

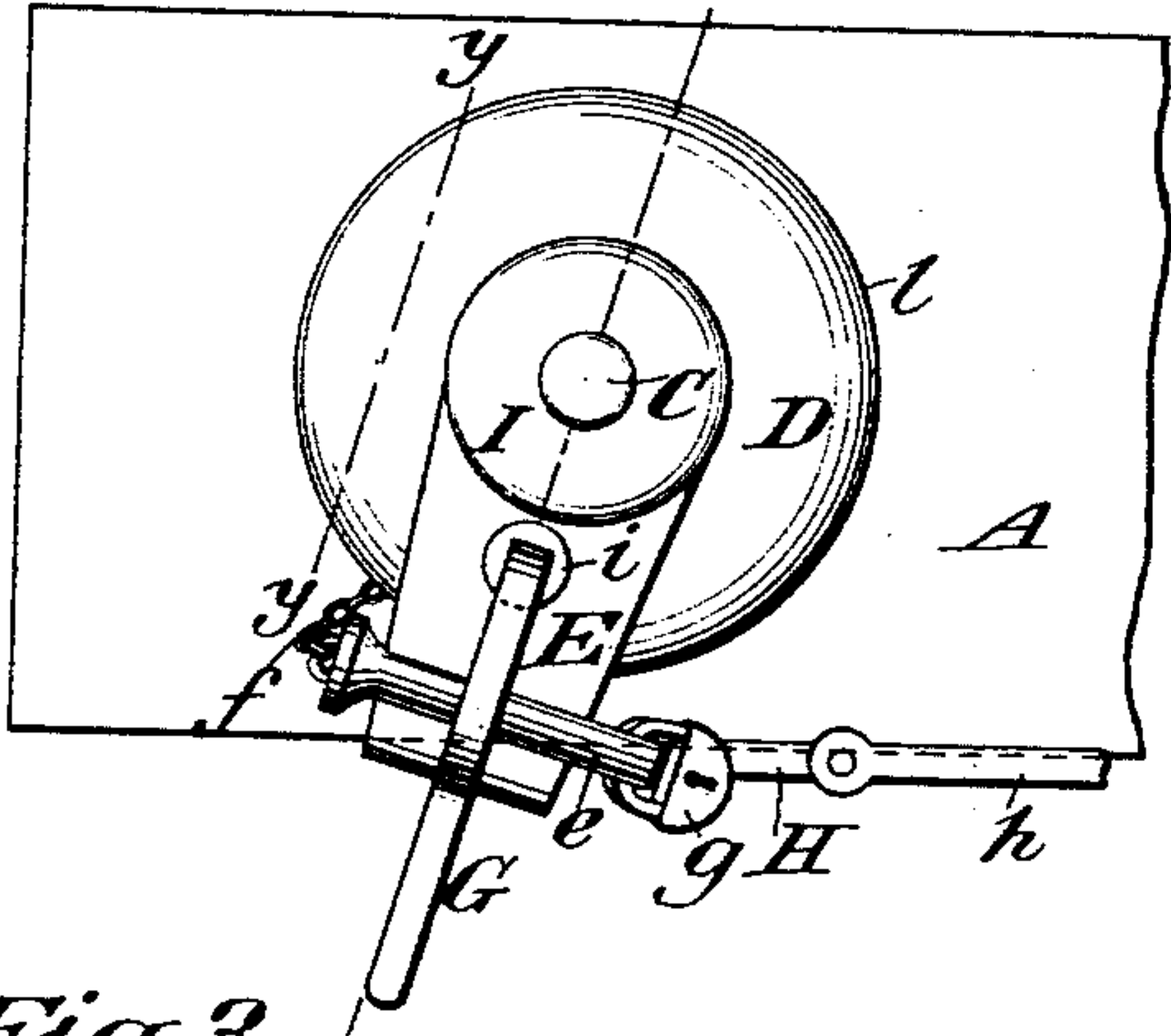
(No Model.)

D. M. CHURCH.  
RAILWAY SWITCH.

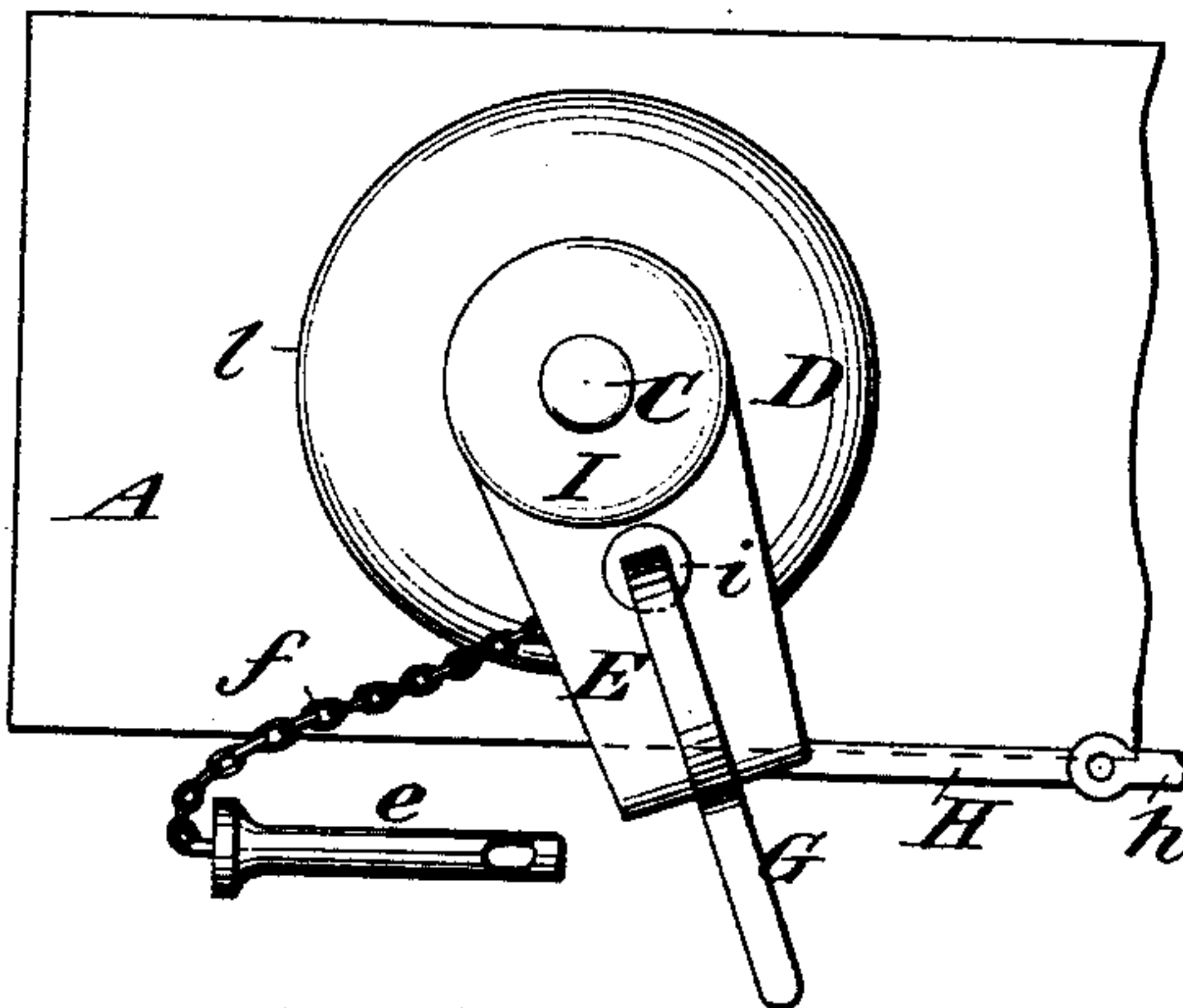
No. 520,254.

Patented May 22, 1894.

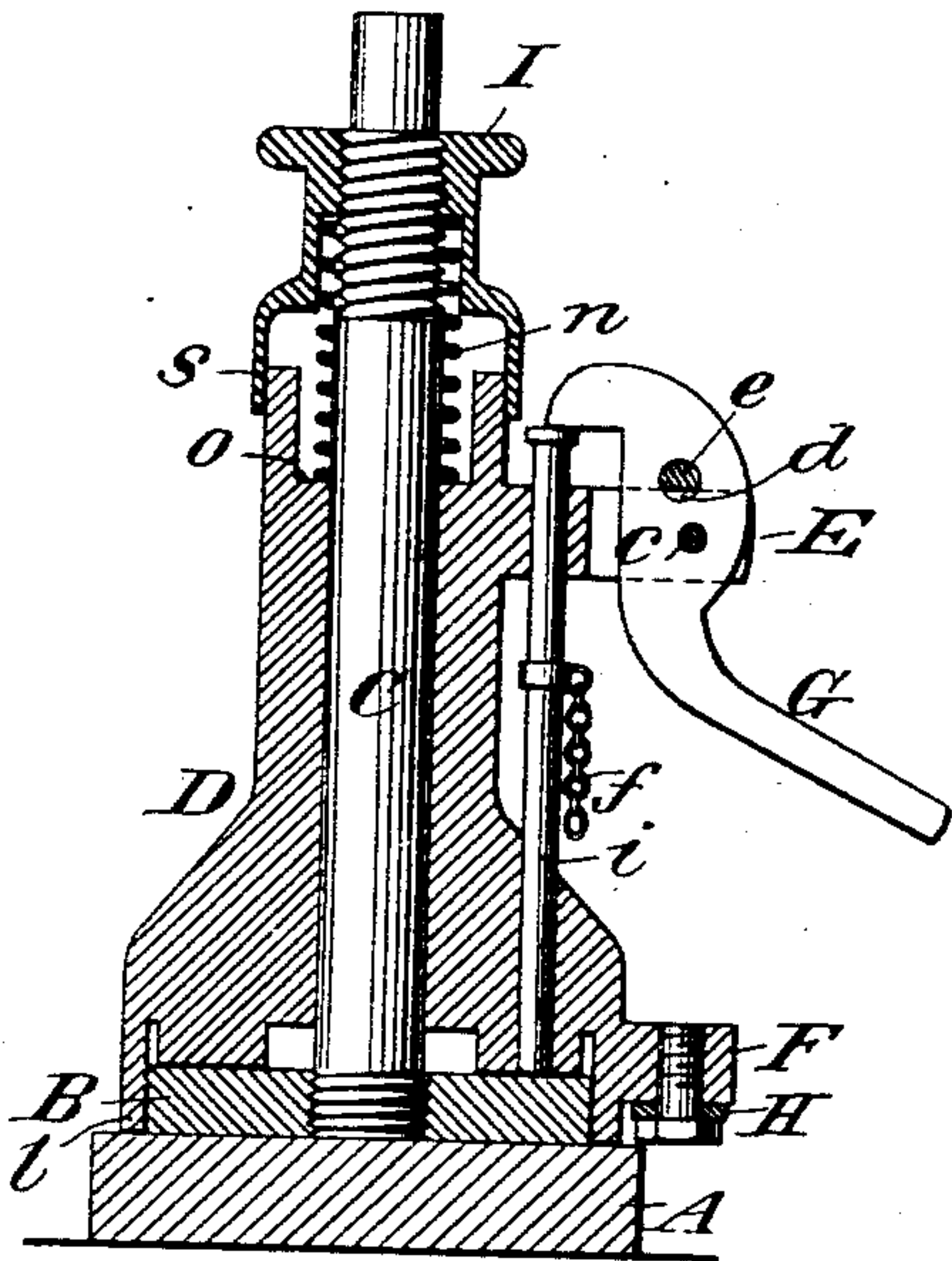
*Fig. 1,*  
*x*



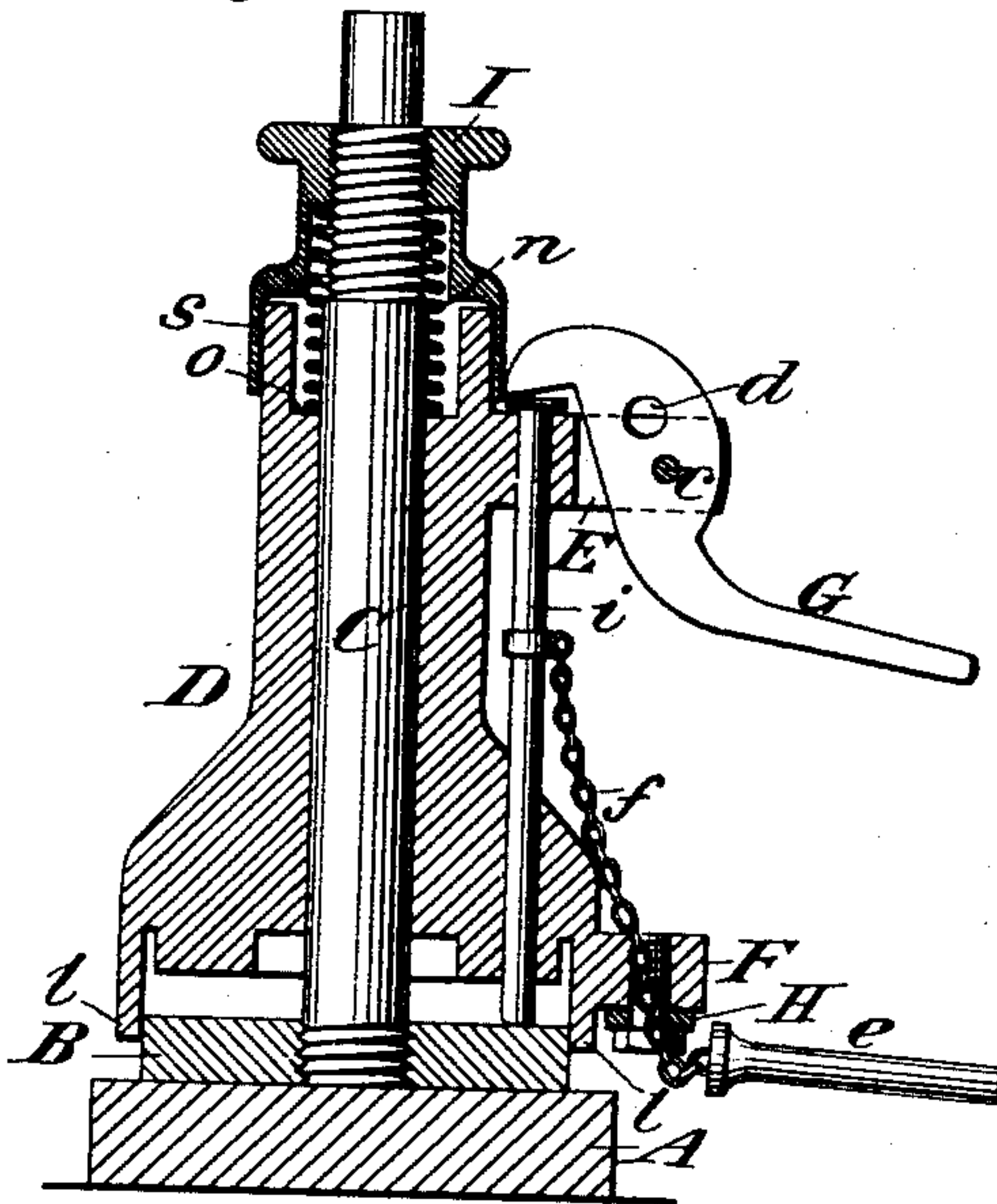
*Fig. 2,*



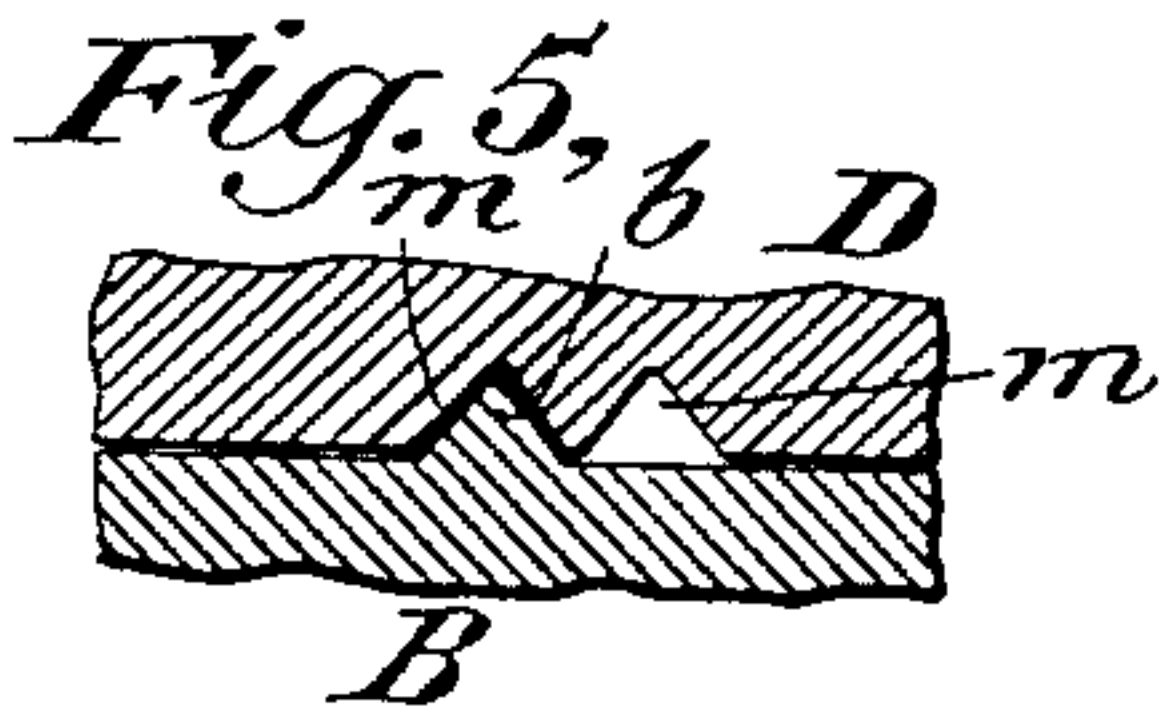
*Fig.3, x*



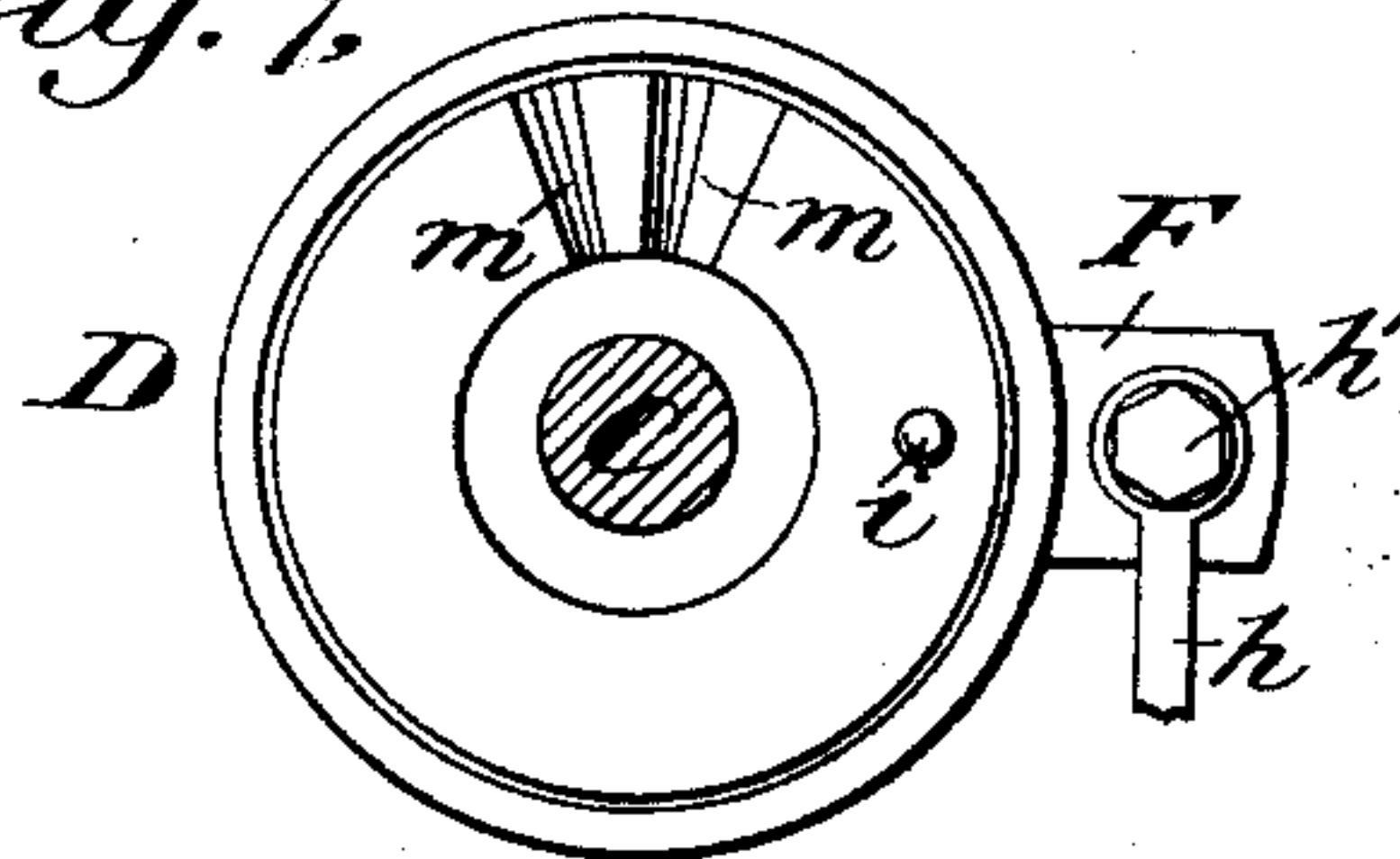
*Fig. 4,*



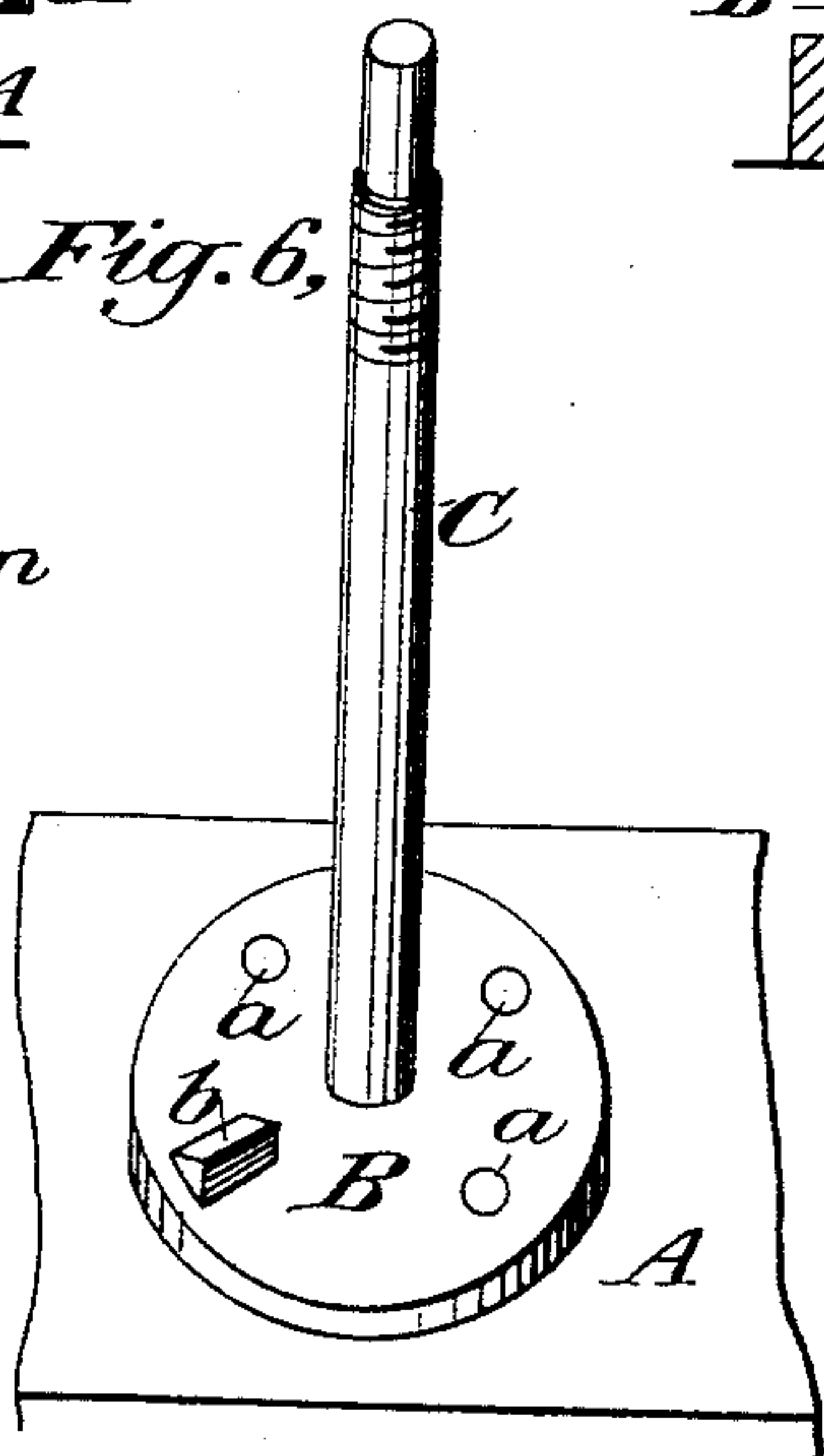
*Fig. 6,*



*Fig. 7.*



Witnesses:-  
H. H. Kayport.  
 M. E. Foster.



Inventor:  
J. M. Church  
by atty.  
J. N. M. Tuttle



# UNITED STATES PATENT OFFICE.

DWIGHT M. CHURCH, OF WILLIMANTIC, CONNECTICUT, ASSIGNOR OF TWO-THIRDS TO EDGAR B. FOSS, OF BAY CITY, MICHIGAN.

## RAILWAY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 520,254, dated May 22, 1894.

Application filed February 21, 1894. Serial No. 500,961. (No model.)

*To all whom it may concern:*

Be it known that I, DWIGHT M. CHURCH, of Willimantic, in the county of Windham and State of Connecticut, have invented a certain  
5 new and useful Improvement in Railway-Switches; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this  
10 specification.

My invention relates to that type of switch mechanism, in which there is a switch stand, provided with a hand-lever, by which the switch-points may be set; and in which the  
15 switch-rails may be automatically shifted by a device on the train, even though the hand-lever of the stand be locked in an inoperative condition. I propose to provide for use a switch mechanism of this type, which will  
20 be more efficient and reliable, as a preventive of accidents, from misplaced switches, than those heretofore used, that I know of; and which, at the same time, may be easily applied to any and all switch rails; is exceedingly simple and economic of construction;  
25 and will not have its efficiency, or the working of its parts impaired by exposure to the elements.

To these main ends and objects my invention consists in the novel structural features, or combinations of parts, which will be found hereinafter fully described, and which will be most particularly pointed out in the claims of this specification.

35 To enable those skilled in the art to which my invention relates, to make and use switch mechanisms embracing the same, either in whole, or in part, I will now proceed to more fully describe the construction and operation  
40 of my improved switch mechanism, referring by letters to the accompanying drawings which form part of this specification, and in which I have shown my invention carried out under the precise form of mechanism that I  
45 have, so far, successfully used, though various modifications therein may, of course, be made, without changing it substantially, and, hence, without departing from said invention.

50 In the drawings, Figure 1 is a top view of my improved contrivance, with the working

parts shown as locked against action, through the medium of the switchman's lever. Fig. 2, is a similar view, but with the hand-lever unlocked, and the movable parts set in a different position. Fig. 3, is a vertical section  
55 taken in a plane indicated by the line  $x, x$ , of Fig. 1. Fig. 4 is a similar sectional view; but with the hand-lever shown in the condition in which it is during the operation of shifting the switch by hand, and with the revoluble  
60 parts turned about half way of their maximum movement. Fig. 5, is a detail sectional view at  $y, y$ , of Fig. 2, showing mainly the impositive lock mechanism. Fig. 6, is a perspective view of the base plate (spiked to a  
65 tie), and its rigidly connected vertical shaft, or spindle. Fig. 7 is a bottom view of the revoluble part of the stand, detached.

In the several figures the same part will be found always designated by the same letter  
70 of reference.

A is a portion of that one of the rail-road ties, or sleepers, of a track, to which my switch stand, or mechanism, is supposed to be applied, and to which, in the case shown,  
75 it is secured by means of spikes  $a$ , by which the circular base-plate B is permanently fastened to said tie. This base-plate is cast, or otherwise provided with a radially arranged  
80 upwardly projecting lug  $b$ , which is about triangular in cross sectional shape (see Fig. 5), and that constitutes the male member of an impositive lock mechanism, the functions and effects of which will be presently explained.  
85

C is a vertical spindle, or cylindrical bar, which, as shown, projects upwardly from the middle of the base-plate B, to which its lower end is securely fastened, in any suitable  
90 manner, and which is of a height sufficient to hold in place properly, the parts which encircle it.

D is a revoluble stand comprising, as seen, an upper tubular portion, and an integral, enlarged, lower part, and which is adapted to turn on the rod, or shaft C. The said  
95 stand D is formed or provided, near its upper end, with a laterally projecting arm, or lug, E, and near its lowermost portion (preferably at a point vertically under lug E) with  
100



another, but smaller, lateral projection F. In the slotted-out end-portion of arm E is hung, on the pivot *c*, a hand-lever G, adapted to operate in a manner and for purposes to be presently described; and which is perforated at *d*, for the accommodation of a pin *e*, which is connected to the switch-stand by a piece of chain *f*, and that is adapted to be held in place when applied to the lever G, by means of a pad-lock *g*; all as clearly shown.

H is a link-bar, or pitman, one end of which is coupled, to the slide-bar of a switch-rail, or a pair of switch-points, and the other end of which is connected by a pivot *h'* to the lower lug F of the revoluble stand D.

Arranged exteriorly of the smaller, tubular, portion of D, but within perforations in the arm E, and in the lower, enlarged, part of stand D, is a lifter-rod, or push-bar *i*, the function of which will be presently explained; and the said lower enlargement of the revoluble part D has a thin cylindrical shell, or base rim, *l*, that, at its lowermost part, encircles the perimeter, or peripheral portion, of the circular base plate B; all as clearly shown.

*m, m*, are two notches, or the female members, of the impositive lock mechanism, of which *b* is the male member, and said female members are, preferably, composed of depressions, in the bottom portion of the casting D (see Figs. 5 and 7), and of the proper size and shape, to accommodate the male device *b*.

The upper end of the centrally bored part D is countersunk, to form a shoulder at *o*, and within said counter sink, and on top of said shoulder, is located the lower portion of a strong spiral spring *n*, the upper, or remaining portion of which is incased within a doubly countersunk screw cap I, the lower rim *s* of which encircles, or embraces, the upper end portion of stand D; but fits over the same loosely enough to permit said cap to turn freely round about the part D; and to permit the upper end of D to move telescopically within the said rim *s*. As clearly shown (see Figs. 3 and 4), the said cap I is screw-threaded on the spindle, or rod, C, and incases the upper half of spring *n*, so that the latter is compressed and confined, end-wise, between the shoulder *o* of part D, and a similar shoulder in the cap I; and it will be understood that by adjusting the cap I up and down on rod C, the spring *n* will be compressed more, or less, to increase its tension. The push-rod *i* is, preferably, formed with an enlargement, or head, at its upper end; and the upper portion of the hand-lever G is so shaped, it will be observed, (see Figs. 3 and 4) that it overlies the head of said push-rod, so as to act when required, as a presser thereon.

I make and arrange the hand-lever G by preference, in about the manner shown, so that the initial tendency, when the lower por-

tion of the lever is grasped by the switchman to set the switch, will be to lift the lower end of the lever, since this motion of the lever must be first effectuated, before any lateral movement can be made.

The operation of the mechanism, so far described mainly with reference to the construction and arrangement together of its parts, is as follows:—With the parts in the condition, or relative positions, seen at Figs. 1 and 3 (in which it may be supposed that the switch is, for instance, closed) to open the switch, or shift the positions of the working parts of the mechanism by hand, the switchman has only to unlock and pull out of place the pin *e*; then taking hold of the lower end of hand-lever G, first lift it, to cause its upper end to press forcibly and downwardly on the upper (headed) end of the push-bar *i*; and then pull side-wise on the lever. The lifting of the lower end of lever G, so that its upper end thus bears on the head of rod *i*, causes the point of contact of lever G and rod *i*, to become the fulcrum, so to speak, of the hand-lever (a sort of sliding fulcrum), and the power applied in lifting the lower end of said lever operates to lift, bodily, the revoluble portion D, of the switch stand, until the female members *m, m*, of the impositive lock mechanism, shall have been lifted out of mesh (or out of engagement) with the fixed male member *b* of the base plate B, as best shown at Fig. 5. Then the lateral movement, or swinging of said lever G, by the switchman, operates to revolve, or turn, the part D, axially, round about the spindle C, until the relationship of the male and female members of the lock, becomes such that the male can come into mesh with a different (or the other) one of the female members. An examination of Fig. 4 will make clear this operation of these parts, as in said figures, the mechanism is shown with the part D, and its attachments, lifted, and also turned about half of the distance necessary for it to revolve, in order to shift the engagement of the male member *b* of the lock from one to the other of the female members. This movement of the parts, by the manipulation of the hand-lever, effectuates the setting of the switch in the other one of its two positions, since through the medium of the pitman, or link-bar H, the vibratory movement of the outer end of lug F of the part D, imparts the necessary reciprocatory movement to the slide-bar *h*, to which the switch-points are supposed to be fastened. Of course, the lifting of the lower end of lever G again, and the swinging of it in the opposite direction, or back to its former position, will cause the switch-bar, or slide, *h*, to return the switch-points to their former position. And it will be understood that in either of its two normal positions, the revoluble part D, with its attachments, cannot be tampered, or meddled with (to shift the switch), if the hand-lever G be locked up, by



the insertion within its perforation *d* of the pin *e*, and the application to said pin of the pad-lock *g*, as shown. At the same time, the said part D, with its attachments may be actuated by the slide *h*, through the medium of pitman H, in the event of the switch-points, or the slide *h*, being moved (to shift the switch) by means of an actuating device on the locomotive, or a car of the train. But the spring *n* which operates, by expansion, to force the part D downward, at all times, and to hold the members *b* and *m* of the impositive lock in mesh, is made so strong and kept adjusted to such a degree of tension, that no power, or force, short of the several tons pressure, exerted by the device on a moving train, will be sufficient to start the revoluble part D, or shift its position.

It will be seen that while the mechanism shown and described, permits (like some others heretofore devised) an easy setting of the switch by hand (when the hand lever is unlocked); and, at the same time, prevents any meddling with the locked switch, while permitting the latter to be set by the force of an actuating device on the train, the whole construction is exceedingly simple, strong, and durable, and is such that it can be applied, or adapted, economically to any and all sorts of switches now in use on railroads. There are no double slides, or other complication of parts, and yet the mechanism accomplishes all the designed purposes of the more complex contrivances heretofore made.

By the direct connection of the pitman H to the slide bar of the switch, and to the revoluble part D of the switch-stand, I am enabled to dispense with any crank shaft for operating the said connecting link H, and, at the same time, I am enabled to get the necessary amount of throw, or motion, in the slide bar *h*, with a minimum extent of motion in the working parts of the stand.

While the arrangement of hand-levers shown, and push-bar described, with the part D, and its powerful spring *n*, enables the switchman to easily lift the part D, so that it and its attachments can be readily turned to throw the switch-bar, one way, or the other, there is no way, it will be seen, of getting any purchase on the parts to lift them by hand power, when the lever G is locked in a state of disuse.

By the construction shown, with the lock mechanism wholly inclosed and above the level of the extreme base of the switch stand, and with the annular rim *l* of part D, encircling the base-plate B, as described, while the movable parts are free to work as explained, the lock mechanism is wholly inclosed, and it, as well as the working parts incasing it, are not at all liable to get clogged, or rendered inoperative, by snow, or ice; and, in like manner, the arrangement of the spring inclosing devices, as shown, so that the depending flange, or rim *s* of the screw-cap *i* encircles the upper end of the device D, the spring and the telescopically working parts,

are not subjected to any liability of derangement by the action of the elements.

I wish it to be understood that while I prefer to use, in one mechanism, all the novel structural features herein shown and described, such of them as are separable from the others may be used alone, in a switch mechanism, with more, or less, advantage.

Having now so fully explained the construction and operation of my improved mechanism that those skilled in the art can practice my invention, either in whole or in part, and in either the precise form of device shown or under some mere modification thereof, what I claim as new, and desire to secure by Letters Patent, is—

1. In a switch-stand, or mechanism, the combination with a circular base plate, adapted to be secured to the road-bed; and a shaft, or spindle, projecting upwardly therefrom and made fast thereto, of a revoluble device adapted to turn on said shaft, and having an enlarged portion encircling said base plate; and the male and female members of an impositive lock, arranged intermediate of said base plate, and said revoluble device and, respectively, fast to said base plate and said device; all substantially as and for the purposes set forth.

2. The combination with the base plate; the vertical spindle; the revoluble part; the spiral spring and means for retaining said spring in place against any lifting tendency of said revoluble part, of means for lifting and turning said revoluble part by hand; and male and female members of an impositive lock, against the turning of said revoluble part; all substantially as and for the purposes set forth.

3. The combination with the base-plate; vertical spindle; the part D, adapted to rise and fall, and also to turn on said spindle; and a spring which exerts a constant depressing effect on the part D, of a hand lever pivoted in a lateral projection of the part D; and a push-bar *i*, the upper end of which serves as a fulcrum of said lever when the latter is used to lift the part D against the power of said spring; all substantially in the manner and for the purposes set forth.

4. In combination with the stationary and revoluble parts of the switch stand; an impositive lock arranged intermediate of said parts; and means for overcoming the lock and turning the revoluble parts by hand, of a lateral projection of said revoluble part; and a pitman, or link-bar, directly connecting said lug to the slide bar of the switch points of a rail-road; all in the manner and for the purposes set forth.

5. The combination, with the base plate; and its upwardly projecting spindle, of a sliding and revoluble part D, formed, or provided with a rim *l* that encircles the base plate; and an impositive locking mechanism, arranged within the part D; all in the manner and for the purpose set forth.



6. The combination with the tubular and  
movable part D; the base plate provided with  
a vertical spindle; a screw cap I; and a spiral  
spring inclosed within said parts D and I, of  
5 a rim s on the cap, encircling the upper end  
of D; the whole arranged and operating in  
the manner and for the purpose set forth.

In witness whereof I have hereunto set my  
hand this 15th day of January, 1894.

DWIGHT M. CHURCH.

In presence of—

ALFRED B. LENNOX,

RICHARD A. MCKAY.