

No. 892,753.

PATENTED JULY 7, 1908.

G. L. MANSFIELD.
SWITCH STAND.

APPLICATION FILED JAN. 15, 1908.

Fig. 1.

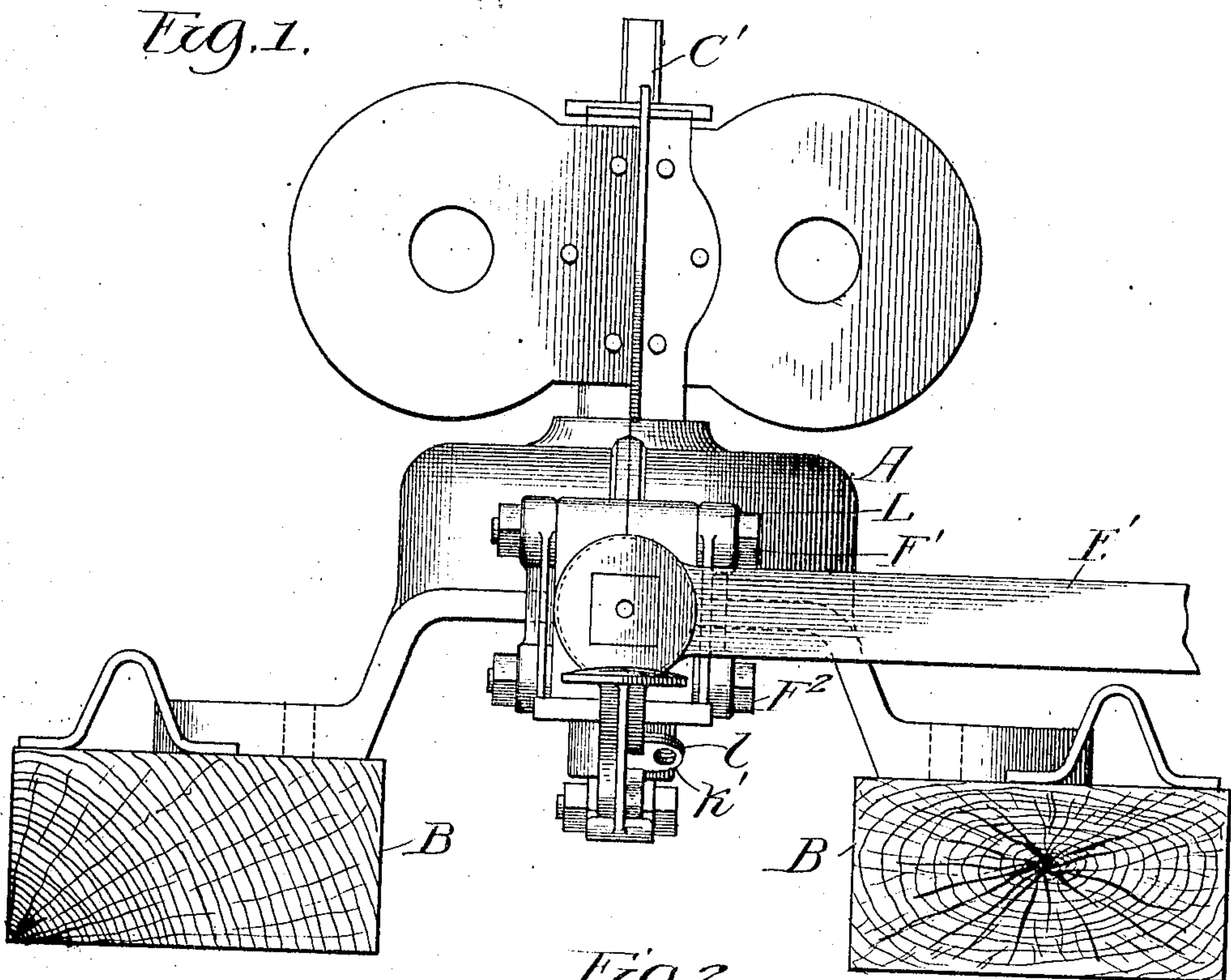


Fig. 2.

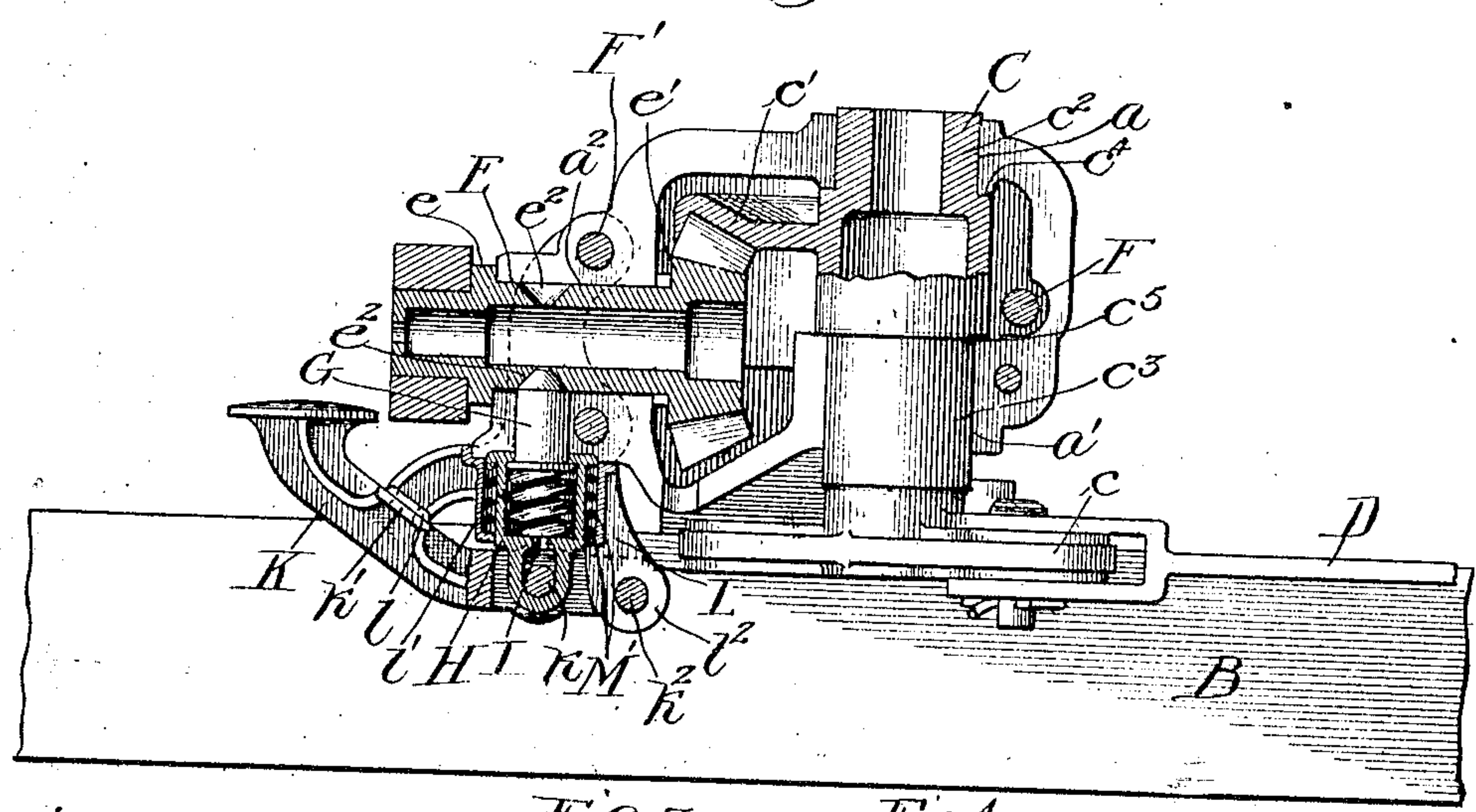


Fig. 3.

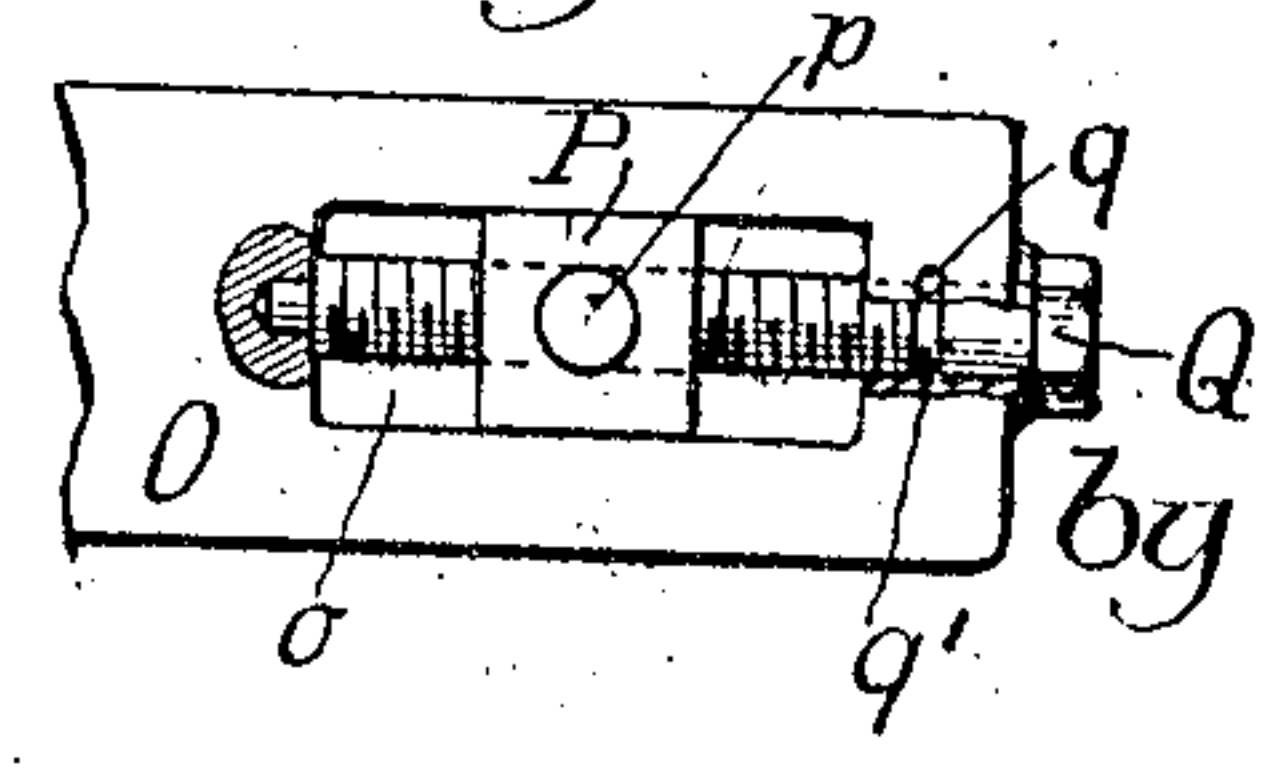
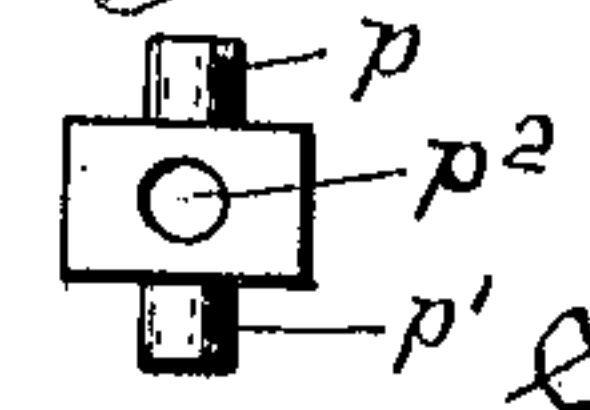


Fig. 4.



Witnesses
O. M. Munnell
Ruby V. Nash.

Inventor
G. L. Mansfield,
Walter H. Chamberlin
Attley.

UNITED STATES PATENT OFFICE.

GEORGE L. MANSFIELD, OF CHICAGO, ILLINOIS.

SWITCH-STAND.

No. 892,753.

Specification of Letters Patent.

Patented July 7, 1908.

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To all whom it may concern:

Be it known that I, GEORGE L. MANSFIELD, a citizen of the United States, residing at Chicago, county of Cook, State of Illinois, have invented a certain new and useful Improvement in Switch-Stands, and declare the following to be a full, clear, and exact description of the same, 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.

My invention relates to switch stands, particularly those wherein, after a switch is locked in one position, it may be thrown into its other position and again locked by a passing train; and it has for its object to simplify and improve the construction thereof.

The various features of novelty whereby my invention is characterized will be pointed out with particularity in the appended claims, but for a full understanding of my invention and of its various objects and advantages reference may be had to the following detailed description taken in connection with the accompanying drawing, wherein:

Figure 1 is a side elevation of a stand embodying a preferred form of my invention; Fig. 2 is a section taken centrally of the stand on a plane at right angles to the plane of Fig. 1; Fig. 3 is a plan view of one end of the operating lever; and Fig. 4 is a detail showing the adjustable trunnion block carried by the lever.

Referring to the drawing, A indicates the frame of the switch stand which is adapted to be supported rigidly adjacent the switch to be controlled, as for example upon ties B, B. This frame, which also serves as a housing for some of the movable parts, is divided upon a central vertical plane into two halves.

C is a member adapted to be revolubly supported by the frame and to carry a mast C'. This member is adapted to be connected to the switch points, so as to actuate the same, by means of a link D.

E is a short shaft which is adapted to be supported, preferably at right angles to the member C, and to be geared thereto so that when the shaft is turned, as by means of a lever E', the member C is rotated and, through its connection with the switch points, moves the same from one position to another according to the direction of rotation of the shaft. Ordinarily the movable parts be-

tween the lever E' and the link D are each built up of a plurality of elements which must be manufactured independent of each other and then assembled in such a manner as to insure the permanence of such assembly. It is the purpose of the present invention to reduce the number of separate elements as low as possible and to this end I prefer to cast or otherwise form the members C and E in such a manner that all of the movable elements between the lever E' and the link D form an integral part of one or the other of these members. To the above end the member C has formed integral therewith at its lower end a lever arm c to which the link D is adapted to be attached; between the ends of this member is a segmental gear c' which is also formed integral with said member.

There is formed at the upper end of the member C a journal c² and at a point immediately above the member c a second journal c³. These journals are so formed as to leave shoulders c⁴ and c⁵ between the same. The member E has formed integrally therewith near one end a flange e projecting laterally therefrom and at its other end a pinion e' which is adapted to mesh with the gear c'. Each of the halves of the frame is provided with vertical half bearings a and a' in axial alinement with each other, and with a horizontal bearing a². The parts are so proportioned that the journals c² and c³ of the member C may be introduced into the bearings a and a', respectively, of one of the halves of the frame, while the intermediate portion of the member E, which also serves as a journal, may be placed in the bearing a² of the same half-frame. The pinion e' will now mesh with the gear c'; the shoulders c⁴ and c⁵ will engage with fixed portions of the frame; while the flange e and the inner end of the pinion e' will also engage with fixed portions of the frame. The other half of the frame may now be superposed upon the parts thus assembled and be securely locked to its companion frame member by means of bolts such as F, F' and F². It will be seen that the members C and E are revolubly supported by the frame but are prevented from moving axially without the use of any detachable parts on these members: thereby furnishing an exceedingly simple, strong and durable construction wherein all danger of disarrangement due to the loosening of separable parts is avoided.

The arrangement heretofore described may be used to advantage for switch stands wherein the sole control over the switch is accomplished by means of the manually operated lever E' , the switch being then locked in its open or closed position in any usual way. Where it is desired, however, to make use of a switch stand which will permit a train to throw the switch points, even while the switch is locked securely against manual control, the locking arrangement which I shall now describe may be utilized.

The member E is provided, at a point between the flange e and the pinion, with a pair of sockets e^2 e^3 which are preferably though not necessarily, cone-shaped and located diametrically opposite each other.

G is a plunger the end of which is also preferably cone-shaped so as to fit either of the sockets in the member E . The plunger is preferably arranged within a cup-shaped holder H within which and beneath the plunger is arranged a strong spring I . The holder is connected to a movable lever K , preferably by means of a pin and slot connection k . The member K is provided with an ear k' which is adapted to engage with a fixed ear l and to which it may be locked in any suitable manner, as by means of a padlock or the like. The holder H is slidably arranged in a housing L' and is normally held in position to cause the plunger to be seated in one of the sockets in the member E by means of a spring M which is interposed between the member L' and the holder. The spring M is weaker than the spring I so that an operator may without difficulty compress the spring M by pushing down on the member K and thereby carry the plunger out of engagement with the socket in which it may be seated. The pin and slot connection between the holder and the member K is such, however, that the downward movement of the holder is arrested, in case the member E is turned, before the plunger is free of the socket. In order therefore to effect the release of the plunger from the socket by turning the member E when the member K is locked, it is necessary to apply sufficient power to compress not only the spring M but also the spring I . The spring I is made powerful enough so that the release of the plunger from its cooperating socket cannot be effected by means of the hand lever E' . However, when a train is passing through the switch while its points are in engagement with the main rails, the lateral impetus given to the switch points by reason of the passage of the wheel flanges between one of the points and the rail is sufficient to turn the member E against the tension of the strong spring so as to completely release the member E from the plunger and also to continue the rotation of this member so as to bring the other socket into registration with the top of the

plunger. As soon as the second socket aligns with the plunger the springs act to throw the plunger upwardly into such socket so as to lock the switch in its new position.

The ear l and the housing L' may be associated with the rigid frame in any suitable manner: they may conveniently, however, form part of a yoke L which embraces that portion of the two halves of the frame which surrounds and forms a bearing for the shaft E , this yoke being secured in place by means of the bolts F' and F^2 which are used to fasten together this side of the two-part frame. The lever K may in this case be pivoted to a downward extension l^2 of the member L as at k^2 . By making the parts which support the locking mechanism separate from the main frame or housing the same frame or housing may be employed for a switch stand in which the automatic feature is employed or wherein it is omitted.

It will be seen that the purpose of making the sockets and the top of the plunger cone-shaped is to permit the plunger to be forced out of one of the sockets through the turning of the shaft and at the same time to make the plunger fit both sockets closely so as to avoid lost motion. It will of course be understood, however, that any other desired shaping of the sockets or of the upper end of the plunger which will permit the plunger to be forced downward and out of one of the sockets when the shaft is turned sufficiently will be within the scope of my invention. The member C is preferably made tubular so as to lighten and strengthen it and also to permit leads to a superposed lamp to be passed up through it.

Since the proportions and adjustments of switches vary greatly in practice, it is usually necessary in any particular case to locate the switch stand in a position which will harmonize its throw with that of the switch; a different location being selected for each switch. In accordance with one feature of my invention I provide means for adjusting the point of connection between the lever arm of the switch stand and the link or strut leading to the switch points in such a manner that the switch stand may be located in the most convenient position: the throw of its lever being then nicely adjusted to suit the particular switch points which are to be controlled. This latter feature of my invention is illustrated in Figs. 3 and 4.

O represents a lever arm which may be formed integral with the member C of the switch stand as in the case of the member c ; or it may be any usual lever arm.

o is a slot extending radially of the arm.

F is a block slidably mounted in the slot o and having laterally projecting trunnions p and p' .

Q is an elongated screw extending length-

wise through the slot *o* and journaled at its opposite ends in the lever. This screw passes through a screw-threaded opening p^2 in the block *P* and is held against axial movement in any suitable manner as, for example, by means of a pin *q* engaging in a groove *q'*. It will be seen that by turning the screw the block will be moved along the lever arm; so that, by connecting the lever of the switch-operating link or strut to the trunnion *p* and *p'*, the throw of the switch-stand may always be adjusted to meet the requirements of a particular switch.

Having now fully described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In a switch stand, a combined housing and frame divided on a central vertical plane, a vertical switch-operating member arranged in registering bearing portions in the halves of the housing, a horizontal shaft arranged in registering bearing-ports in the halves of the housing, and intermeshing gears carried by said member and said shaft within the housing.

2. In a switch stand, a combined housing and frame divided on a central vertical plane, a vertical switch-operating member arranged in registering bearing portions in the halves of said housing, a horizontal shaft arranged in registering bearing-ports in the halves of said housing, integral shoulders upon said member and said shaft engaging with said housing to limit axial movements of said member and said shaft, and intermeshing gears carried upon said member and said shaft within said housing.

3. In a switch stand, a combined housing and frame divided on a central vertical plane, a vertical switch-operating member arranged in registering bearing portions in the halves of said housing, a horizontal shaft arranged in registering bearing-ports in the halves of said housing, integral shoulders upon said member and said shaft engaging with said housing to limit axial movements of said member and said shaft, and intermeshing gears arranged within said housing and formed integral with the said member and said shaft respectively.

4. As an article of manufacture, a switch-operating member made of a single piece and comprising a shaft portion having a lever arm at one end and a laterally-projecting gear segment between the ends.

5. As an article of manufacture, a switch-operating member made of a single piece and comprising journal portions, shoulders adjacent said journal portions, a lever arm at one end, and a gear segment projecting laterally therefrom.

6. A switch lock comprising a plunger engaging with a socket in a member adapted to be connected with a switch a spring for holding said plunger in said socket, and a weaker

spring supporting said plunger and the first mentioned spring, the parts being so arranged that the weaker spring is normally prevented from being compressed sufficiently to permit the plunger to be withdrawn from said socket. 70

7. In combination, a supporting frame, a revoluble switch-operating member having a socket, a plunger normally engaged in said socket, a holder for said plunger, a spring within said holder beneath the plunger, a spring arranged between a fixed portion of said housing and said holder, and a lever adapted to be locked in a predetermined position to said frame, there being a lost-motion connection between said lever and said holder sufficient to permit the plunger to be partially retracted from its socket without compressing the spring in the holder when the lever is locked. 75

8. In combination, a supporting frame, a movable switch-operating member having a socket, a plunger normally engaged in said socket, a holder for said plunger, a supporting spring for said plunger carried by said holder, a supporting spring for said holder carried by said frame, and a retracting lever for said holder and plunger adapted to be locked to said frame, there being a lost-motion connection between said lever and said holder sufficient to permit the partial retraction of said plunger from the socket without compressing the plunger-supporting spring. 85

9. In combination, a supporting frame, a movable switch-operating member having a pair of sockets, a plunger in position to be engaged in one of said sockets when the switch is open and in the other when the switch is closed, a holder for said plunger, a supporting spring for said plunger carried by said holder, a supporting spring for the holder carried by the frame, and a retracting lever for said holder and said plunger adapted to be locked against said frame, there being a lost-motion connection between said holder and said lever sufficient to permit the partial retraction of the plunger from one of the sockets without compressing the plunger-supporting spring. 90

10. In combination, a supporting frame, a movable switch-operating member having a pair of sockets, a plunger in position to be engaged in one of said sockets when the switch is open and in the other when the switch is closed, a holder for said plunger, a supporting spring for said plunger carried by said holder, a supporting spring for the holder carried by the frame, and a retracting lever for said holder and said plunger adapted to be locked against said frame, there being a lost-motion connection between said holder and said lever sufficient to permit the partial retraction of the plunger from one of the sockets without compressing the plunger-supporting spring, the end of the plunger and one of said sockets being so shaped that the operation of said member by reason of a train 105 110 115 120 125 130

passing through the switch causes the plunger to be forced out of said latter socket and to be engaged in the other socket, the holder-supporting spring being weaker than the other.

11. In combination, a supporting frame; a revoluble switch-operating member mounted in said frame and having a pair of cone-shaped sockets; a plunger having a cone-shaped end adapted to be engaged in one or the other of said sockets according as the switch is open or closed; means for manually operating said member; and controlling means for said plunger including a lever adapted to be locked to the frame, a strong spring between the lever and the plunger for permitting the plunger to be wholly retracted when the switch is thrown by a passing train, and a weaker spring arranged to permit the plunger to be wholly retracted through said lever or partially retracted independently of

the other spring when the switch is thrown by a passing train while the lever is locked.

12. In a switch stand, a pivoted lever, means for operating said lever, a link or strut for connecting the lever to the points of a switch, and means for adjusting the point of connection between the lever and said link or strut.

13. In a switch operating mechanism, a lever, said lever having guides thereon, a trunnion block arranged to travel between said guides, means for adjusting the block along the guides, and a strut connected at one end to said trunnion block and at its other end to the points of the switch.

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

GEORGE L. MANSFIELD.

Witnesses:

WM. F. FREUDENREICH.
RUBY V. NASH.