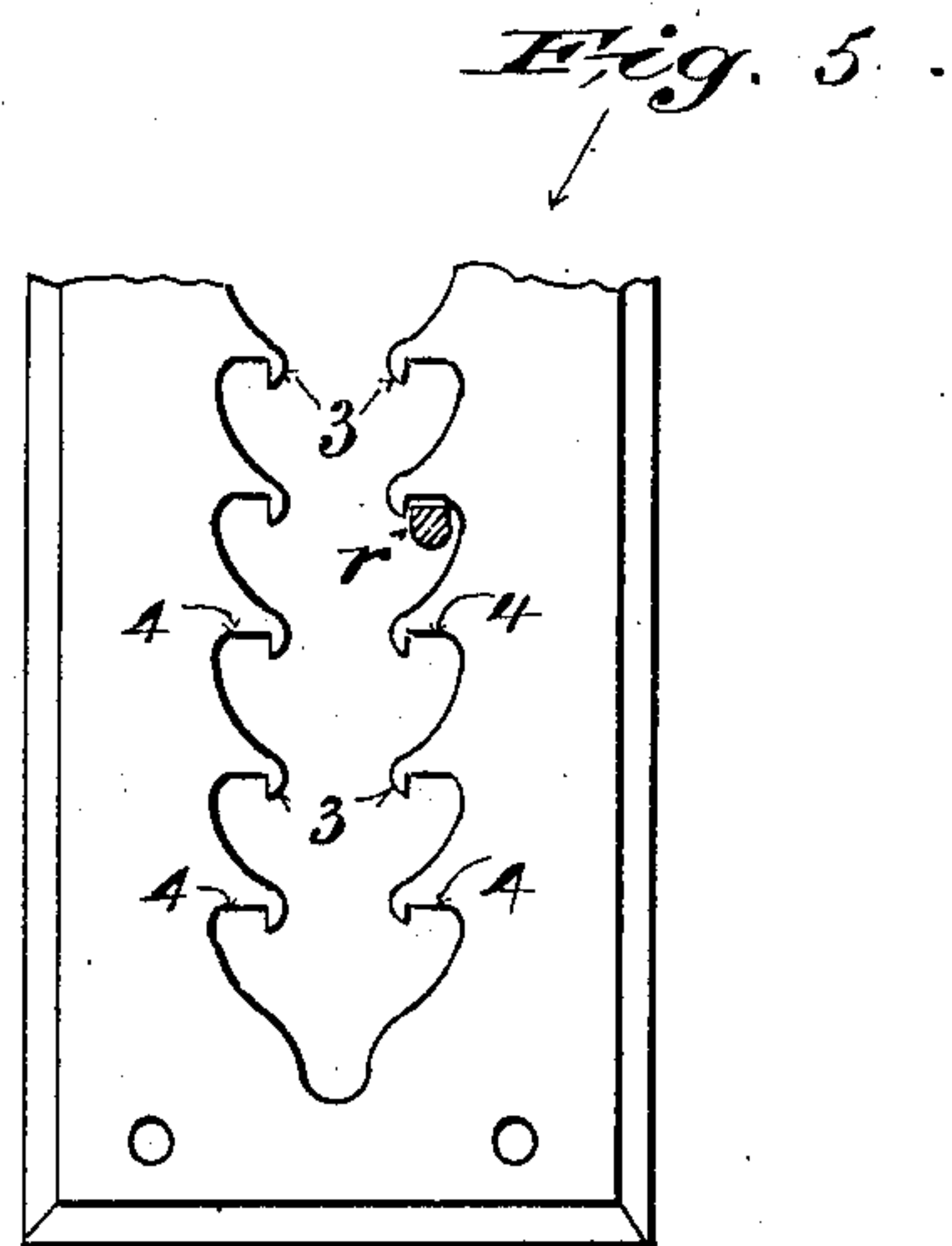
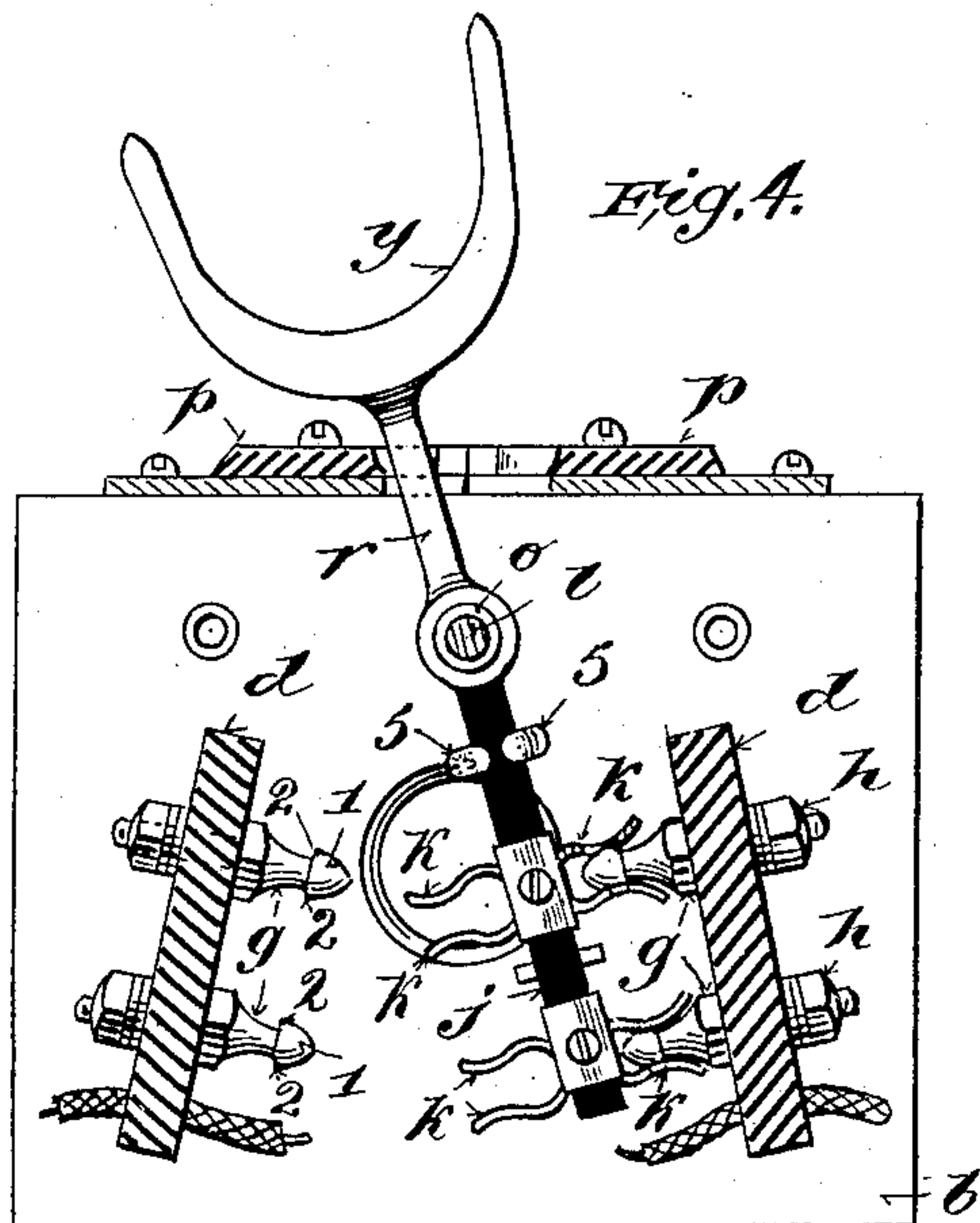
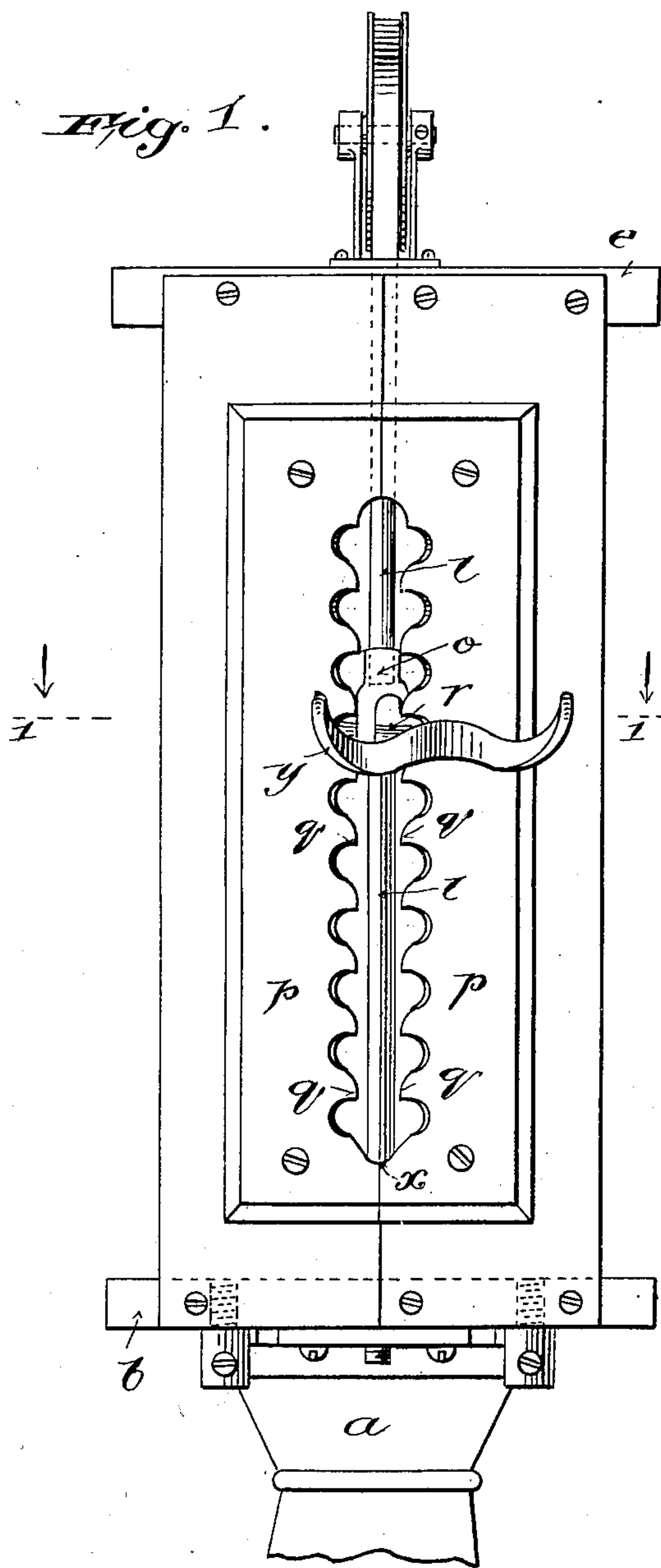


C. C. GOULD.
ELECTRIC SWITCH.
APPLICATION FILED MAR. 19, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses:
C. W. Benjamin
H. S. Marton

Inventor:
Cornelius C. Gould.

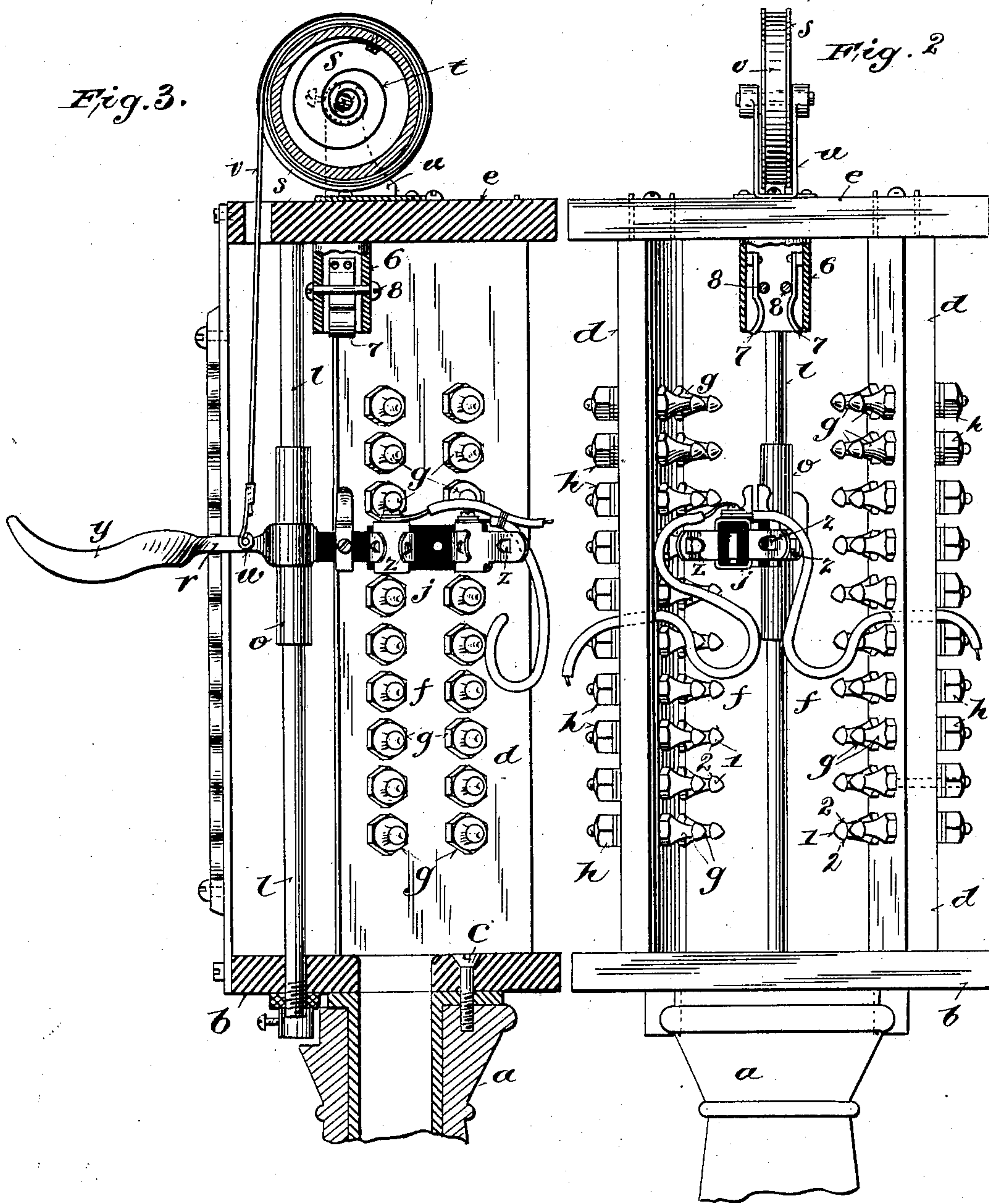
by *Harold M. [Signature]*
att'y

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NO MODEL.

2 SHEETS—SHEET 2.



Witnesses:
 C. M. Benjamin
 H. S. Morton.

Inventor,
 Cornelius C. Gould,
 by *Harold Blum*
 atty

UNITED STATES PATENT OFFICE.

CORNELIUS C. GOULD, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF SIXTEEN TWENTY-SEVENTHS TO MAXWELL SOMMERVILLE AND LEWIS B. MATHIAS, OF PHILADELPHIA, PENNSYLVANIA, WALTER C. TIMM, JR., AND DEVERE WORRELL, OF MORTON, PENNSYLVANIA, AND WILLIAM W. MORTON, OF CAMDEN, NEW JERSEY.

ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 735,966, dated August 11, 1903.

Application filed March 19, 1902. Serial No. 98,932. (No model.)

To all whom it may concern:

Be it known that I, CORNELIUS C. GOULD, a citizen of the United States, whose residence and post-office address is 2518 South Fifteenth street, Philadelphia, Pennsylvania, have invented certain new and useful Improvements in Electric Switches, of which the following is a specification, accompanied by drawings.

My invention relates, broadly, to switches and switching apparatus for changing the relations of electric circuits; and it is applicable to electric-light circuits, telephone and telegraph circuits, electric signaling, and the like.

One of the objects of my invention is to enable the relations of electric circuits to be readily changed and controlled as desired by means of a single piece of apparatus which is particularly applicable to those cases where a plurality of branches are adapted to be energized from a main line and it is required to switch from one branch to another.

Another object of my invention is to enable the switching apparatus to be securely held or locked in any desired position to complete circuit, whereby certainty of operation is secured and liability of derangement of the apparatus by means of jars or knocks prevented.

Further objects of my invention will hereinafter appear in the accompanying specification.

To these ends my invention consists in means for carrying out the above objects embodied in the apparatus and devices having the general mode of operation, as hereinafter fully described and shown in the accompanying specification and drawings, in which—

Figure 1 is a front elevation, partly broken away, of a switching device embodying my invention. Fig. 2 is a rear elevation of said device, partly in section. Fig. 3 is a side elevation of the same, partly in section, one of the sides being removed. Fig. 4 is a sectional plan view on the line 1 1 of Fig. 1. Fig. 5 is a front view of a modified form of apparatus.

My invention may be illustrated in many and various forms; but that form of apparatus illustrated in the accompanying drawings

and hereinafter described has been found suitable and convenient for carrying out the objects of my invention.

Referring to the drawings, upon a suitable base *a*, which may be hollow and a portion of which is shown broken away, is secured a base-plate *b*, as by screws *c*, the base and base-plate forming a stand for the apparatus. The complete apparatus or switching device as a whole is designed to be portable, so that it may be readily used in any situation to which it is applicable, as upon an office-desk or in a railway-train or affixed to a switchboard or wall in a power-station.

Suitably supported upon the base-plate *b* are arranged contacts, in this instance oppositely-located supports *d* being shown secured to the plate *b* in an upright or substantially vertical position and connected at the top by a plate *e*, the supports and top plate forming together a framework for supporting the contacts.

The supports *d* are provided, preferably, on their inwardly-facing sides with series of contacts *f*, comprising individual contacts *g*, shown in this instance arranged in pairs and each having a binding-screw and nut *h*, preferably on the outside of the supports, for the attachment of circuit-wires.

The contact-carrier *j* is suitably mounted in connection with the apparatus, and means are provided whereby the contacts on the carrier and those on the frame may be moved relatively to each other in such manner that circuit may be completed between the contacts on the carrier and those on the frame. As shown in this instance, the framework is stationary, and the carrier *j* is movable relatively thereto, and the plurality or series of contacts *f f* are carried by the supports *d*, while a lesser number, in this instance shown as two pairs of coöperating contacts *k k*, are provided on the carrier *j*, and the carrier is so mounted that it may be moved to complete circuit between its contacts *k k* and any of those of the series *f f*. In order to provide for such movement of the carrier *j* as described, it is preferable to so mount it rela-

tive to the supports and their contacts that it is movable in two directions relative to said supports, or, in other words, I prefer to so mount the carrier that it may have movement longitudinally or in a direction substantially parallel to the supports, while at the same time it may be moved to and from them. Therefore the carrier by such mounting may be moved along the series of contacts and to and from the same to complete circuit between the contacts on the carrier and those of the series.

The carrier may be conveniently slidably and pivotally mounted, as shown, a rod *l* being connected to the frame of the apparatus, so that its length extends substantially parallel to the side supports *d*, and carrier *j* is then connected to a sleeve *o*, adapted to slide upon the rod *l* and to turn thereon about said rod. The carrier for convenience should extend between the supports *d d*, so that by turning it to one side or the other of the rod *l* circuit may be completed between the contacts on the carrier and those on either support.

It may be here stated that my invention does not necessarily contemplate a plurality of supports or two supports *d*, as shown in the drawings; but one support might be provided with a plurality of contacts therein and the carrier may be slidably and pivotally mounted relatively thereto. Such construction might be found desirable where it was unnecessary to use so many contacts; but with two supports provided with inwardly-facing contacts a great variety of changes in circuits are provided for within a small space, which is a great advantage.

Preferably that portion of the carrier extending between the supports *d d* is made of insulating material, so that the contacts *k k*, connected thereto, are insulated from each other. It will be seen that if the main-line wires or the wires of an electric circuit are connected to contacts *k k*, while branch circuits, as light-circuits or telephone or telegraph circuits, are connected to the binding-posts *h* the main line may be switched to any branch that is desired and the circuit completed therewith between the contacts on the carrier and the contacts on a support to which the particular branch circuit is connected.

It is desirable to provide means for holding the carrier and its contacts in any particular position in which the circuit is completed. While this may be done in a variety of ways, according to my construction I provide the apparatus with plates *p*, connected to the framing, which plates have serrated edges, the serrations or teeth *q q* of which should be formed substantially hook-shaped, as shown in Fig. 1, such teeth forming a means for holding the carrier *j* in any desired position to maintain the circuit closed. For this purpose an arm *r* extends from the carrier, to which it is connected, adjacent to the serrated edges of the plates *p*, so that the arm *r*

may enter between any two of the teeth *q*. In order to facilitate the locking of the apparatus, means are provided normally acting to retract the carrier *j* in one direction along the rod *l*, as shown, a spring-actuated roller *s* being mounted on the apparatus, the actuating-spring *t* of which is connected at one end to a bracket *u* and at the other to the roller *s*, while a cord or ribbon *v* is wound upon the roller and connected thereto at one end, while at the other end said cord or ribbon *v* is connected to the carrier *j*, as at the point *w* on the arm *r*. By the arrangement described the tension of the spring tends to move the carrier *j* along the rod *l*, so that when the rod *r* is moved between two of the teeth *q* of the plate *p* the carrier will be locked or held against the tension of the spring *t*. Means are then provided for returning the carrier *j* to its normal position by means of gravity, it being intended that the normal position of the carrier shall be with the arm *r* resting at the bottom portion *x* of the serrated edges of the plates *p*. The carrier may be moved to normal position by means of any suitable weight connected thereto; but for convenience I show a hook *y*, connected to arm *r*, as in telephone apparatus, so that the weight for returning the carrier *j* to normal position at *x* by gravity may be a telephone-receiver when my switch is used in connection with telephone circuits and apparatus. Further means are provided for locking the carrier when circuit is completed between its contacts and those of the supports, this further locking means being preferably connected with the contacts themselves and so designed that lateral movement of the carrier on its pivot is prevented. In the drawings the carrier is shown as having vertical and horizontal movement; but the terms "vertical" and "horizontal" only apply in a case where the apparatus is arranged upright, as shown, and in apparatus built as described the means for locking the contacts to each other is designed to prevent this horizontal movement of the carrier.

The contacts *k* on the carrier are preferably formed of spring-clips, each provided with an aperture *z*, which may be of the form shown in Figs. 2 and 3, while the contacts carried by the supports *g* each has a head 1 with rounded shoulders 2, the construction and arrangement being such that when circuit is completed between the contact on the carrier and one of those on the support *d* the head 1 of said contact will enter the apertures *z* of the spring-clips, as shown in plan view in Fig. 4, where a circuit is shown completed, and thus securely hold or lock the contacts together. The contacts may be readily separated by a push or pull on the outer end of the carrier *j*.

In Fig. 5 a modification is shown of the plate provided with serrations, in this instance it not being necessary to provide means between the contacts for locking them to-

gether to prevent lateral movement of the carrier, whereby the contacts might be separated; but the serrations on the locking-plate are constructed to provide for this contingency. As shown, there are projecting shoulders 3 at each indentation or serration of the locking-plate, so that when the arm *r* of carrier *j* is placed within one of the indentations the tension of the spring *t* tends to pull the arm *r* against the flat portion 4 of the indentation, while the projection 3 prevents lateral movement of said arm *r*.

Further means are provided for changing and varying the relations of electric circuits connected to my switching apparatus or switching device. As shown, the top plate *e* is provided with contacts, to which branch circuits may be connected, and contacts 5 5, insulated from each other, are arranged on carrier *j*, adapted to cooperate with the contacts connected to the plate *e*. In the sectional views of Figs. 2 and 3 a holder 6 of insulating material is shown connected to the plate *e*. Within said holder are provided spring-clips 7 of conducting material, while contacts in the form of screws 8 form additional means for the connection of circuits to the apparatus. When the carrier *j* is moved to its greatest extent in the direction to which it is normally retracted by means of spring *t*, the contacts 5 5 on the carrier are adapted to enter within the holder 6 and complete circuit with spring-clip 7 and contacts 8.

Obviously, as hereinbefore stated, some features of my invention may be used without other features and may be embodied in widely-varying forms. For this reason, without enumerating equivalents nor limiting myself to the construction shown and described,

I claim, and desire to obtain by Letters Patent, the following:

1. In an electric switch, the combination of a support provided with contacts, a carrier provided with contacts and bodily movable substantially parallel to said support and to and from the same, whereby circuit may be completed between the contacts on the support and those on the carrier, and means for locking the contacts to each other when circuit is so completed, for substantially the purposes set forth.

2. In an electric switch, the combination of a series of contacts provided with heads, a carrier provided with contacts consisting of spring-clips having apertures therein, and means for moving said carrier to complete circuit between its contacts and any of those of the series, whereby when circuit is so completed the head of a contact enters the apertures in the clips and forms a lock, for substantially the purposes set forth.

3. In an electric switch, the combination of oppositely-located supports provided with contacts, a carrier provided with contacts, and means whereby said carrier may be moved to complete circuit between its contacts and any

of those on the supports, and means in the contacts for locking the contacts to each other when circuit is so completed, for substantially the purposes set forth.

4. In an electric switch, the combination of oppositely-located supports provided with contacts, a carrier provided with contacts, and means whereby said carrier may be moved to complete circuit between its contacts and any of those on the supports, means in the contacts for locking the contacts to each other and means for locking the carrier to the support when circuit is so completed, for substantially the purposes set forth.

5. In an electric switch, the combination of oppositely-located supports provided with contacts, a carrier provided with contacts, means whereby said carrier may be moved to complete circuit between its contacts and any of those on the supports, a spring normally acting to retract said carrier in one direction and a plate provided with straight serrated edges for locking the carrier against the tension of the spring when circuit is completed, for substantially the purposes set forth.

6. In an electric switch, the combination of a contact provided with a head and a cooperating contact consisting of spring-clips provided with apertures, whereby when circuit is completed, said head enters the apertures in the clips and locks the contacts together, for substantially the purposes set forth.

7. In an electric switch, the combination of a frame, series of contacts on the sides thereof, contacts on the end thereof, and a carrier movable within the frame and provided with contacts whereby circuit may be completed between its contacts and those on the sides and end of the frame, for substantially the purposes set forth.

8. In an electric switch, the combination of a frame, series of contacts on the sides thereof, contacts on the end thereof, and a carrier movable within the frame and provided with contacts whereby circuit may be completed between its contacts and those on the sides and end of the frame, and means for maintaining the carrier in any position to which it is moved to complete circuit, for substantially the purposes set forth.

9. In an electric switch, the combination of a frame, a plurality of series of contacts thereon, a carrier movable within the frame and provided with contacts whereby circuit may be completed between its contacts and the contacts of any series on the frame, and means in the contacts for locking them to each other when circuit is completed, for substantially the purposes set forth.

10. In an electric switch, the combination of a frame, a series of contacts on the sides thereof, contacts on the end thereof, a carrier movable within the frame and provided with contacts whereby circuit may be completed between its contacts and those on the sides and end of the frame, and plates connected to the frame provided with serrated

edges for locking the carrier in position when circuit is completed between its contacts and any of those on the sides of the frame, for substantially the purposes set forth.

- 5 11. In an electric switch, a series of contacts, contacts adapted to cooperate with those of the series, and means for moving the series of contacts and the cooperating contacts relatively to each other, whereby circuit may
10 be completed between the cooperating contacts and the individual contacts of the series, and means in the contacts for locking them to each other, substantially as set forth.
12. In an electric switch, a series of con-
15 tacts, contacts adapted to cooperate with those of the series, and means for moving the series of contacts and the cooperating contacts in two directions relatively to each other, whereby circuit may be completed between
20 the cooperating contacts and the individual contacts of the series and means for locking the contacts to each other, for substantially the purposes set forth.
13. In an electric switch, the combination
25 of a series of contacts and a pivoted and slidable carrier provided with contacts adapted to cooperate with the contacts of said series, whereby circuit may be completed between the contacts on the carrier and the individual
30 contacts of the series, and means for locking the contacts to each other, for substantially the purposes set forth.
14. In an electric switch, the combination
35 of oppositely-arranged supports, series of contacts on the inner faces thereof, a rod extending substantially parallel to said supports, a carrier slidably and pivotally mounted on said rod and provided with locking-contacts adapted to cooperate with the series of contacts on
40 said supports and lock the carrier against movement to and from the supports, for substantially the purposes set forth.
15. In an electric switch, the combination
45 of a support, series of contacts thereon, a carrier movable in two directions relatively to the said contacts and provided with contacts, whereby circuit may be completed between the contacts on the carrier and those on the support, and means on the carrier cooperating
50 with means on the said support which has the series of contacts, for locking the carrier to the said support when circuit is completed, substantially as set forth.
16. In an electric switch, the combination
55 of a support, a plurality of series of contacts thereon, a carrier provided with contacts, means for moving the carrier and support relatively to each other in two directions, whereby circuit may be completed between
60 the contacts on the carrier and the contacts of any series on the support, and means for locking said carrier and support together when circuit is completed, for substantially the purposes set forth.
- 65 17. In an electric switch, the combination of a support, a plurality of series of contacts thereon, a carrier provided with contacts,

means for moving the carrier and support relatively to each other in two directions, whereby circuit may be completed between 70 the contacts on the carrier and the contacts of any series on the support, means for locking said carrier and support together when circuit is completed, and means normally acting to retract the carrier to normal position, 75 for substantially the purposes set forth.

18. In an electric switch, the combination of oppositely-located supports, series of contacts thereon, plates connected to the supports and provided with serrated edges, a carrier 80 provided with contacts and slidably and pivotally mounted relative to said supports and extending between said plates, whereby the carrier may be held by the serrations of said plates to maintain circuit completed be- 85 tween the contacts on the carrier and the contacts on the supports, for substantially the purposes set forth.

19. In an electric switch, the combination of a support, a plurality of contacts thereon, 90 a plate connected to said support and provided with serrated edges, a carrier adapted to engage directly with said serrated edges and provided with contacts and movable relatively to said support, whereby the carrier 95 may be locked by the serrations of said plate to maintain circuit completed between the contacts on the carrier and any of the contacts on the support, for substantially the purposes set forth. 100

20. In an electric switch, the combination of a support and contacts thereon, a carrier provided with contacts cooperating with the contacts on the support, and a plate provided with a serrated edge, said carrier being adapt- 105 ed to engage directly with the serrations of the plate for locking the carrier in different positions, for substantially the purposes set forth.

21. In an electric switch, the combination 110 of a series of contacts, a carrier provided with contacts cooperating therewith, means normally acting to move the carrier in one direction and a plate provided with a serrated edge, said carrier being adapted to engage di- 115 rectly with the serrations of the plate for locking the carrier in different positions, for substantially the purposes set forth.

22. In an electric switch, the combination of oppositely-located supports provided with 120 contacts on their inwardly-facing sides, a carrier pivoted to swing between said supports and adapted to be moved longitudinally relatively thereto, contacts on said carrier adapted to cooperate with the contacts on said sup- 125 ports, means normally acting to retract the carrier longitudinally in one direction, means for returning the carrier to normal position by gravity, and means for locking the carrier in any desired position to maintain cir- 130 cuit closed, for substantially the purposes set forth.

23. In an electric switch, the combination of a support provided with contacts, a car-

rier movable substantially parallel to the support and provided with contacts, means normally acting to retract said carrier in one direction parallel to the support, means for re-
5 turning the carrier to normal position in the opposite direction by gravity, and means for holding the carrier in a given position to complete circuit, for substantially the purposes set forth.

10 24. The combination of a support provided with contacts, a carrier provided with contacts cooperating with those on the support, and means in the contacts for locking the con-
15 tacts to each other and means for locking the carrier to the support when circuit is completed, substantially as and for the purposes set forth.

25. In an electric switch, the combination

of oppositely-arranged supports, series of con-
tacts on the inner faces thereof, a rod extend- 20
ing substantially parallel to said supports, a carrier slidably and pivotally mounted on said rod and provided with contacts adapted to cooperate with the series of contacts on
said supports, means normally acting to move 25
the carrier along the rod in one direction, and means for locking the carrier in a given position relative to the series of contacts on the supports, for substantially the purposes set forth. 30

Signed this 12th day of March, 1902, at New York.

CORNELIUS C. GOULD.

Witnesses:

E. VAN ZANDT,

HERBERT G. OGDEN, Jr.