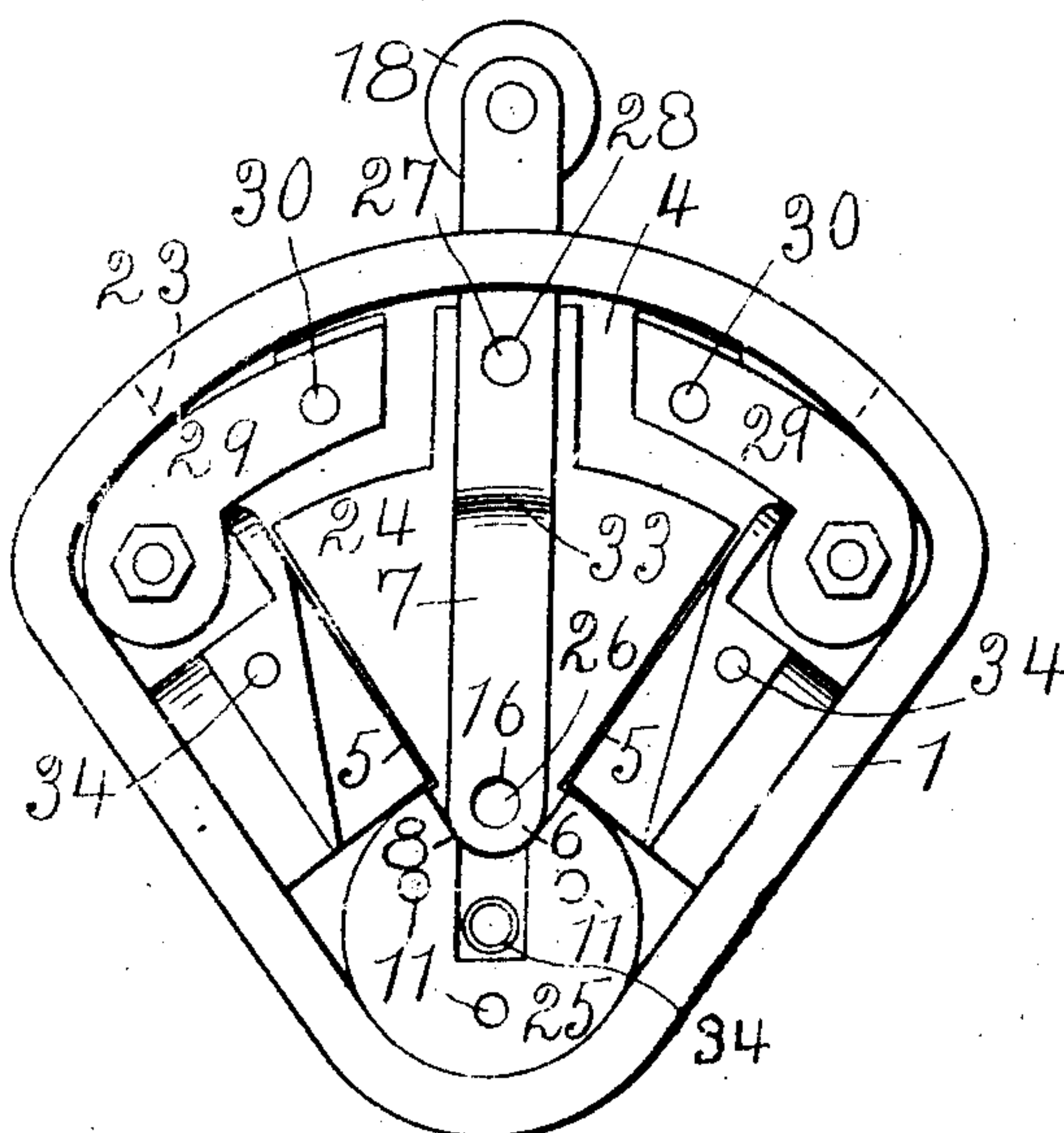


FIG. 7.

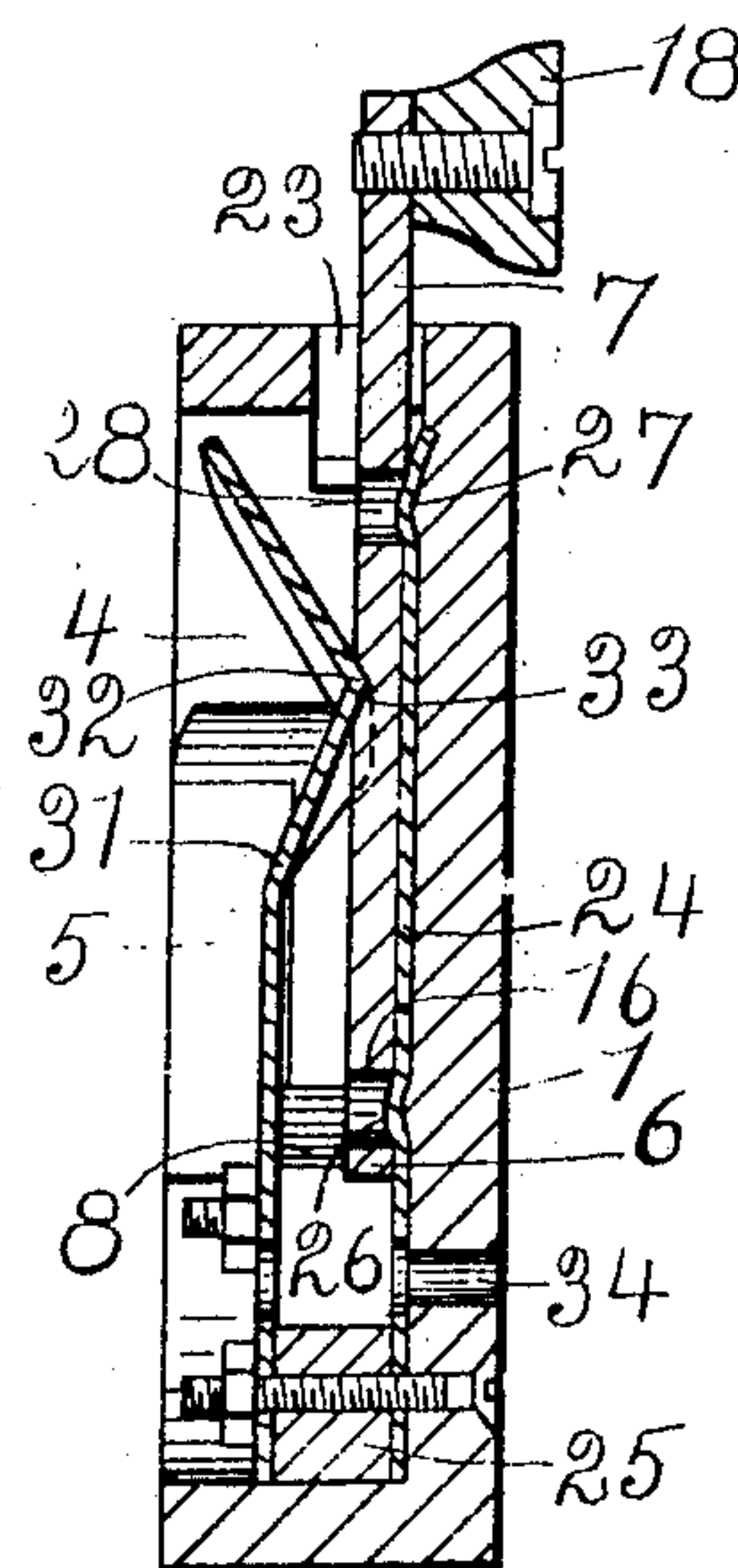


FIG. 1

WITNESSES

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G. C. Durbanks
J. M. Sterne

INVENTOR

Stacey G. Read,

64

Webster & Co.
ATTORNEYS

UNITED STATES PATENT OFFICE.

STACEY G. READ, OF SPRINGFIELD, MASSACHUSETTS.

ELECTRIC SWITCH.

No. 914,878.

Specification of Letters Patent.

Patented March 9, 1909.

Application filed January 20, 1908. Serial No. 411,620.

To all whom it may concern:

Be it known that I, STACEY G. READ, a citizen of the United States of America, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented a new and useful Electric Switch, of which the following is a specification.

My invention relates to improvements in electric switches and particularly to the arms of such switches and the fulcrums for such arms, and consists essentially of a block provided with convergent guides, a fulcrum-pocket and a pivot, and of a spring-pressed, removable arm adapted when inserted in said block or into the chamber therein to be directed to such fulcrum-pocket and pivot in and upon which it turns, regardless of the angle at which said arm may be introduced into such chamber, together with such auxiliary and subsidiary parts as are needed to make the device practical, all as hereinafter set forth.

The objects of my invention are, first, to produce an electric switch which is particularly well adapted for automobiles by reason of the fact that the switch-arm can be instantly removed and instantly replaced, so that the operator of a machine equipped with this switch when he leaves said machine is enabled to take the switch-arm with him and thus guard against unauthorized manipulation of the switch during his absence; second, to produce an electric switch, having a detachable or removable arm, in which the contact points are inclosed, concealed and protected so that they are kept free from dirt and dust to a considerable extent and can not easily be gotten at to tamper with, and the fulcrum for said arm and the major portion of the latter when in place are also inclosed and protected; third, to provide such a switch with a suitable fulcrum for the arm and with positive means for guiding said arm to said fulcrum; fourth, to provide such a switch with suitable resilient means for assisting to hold the head of such arm in place as well as for insuring good contacts at two points on the arm, and, fifth, to produce a switch of this kind that is comparatively simple and inexpensive, is convenient, and withal is practicable and efficient. I attain these objects by the means illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of one embodiment of my invention complete; Fig. 2, a similar view after the face-plate has been re-

moved; Fig. 3, a transverse vertical section through such device, looking toward the left; Fig. 4, a front elevation of a slightly modified form of said invention; Fig. 5, a transverse vertical section through the device shown in the preceding view, looking toward the left and including the face-plate which is omitted from said preceding view; Fig. 6, a rear elevation of a switch disclosing still another modification; Fig. 7, a similar view without the spring, and, Fig. 8, a transverse vertical section through the last modification, looking toward the left.

Similar figures refer to similar parts throughout the several views.

Referring first to Figs. 1, 2 and 3, it will be observed that I provide a block 1, of material which is a suitable non-conductor of electricity, on the front of which is a face-plate 2 fastened thereto by means of screws 3—3 which also serve to fasten the complete device in operative position. This block is substantially triangular in outline, and is open both front and back, the front opening or chamber 4 having inwardly convergent side walls which form guides 5—5 for the head 6 of a lever or arm 7, and unite at the bottom to form a semi-circular shoulder or pocket 8 for said head. The pocket 8 constitutes a fulcrum for the arm 7. The top of the chamber 4 is open. Within the aforesaid chamber are three contacts 9 and 10—10, the contact 9 being in the fulcrum-pocket 8 and the other contacts being in the upper part of the chamber adjacent to the guides 5. The contacts 9 and 10 are held in place by means of screws or binding-posts 11 and nuts 12, and nuts 13 are also present for the purpose of fastening wires to said binding-posts, all in the usual and well-known manner. The axis of the binding-post 11 for the contact 9 coincides with that of the fulcrum-pocket 8, and the front end 14 of said binding-post extends forward of said contact a little way to serve as a pivot for the arm 7, as presently will be made to appear more clearly, and such end is rounded to enable the head 6 of said arm to be forced over the same. Thus it will be seen that a two-part fulcrum is provided for the switch-arm. Between the two contacts 10 there is a metallic fender 15 indented in the center, such fender in the present instance consisting of a bent wire. The purpose of the fender 15 is to prevent the arm 7 from rubbing on and wearing away the block 1 between the contacts 10, and further to

afford an intermediate stop for said arm. The switch-arm head 6 is rounded to fit the fulcrum-pocket 8, and has an opening 16 therein to receive the pivot 14. A bow-spring 17 is fastened at one end to the head 6 and extends from said head over the major portion of the front side of the arm 7. At the end of the arm opposite the head 6 is a forwardly projecting knob or handle 18, and a pin 19 projects a little beyond the front side of said arm adjacent to the center of the bowed part of the spring 17 to prevent said spring from being flattened too much and so injured, as might happen in the absence of some expedient of this kind, since the spring comes into contact with said pin when compressed sufficiently and is thereby supported against further compression. The spring 17 is bowed enough to insure its compression by the face-plate 2 when the arm is in the block 1. Assuming that the arm 7 is in place in the block 1, with its head 6 in the fulcrum-pocket 8 and the pivot 14 in the opening 16, it will be readily seen that said arm must be held quite securely against upward displacement through the medium of said pivot and owing to the fact that the spring 17, compressed as it is between the arm and the face-plate 2, forces said arm hard against the contact 9 and either one of the contacts 10 or the fender 15; yet said arm can be turned upon its fulcrum to engage said contacts and said fender in the usual manner, without exerting a great amount of force. The engagement between the pivot 14 and the head 6 is of such a nature, however, that the arm 7 can be drawn upward out of the block at any time by applying a reasonable amount of force thereto in that direction; and said arm is returned to operative position in a similar manner, the guides 5 directing it unerringly to its fulcrum as soon as the head 6 enters the chamber 4. As an additional retaining means for the arm while in its operative position, a tongue-and-groove connection may be provided between the face-plate 2 and the spring 17, it not being particularly important which member is tongued and which grooved. In the construction above described the tongue, 20, is in the spring and the groove, 21, in the face-plate, while in the construction shown in Figs. 4 and 5 this order is reversed. It is obvious that whichever of these elements is in or on the face-plate, such element must be in the form of an arc struck from the center of the pivot 14 so as to permit the switch-arm to be swung about or upon said pivot. This tongue-and-groove connection augments the pivot 14 in keeping the switch-arm in place, without interposing so much resistance as to prevent said arm from being withdrawn from and introduced into the block when a reasonable amount of force is exerted.

Passing now to Figs. 4 and 5 the same ele-

ments are found as before although somewhat differently arranged as will next be explained. A round block, 1, is here provided, the contact 9 and pivot 14 are in the center of said block while the contacts 10 and the fender 15 are in the lower part of the chamber 4, and the fulcrum-pocket 8 is open at the base for the passage and swing of an extension 22 from the head 6 of the arm 7, it being this extension which is designed to pass over and engage with said contacts 10 and fender 15. The operation of this switch does not differ materially from that of the switch first described. Finally, in the last three views, I disclose a triangular block, 1, again in the back of which is a chamber, 4, for the switch-arm 7, the top of said block being slotted at 23 to accommodate said arm. A plate 24 is fastened against the back of the chamber 4 by means of screws 11 and nuts 12, which also hold in place a mutilated disk 25 of some thickness which forms the fulcrum-pocket 8 for the rounded head 6 of the arm 7. The plate 24 serves both as a contact and a fender for the switch-arm, and a raised portion or protuberance 26 on said plate in the center of the fulcrum-pocket is provided to enter the opening 16 in said arm and take the place of the pivot 14 in the other cases. Near the upper end of the plate 24 is a second protuberance 27 which serves as an intermediate station or stop for the switch-arm, the latter having an opening 28 therein to receive such protuberance. Instead of the contacts 10 two plates 29, each having a protuberance 30 adapted to enter the opening 28 in the switch-arm, are provided, the same being attached to the block by means of additional screws and nuts. The spring, 31, in this form of construction is not attached to the switch-arm, but instead has its lower end held firmly in position by the screws and nuts which fasten the plate 24 and the mutilated disk 25 to the block. The spring 31 is arranged to bear forcibly on the front side of the switch-arm when the latter is in place, as shown, to keep such arm in position in the fulcrum-pocket on its pivotal protuberance 26 and to insure good contacts with the plates 24 and 29. To further the first of these ends the spring 31 and the switch-arm may be tongued and grooved as at 32 and 33, respectively, the tongue 32 being preferably curved to conform to the arc described by the grooved portion of said arm when swung between the confines of the guides 5. Any one of the three lower screws 11 is used as a binding-post when the switch is wired. Openings 34 are provided in the block for the passage of the screws (not shown) with which the device is fastened to its support; suitable openings, necessarily larger than the others, so as to avoid short-circuiting, are also made in the plate 24, the mutilated disk 25 and the head of the spring 130.

31, in front of the lower opening 34, for the free passage of the corresponding screw. The operation of this switch does not differ essentially from that of either of those previously described.

In the first two constructions each switch-arm has a contact protuberance 35 and each contact 10 has an indentation 36 to receive said protuberance, which arrangement is the reverse of that in the last construction, but this is an unimportant matter since any suitable means for making good electrical contacts may be employed and any suitable contact members as well. The number of contacts 10 or 29 need not be limited necessarily to two for any given switch. The tongue-and-groove connection may or may not be used in any or all of the switches as may be found most expedient.

Although especially well adapted for automobiles this invention is in no sense restricted to such use. Furthermore, it is to be clearly understood that I do not intend to be restricted or limited to the identical construction of any one of those herein shown and described, but seek to include whatever modifications in shape, size, and construction may be said fairly to fall within the scope of the appended claims.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, in an electric switch, of a block provided with a fulcrum-pocket, a removable oscillatory switch-arm adapted when in position to utilize the walls of said pocket as an external fulcrum, and convergent means to direct the fulcrum part of said arm into such pocket.

2. The combination, in an electric switch, of a block provided with a two-part fulcrum, a removable switch-arm connectible with said fulcrum, and convergent means to direct said arm to such connection.

3. The combination, in an electric switch,

of a block provided with a two-part fulcrum, a removable spring-pressed switch-arm connectible with said fulcrum, and convergent means to direct said arm to such connection.

4. The combination, in an electric switch, with a block provided with a fulcrum-pocket and with convergent guides to such pocket, of a removable switch-arm having a head adapted to be received in said pocket and to partially rotate therein, the walls of the pocket serving as a fulcrum for said arm.

5. The combination, in an electric switch, with a block provided with a fulcrum-pocket having a central pivot therein, of a removable switch-arm having a head adapted to be mounted on said pivot and to bear against the walls of said pocket, and convergent means to guide said arm to such pivot.

6. The combination, in an electric switch, with a chambered block provided with an internal fulcrum-pocket and with internal convergent guides to such pocket, and a plate on such block, of a removable switch-arm having a head adapted to be received in said pocket and to partially rotate therein, the walls of the pocket serving as a fulcrum for said arm, and a spring between said plate and arm.

7. The combination, in an electric switch, with a chambered block provided with an internal fulcrum-pocket and with internal convergent guides to such pocket, and a plate on such block, of a removable switch-arm having a head adapted to be received in said pocket and to partially rotate therein, the walls of the pocket serving as a fulcrum for the arm, a spring between said plate and arm, and a tongue-and-groove connection between said spring and plate.

STACEY G. READ.

Witnesses:

A. C. FAIRBANKS,
F. A. CUTTER.