

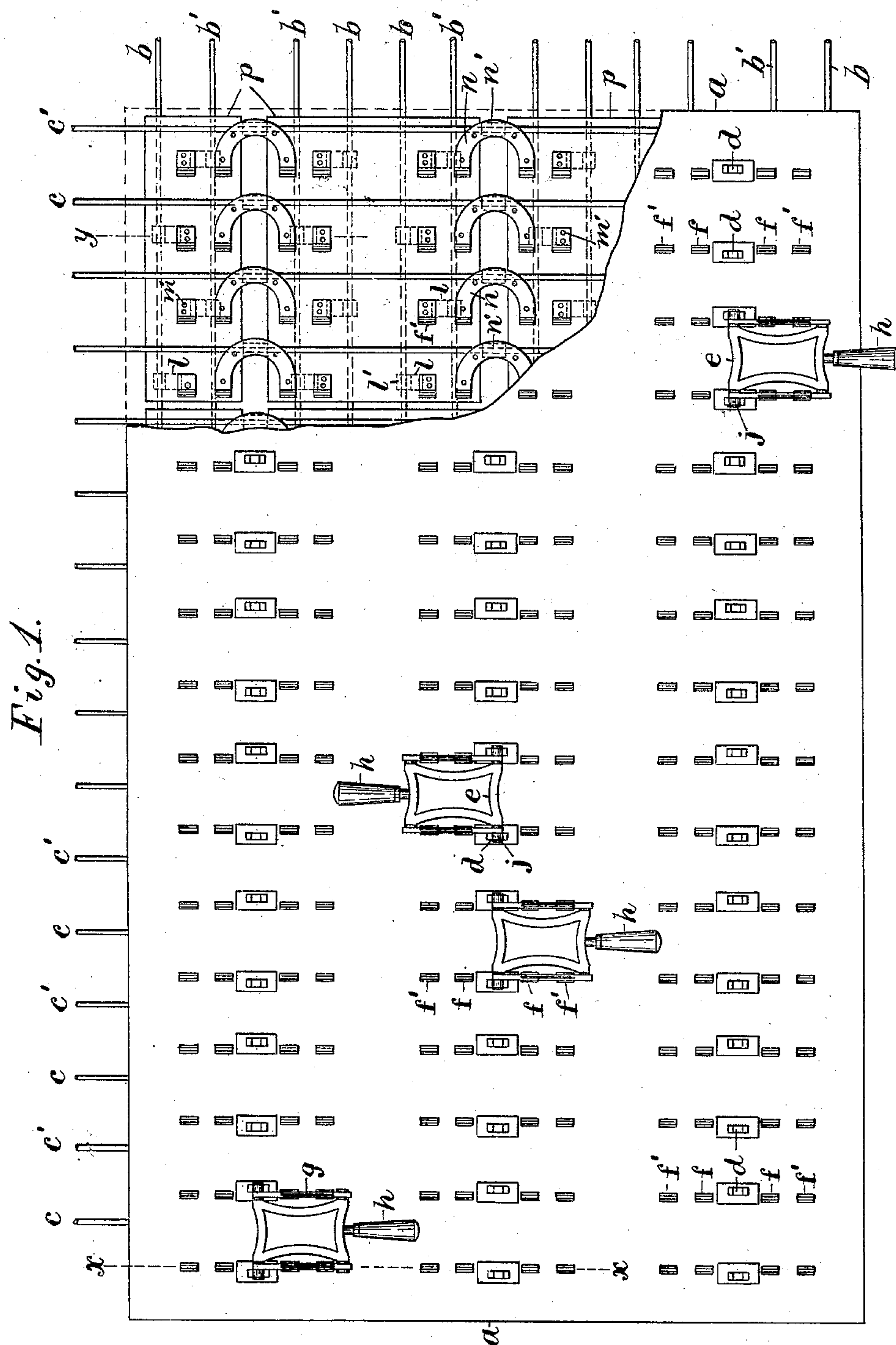
(No Model.)

2 Sheets—Sheet 1.

J. B. McGIFFERT.
ELECTRIC LIGHTING SYSTEM.

No. 509,443.

Patented Nov. 28, 1893.



Attest:

Edw. F. Kinsey.
William Batson

Inventor.

James B. McGiffert.
per Crane & Miller, attys.

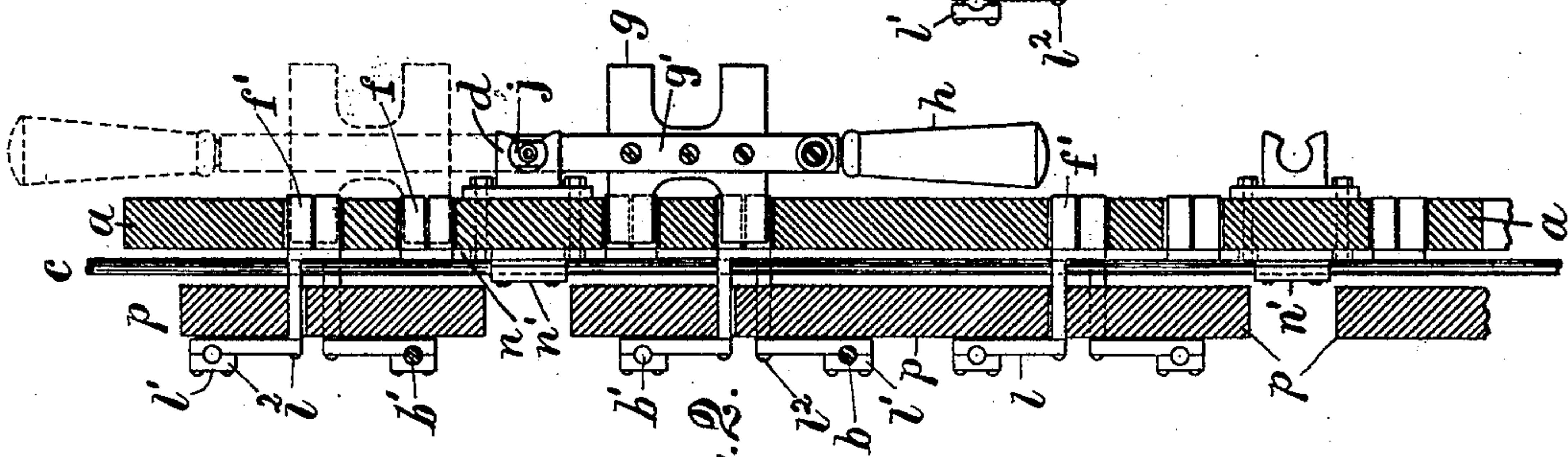
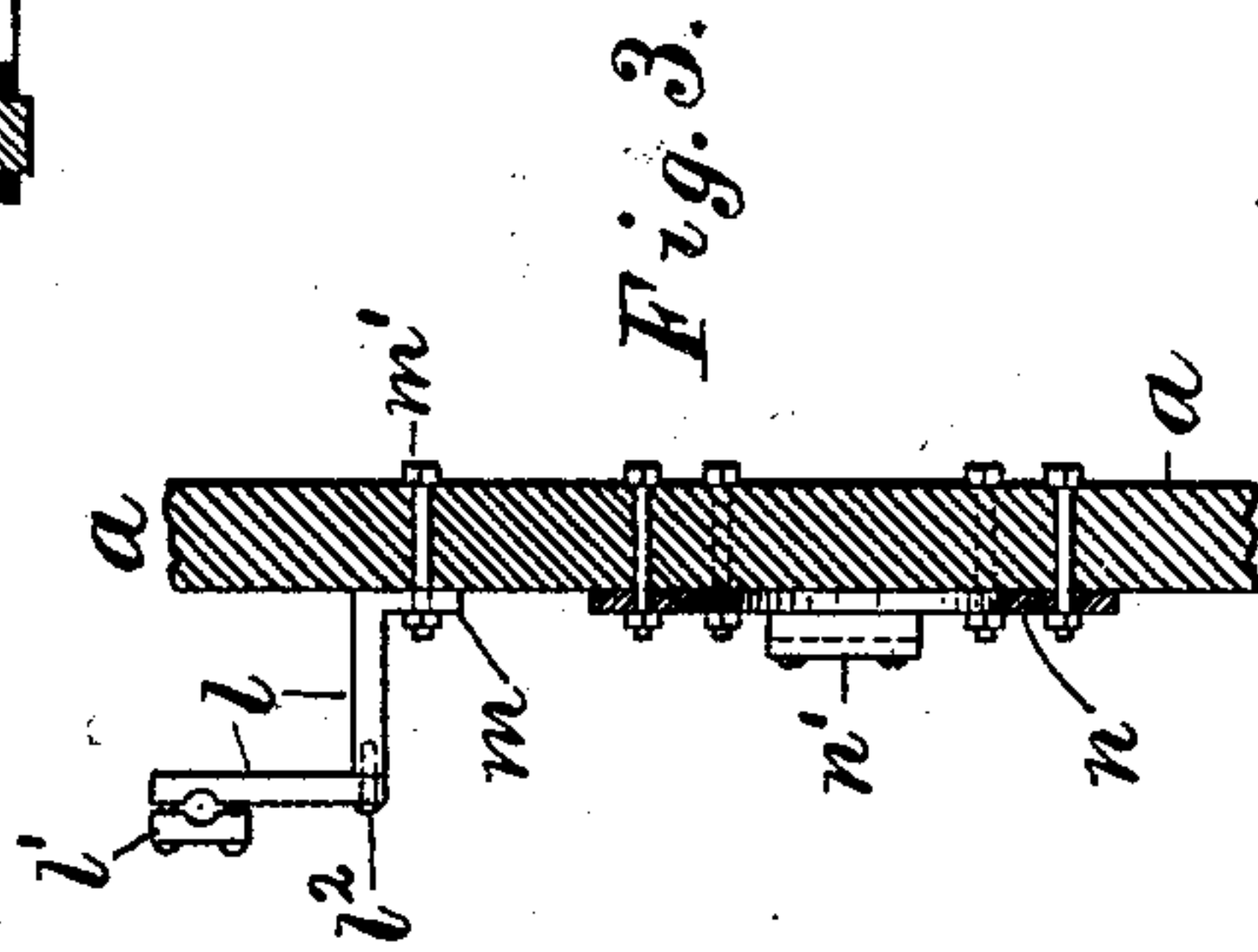
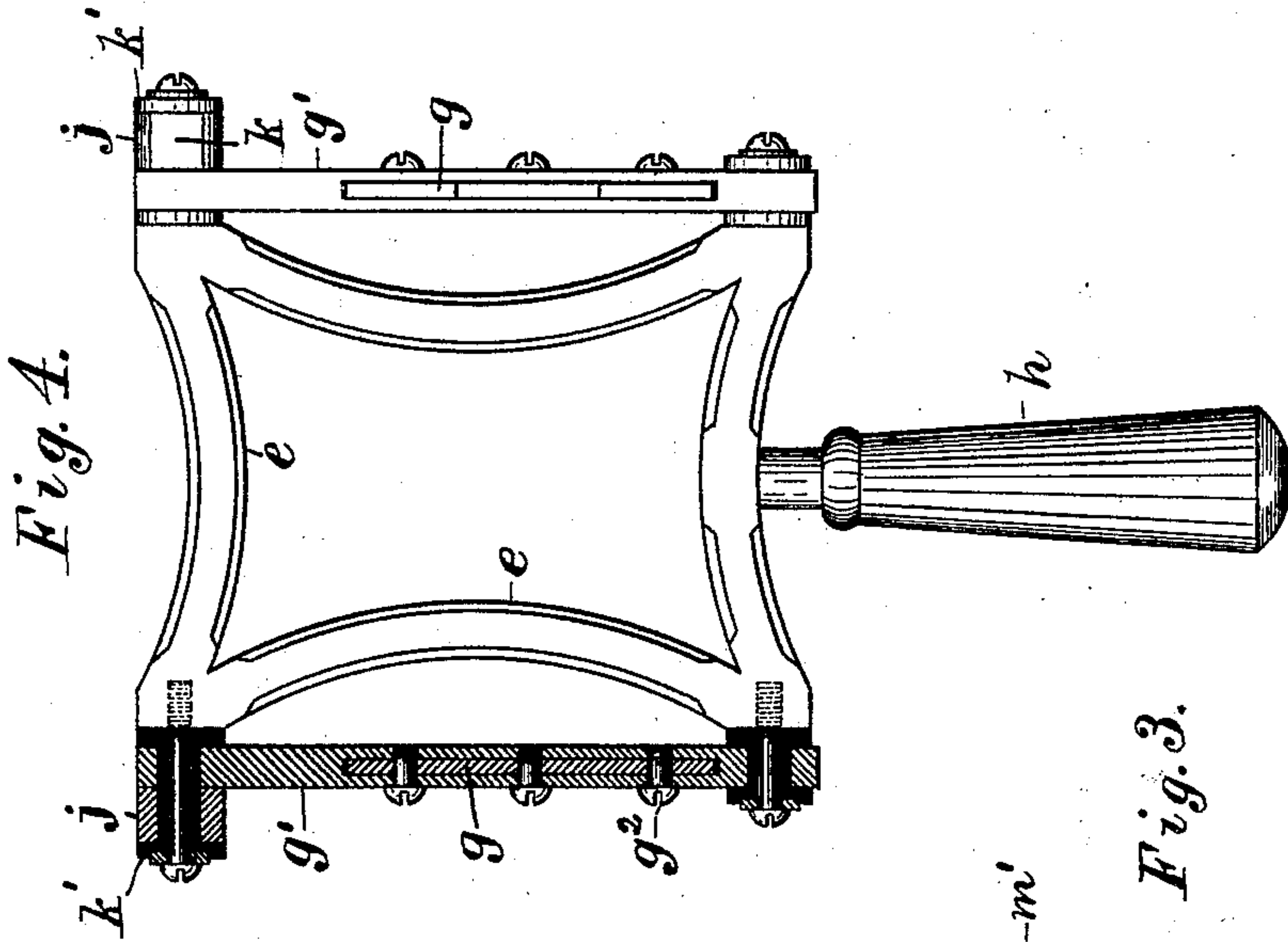
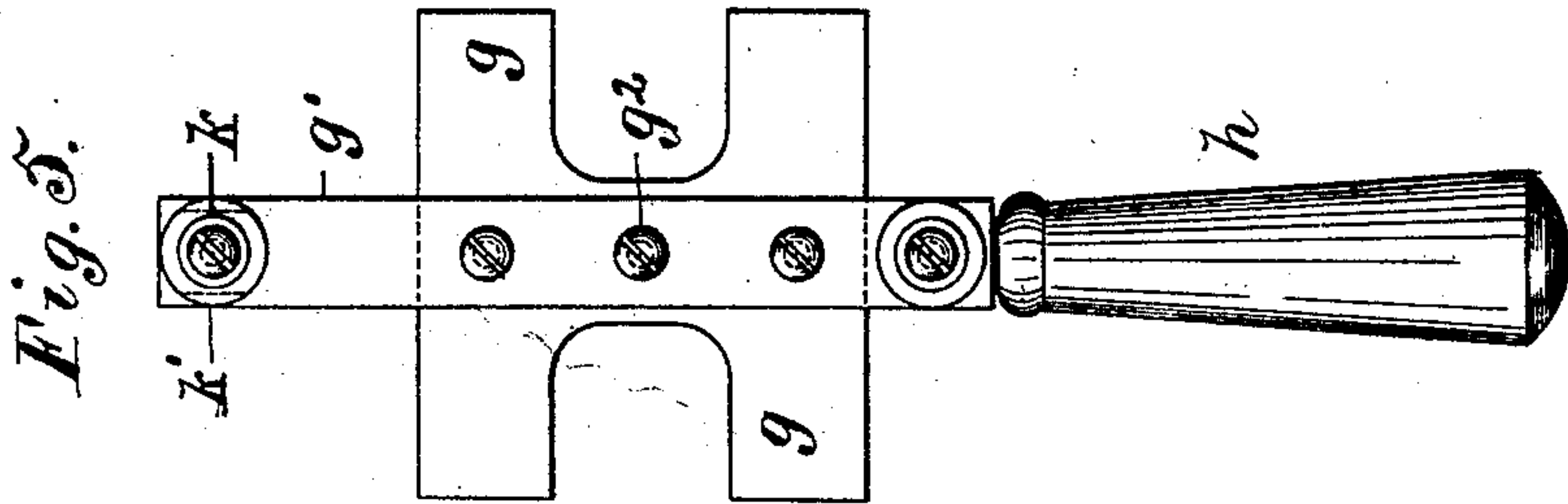
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2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

JAMES B. MCGIFFERT, OF ELIZABETH, NEW JERSEY.

ELECTRIC-LIGHTING SYSTEM.

SPECIFICATION forming part of Letters Patent No. 509,443, dated November 28, 1893.

Application filed March 24, 1893. Serial No. 467,411. (No model.)

To all whom it may concern:

Be it known that I, JAMES B. MCGIFFERT, a citizen of the United States, residing at Elizabeth, Union county, New Jersey, have invented certain new and useful Improvements in Switchboards, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

10 This invention relates to such switch boards as are used for connecting dynamos interchangeably with circuits in which the current is employed for the generation of light or power.

15 The invention consists partly in a switch board provided with series of clips connected with the dynamo and circuit conductors, bearings adjacent to such clips and contact levers each fitted detachably to the bearings of a separate series and adapted to form electrical connection between the said clips; partly in a special construction for the contact lever; and partly in a special means of supporting and insulating the conductors.

25 In the annexed drawings, Figure 1 is a front elevation of a switch board embodying my improvement, showing the upper right hand corner of the face plate broken away to exhibit the conductors, their contact pieces and the sectional insulators. Fig. 2 is a sectional elevation of a portion of the switch board on line *x x* in Fig. 1, but upon a larger scale. Fig. 3 is a similar section of a portion of the switch board on line *y y* in Fig. 1. Fig. 4 is a plan, and Fig. 5 an edge view of the pivoted contact levers, and upon a still larger scale.

35 *a* is the face plate of the switch board which is provided with connections for six dynamos and eight circuits; the conductors *b b'* being connected with the dynamos, and the conductors *c c'* with the circuits. The face plate is provided with three rows of journal bearings *d* to which the contact levers *e* are fitted, and the face plate is provided with two rows of slots at each side of such bearings for clips *f f'* into which the knives *g* of the contact lever may be thrust by means of the handle upon such lever. The clips *f* nearest to the bearings *d* are connected with the circuit conductors *c c'*, and the clips *f'* which are farthest from the bearings are connected to the dynamo conductors *b b'*. The conductors *b b'*

are connected to their respective clips by means of brackets *l* provided each with a clamp *l'* upon its outer arm to embrace the conductor, and provided on its inner end with the foot piece *m*, which is secured to the back of the face plate by bolts *m'* and from which the clips *f'* project through a slot in the face plate. The clips are omitted in Fig. 3, as the face plate is in section through the bolt *m'* which lies at one side of the slot in which the clip is inserted. The outer arm of the bracket is shown secured detachably to the adjacent portion by the screw *l²*. Each of the circuit conductors *c c'* is connected with two of the clips nearest to the bearings *d* by a segmental plate *n* with a clamp *n'* at the middle to embrace the conductor. A series of insulating plates *p* is shown hung upon the brackets *l* and thus lie between the two sets of conductors and serve to effectually insulate them from one another. Both sets of conductors are sustained exclusively by fastenings to the face plate, and the plates *p* are provided with holes at suitable points through which the brackets *l* are projected to support such plates. By securing all the fixtures to the face plate, I am enabled to employ merely a rough and unfinished plate or series of plates *p* to provide the suitable insulation between the two sets of conductors; by the use of which the cost of the switch board is considerably reduced.

The construction in detail for the contact levers is shown in Figs. 4 and 5, comprising slotted bars *g'* having removable knives *g* secured in the slots by screws *i*; the bars *g'* being affixed at their ends to the corners of an independent rigid frame *e* to one end of which the handle *h* is attached, and from the opposite ends of which the pivots *j* are projected laterally to engage the bearings *d*. The bars *g'* are insulated from the frame in the usual manner, as indicated at the left side of Fig. 4. The frame is of substantially rectangular shape with concave sides; but the specific shape and construction of the frame are immaterial provided it furnishes a rigid foundation to which the bars *g'* are detachably connected. By the use of such a rigid frame, the handle, the pivots and the bars *g'*, which together form what I have termed the "contact lever," are held in their desired relations in the most rigid manner, and cannot be

racked and the stiffness of the structure lessened by continued use.

The bearings, as shown in Fig. 2, are formed with open sockets which include more than one half of a circle, and the pivots j are made of circular studs adapted to fit such bearings and provided with flattened portions k upon two sides in line with the bars g' , as shown in Fig. 5, so as to enter the open side of the bearing when the frame is held in such position, and the frame is thus adapted to operate interchangeably with any of the bearings upon the face plate. The pivots may therefore be inserted in or removed from the bearings when the lever is held in such position, and the lever is thus adapted to operate interchangeably with any of the bearings upon the face plate. When the pivots are entered in the bearings the frame may be turned upon the pivots to throw the knives into the clips at either side of the bearings, as shown in full and dotted lines in the upper part of Fig. 2; as the bearings engage with the round portion of the pivots and hold them securely during such movement.

The washer k' which is shown upon the outer end of the pivot k in Figs. 3 and 4, is omitted from Fig. 2 to show the arrangement of the pivot within the socket of the bearing. While the lever is journaled in one pair of the bearings it thus serves to connect the conductors of a single circuit with either of the two dynamos; but is equally adapted to use in two other bearings to connect the same circuit conductors with two other dynamos.

In Fig. 1 the vertical rows of clips in line with each pair of bearings are connected with the same circuit conductors c, c' , and three pairs of bearings are shown in such row, with any of which the pivoted frame and its contacts may operate. In practice I furnish the switch board with only a single contact lever for all the clips which are connected with a single circuit, and transfer the same to any of the bearings in such row to connect such circuit with the desired dynamo.

In four places upon the face plate in Fig. 1, I have shown the contact levers applied to the bearings and in contact with certain of the clips, the levers being removed from the remainder of the rows to illustrate their detachability more fully.

By furnishing only one contact lever for each vertical row, I compel the operator to shift the frame to the proper bearings in connecting any of the circuits with the required dynamo, and it is thus impossible to connect the circuit with more than one dynamo at the same time.

In some instances it may be found desirable to form each contact lever interchangeable in only one of the rows of bearings, in order to prevent positively the application of more than one lever to the same dynamo conductors. In such case the form or dimensions of the bearings in the different rows may be slightly varied, the switch board be-

ing supplied with a single lever for each row of such bearings.

In the drawings, the switch board is constructed for eight circuits and six dynamos, and the circuit conductors are arranged in vertical rows; but it is obvious that the switch board may be enlarged or reduced in size as may be required, and that the conductors may be arranged and connected in any other convenient manner.

Although a single rough slab of slate or other suitable material may be used to insulate the two sets of conductors supported by the face plate a , I consider it preferable to divide the same into sections, as shown in the drawings to afford access between the same to the fixtures applied to the back of the face plate; or to permit the removal of such portion as may be necessary to expose such fixtures.

From the foregoing description it will be seen that the essential feature of my improvement is the provision, in a switch board having several series of bearings and adjacent contact clips, of removable contact levers each fitted to and interchangeable with the bearings of a separate series; and that it is not material that each series of bearings should be provided with a separate contact lever, although each lever must be applied to a different series of bearings, in order to effect the object of the invention.

The formation of the angle piece or bracket l with detachable arms permits the application of the insulation plates p to the inner arm before the outer arm is secured in place by the screws l^2 , but any other construction may be adopted to introduce the series of plates between the clamps l' and n' , which support the sets of conductors.

It is immaterial what form of bearing be used for the contact levers, provided the pivots be fitted detachably to such bearings.

By the above described improvements, I add to the durability of the apparatus, increase the accuracy of its operation, and prevent the improper connection of the circuits.

Having thus set forth the invention, what I claim is—

1. A switch board comprising several series of bearings, a contact lever fitted removably and interchangeably to the bearings of one or more of the said series, and contact clips adjacent to the bearings of each series, as set forth.

2. A switch board comprising several series of bearings, a contact lever for each series fitted removably and interchangeably to the bearings thereof, and contact clips adjacent to the bearings of each series, as set forth.

3. The combination, with a rigid frame having a handle at one end and laterally projecting pivots at the opposite end, of detachable bars carrying contact knives upon the sides of such frame and insulated therefrom, as set forth.

4. In a switch board, the combination, with

bearings having open sockets and suitable clips adjacent thereto, of contact levers each comprising the frame *e* with handle *h* at one end, the flattened pivots *j* projected laterally at the opposite end and the insulated bars with contact knives upon the sides of the frame, substantially as herein set forth.

5. In a switch board, the combination, with the face plate *a* having slots with clips fitted therein, of suitable bearings with contact levers pivoted therein and adapted to engage the clips, two sets of conductors at right angles in the rear of the face plate with connections to such clips, and an insulating plate or plates interposed between the two sets of conductors, substantially as herein set forth.

6. In a switch board, the combination, with the face plate *a* having slots with clips fitted therein, of suitable bearings with contact levers pivoted therein and adapted to engage the clips, the clamps *n'* attached to the face plate, the angle pieces *l* having arms connected detachably and the series of plates *p* sustained upon the same, substantially as set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JAS. B. MCGIFFERT.

Witnesses:

FOSTER M. VOORHEES,
HENRY J. MILLER.