

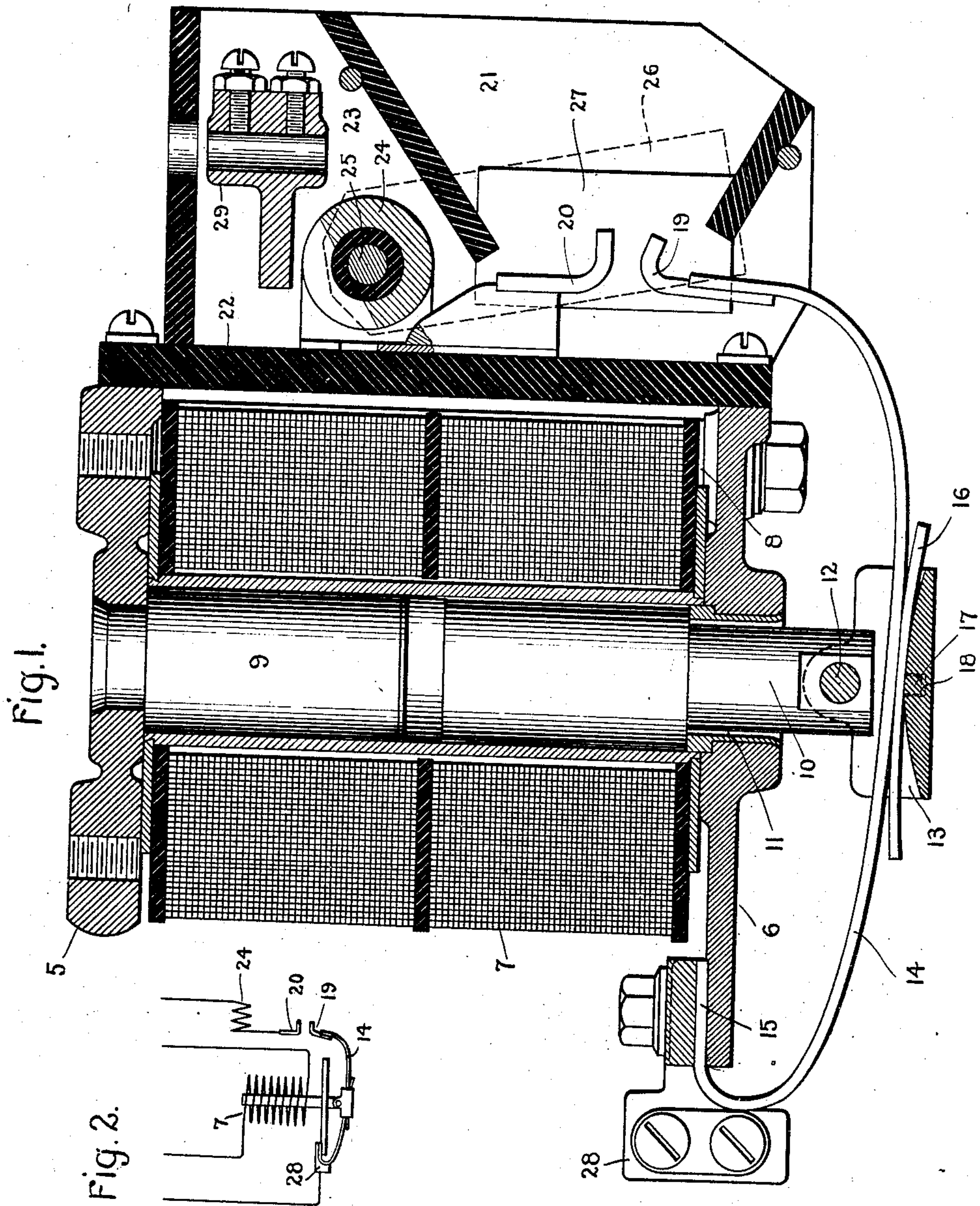
No. 894,643.

PATENTED JULY 28, 1908.

G. H. HILL.
CONTACTOR.

APPLICATION FILED DEC. 31, 1903.

2 SHEETS—SHEET 1.



Witnesses:

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Benjamin B. Hill

Inventor,
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2 SHEETS—SHEET 2.

Fig. 4.

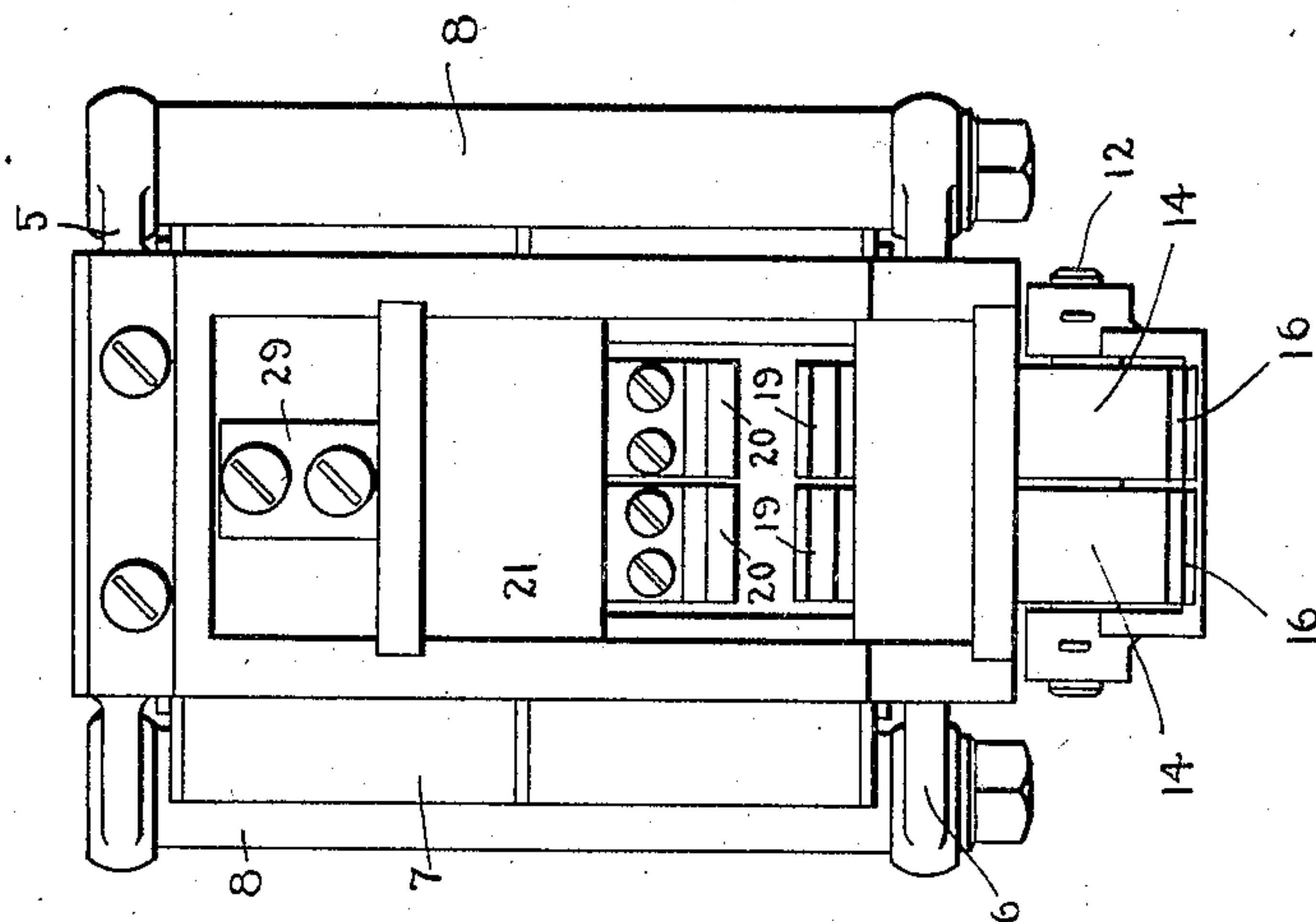
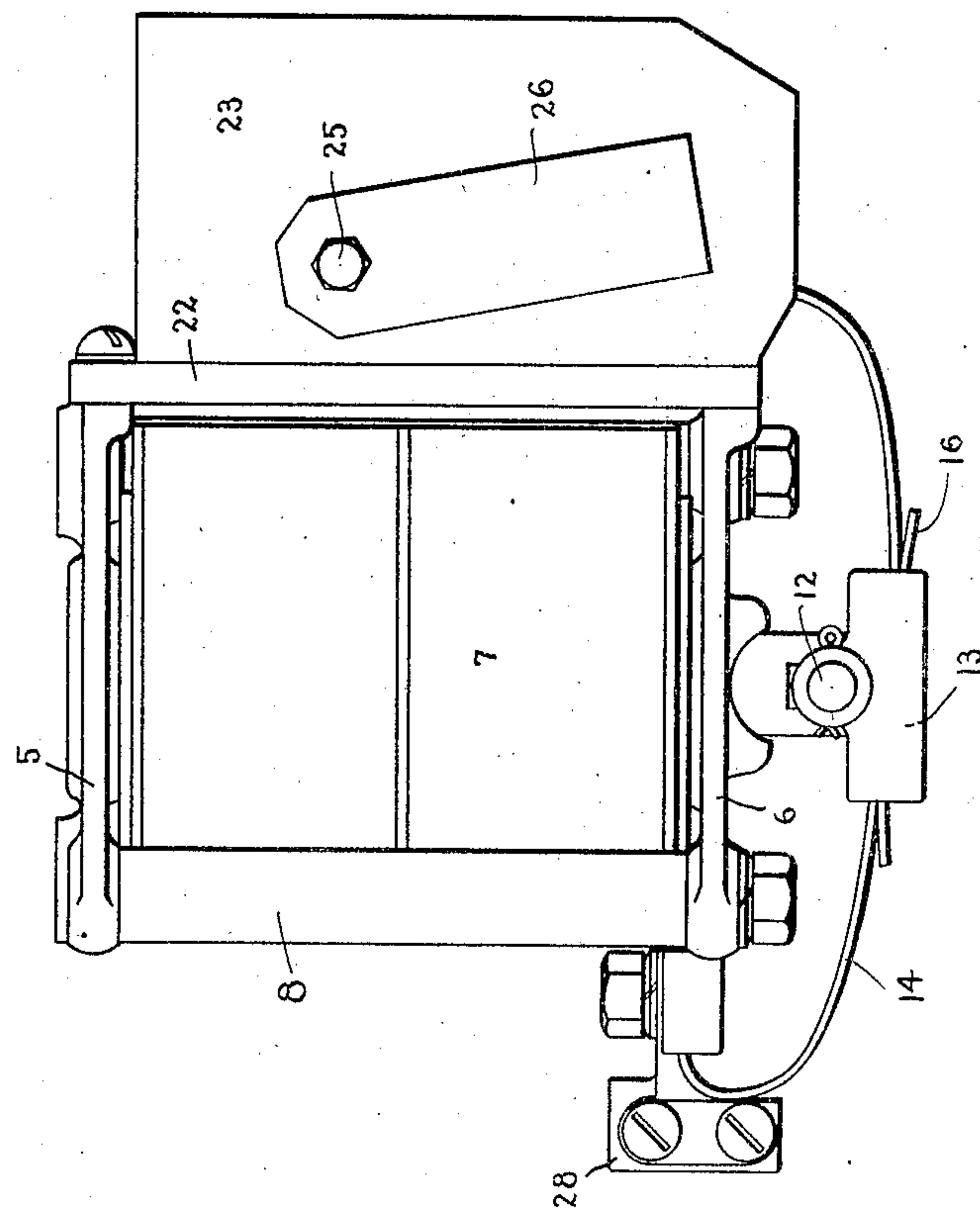


Fig. 3.



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UNITED STATES PATENT OFFICE.

GEORGE H. HILL, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK

CONTACTOR.

No. 894,643.

Specification of Letters Patent.

Patented July 28, 1908.

Application filed December 31, 1903. Serial No. 187,287.

To all whom it may concern:

Be it known that I, GEORGE H. HILL, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Contactors, of which the following is a specification.

My present invention relates to the construction and arrangement of power-actuated switches or contactors.

The invention relates more particularly to that type of contactor employed in systems of motor-control in which a motor-controller of the separately-actuated contact type under the control of the master-controller is employed.

In electromagnetically-actuated switches especially adapted for the purpose above stated and which are controlled from a distance, the operating parts have heretofore been made of quite heavy material, and the movable contact-fingers of the switches have been pivotally connected to the frame on which the actuating means for said fingers is mounted.

The object of my invention is to produce a more simple construction of the contactor or switch, and to this end I substitute for the heavy pivoted castings forming the movable contact-finger a spring arm or strip of spring-conducting material rigidly fastened to the supporting frame and constructed in such a manner as to allow a sliding engagement of the contacts of the switch.

Some of the advantages of my improved construction of contact-finger over the standard construction lies in the omission of hinged connections and heavy castings with a consequent reduction of wear, and also in the omission of the shunt in the electrical circuit around said hinged connections. The reduction of the weight of the contact-finger causes an increase in the rapidity of movement of the contactor and by the use of a spring contact-finger so mounted that it will exert some pressure even when the switch is in its open position a quicker opening and more positive action is obtained.

My invention will be more clearly understood by reference to the accompanying drawings which illustrate the preferred embodiment of my invention and in which

Figure 1 is a vertical sectional view of my improved contactor; Fig. 2 illustrates diagrammatically the electrical connections of

said contactor; and Figs. 3 and 4 are side and front elevations respectively of the contactor.

Referring now to Fig. 1, the top and bottom plates of the frame upon which the actuating coil is mounted are represented by 5 and 6 respectively. The said plates are held together by means of bolts 8 (shown more clearly in Figs. 3 and 4). The fixed core of the actuating coil 7 is indicated by 9. The movable core 10 passes through an opening 11 in the bottom plate 6 and has pivotally mounted at 12 on its lower end a stirrup 13. The movable contact-finger or fingers 14 are rigidly fastened at one end 15 to the bottom plate 6 and pass through and are supported by the stirrup 13. In the contactor illustrated, two movable contact-fingers operated by the same coil are shown, (see especially Fig. 4), but it will of course be understood that one or any number of contact-fingers may be employed and other means aside from the specific means shown may be used for operatively connecting the spring finger or fingers to the core 10 or other actuating means. Mounted within the stirrup 13 are two bow-shaped pieces of material 16 each of which carries a lug 17 which engages a recess 18 formed in the lower part of the stirrup 13. The bow-shaped pieces 16 form bearing plates on which the contact-fingers operate during the opening and closing movements of the switch. The cooperating lug and recess 17 and 18 prevent the pieces 16 from being moved out of the stirrup 13 during the normal operation of the contactor, while at the same time they allow the said pieces 16 to move in said stirrup with a rocking motion which permits great freedom of movement of the fingers 14. The fingers 14 preferably carry removable contact tips which are adapted to engage the fixed contacts 20 within the blow-out chute 21. Mounted on the insulating plate 22 within the housing 23 above the blow-out chute 21 is the coil 24 of the blow-out magnet, the core of which is designated by 25 and the poles by 26. The sides of the blow-out chute adjacent the contacts are provided with pieces 27 of fire-resisting material. The binding-posts or terminals through which the circuit connections are made are indicated by 28 and 29 respectively.

Referring now to Fig. 2, it will be clearly seen how the circuit connections for this contactor are made. The controlled circuit

may be traced from the terminal 28 through the spring contact-finger 14, the contact tips 19 and 20 and then through the blow-out coil 24. The actuating or controlling circuit is independent of the controlled circuit and includes the actuating coil 7, as shown.

For a more detailed description of the motor-control system to which my improved contactor is especially applicable, reference may be had to the patents to Perry, No. 687,060, granted November 19, 1901, and Case, No. 716,189, granted Dec. 16, 1902.

While I have shown and described my invention as applied to an electromagnetically-actuated contact, it will be clear that the actuating means may be any other desired power, and in the claims hereto appended I aim to cover all modifications which do not involve a departure from the spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States, is,—

1. In a power actuated switch, a fixed contact member, a movable contact member comprising a curved spring strip rigidly secured at one end and biased for movement away from the fixed contact, a solenoid, and a core in said solenoid loosely connected to the curved portion of said spring strip intermediate its ends, whereby the latter is moved into sliding engagement with said fixed contact.

2. In a power-actuated switch, a movable contact-finger composed of a strip of spring-conducting material rigidly fastened at one end, a rod carrying a stirrup through which said contact-finger loosely passes, means for operating said rod, and a bearing plate carried by said stirrup on which said contact-finger operates during the opening and closing movements of the switch.

3. In an electric switch, a fixed contact member, a movable contact member comprising a curved spring strip rigidly secured at one end, and means for moving the free end of said strip into engagement with the fixed contact and changing the curvature of the strip to produce a sliding connection.

4. In an electric switch, a fixed contact member, a movable contact member comprising a curved spring strip rigidly secured

at one end, and means for moving the free end of said strip into engagement with the fixed contact and partially straightening the curvature of the strip to produce a sliding connection.

5. In an electric switch, a frame upon which the actuating means is mounted, a fixed contact mounted upon said frame, a U-shaped spring strip secured by one arm to said frame and having its other arm elongated and provided with a contact piece, and a loose connection between said spring strip and the actuating means.

6. In an electric switch, an electromagnet, a frame within which said electromagnet is arranged, a fixed contact supported upon said frame at one side of the electromagnet, and a U-shaped spring strip secured by one arm to said frame at a point opposite the fixed contact and having its other arm elongated and provided with a contact piece, together with a loose connection between the elongated arm of said spring strip and the core of the electromagnet.

7. In an electric switch, an electromagnet, a frame within which said electromagnet is arranged, a fixed contact supported upon said frame at one side of the electromagnet, and a curved spring strip secured to the frame at the opposite side of the electromagnet and provided with a contact piece at its free end, together with a loose connection between said spring strip and the core of the electromagnet.

8. In an electric switch, a fixed contact, a movable contact adapted to make a wiping or sliding contact therewith, the engaging surfaces of said contacts being adapted to meet in a plane substantially at right angles to the motion of said movable contact, a curved spring strip fixed at one end and carrying said movable contact at its other end, and an electromagnet having its core loosely connected to said spring strip.

In witness whereof, I have hereunto set my hand this 29th day of December, 1903.

GEORGE H. HILL.

Witnesses:

BENJAMIN B. HULL,
MARGARET E. WOOLLEY.