

No. 881,686.

PATENTED MAR. 10, 1908.

S. HOADLEY.
ELECTRIC SWITCH.

APPLICATION FILED AUG. 12, 1907.

2 SHEETS—SHEET 1.

Fig. 1.

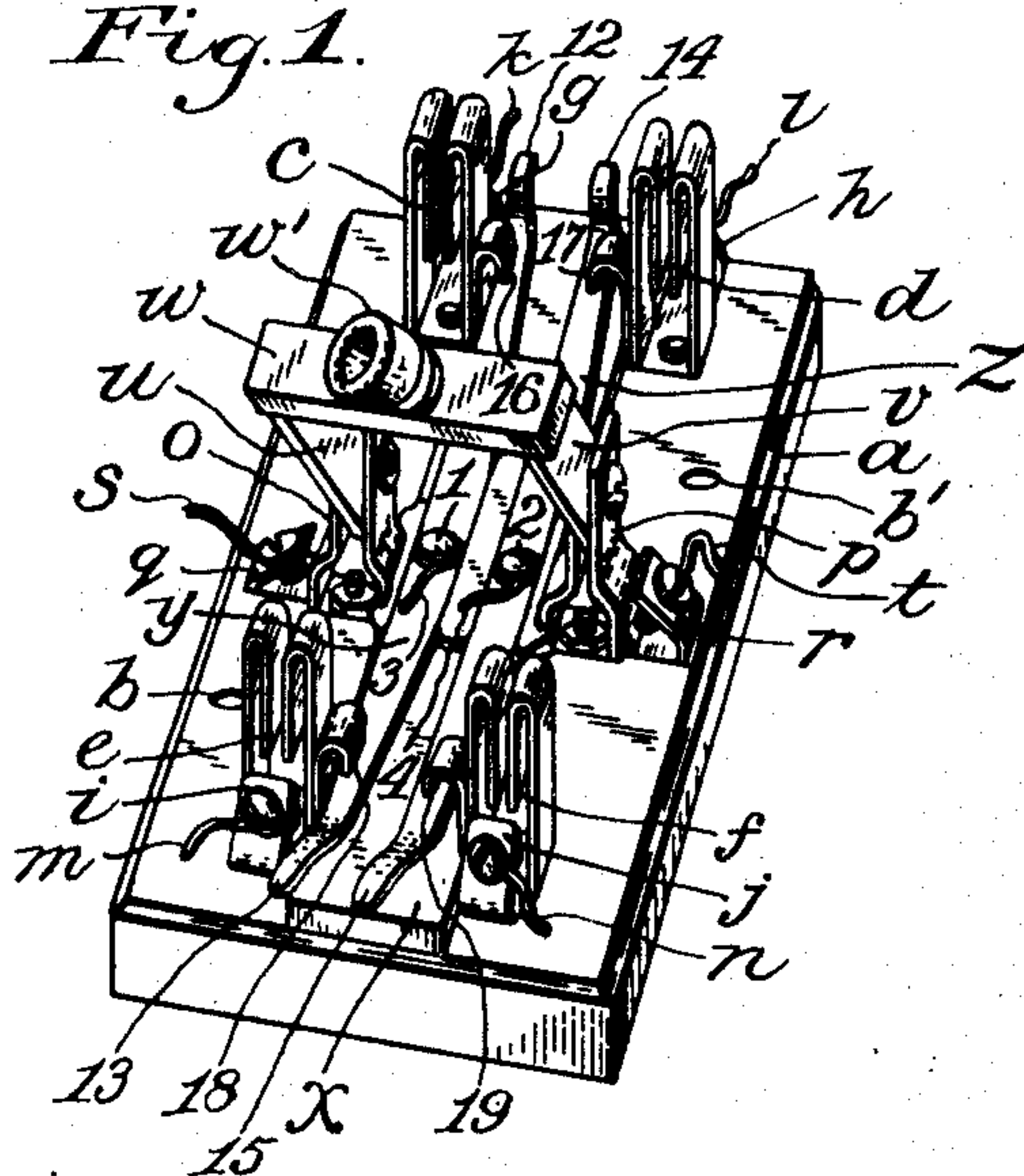


Fig. 2.

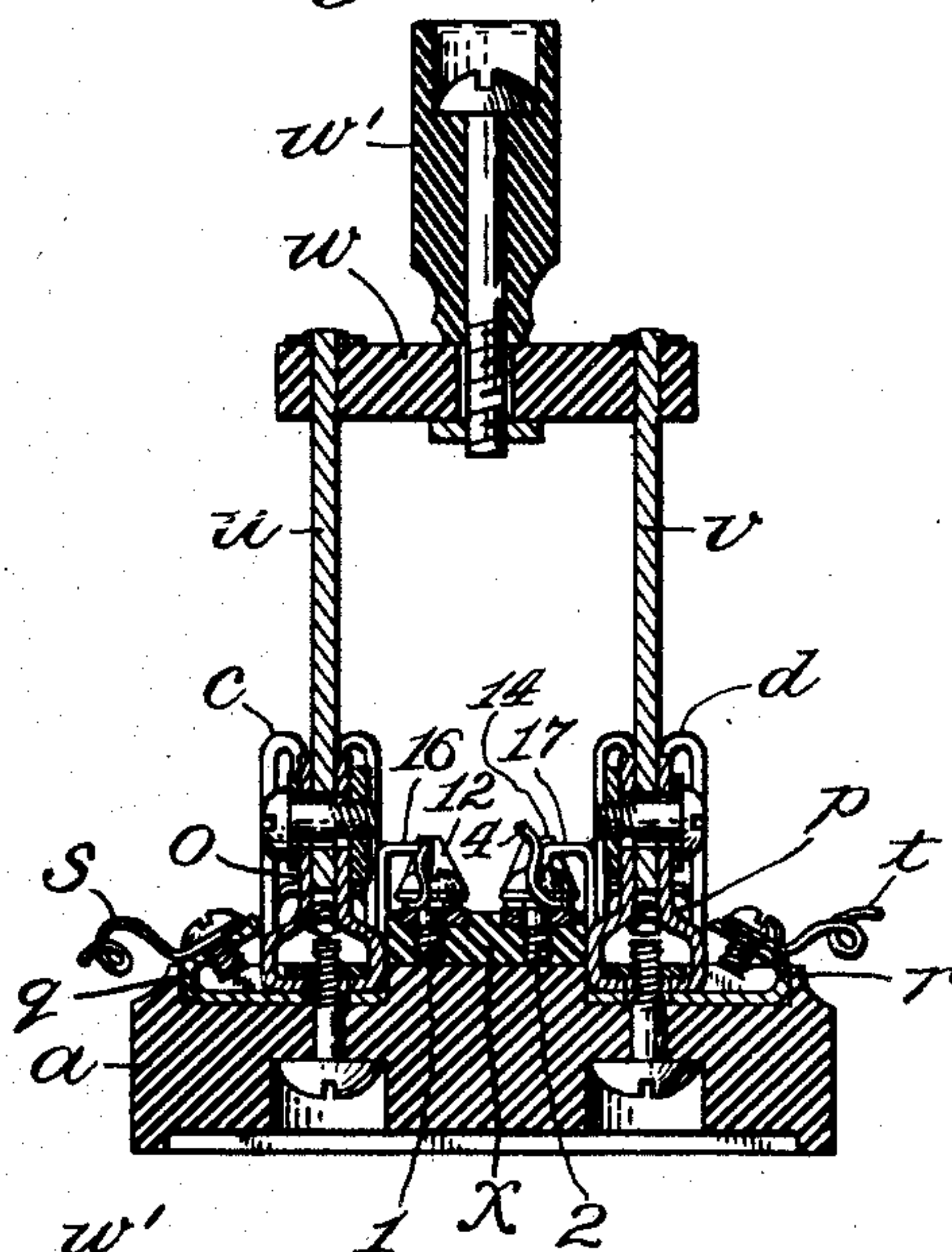


Fig. 3.

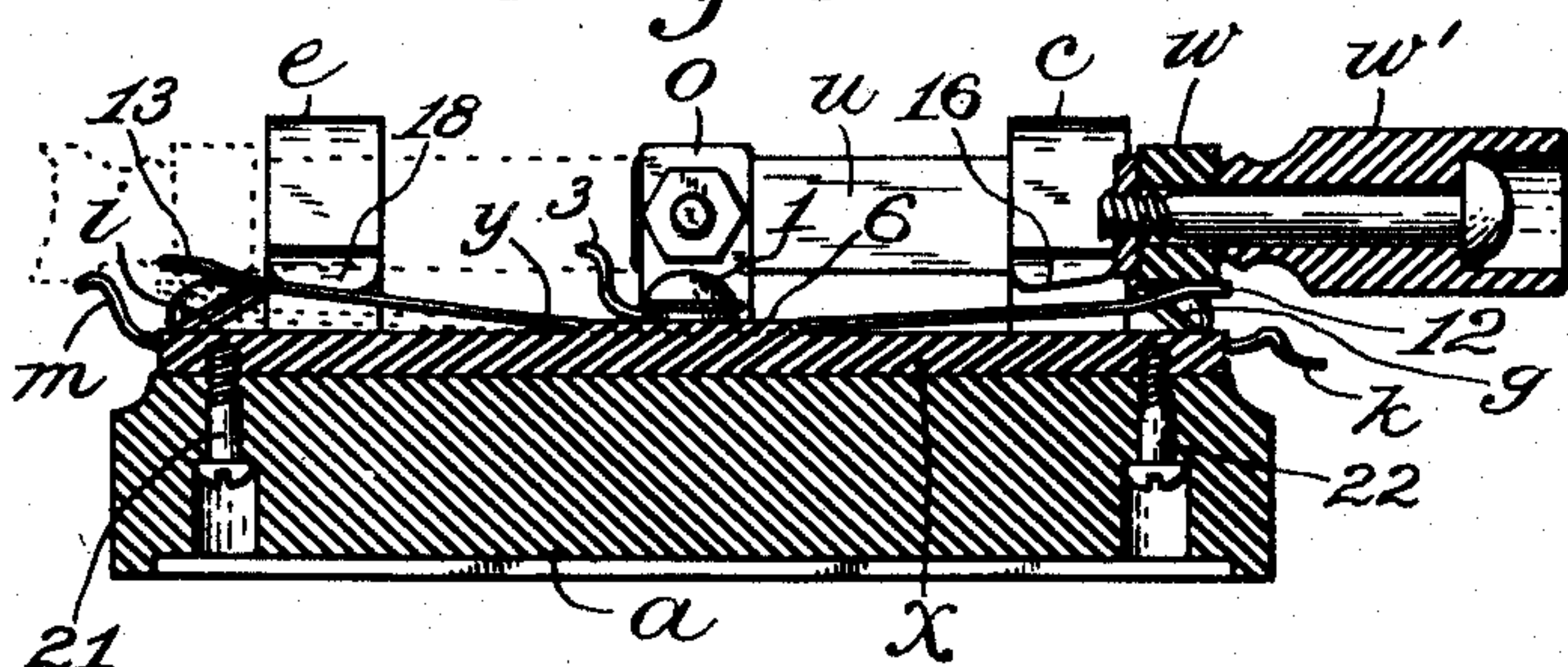


Fig. 4.

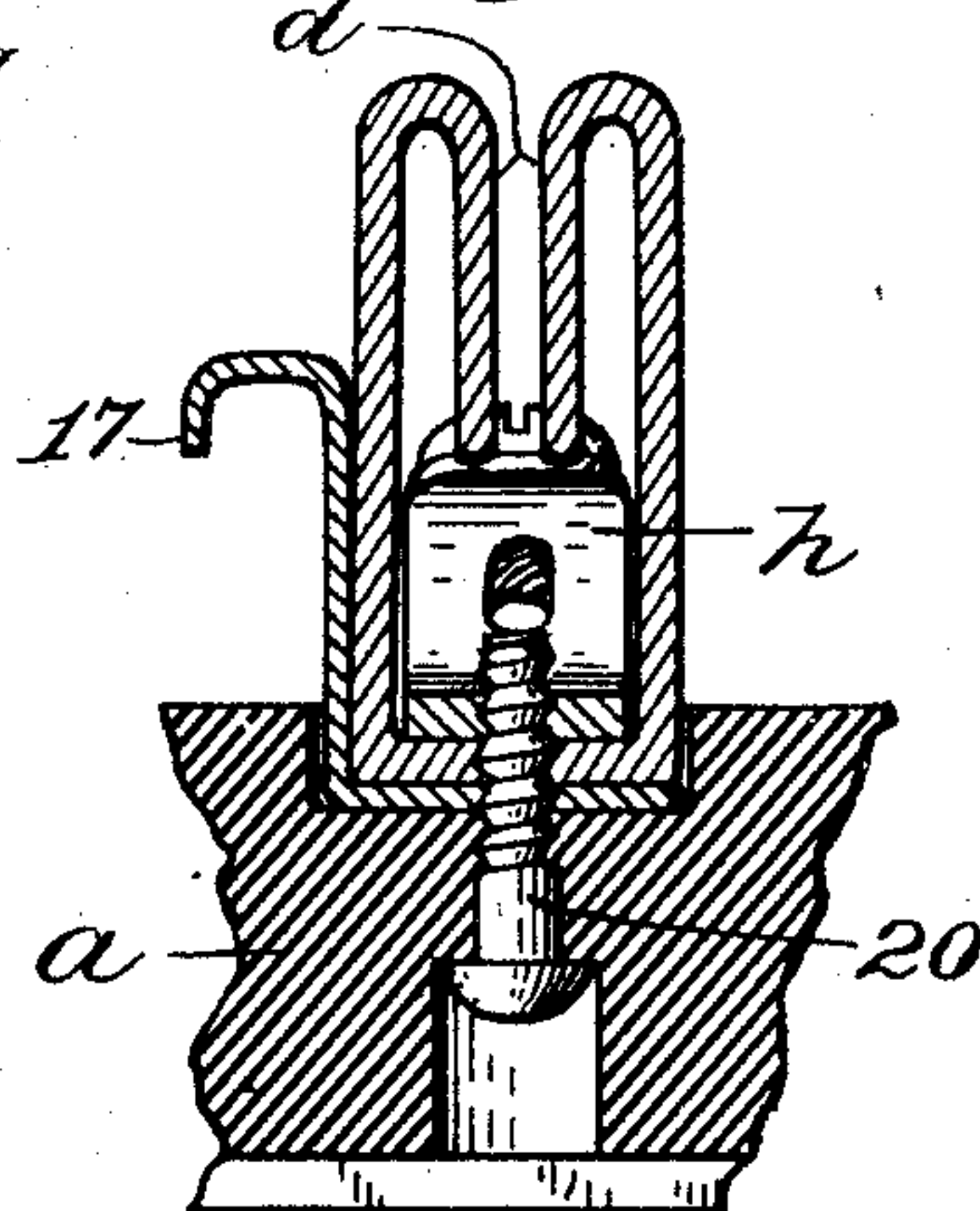
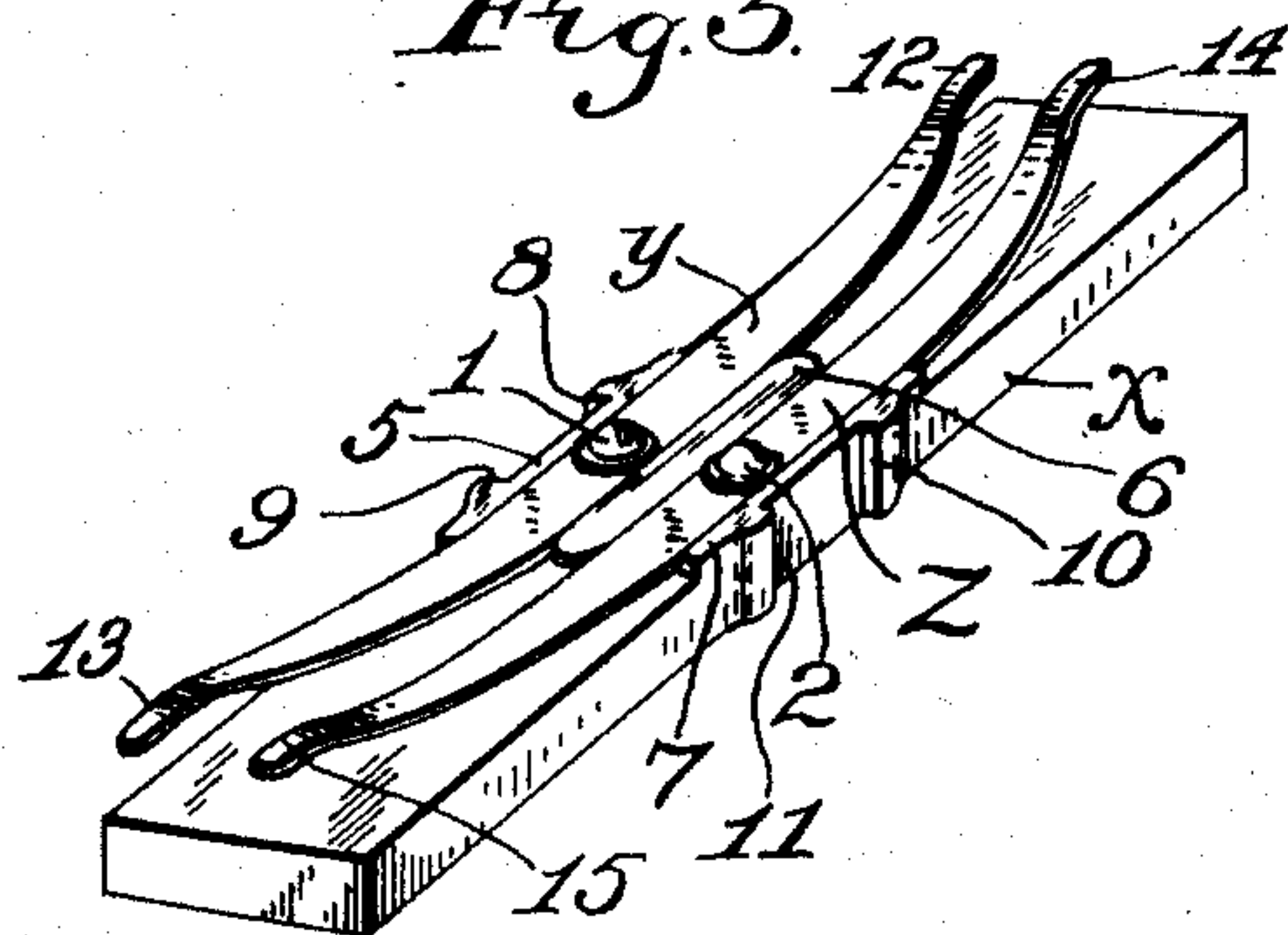


Fig. 5.



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2 SHEETS—SHEET 2.

Fig. 6.

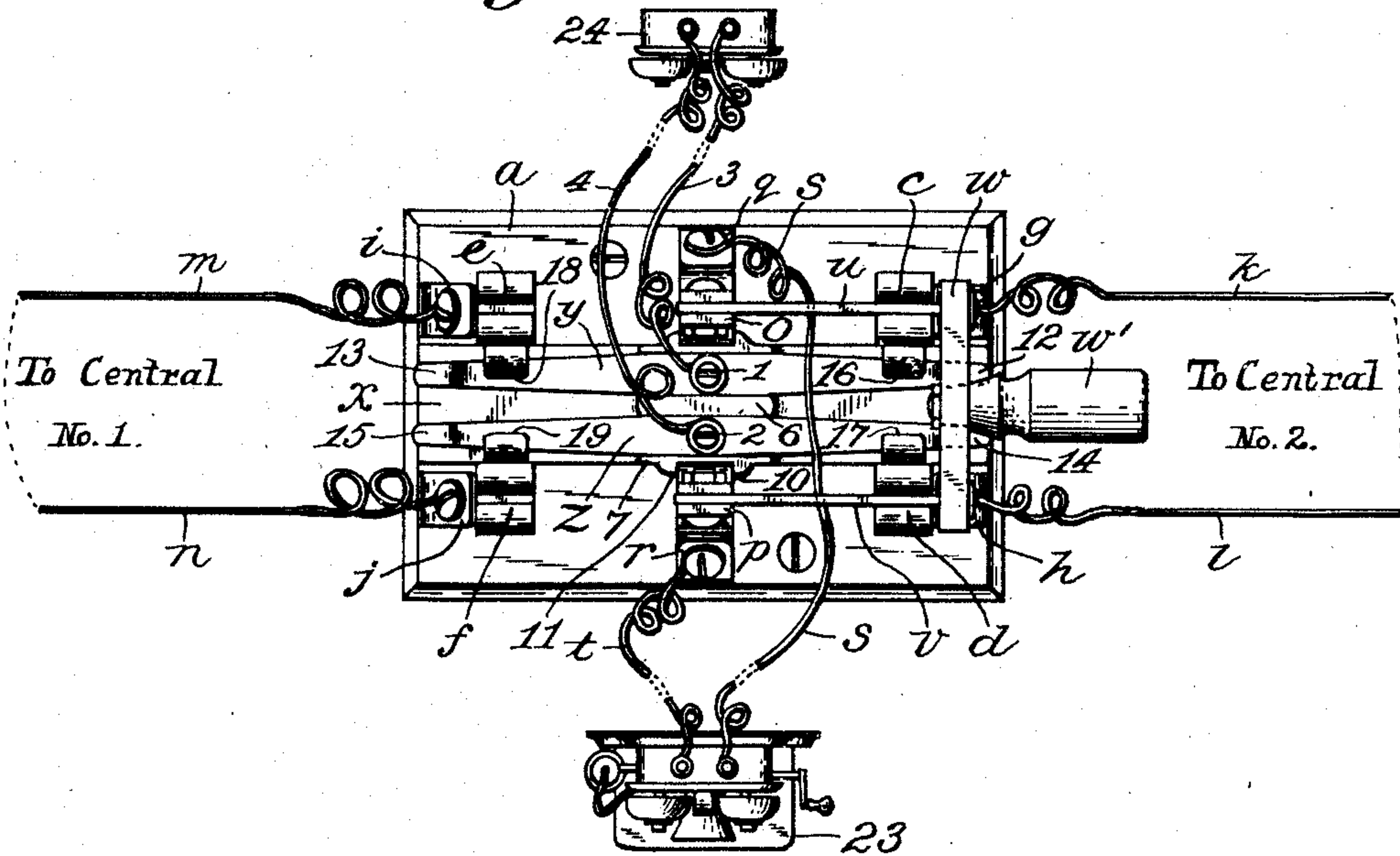
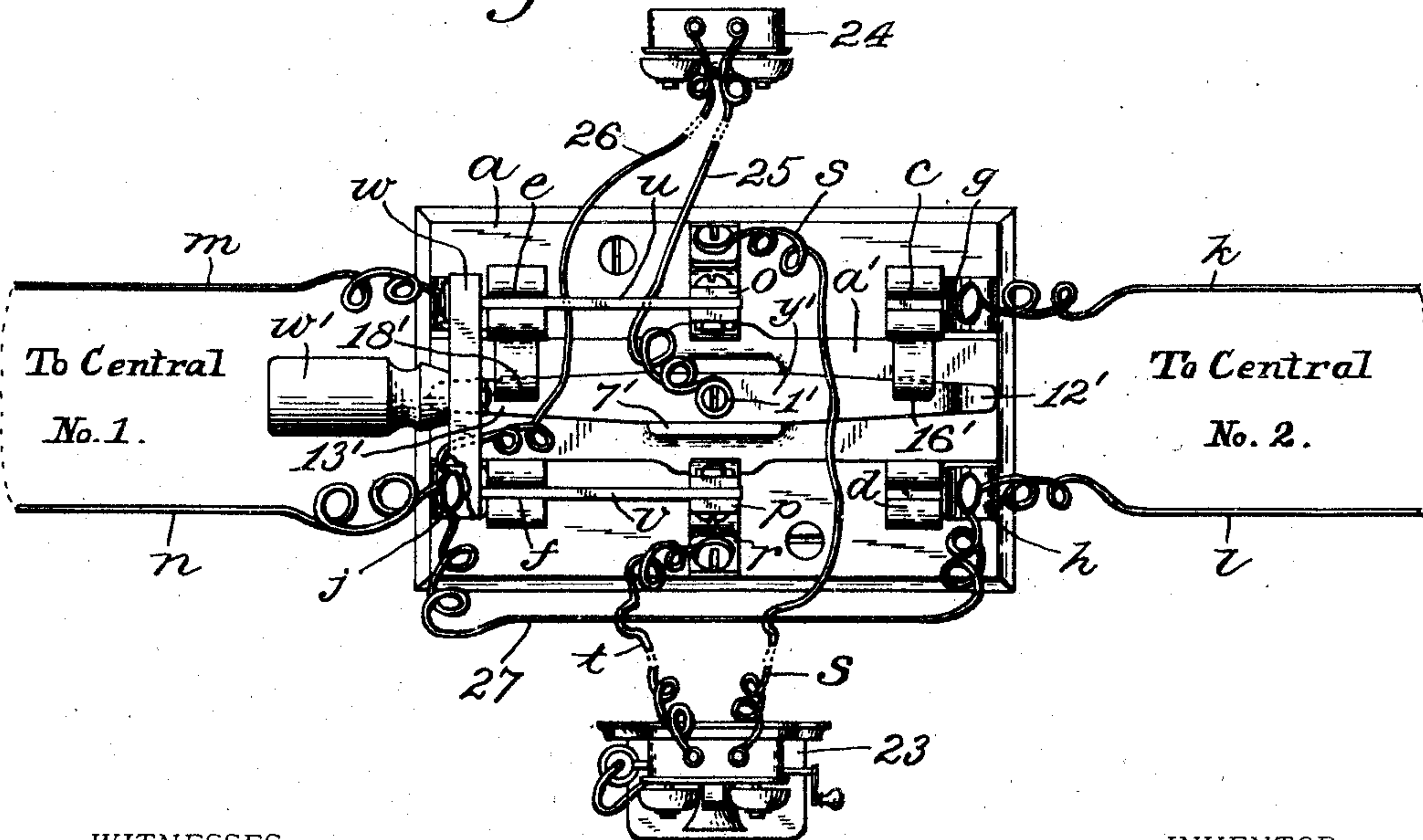


Fig. 7.



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UNITED STATES PATENT OFFICE.

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ELECTRIC SWITCH.

No. 881,886.

Specification of Letters Patent.

Patented March 10, 1908.

Application filed August 12, 1907. Serial No. 388,092.

To all whom it may concern:

Be it known that I, SILVESTER HOADLEY, a citizen of the United States, residing at Gosport, in the county of Owen and State of Indiana, have invented certain new and useful Improvements in Electric Switches; and I do declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to electrical switches and has reference particularly to devices whereby telephone signal bells may be switched in or out of circuit where a telephone may be arranged to be switched in or out of connection with either one of two central telephone stations or exchanges, and where an extension bell or separate bell is used for calling the telephone subscriber, so that when the subscriber has speaking connection with either one of the two exchanges he may be called from the other exchange.

The object of the invention is to provide an improved switch for independent or extension call bells of telephones adapted to operate in connection with a telephone and two central exchanges or similar connections, a further object being to provide improvements in switches of well known construction whereby to adapt them for automatically switching a separate or extension call bell in or out of connection with either one of two central exchanges in order that the subscriber may be enabled to use but one telephone instrument with two telephone systems, thus obviating the necessity of providing a telephone instrument for each system, a still further object being to provide switching apparatus of the above-mentioned character that may be produced at relatively small expense and be durable and economical in use.

With the above-mentioned and minor objects in view the invention consists in an improved telephone switch comprising two pairs of contact devices adapted to be connected with circuit wires and having each a supplemental contact element connected therewith, a pair of pivoted switch bars adapted to be connected with circuit wires, and elastic connections normally engaging the supplemental contact elements and adapted to be disengaged from either pair of

contact elements automatically by means of the operations of the switch bars, the invention consisting further in the novel elements and combinations and arrangements of elements as hereinafter particularly described and referred to in the appended claims.

Referring to the drawings Figure 1 is a perspective view of the improved switch; Fig. 2, a transverse sectional view thereof taken through the switch bars in mid position; Fig. 3, a longitudinal central sectional view with the switch bars in proper position for connecting the telephone with one of the exchanges; Fig. 4, a fragmentary sectional view showing details of construction of one of the contact devices and supplemental contact elements; Fig. 5, a perspective view of the elastic connectors as preferably constructed for application to switches which may have been heretofore constructed; Fig. 6, a plan view of the improved switch diagrammatically connected with a telephone and a separate or extension signal bell; and, Fig. 7, a modified form and arrangement of the switch with the telephone and signal bell.

Similar reference characters in the various figures of the drawings designate corresponding elements or features of construction.

In practically carrying out the objects of the invention, the entire switch may be variously constructed in detail, but for the purposes of illustrating and describing the invention a well known type of plain switch is shown which comprises an insulating base *a* which may be suitably composed of porcelain or similar material and having holes *b* and *b'* to receive screws or other devices for securing the base to a wall or other support, one end of the base having a pair of double spring contact devices *c* and *d* mounted thereon, and the opposite end of the base having another pair of similar contact devices *e* and *f* mounted thereon, the contact device *c* being connected to a binding post *g*, the contact device *d* being connected to a binding post *h*, and the other contact devices *e* and *f* being connected to binding posts *i* and *j* respectively. Circuit wires *k* and *l* are connected to the binding posts *g* and *h* respectively, and these are designated as being in electrical connection with a central exchange, two other wires *m* and *n* being connected to the binding posts *i* and *j* respectively, and may be in electrical connection with a separate central exchange. The contact devices

are preferably composed of copper or other suitable electrical conducting material. A pair of supports *o* and *p* are mounted on the base midway between the two pairs of contact devices and have binding posts *q* and *r* respectively connected therewith, and to which two circuit wires *s* and *t* are connected, the posts and supports being electrical conductors. A pair of switch bars *u* and *v* are pivoted to the supports *o* and *p* respectively, and they swing into contact either with the pair of contact devices *c* and *d* or with the pair of contact devices *e* and *f*, the switch bars being provided with an insulating operating bar *w* having a handle *w'*. It will thus be seen that either the two wires *k* and *l* may be switched into connection with the two wires *s* and *t* or may be cut out and the wires *s* and *t* connected with the wires *m* and *n*, and this switching apparatus may be used in various electrical systems other than with two telephone exchange systems, as will be understood. Such switches are now largely used substantially as shown and hereinbefore described, but for the purposes of the invention the various elements thereof may be variously constructed and improved.

The essentially new elements of the invention considered separately, comprise an oblong insulating plate *x* on which two elastic connectors *y* and *z* composed of conducting metal are suitably mounted with their middle portions in contact with the middle portion of the plate, the end portions of the connectors being curved away from the plate so that the connector *y* has two elastic contact fingers 12 and 13 at opposite ends thereof, and the connector *z* has two contact fingers 14 and 15 at the ends thereof adapted to be forced towards the plate but normally held therefrom elastically. The connector *y* is provided with a binding screw 1, and the connector *z* is provided with a binding screw 2; and these screws may be suitably employed for securing the connectors to the plate *x*. The binding screw 1 has a circuit wire 3 connected thereto thus electrically connecting the wire to the connector *y*, and a circuit wire 4 is connected by the screw 2 with the connector *z* when the plate *x* is arranged on the base *a* as designed in the practical use of the invention when combined with the other features hereinbefore indicated. Preferably the plate *x* has guides 5, 6 and 7 for assisting in retaining the connectors *y* and *z* on the plate, or other suitable means may be employed, and the plate *x* preferably has shoulders 8 and 9 to engage the support *o*, and shoulders 10 and 11 to engage the support *p* for holding the plate against sliding movement on the base *a*, and the plate may be further secured by other suitable means if desired while it extends between the supports *o* and *p* so that the fingers 12 and 14 will extend between the contact devices *c*

and *d*, and the fingers 13 and 15 between the contact devices *e* and *f*. A supplemental contact element 16 is connected to the contact device *c* and is normally engaged by the finger 12, a supplemental contact element 17 being connected with the contact device *d* and normally engaged by the finger 14, and supplemental contact elements 18 and 19 are connected with the contact devices *e* and *f* respectively and normally engaged by the fingers 13 and 15 respectively. The supplemental contact elements, as 17, may be suitably connected to the contact devices by means of shanks extending under the contact devices and secured by a screw 20 which secures the contact device *d* to the base *a* as shown particularly in Fig. 4, or otherwise as may be desired. Also if desired the plate *x* may be secured to the base *a* by means of screws 21 and 22 as shown in Fig. 3.

In some cases, especially when the entire switch is constructed and assembled at one time, the base *a* may be formed with an elevated portion *a'* to serve the purpose of the separate base plate *x*, the modification being shown in Fig. 7 in which the switch is otherwise slightly modified, there being a single connector *y'* used instead of two connectors and having a binding screw 1, the connector being partially retained by means of ribs 7' on the elevated portion *a'*. In this modification a supplemental contact element 16' is electrically connected with the contact device *c*, and a similar supplemental element 18' is connected with the contact device *e*, to be normally engaged by the contact fingers 12' and 13' respectively of the connector.

As shown in Fig. 6, a telephone instrument 23 is connected to the wires *s* and *t* and a separate or extension signal bell 24 of suitable construction is connected to the wires 3 and 4, so that when the wires *k* and *l* are connected with the wires *s* and *t* and therefore with the telephone, the switch bars *u* and *v* have engagement with the contact devices *c* and *d*, and the operating bar *w* will engage the fingers 12 and 14 and force them out of contact with the contact elements 16 and 17 as illustrated in Figs. 3 and 6, or in some cases the bar *w* need not be moved far enough to engage the fingers 12 and 14 to disconnect them, and this in some cases may be desirable. It will be seen therefore that while connection is made between central No. 2 and the telephone, the subscriber may be called by central No. 1 because the signal bell 24 will be connected with central No. 1 through the wires 3 and 4, and the connectors *y* and *z* in engagement with the contact elements 18 and 19, and therefore with the wires *m* and *n*. If however, the switch bars be thrown over in reverse positions so as to connect the telephone with central No. 1, the signal bell will be disconnected from central No. 1 by means of the bar *w* engaging the fingers

13 and 15, but the bar *w* will have released the fingers 12 and 14 so that the signal bell will be in connection with central No. 2.

In some systems of wiring as illustrated in Fig. 7, the telephone is connected as above described and a wire 25 connects the signal bell 24 with the connector *y'* by means of the binding screw 1', a wire 26 connects the signal bell with the binding post *j* and therefore with the wire *n*, and a loop 27 connects the binding posts *h* and *j*, thereby making a continuous line of the wires *l* and *n* with a branch comprising the wire 26 to the signal bell 24. In this case when new switches entire are constructed, the switch bar *v* may be dispensed with and then the wire *t* may be connected with the line comprising the loop 27 so that the circuit will be made or broken as between the wires *k* and *m*, and the circuit between one or the other and the signal bell by means of the contact fingers 12' and 13', so that the subscriber may be called either by central No. 1 or by central No. 2 when the telephone is connected with the other exchange as illustrated in Fig. 7.

In practical use if the switch bars *u* and *v* are in mid position so as to not engage either pair of contact devices, the signal bell 24 may be sounded from either telephone system, and if the switch bars *u* and *v* connect the subscriber with central No. 2 as in Fig. 6 then obviously central No. 2 may call the subscriber by means of the usual telephone call bell, and conversation may be carried on with a subscriber of central No. 2, and at the same time the subscriber may also be called by central No. 1 through the means of the signal bell 24. The reverse connections are illustrated in Fig. 7 in which the telephone is connected with central No. 1 and the signal bell 24 is connected with central No. 2. It will be understood of course that the improved switch may be used in various other electrical circuits and for other purposes than herein-described.

Having thus described the invention, what is claimed as new is—

1. An electrical switch including an insulating base member, two contact devices mounted on the base member and provided each with a supplemental contact element, an electrical connector provided with a binding screw and mounted on the base member

and having two elastic fingers, each finger normally in contact with its respective contact element, a switch bar mounted on the base member and movable into connection with either contact device, and a non-conducting element attached to the switch bar to press either one of the fingers away from the contact element.

2. An electrical switch including an insulating base member, two pairs of contact devices mounted on the base member and each contact device provided with a supplemental contact element, a pair of electrical connectors provided each with a binding screw and mounted on the base member and each having two elastic fingers, each finger of each connector normally in contact with its respective contact element of a contact device of either pair thereof, a pair of switch bars mounted on the base member to engage either pair of contact devices, and an operating bar attached to the switch bars to engage a finger of each connector.

3. In an electrical switch, the combination of a base member, two pairs of electrical contact devices mounted on the base member and having each a supplemental contact element electrically connected therewith that extends opposite to the base member, each contact device being provided with a binding post and insulated one from another, a pair of conducting supports mounted on the base member and provided each with a binding post, the supports being insulated one from the other, a pair of switch bars pivoted to the supports to engage either pair of contact devices, an operating bar attached to the pair of switch bars, and a pair of electrical connectors provided each with a binding screw and mounted on the base member between the supports and electrically insulated from the supports and the contact devices, each connector having two elastic fingers normally in contact with two of the supplemental contact elements to be disconnected therefrom by the operating bar.

In testimony whereof, I affix my signature in presence of two witnesses.

SILVESTER HOADLEY.

Witnesses:

ASAHEL H. WAMPLER,
JOHN W. GRAHAM.