

(No Model.)

2 Sheets—Sheet 1.

S. WALKER & LE GRAND MARSHALL.
SWITCH OPERATING MECHANISM.

No. 509,340.

Patented Nov. 21, 1893.

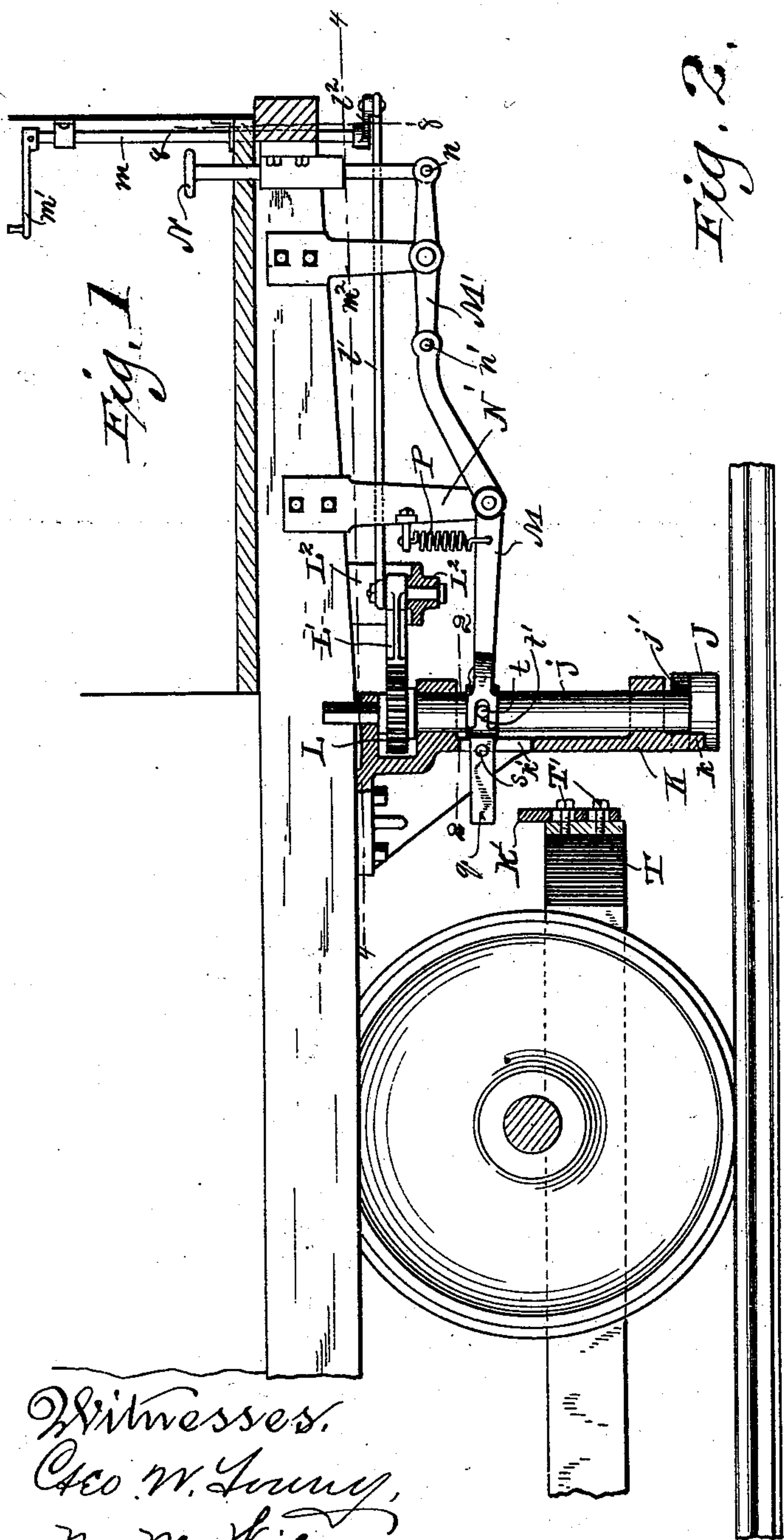


Fig. 1

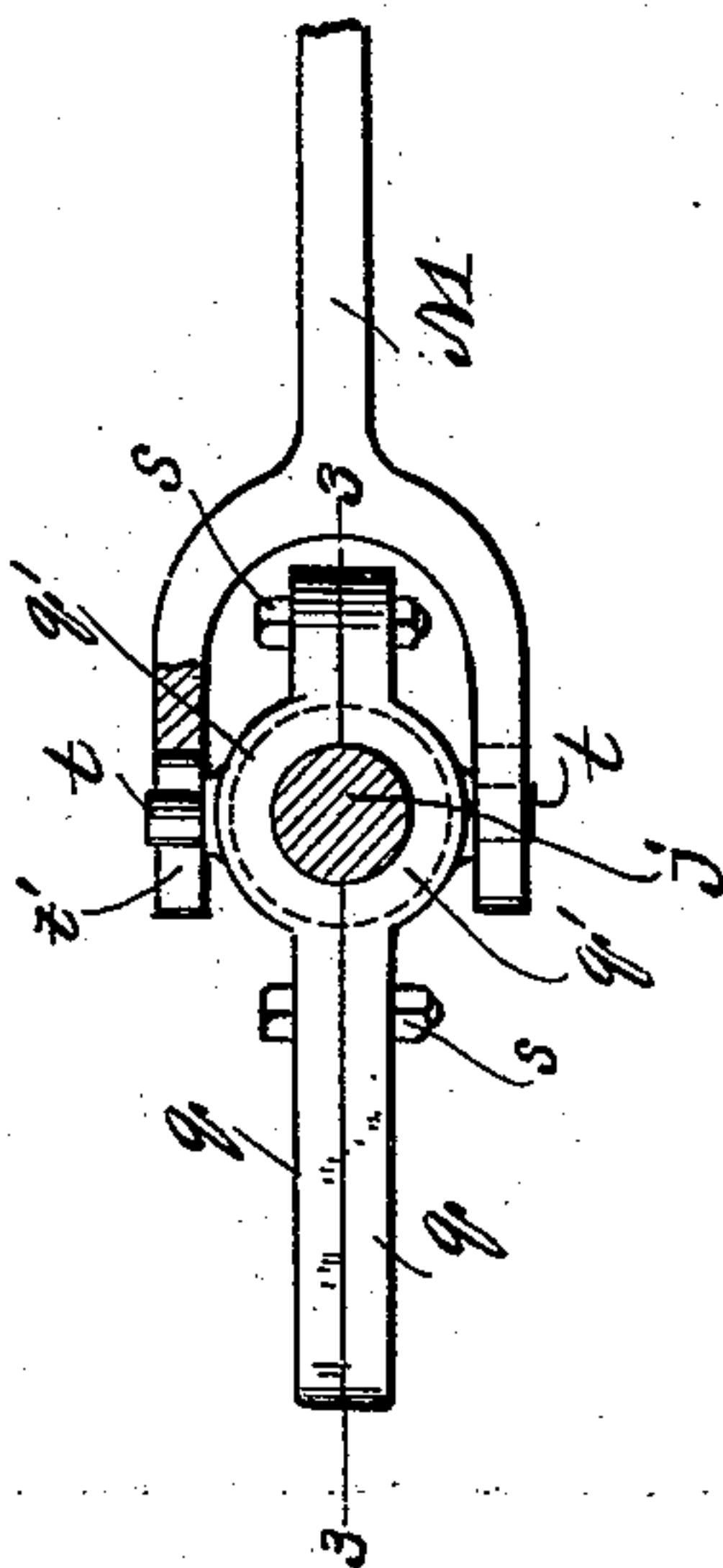


Fig. 2.

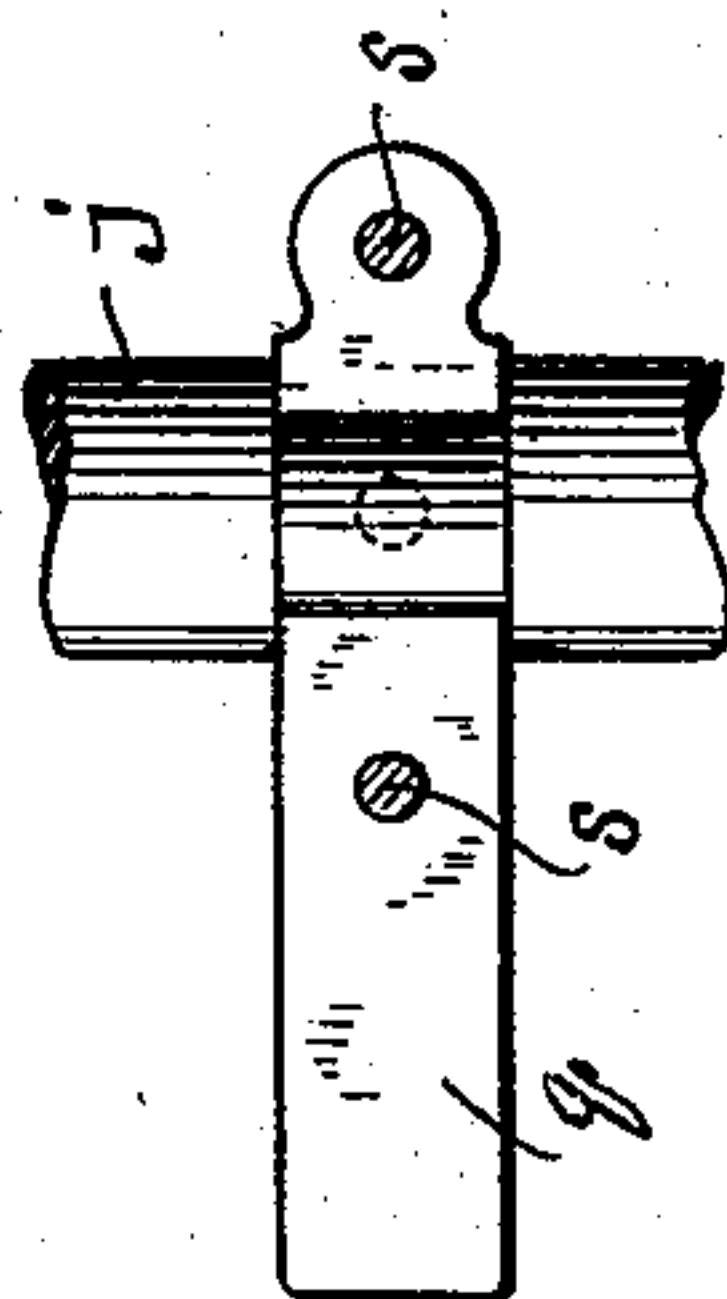


Fig. 3.

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Fig. 4.

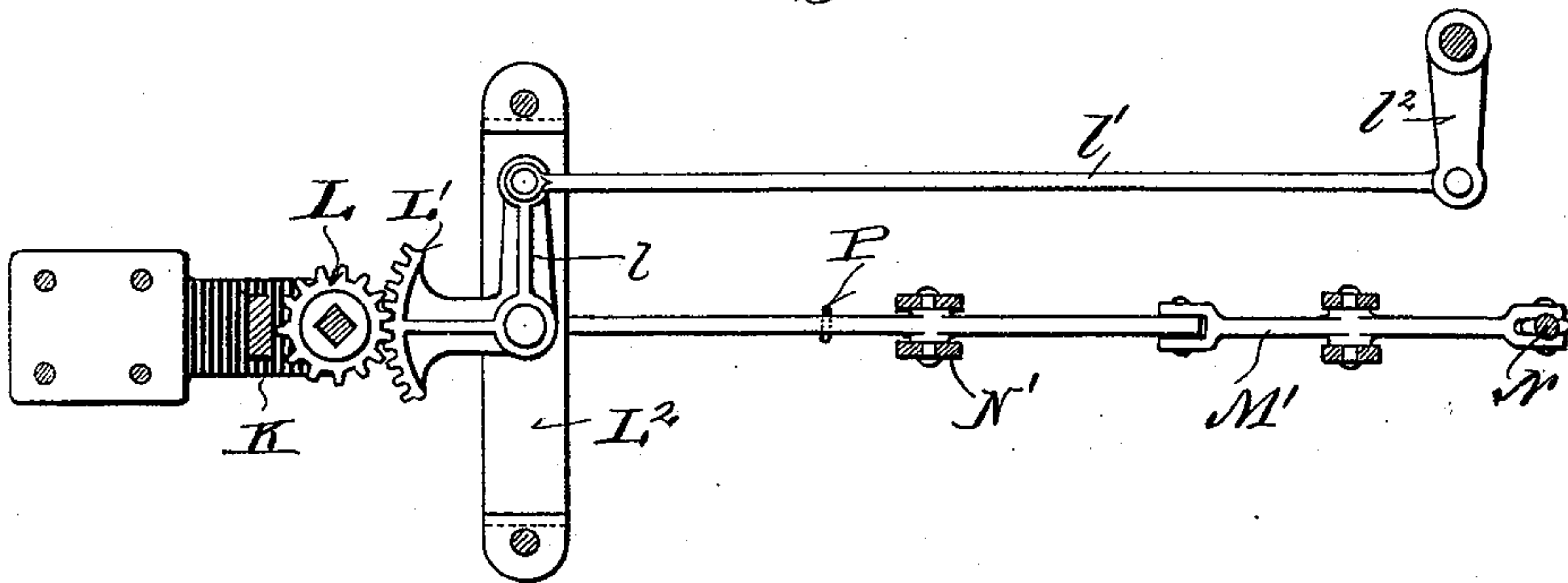


Fig. 5.

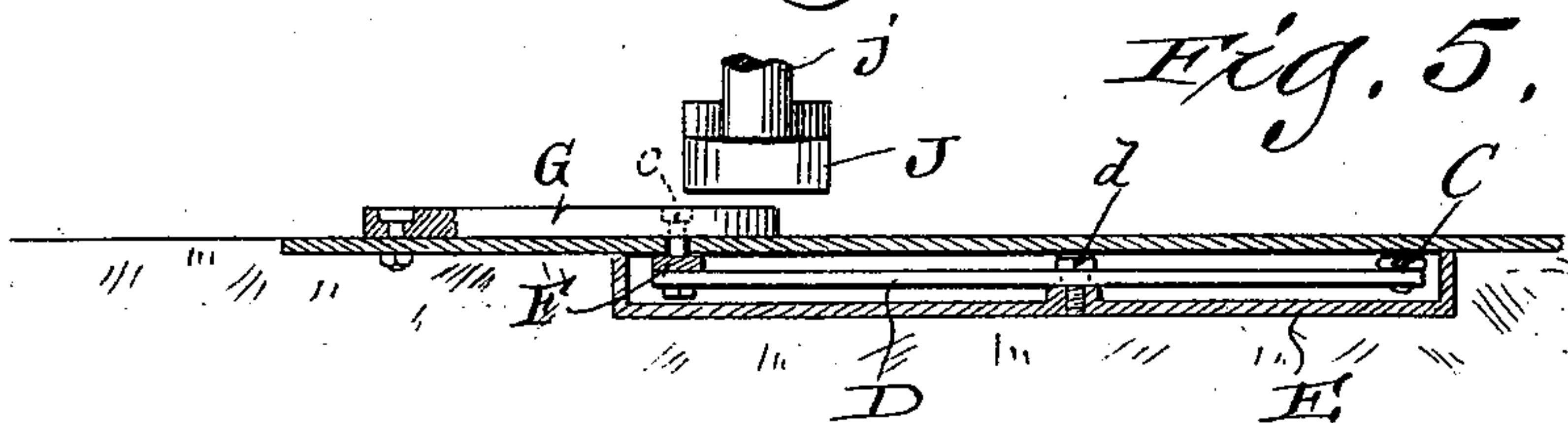


Fig. 6.

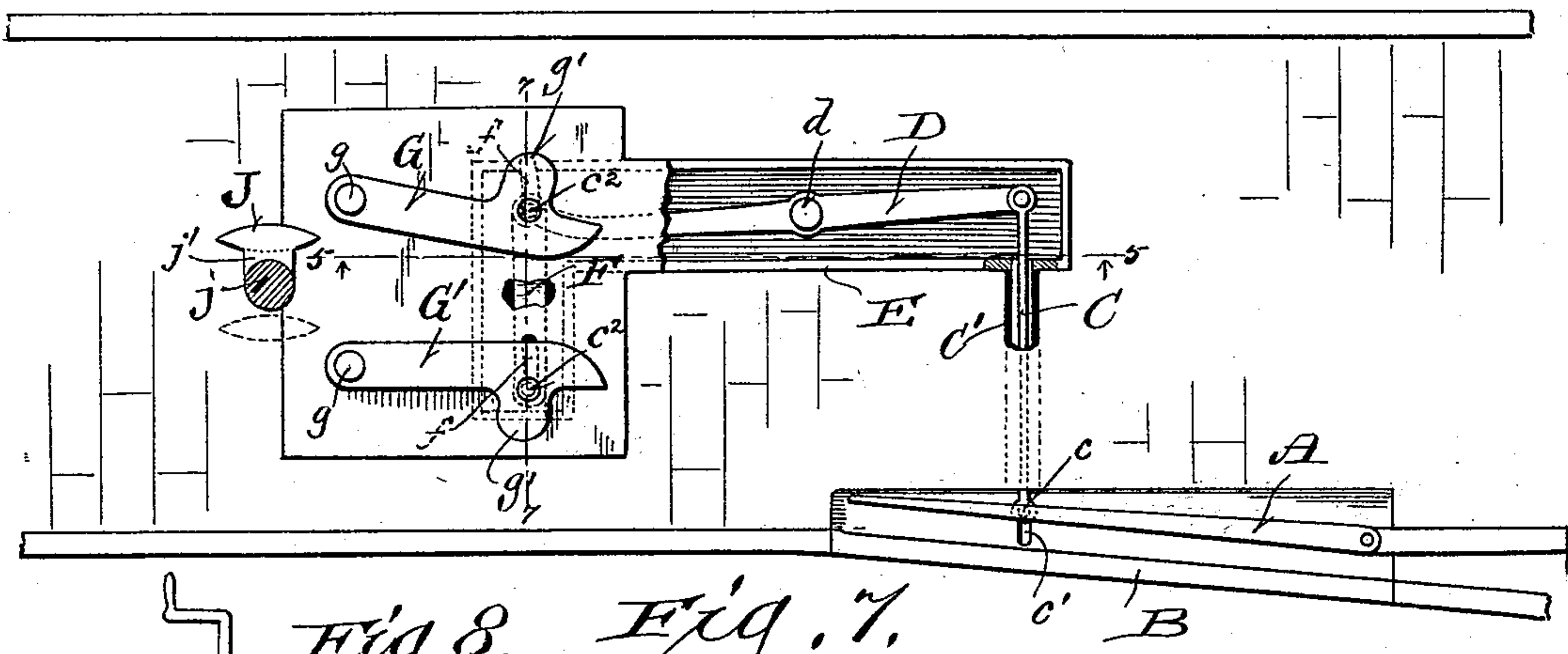


Fig. 8.

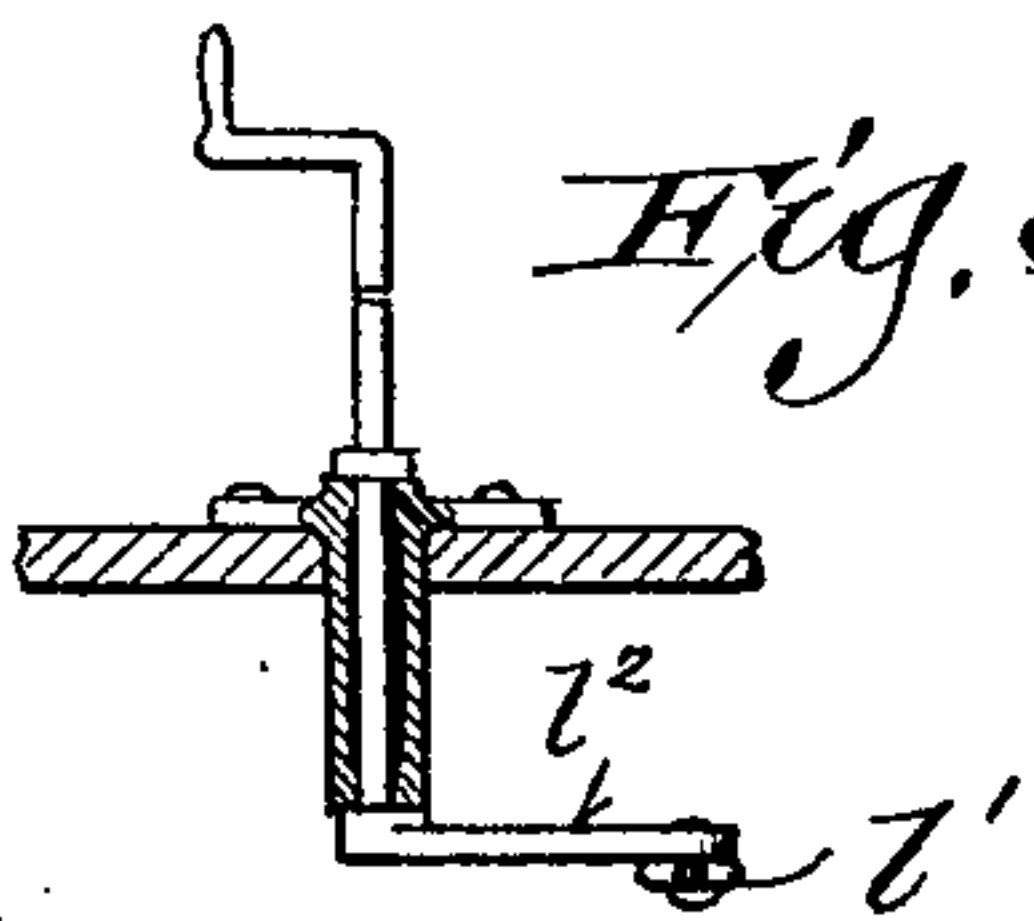
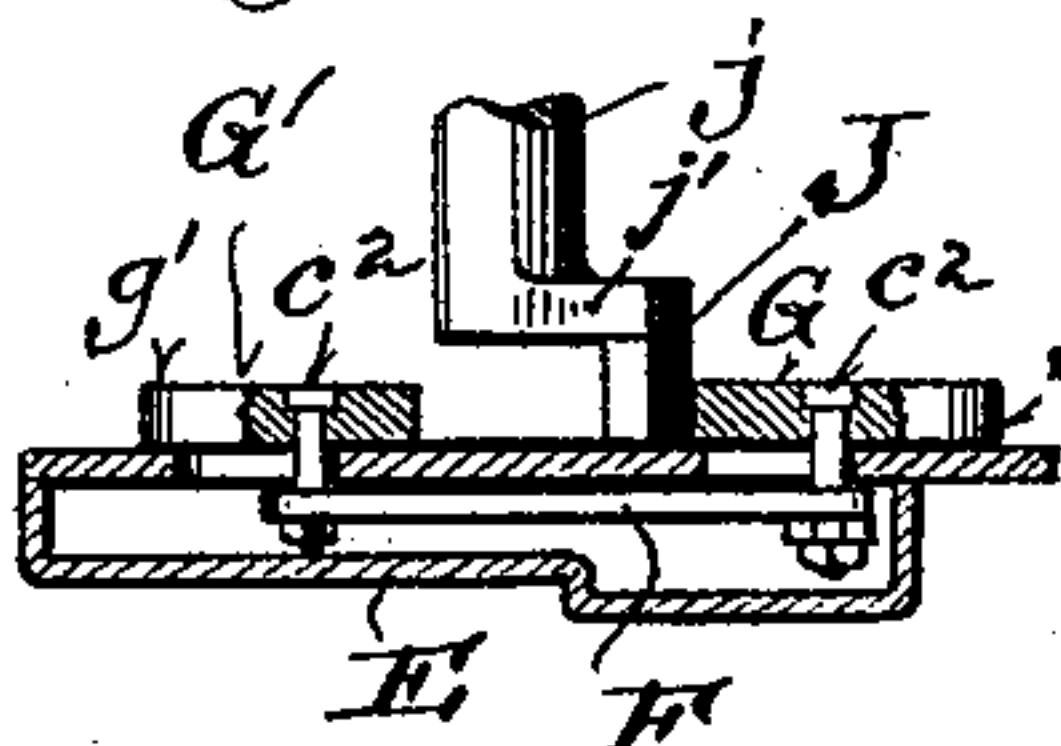
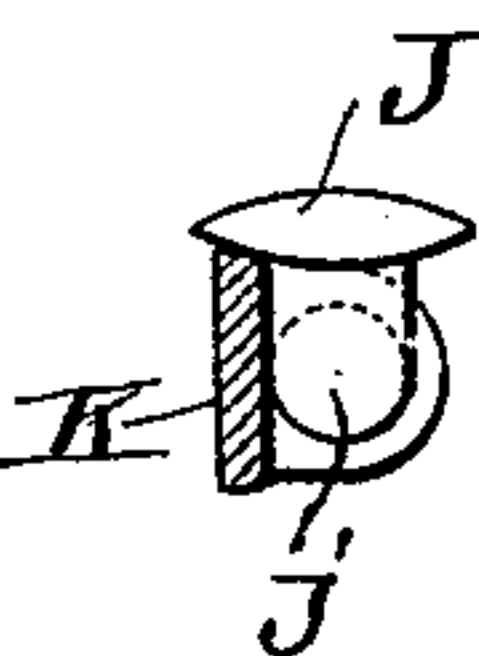


Fig. 7.



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Fig. 9.



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UNITED STATES PATENT OFFICE.

SAMUEL WALKER AND LE GRAND MARSHALL, OF MILWAUKEE, WISCONSIN.

SWITCH-OPERATING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 509,340, dated November 21, 1893.

Application filed May 19, 1893. Serial No. 474,794. (No model.)

To all whom it may concern:

Be it known that we, SAMUEL WALKER and LE GRAND MARSHALL, citizens of the United States, residing at Milwaukee, county of Milwaukee, State of Wisconsin, have invented a certain new and useful Improvement in Switch-Operating Track Mechanism; and we declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

Our invention relates to improvements in the construction of switch actuating track mechanism for railways, and consists in the matters hereinafter described and pointed out in the appended claims.

Our invention consists primarily of a switch tongue having operative connection with suitable operating levers located between the track rails and preferably below the level of the track, and adapted to be operated by a suitable device carried by a car to open or close the switch, as will be presently described in detail.

In the accompanying drawings illustrating our invention: Figure 1. is a vertical sectional view of one end of a car equipped with our improved device for engagement with the lever mechanism between the track rails. Fig. 2. is an enlarged detail sectional view taken on line 2—2, of Fig. 1. Fig. 3. is a detail vertical sectional view of the same taken on line 3—3, of Fig. 2. Fig. 4. is a horizontal sectional view taken on line 4—4, of Fig. 1. Fig. 5. is a vertical sectional view taken on line 5—5, of Fig. 6. Fig. 6. is a plan view of the lever mechanism located between the track rails, and shows part of the casing broken away to expose the operating parts. Fig. 7. is a transverse sectional view taken on line 7—7, of Fig. 6. Fig. 8. is a detail vertical sectional view taken on line 8—8, of Fig. 1. Fig. 9. is a detail of lower end of shaft *j*.

Referring by letter to said drawings, A represents the switch tongue, which is pivoted to the base plate of the switch in the usual manner, and B the rail leading from the main to a branch or side track. The pivoted switch tongue A is pivotally engaged at *c*, with a transversely arranged link C, by means of a

vertical bolt or pin which extends upwardly through a slot *c'* in the base plate of the switch. This link C is arranged to extend horizontally through a pipe C' which is arranged beneath the central portion of the track and communicates with a suitable horizontally disposed casing or housing E, within which a lever D is pivotally supported as at *d*, said lever being operatively engaged at one end with the end of the link C, as best illustrated in Fig. 6, of the drawings, and at its other end having an operative connection with the lower end of a bolt *c*², which serves to connect the said lever with a transverse bar F, arranged to reciprocate within the casing E. Two of these bolts *c*² *c*² are provided at opposite ends of said bar F, and are arranged to extend upwardly through slots *f f* in the upper plate of the casing E. Above said plate are arranged two levers G G', operatively connected with the two upwardly extending bolts *c*² *c*² as illustrated more particularly in Figs. 6 and 7, of the drawings, and pivotally engaged at their other ends with the upper side of said plate, as at *g g*. As illustrated more particularly in Fig. 6, these levers G G', are provided with laterally extending ears *g' g'*, which are arranged to cover the slots *f f* in the top plate of the casing E. It will be seen that by this construction, the two levers G G' being tied together by the transverse bar F, and the lever D being operatively connected with the said transverse bar, a movement of either lever G or G' in either direction, will produce a corresponding movement of the other lever, and the said transverse bar F, and thus through the medium of the lever D and the link C, will operate to adjust the switch tongue A, to open or close the switch, according to the direction of the movement of the levers G G'. The two levers G G' are so disposed upon the upper side of the casing E, that their inner faces will converge toward the free ends of said levers, and the free ends of said levers are curved or rounded outwardly in the manner shown, for a purpose to be presently described.

In order to operate said switch mechanism, a suitable device is provided upon a car, which may be of any desired or convenient construction, said device being arranged pref-

erably upon the end of the car, under the control of the motor-man or driver, and adapted to be lowered for engagement with the track device, or raised above the line of the same. We prefer, as a matter of convenience, however, to employ a device of substantially the form of construction illustrated in the accompanying drawings, for use upon the car for actuating our track device, this particular device being the subject of a separate application for patent, filed by us on August 21, 1893, Serial No. 483,616. In this particular form of construction the actuating mechanism upon the car comprises a vertically disposed post *j*, revolvably journaled in bearings in a bracket *K* which depends from the bottom of the car, and this post carries at its lower end, a suitable cam *J*, which is arranged at the end of a laterally directed arm *j'*, and adapted by a depression of said post to be brought into engagement with one of the levers *G G'*, according to the position of the said cam with respect to the post. The upper end of the post *j*, is squared to receive a pinion *L*, which is arranged to mesh with a segmental gear *L'* having a bearing in a suitable hanger *L²* beneath the car, and as illustrated in Fig. 1, of the drawings, the squared part of the post *j*, is arranged to normally extend considerably above the pinion *L*, so as to permit the said post to be depressed without affecting the engagement of the pinion therewith, the squared part of the post simply slipping down or up through the angular aperture in the pinion in an obvious manner. The segmental gear *L'* is arranged at the end of one arm of a bell crank *l*, to the other arm of which is connected a rod *l'* having operative engagement at its other end with a crank arm *l²* upon the lower end of a vertically disposed shaft *m*, which extends upwardly through the floor of the car and is provided at its upper end with a suitable operating handle *m'*.

Pivotaly supported in a hanger *m²* beneath the car, is a lever *M'*, having a pivotal engagement at one end, as at *n* with a push bar *N*, which is arranged to extend downwardly through the floor, as in Fig. 1, and the other end of said lever *M'* is operatively engaged at *n'* with a second lever *M*, which is pivotally supported at the lower end of a suitable hanger *N'*, the other end of said lever *M* being bifurcated and arranged to embrace the post *j*, as best illustrated in Fig. 2, of the drawings.

An annular groove is provided in the outside of the post *j*, and two plates *q q*, each provided with a half bearing for said post, are arranged to embrace the post and to rest within said annular groove, suitable bolts *s s* serving to secure the two plates together, and the parts *q' q'* forming the bearing for the post, being provided with lateral studs *t t*, arranged to engage with slots *t' t'* in the ends of the bifurcated part of the lever *M*. A spring

P, is engaged at one end with the hanger *N'* and at the other end with the lever *M*, and serves to normally hold up the end that is connected with the post *j*, as shown in Fig. 1.

At a convenient point upon the truck frame *T*, is provided a stop plate *K'* adjustably secured to the truck frame by means of bolts *T' T'* passed through slots in said stop plate. The rear ends of the plates *q q* extend into the line of the stop plate *K'*, so that when the mechanism which operates to depress the post *j*, has been moved so as to bring the lower end of said post to a predetermined level, the rear ends of the plates *q q* will come into engagement with the said stop plate to limit the movement of said post in an obvious manner.

As illustrated in Fig. 1, the plates *q q* are arranged to extend rearwardly through a slot *k'* in the hanger *K*, so as to prevent any tendency of said plates to rotate with the post *j*.

The operation of our improved device is as follows: When a car equipped with our improved actuating device approaches a switch constructed as before described, the man upon the front platform by means of the handle *m'* upon the upper end of the shaft *m*, rotates said shaft so as to give a partial rotation to the segmental gear *L'* and the pinion *L*, to partially rotate the post *j*, and move the cam *J* to the desired side of the said post, so as to enable said cam to engage with a desired one of the levers *G G'*. Then by a downward pressure upon the push bar *N*, he actuates the levers *M'* and *M*, to depress the post *j* so as to bring the cam *J* into the same horizontal plane with the levers *G G'*, when by the forward movement of the car, the cam *J* will be operated to open or close the switch, according to the one of said bars engaged by the said cam. The levers or bars *G G'* are made of sufficient length to effect a gradual movement of the switch tongue and the intermediate mechanism as the car approaches the switch, and the movement of the parts are thereby rendered even and uniform.

In order to afford a support for the cam *J*, when it is in engagement with the switching bar *G* or *G'*, the hanger *K* is provided immediately in rear of the post *j*, with a transversely arranged shoulder *k*, against which the lateral arm *j'* rests when the post is turned so as to bring the cam into operative engagement with either one of said bars.

Our improvements may be readily adapted to any of the ordinary switch constructions in common use, and the actuating mechanism carried by the car, may be readily applied to any of the ordinary forms of cars.

Our improved device is very simple and strong, in its construction, easy of operation and durable, and capable of operation by any suitable or desired form of apparatus carried by the car, and arranged to depend therefrom so as to be engaged with the levers between the track rails.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination with the main track rails and the switch tongue, of a suitable housing, a lever pivotally supported within said housing, and linked at one end to the switch tongue, a pair of actuating levers pivoted upon the upper side of said housing, and adapted for engagement with a depending device upon a car, and an operative engagement between the free ends of said actuating levers and the first mentioned lever, substantially as described.
2. The combination with the main track rails and the switch tongue, of a suitable housing located between the track rails, a lever pivotally supported within said housing and linked to the switch tongue, a pair of actuating levers pivoted upon the top of the housing, and linked together at their free ends with said free ends nearer together than their pivoted ends and an operative connection between said link and the free end of the first mentioned lever, substantially as described.
3. The combination with the main track rails and the switch tongue, of a suitable housing located between the track rails a lever pivotally supported within said housing, and linked at one end to the switch tongue, a pair of actuating levers pivotally supported upon the top of said housing, and arranged with their inner faces oblique to each other, and adapted for engagement with a device carried by the car, suitable slots in said top beneath

the free ends of said actuating levers, suitable pins or bolts extending downwardly from the ends of said levers, through said slots, a transversely disposed link connecting the lower ends of said pins or bolts, and an operative connection between said link and the free end of the first mentioned lever, substantially as described.

4. The combination with the main track rails and the switch tongue of a suitable housing located between the rails, a lever, pivotally supported within said housing, and linked at one end to the switch tongue, a pair of actuating levers pivotally supported upon the top of said housing, and arranged with their inner faces oblique to each other, and adapted for engagement with a device carried by the car, suitable slots in said top beneath the free ends of said actuating levers, suitable pins or bolts extending downwardly from the ends of said levers, through said slots, a transversely disposed link connecting the lower ends of said pins or bolts, an operative connection between said link and the free end of the first mentioned lever, and lateral extensions upon the free ends of said actuating levers arranged to cover said slots, substantially as described.

In testimony whereof we sign this specification in the presence of two witnesses.

SAMUEL WALKER.
LE GRAND MARSHALL.

Witnesses:

JOHN E. WILES,
MICH. ZIMMERS.