

M. H. JOHNSON.  
SWITCHBOARD AND FUSE BOX.

(Application filed Mar. 28, 1900.)

(No Model.)

2 Sheets—Sheet 1.

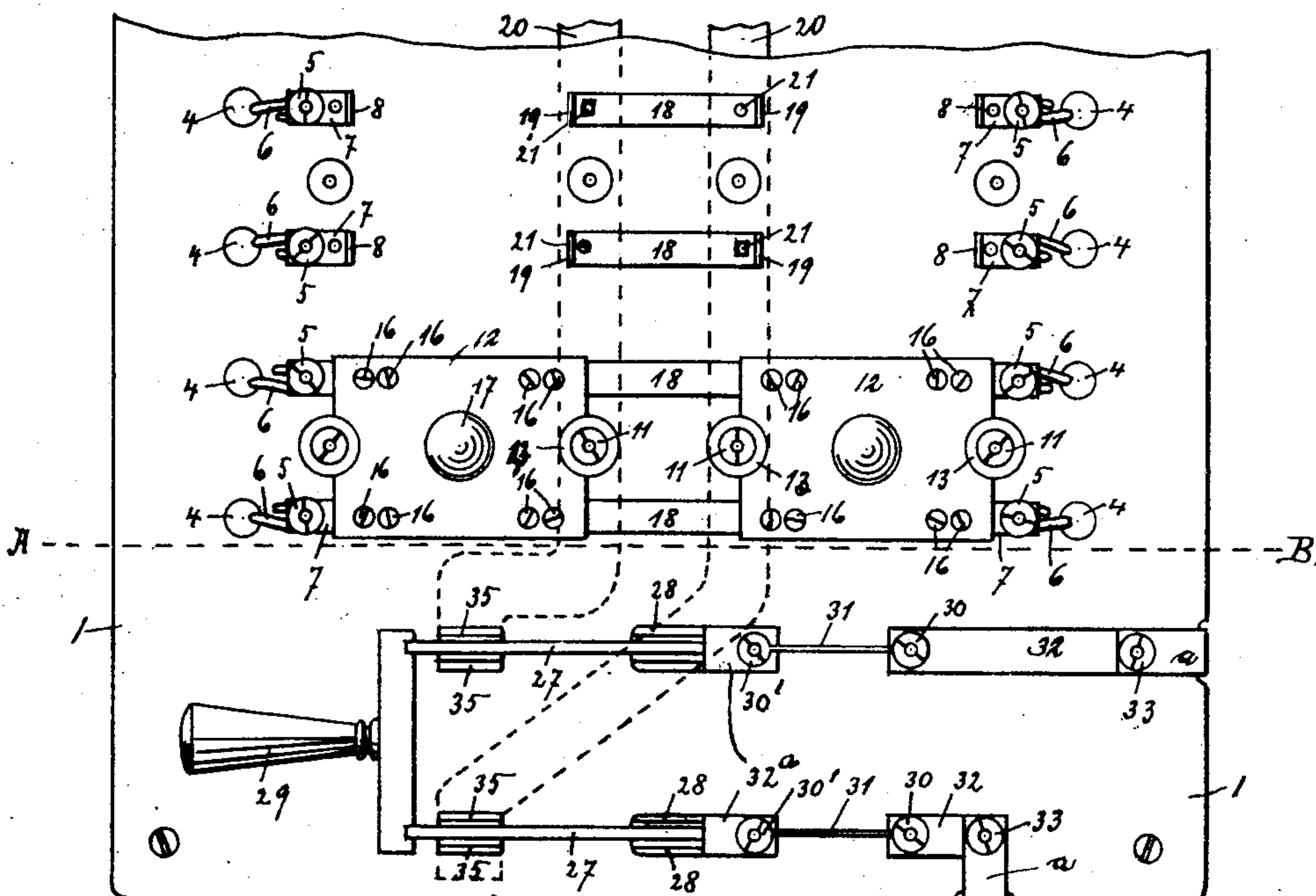


Fig. 1.

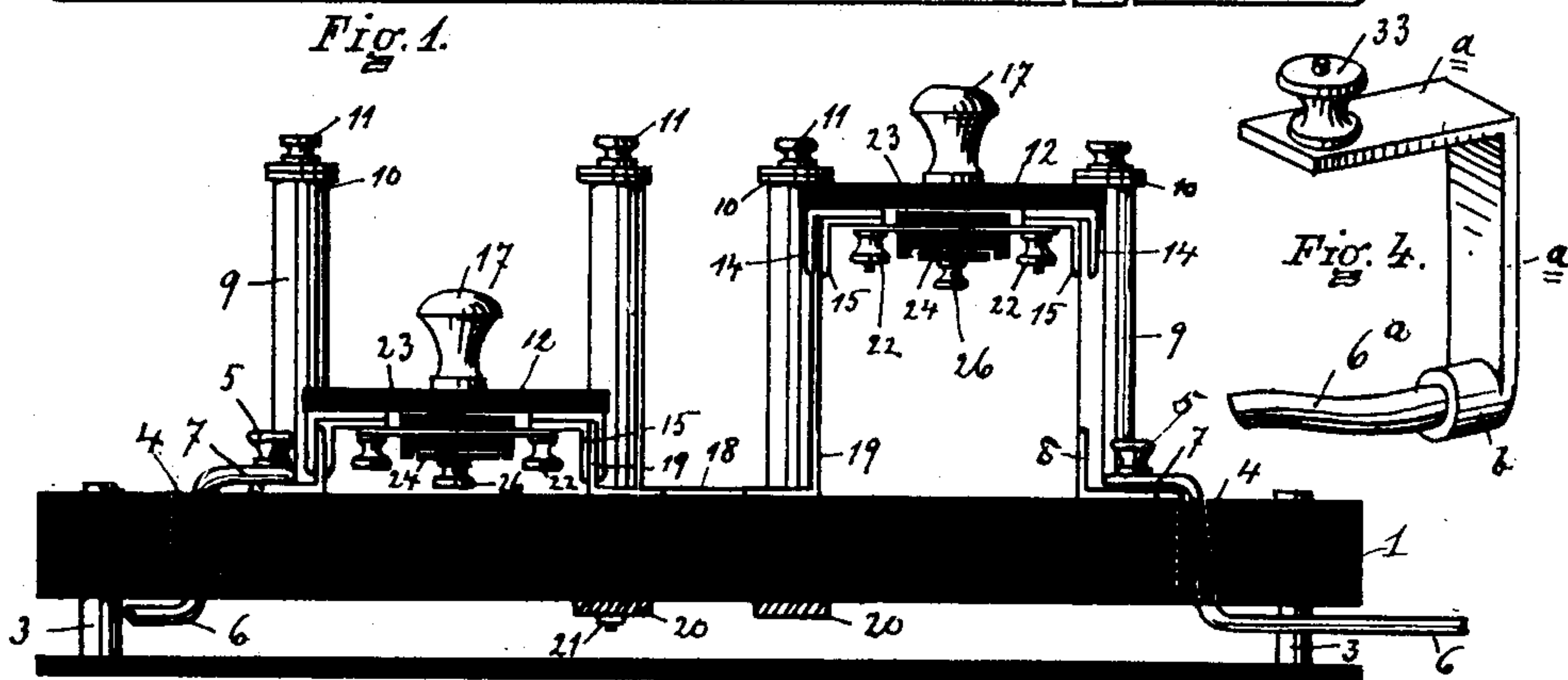


Fig. 2.

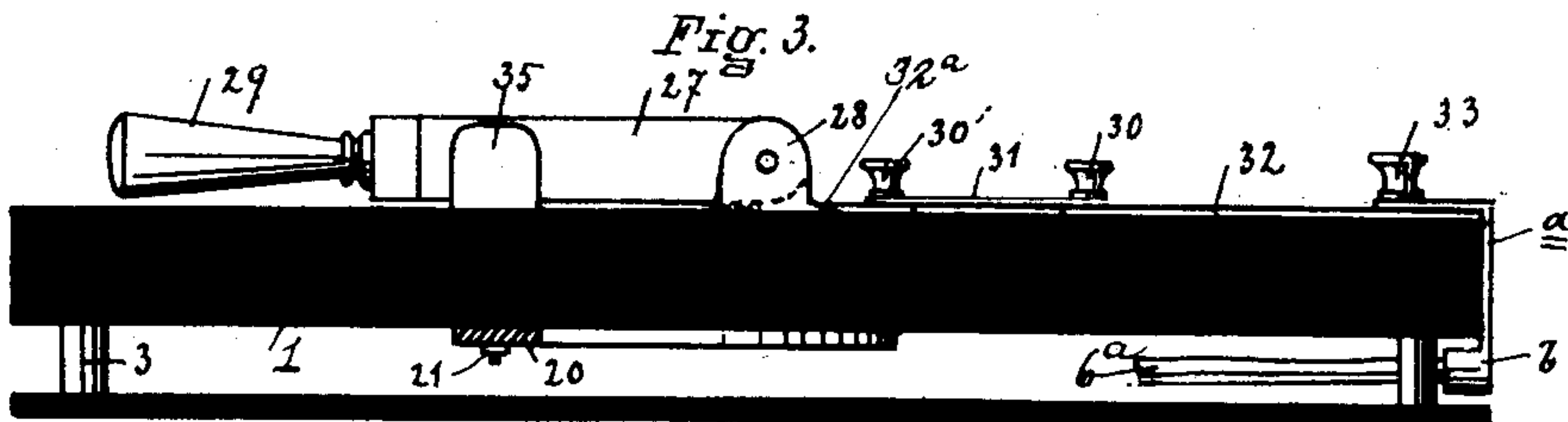


Fig. 3.

WITNESSES

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No. 685,613.

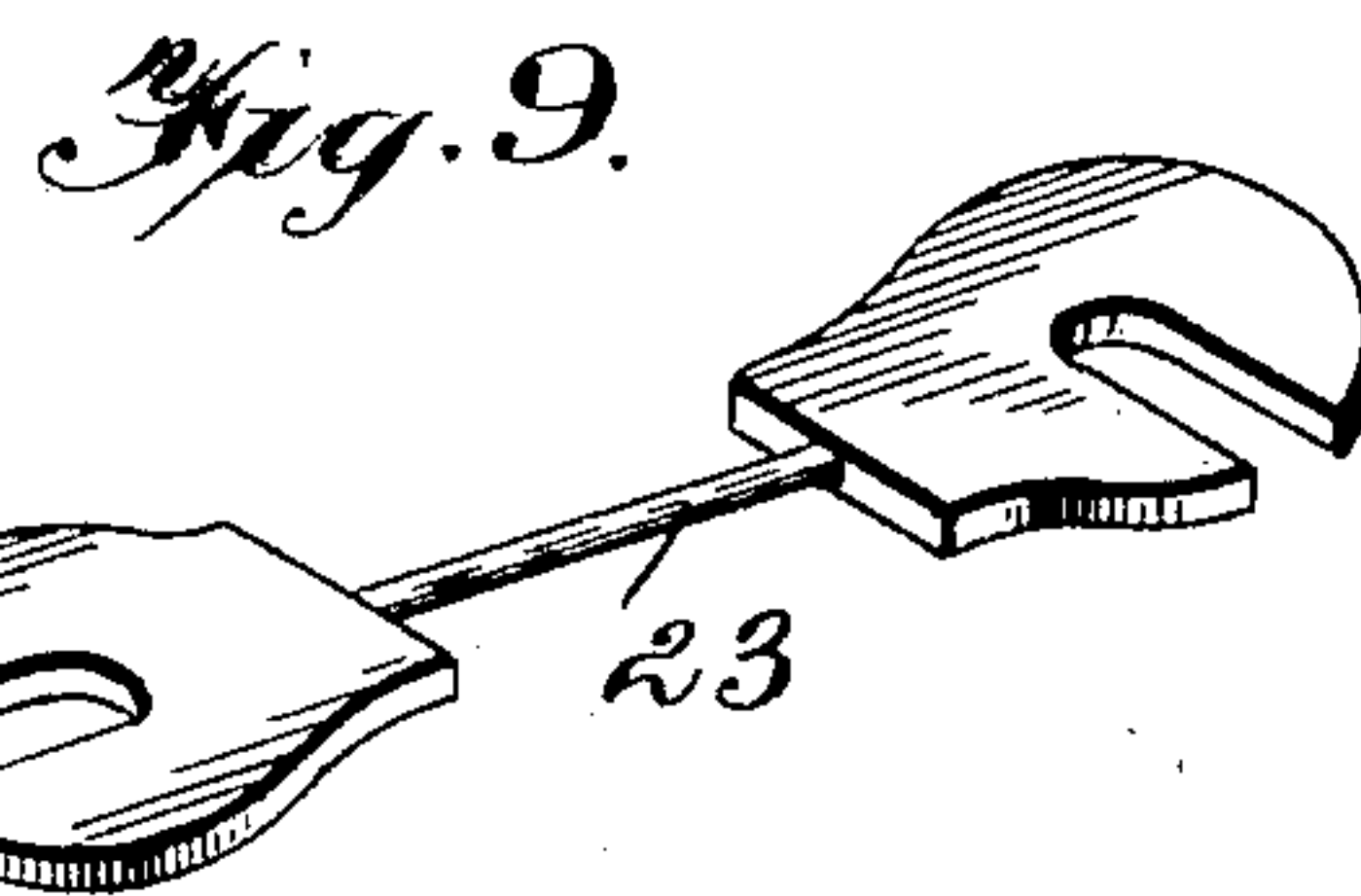
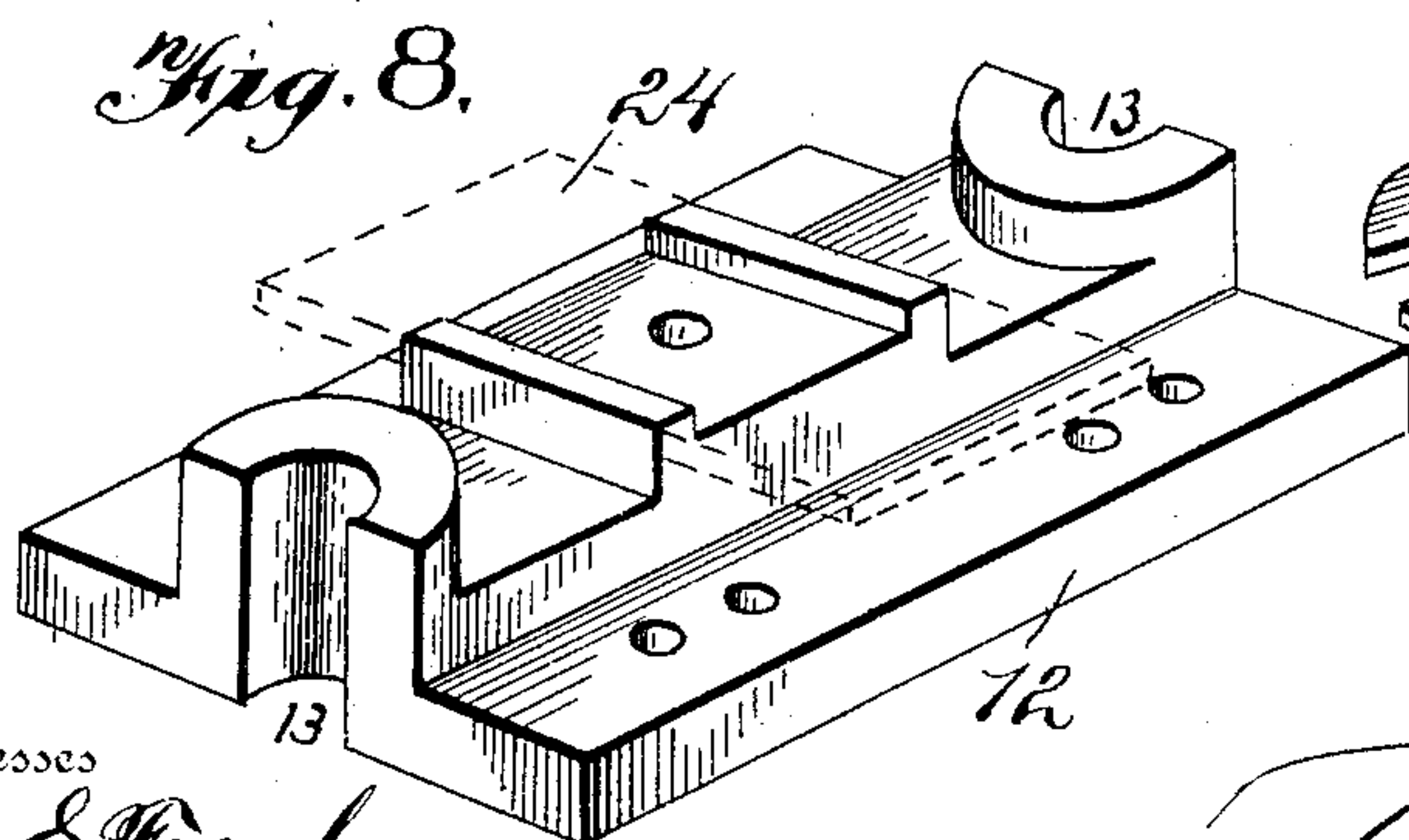
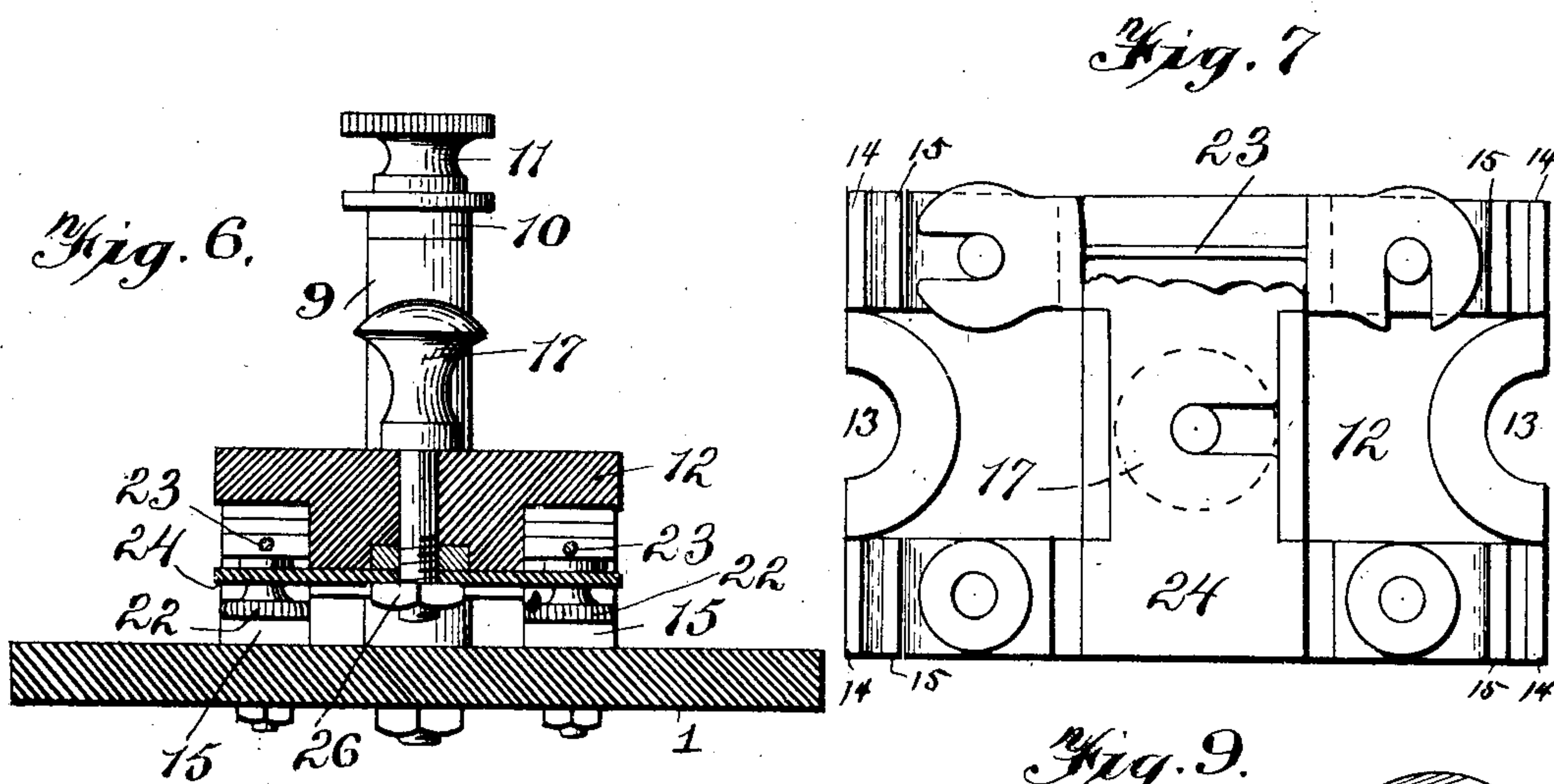
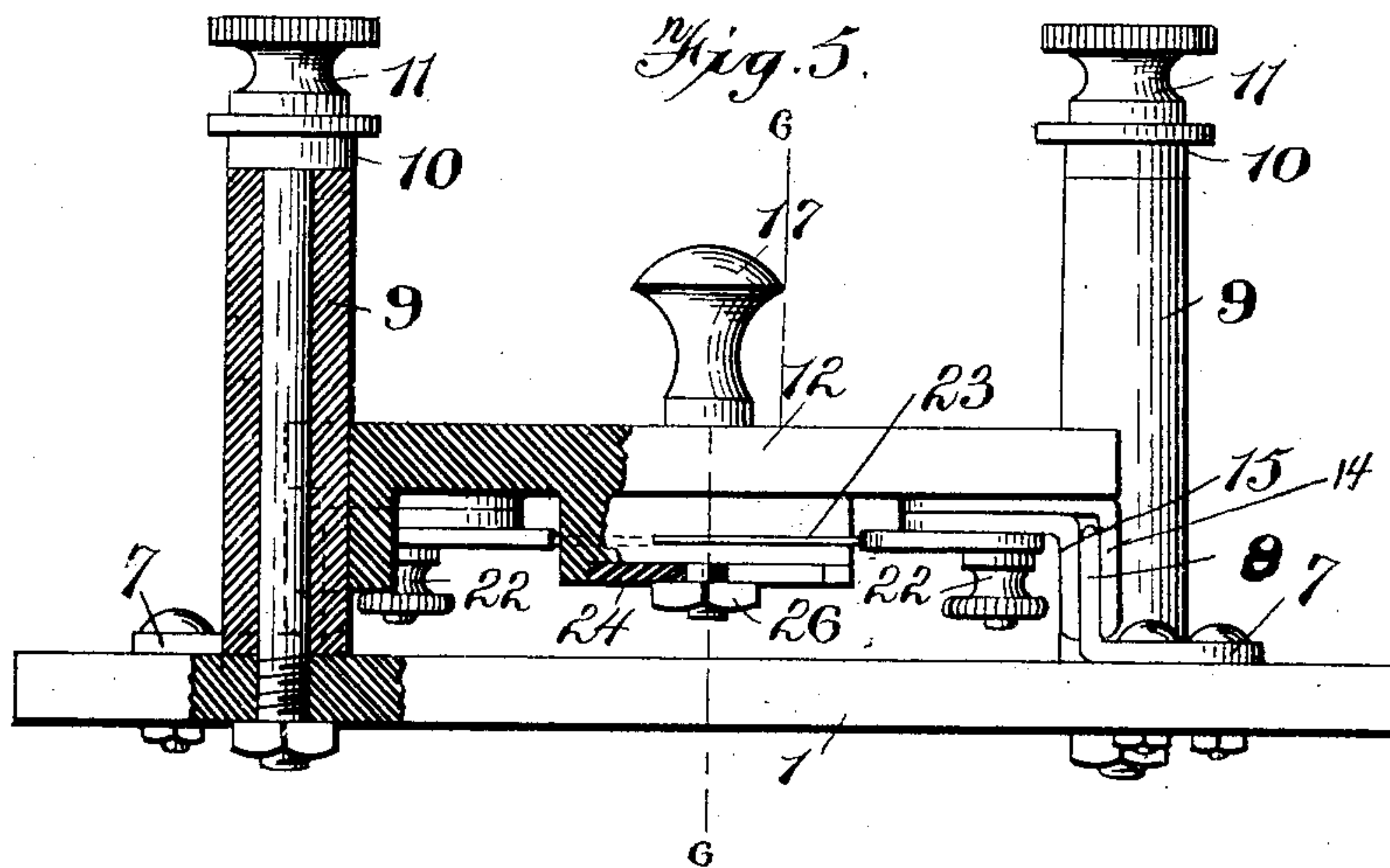
Patented Oct. 29, 1901.

M. H. JOHNSON.  
SWITCHBOARD AND FUSE BOX.

(Application filed Mar. 26, 1900.)

(No Model.)

2 Sheets—Sheet 2.



Witnesses

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# UNITED STATES PATENT OFFICE.

MONTGOMERY H. JOHNSON, OF UTICA, NEW YORK.

## SWITCHBOARD AND FUSE-BOX.

SPECIFICATION forming part of Letters Patent No. 685,613, dated October 29, 1901.

Application filed March 26, 1900. Serial No. 10,141. (No model.)

*To all whom it may concern:*

Be it known that I, MONTGOMERY H. JOHNSON, a citizen of the United States of America, and a resident of Utica, Oneida county, New York, have invented certain new and useful Improvements in Switchboards and Fuse-Boxes, of which the following is a specification.

My invention relates to a device for distributing electrical energy from large conductors to smaller ones and properly protecting and maintaining the mechanism employed for this purpose.

The purpose of my invention is to provide mechanism for distributing electrical energy which shall be so arranged as to be easily installed under all of the varying conditions required in such work, through the operation of which absolute safety and convenience to the operator can be secured in replacing or readjusting fuses and opening and closing connection therewith, practically eliminating danger from such operations.

In placing and locating the interior connection with electric lighting or power circuits it is not often practical or convenient to determine prior to the performance of the work the exact position in which the wires for main supply, feeders, and branches will enter the switchboard. If the wires are brought directly into the visible part of the interior of the switchboard, there must be an agreement between the interior arrangement of the board and the entering wire or it becomes necessary to expose a considerable length of wires and cross the same over each other in a more or less cumbersome manner, producing an unworkmanlike job in connecting the wires with the terminals. To obviate these difficulties, the switchboard has heretofore been provided with a separate compartment into which the wires are entered and brought to the proper location for entering the visible portion of the board in close proximity to their proper terminals. In cases of the compartment surrounding the outside edges of the board, this necessitates making the board larger and it is cumbersome and costly, and difficulty is often encountered in introducing heavy conductors to their terminals. Other objections and troubles have been encountered in all forms of constructions of this character up to the present time.

The purpose of my invention is to reduce the difficulties to the minimum and provide a safe reliable switchboard and the equipments incident thereto.

In the use of a switchboard for electric energy it is customary to provide fuse-wires to protect the smaller conductors branching therefrom. Fuse-wires become frequently melted and disconnect the circuit in which they are placed when the current is increased to a dangerous degree. In replacing these fuse-wires more or less danger is incurred to the operator. To overcome these difficulties and omit the use of a wiring-compartment, I use a special form of connection for the main wires, consisting of a bent strip of conducting material having upon one end a projection attached to a main conductor on the surface of the tablet and upon the other end a flange, which in this instance is a cup for the attachment of a main conductor in the wiring-compartment.

Having described my invention in general terms, I will now proceed to describe the same with reference to the drawings, in which—

Figure 1 is a plan view of the device, broken lines indicating parts removed. Fig. 2 is a section view on line A B of Fig. 1. Fig. 3 is an edge elevation showing the knife-switch. Fig. 4 illustrates details of construction. Fig. 5 is a sectional end or edge elevation of a portion of the switchboard, parts being removed and other parts broken away. Fig. 6 is a detail cross-sectional view on the line 6 6, Fig. 5. Fig. 7 is a detail bottom plan view of the switch-plate, one end of the apron being broken away to show a fuse-wire. Fig. 8 is a detail bottom perspective view of the switch-plate, parts being removed and the apron shown by dotted lines. Fig. 9 is a detail perspective view of one of the fuse-wires of the switch-plate.

Having described my invention with reference to the figures illustrated in the drawings, I will now proceed to describe the same with reference to the characters, in which similar characters refer to corresponding parts in the several views.

I employ an insulated tablet, plate, or base 1 of the required size, on which the switches are mounted, and forming a part of the switchboard 2 is another non-conducting plate, parallel with and below the plate or tablet 1, and



the two non-conducting plates are held together and separate by studs 3 3. In the tablet 1 I provide openings or wiring-pockets 4 for the passage of the line-wires, which are connected to and held by binding-posts 5. Line-wires are designated by 6. Between the binding-nut 5 and connecting-plate 7 the line-wire is clamped by the binding-nut. The contact or connecting plate 7 is provided with substantially a right-angle bend 8. (Best illustrated in Figs. 1 and 2.)

I mount on the tablet 1 one or more vertical insulated posts 9 9, which are secured to the tablet by longitudinal bolts, it being obvious that one post may be used as a guide, though I prefer two or more. However, the posts 9 9 can be supported on the tablet 1 by any well-known method. On the top of each of these posts I provide a yielding washer 10, which is held in place by thumb-screw 11, which can be removed and replaced. Between posts 9 9 I provide a vertically-movable insulated block, body, fuse-carrier, or switch-plate 12, which at its opposite ends is provided with semicircular openings 13 to fit the posts 9 9, between which the switch-plate 12 is permitted to be moved vertically. The washers 10 10, held by thumb-screws 11, arrest the upward movement of the switch-plate and if taken off will permit the switch-plate and its connecting mechanism to be removed or replaced. On the under side of the switch-plate I provide at each end two conducting-plates 14 and 15, which are right angle in form and are held to the switch-plate by set-screws 16 16. (Best illustrated in Fig. 1.) These set-screws are tapped through the switch-plate 12 down into the angle conducting-plates and hold them rigidly to the switch-plate, leaving a space between the vertical portions for the admission of angle conducting-plate 8 between them, thereby establishing connection in the circuit, or thereby breaking the circuit by the upward movement of the switch-plate 12 by lifting it by handle 17. By this arrangement the switch-plate can be elevated between posts 9 9, thereby breaking the circuit, and by depressing it into the position shown on the left of Fig. 2 the circuit is reestablished. I connect the two sets of switch-plates 12 12 by one or more angular conducting-plates 18, each of which is formed at each end with right-angle projections 19, as illustrated in Figs. 1 and 2.

Underneath tablet 1 I provide metal strips 20, which are best illustrated in Fig. 1 in dotted lines and in Figs. 2 and 3 in section-lines. These strips act as the electrical conductors. They are connected to the under side of the tablet 1 and through tablet 1 to the metal strips 18 by connecting screws or posts 21 alternately.

For connecting the angle-plates on the opposite side of switch-plate 12 I provide set-screws 22. Between the shoulder of the set-screw and the surface of the angle-plates I insert fuse-wire 23, which is held in place by

the set-screws 22 22. For protecting the fuse-wire I place a removable insulated apron 24, which is admitted into a recess on the under side of the switch-plate below the fuse-wires and is held in place by set-screw 26, so that when it is desired to replace the fuse-wire from any cause I elevate the switch-plate into the position shown at the right of Fig. 2, thereby breaking the circuit and permitting the fuse-wire to be removed or inserted with safety by the operator. When I have secured the fuse-wire in place, I move switch-plate 12 into the position shown at the left of Fig. 2, and thereby reestablish the circuit. For breaking the circuit I provide a knife-switch 27, pivoted in brackets 28, secured in any well-known manner to the tablet 1. The knife-switch 27 is provided with a handle 29 and is so arranged as to be raised or lowered. When raised, the circuit is broken and when lowered the circuit is closed.

The two main line conductors or power wires 6<sup>a</sup> 6<sup>a</sup> are arranged at the under or inner face of the tablet 1 of the switchboard, and said line conductors are suitably connected electrically with the opposite sides or blades, respectively, of the knife-switch. In the specific example shown said line conductors are attached to the lower ends of metallic angular terminals, brackets, strips, or plates *a*, fitting the vertical edges of the tablet 1 and extending from the inner face to the outer face of said tablet. Each strip *a* has the vertical portion fitting a vertical edge of the tablet 1 and at its inner end secured to one of the line or power wires 6<sup>a</sup> in a suitable manner—for instance, by being formed with a socket *b* below tablet 1 and in which the end of the line-wire is soldered. Each strip or plate is approximately L-shaped and has its upper end bent approximately at right angles onto the top or outer face of the tablet 1 and provided with a thumb-screw 33 or other suitable means for making electrical connection with a conducting-plate 32 on the outer face of the tablet 1, having a thumb-screw 30, by which the fuse-wire 31 is electrically connected to said plate. The opposite end of the fuse-wire 31 is electrically connected with the conducting-plate 32<sup>a</sup> of a switch-bracket 28 by a thumb-screw 30'. Each connecting strip or plate *a* is independently connected electrically with a switch-bracket 28 by plates, thumb-screws, and fuse-wire, as just described.

I provide on both sides of the knife-switch 27 angle-plates 35 35, which engage both sides of the knife-switch for establishing and breaking the connection in the circuit.

It will be readily seen that changes in details of construction can be readily made without departing from the spirit of my invention.

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

1. A switchboard comprising a non-conducting tablet, electrical conductors thereon, a conducting-plate extending from the inner



face of the tablet across an edge thereof, and having an angular outer end on the outer face of the tablet, means electrically connecting said angular end with conductors on the tablet, a wire at the inner face of the tablet, and means electrically connecting said wire to the inner end of said plate, substantially as described.

2. The tablet in combination with strips carrying current for branch circuits with four upwardly-projecting ends for each branch circuit, a switch-plate making connection with both sides of each of the four said upwardly-projecting ends for connecting and disconnecting the circuit in substantially vertical lines, combined for the purposes stated.

3. A tablet in combination with metal strips or angle-plates carrying currents for branching circuits, the ends of said strips extending upwardly substantially vertically for each branch circuit, a pair of vertical guides, a switch-plate carrying angular metal strips connected by a fuse-wire for making and breaking the circuit, combined, substantially as set forth for the purposes stated.

4. A tablet in combination with current-carrying strips, provided with upward projecting ends, a switch-plate for completing the circuit between the strips, studs mounted on the tablet, said switch-plate moving between the studs and having the fuse completing the circuit connected to angular metal strips attached to the switch-plate for opening and closing the circuit combined, substantially as set forth for the purposes stated.

5. A tablet, the current-carrying strips provided with projections, the upwardly-projecting studs mounted on the said tablet, a non-conducting switch-plate mounted to slide between the vertical studs to engage the projections for opening and closing the circuit, combined, substantially as set forth for the purposes stated.

6. In a switchboard, the combination of an insulated tablet having switch members, a movable switch-plate provided with switch members, a fuse-wire electrically connecting said members carried by said plate, and a removable insulated apron secured to said plate with said fuse-wire between the apron and plate, substantially as described.

7. In a device of the character described, the combination of a vertical guide, a support therefor, a non-conducting switch-plate movable vertically on said guide, and a switch made and broken by the vertical movement of said plate comprising switch members carried by said plate and a fuse electrically connecting said members, substantially as described.

8. The tablet or insulating-base, the current-carrying strips, the upwardly-projecting studs mounted on the tablet, a switch-plate mounted between the studs to be moved up or down for opening and closing the circuit, projecting washers and nuts on the upper ends of the studs arranged to confine or re-

lease the switch-plate, combined substantially as set forth, for the purposes stated.

9. A tablet, conducting-switch members thereon, and a vertical guide carried by the tablet, in combination with a non-conducting switch-plate movable vertically on said guide and provided with switch members opposing said members of the tablet, and a removable fuse electrically connecting said members of said plate, substantially as described.

10. The tablet, current-carrying strips, upward projecting insulated studs provided with removable stops at their upper ends, a non-conducting switch-plate constructed to move between the studs which act as guides combined, substantially as set forth for the purposes stated.

11. A tablet, current-carrying strips supported on said tablet, upwardly-projecting insulated studs, the vertically-movable switch-plate constructed to move between the studs, a handle to move the switch-plate for opening and closing the circuit, conducting-switch members carried by and depending from said plate, and a fuse-wire connecting said members, combined, substantially as set forth for the purposes stated.

12. In combination, a tablet, current-carrying strips, vertical insulated studs mounted on the tablet, a removable non-conducting switch-plate working between and guided by said studs and carrying mechanism for opening and closing the circuit comprising conducting members and an interposed removable fuse, substantially as described.

13. The tablet, the current-carrying strips, one or more upwardly-projecting studs having removable top stops above the switch-plate, a non-conducting removable switch-plate constructed to move vertically guided by said studs and provided with switch members combined, substantially as set forth, for the purposes stated.

14. A switchboard having a movable switch-plate, switch members carried thereby, a fuse-wire electrically connecting said members, said plate having non-conducting portions above and below said fuse-wire, substantially as described.

15. A switchboard having a movable switch-plate, switch members carried thereby, a removable fuse-wire electrically connecting said members, said plate having a non-conducting portion below said wire, and mechanism whereby said fuse-wire can be inserted and removed, substantially as described.

16. In combination, an insulated base carrying metal strips connected with and not forming any part of the bus-bars extending upwardly from the horizontal face of the base, an insulated body sliding fuse-carrier, having metal strips adapted to engage the metal strips on the base.

17. In combination, an insulated base provided with metal strips connected with bus-bars projecting upwardly from the horizontal face of the base, a sliding insulated fuse-car-



rier having metal strips projecting downwardly to engage the metal strips on the base and means for guiding the fuse-carrier.

18. In a switchboard, the combination of a  
5 non-conducting tablet, a two-part knife-switch on the outer face thereof, the two line-wires at the inner face of said tablet, two angular conducting-plates extending from the inner to the outer faces of said tablet and having  
10 said line-wires secured to their inner ends respectively, and electrical connections on the

outer face of said tablet and electrically connecting the outer ends of said angular plates and said switch-knives and comprising fuse-wires and securing devices, such as thumb- 15 screws, substantially as described.

Signed by me at Utica, New York, this 16th day of March, 1900.

MONTGOMERY H. JOHNSON.

Witnesses:

PHEBE A. TANNER,  
EGBERT M. ANTISDEL.