

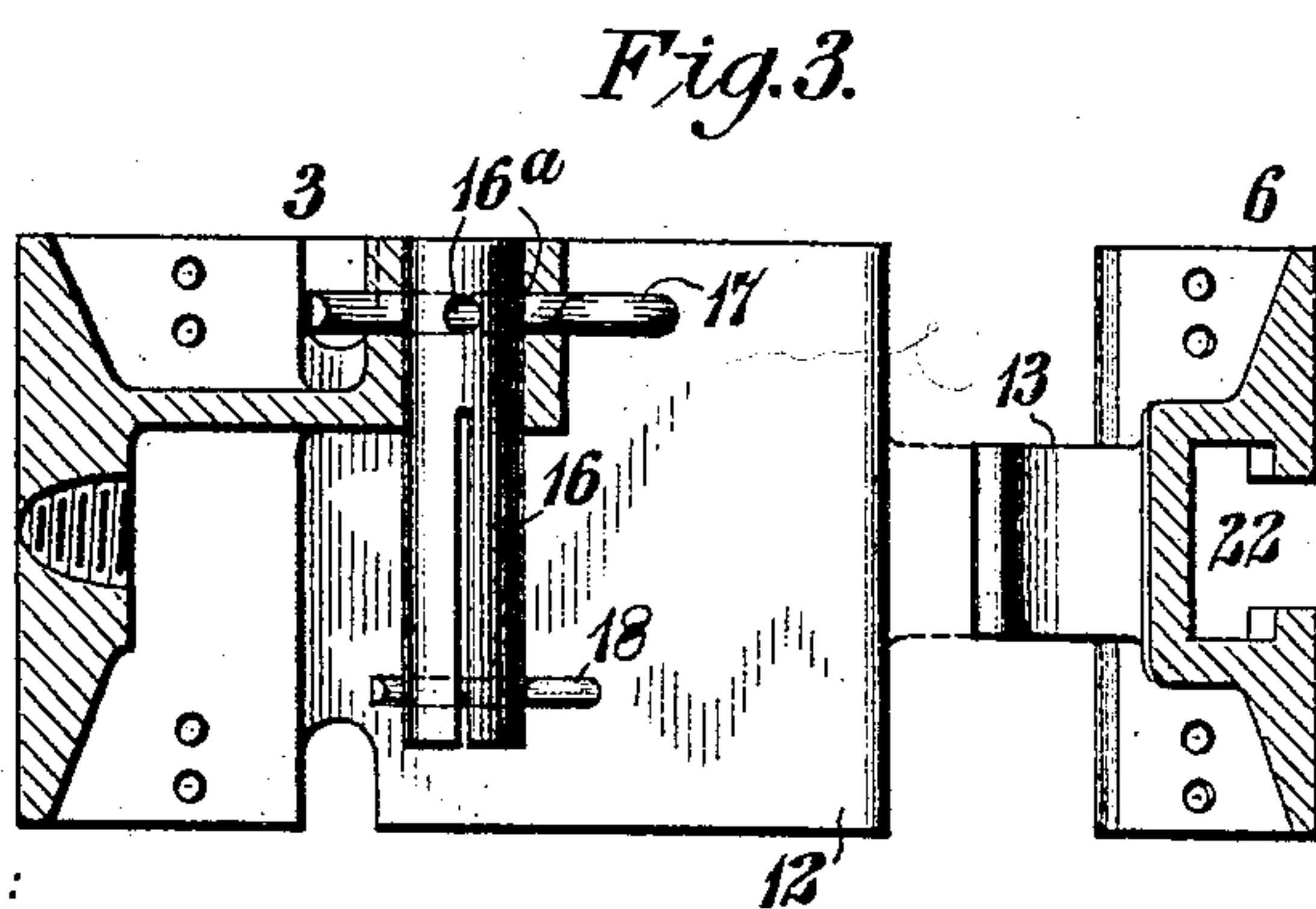
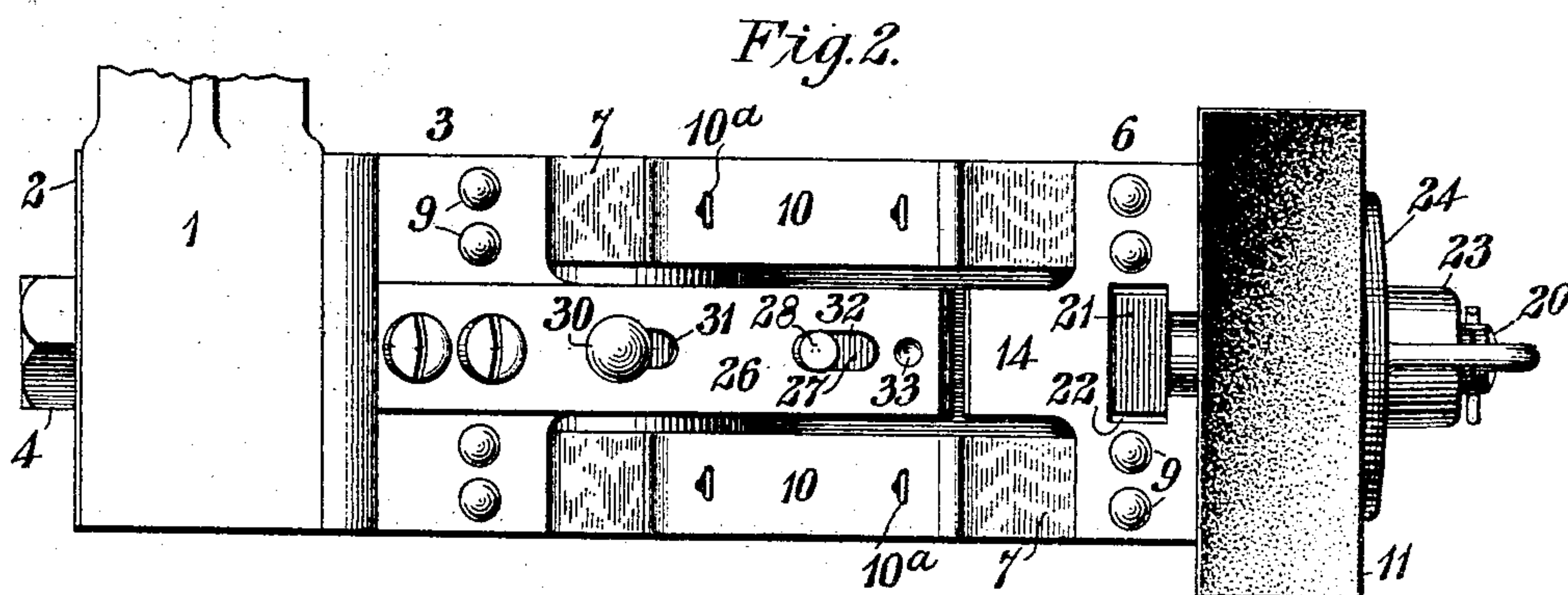
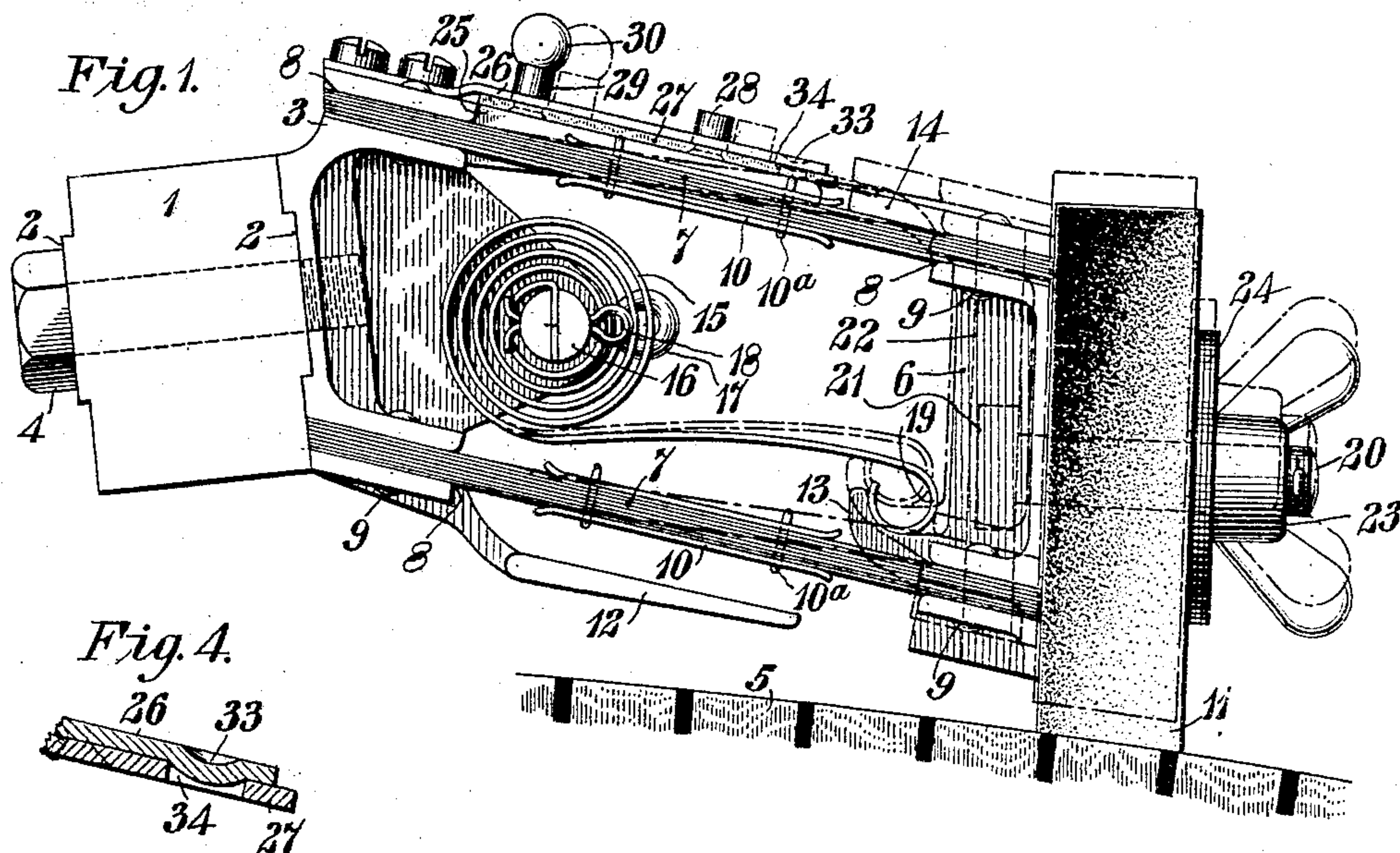
No. 765,207.

PATENTED JULY 19, 1904.

R. SIEGFRIED.  
BRUSH HOLDER FOR ELECTRICAL MACHINES.

APPLICATION FILED NOV. 21, 1903.

NO MODEL.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## BRUSH-HOLDER FOR ELECTRICAL MACHINES.

SPECIFICATION forming part of Letters Patent No. 765,207, dated July 19, 1904.

Application filed November 21, 1903. Serial No. 182,197. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT SIEGFRIED, a citizen of the United States, and a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Brush-Holders for Electrical Machines, of which the following is a specification.

My invention relates to brush-holders for electrical machines; and it has for its object to provide a holder of the parallel-motion type which shall be simple and inexpensive in construction and durable and easily manipulated in service.

In the use of holders for carbon brushes difficulty is often experienced by reason of the particles of carbon and dirt which become lodged between the brushes and the guiding-surfaces of the holder. In the case of holders which are moved and supported upon cylindrical arms or studs the same difficulty is experienced in connection with the bearing-faces of the relatively moving parts.

My present invention is so designed as to avoid these objectionable features, and it is also so simple and compact in construction that the expense of manufacture is reduced to a minimum for this type of holder, and at the same time the holder is readily assembled and the several parts are substantially free from liability to injury or disarrangement in service.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the brush-holder and the rocker-arm from which it is supported. Fig. 2 is a plan view of the brush-holder. Fig. 3 is a sectional view through the two brackets of the holder, most of the other parts being omitted. Fig. 4 is a detail sectional view of a portion of the holder.

The rocker-arm 1 is provided with a longitudinal projection 2 on each of its lateral sides, the one or the other of which fits into a corresponding recess in the brush-holder bracket 3. The bracket 3 is secured to the rocker-arm by means of tap-bolts 4, which may be readily removed and replaced when it is de-

sired to reverse the holder, such reversal being effected by transferring the bracket from one side to the other of the rocker-arm, according to the direction of rotation of the commutator-cylinder 5.

A second bracket 6 is mechanically and electrically connected to the bracket 3 by means of a plurality of flexible bars 7, each comprising a plurality of strips of hard-rolled sheet-copper or other suitable conducting material. The respective ends of the bars 7 are secured in suitable slots 8 in the brackets 3 and 6 by means of rivets 9, and the sheets of the individual bars are firmly held together between stiffening or reinforcing strips 10 by means of a plurality of rivets or other suitable fasteners 10<sup>a</sup>. The bars 7 are primarily employed for obtaining a substantially right-line motion of the carbon brush 11, which is attached to the bracket 6 in a manner to be hereinafter more fully described; but the bars also serve as electrical connectors, since they are composed of good conducting material.

A shield 12 projects from the bracket 3 toward the brush 11 to protect as far as possible the lower bars 7 from the destructive effects of arcs which might occur between the brush-holder and the commutator.

The bracket 6 is provided near its lower end with a laterally-projecting and upwardly-curving arm 13 and near its upper end with a laterally-projecting straight arm 14, both being substantially centrally located with reference to the side edges of the bracket.

Proper pressure of the brush 11 upon the commutator-cylinder 5 is maintained by means of a spiral spring 15, one end of which at the center of the spiral portion is rigidly located in a slot formed in a rod 16, that is supported by and projects laterally from the bracket 3. The rod 16 is provided with two holes 16<sup>a</sup> at right angles to each other and is fastened non-rotatively in its seat or socket in the bracket 3 by means of a cotter-pin 17, which is removably inserted into the one or the other of said holes 16<sup>a</sup>. The outer end of the rod 16 is provided with a cotter-pin 18, which serves to retain the spring in position and may also



be utilized for giving the rod a partial turn in order to adjust the tension of the spring when the pin 17 is removed. The free end of the spring 15 is bent into an approximately annular head 19, which rests upon and conforms to the shape of the upper surface of the arm 13, projecting from the bracket 6. Ordinarily the spring 15 will have a sufficient number of turns, so that a ninety-degree rotational movement of the rod 16 will cause only a small change in the pressure exerted by the end 19 of the spring. It follows, therefore, that a finely-graduated adjustment of the pressure exerted by the spring through a wide range may be effected by the means shown and described.

The brush 11 is held in position against the outer face of the bracket 6 by means of a bolt 20, which projects through a corresponding hole in the brush and is provided with a squared head 21, which fits in an undercut slot 22 in the face of the bracket 6. The outer end of the bolt 20 is provided with a thumb-nut 23, between which and the adjacent face of the brush are located a plurality of spring-metal washers 24. In order to fasten the brush in position out of contact with the commutator-cylinder, I provide the bracket 3 with two forwardly-projecting plates 25 and 26, between which is a space occupied by a sliding latch-plate 27. This plate 27 has riveted to it a short guide-pin 28 and a pin 29, having a knob 30, by means of which it may be moved longitudinally, the pins 28 and 29 being guided and limited in movement by means of slots 31 and 32 in the plate 26, through which the pins project. The sliding plate 27 may be prevented from moving accidentally while the brush is in operation by means of a projection 33 on the bottom face of the plate 26, which fits into a corresponding depression or hole 34 in the plate 27 or by means of any other suitable locking device.

When the brush-holder and its brush are in the operative position, the sliding plate 27 and the other parts will be in the positions indicated in Fig. 2 and in the full-line positions indicated in Fig. 1. When it is desired, however, to hold the brush out of engagement with the commutator-cylinder, the brush may be raised, by means of the thumb-nut 23 or any portion of the bracket 6 which may be readily grasped, until the arm 14 is above the line of the sliding plate 27, when the latter may be moved forward, by means of the knob 30, into the broken-line position indicated in Fig. 1, with its forward end beneath the free end of the arm 14. Since the sliding plate 27 is held by the plates 25 and 26 against movement toward the commutator-cylinder, the brush will be locked in its deflected position until it is desired to again move it into engagement with the cylinder, when the sliding latch-plate will be moved rearwardly from beneath the arm 14.

Any variations in the form and dimensions of parts which do not modify the functional characteristics of said parts or of the apparatus as a whole are within the scope of my invention and are intended to be covered by the claims.

I claim as my invention—

1. In a brush-holder, the combination with a set of flexible, resilient bars and brackets fastened to the ends thereof one of which is provided with two laterally-projecting arms, of a spiral spring one end of which is fastened to the other bracket and the other end of which engages one of said arms.

2. In a brush-holder, the combination with a set of flexible, resilient bars and brackets fastened to the ends thereof one of which is provided with two laterally-projecting arms, of a spiral spring one end of which is fastened to the other bracket and the other end of which engages one of said arms and means for locking the brush in inoperative position.

3. In a brush-holder, the combination with two pairs of flexible, resilient bars, of brackets fastened to the ends of said bars, one of which has a straight, laterally-projecting arm and a curved laterally-projecting arm, and a spiral spring the free end of which engages said curved arm and the other end of which is fastened to the other bracket.

4. The combination with a rocker-arm, of a brush-holder comprising a bracket fastened to said rocker-arm, two pairs of flexible bars projecting laterally from said bracket, a bracket provided with a brush-socket and fastened to the free ends of said bars, a spiral spring interposed between the two brackets and a sliding latch for locking the brush in out-of-contact position.

5. The combination with a rocker-arm, of a brush-holder comprising a bracket fastened to said rocker-arm and having a sliding latch, a set of flexible bars projecting laterally from said bracket, a bracket having a brush-socket and lateral arms and fastened to the free ends of said flexible bars, a spiral spring one end of which is fastened to the rocker-arm bracket and the other end of which detachably engages one of the arms of the other bracket, the other arm of said bracket being engaged by the sliding latch to hold the brush in its out-of-contact position.

6. In a brush-holder, the combination with two brackets one of which has a brush-socket and laterally-projecting arms, of a spiral spring fastened to the other bracket and having a free end resting upon one of said arms, flexible bars connecting the two brackets and a sliding latch adapted to be moved beneath the other bracket-arm to hold the brush in its out-of-contact position.

7. In a brush-holder, the combination with two brackets one of which has a brush-socket and laterally-projecting arms, of a spiral spring fastened to the other bracket and hav-



ing a free end resting upon one of said arms, flexible bars having reinforcing-pieces on both sides and connecting the two brackets, and a sliding latch adapted to be moved beneath the other bracket-arm to hold the brush in its out-of-contact position.

8. In a brush-holder, the combination with two brackets one of which has a brush-socket and laterally-projecting arms, of a spiral spring having a free end which engages one of said bracket-arms, means for adjustably connecting the end of the coiled portion of said spring to the other bracket, flexible bars having reinforcing-pieces and connecting the two brackets and a sliding latch adapted for movement beneath one of the bracket-arms to hold the brush in its out-of-contact position.

9. The combination with a rocker-arm, of a brush-holder comprising a bracket fastened to said rocker-arm, two pairs of flexible bars projecting laterally from said bracket, a bracket provided with a brush-socket and fastened to the free ends of said bars, a spiral

spring interposed between the two brackets, a sliding latch for locking the brush in out-of-contact position and means for preventing accidental movement of the said sliding latch.

10. The combination with a rocker-arm, of a brush-holder comprising a bracket fastened to said rocker-arm, two pairs of flexible bars projecting laterally from said bracket, a bracket provided with a brush-socket and fastened to the free ends of said bars, a spiral spring interposed between the two brackets, a sliding latch-plate for locking the brush in out-of-contact position and a guide-plate for said latch-plate, one of said plates having a projection and the other a corresponding recess for locking the latch-plate against accidental movement.

In testimony whereof I have hereunto subscribed my name this 17th day of November, 1903.

ROBERT SIEGFRIED.

Witnesses:

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