

No. 698,922.

Patented Apr. 29, 1902.

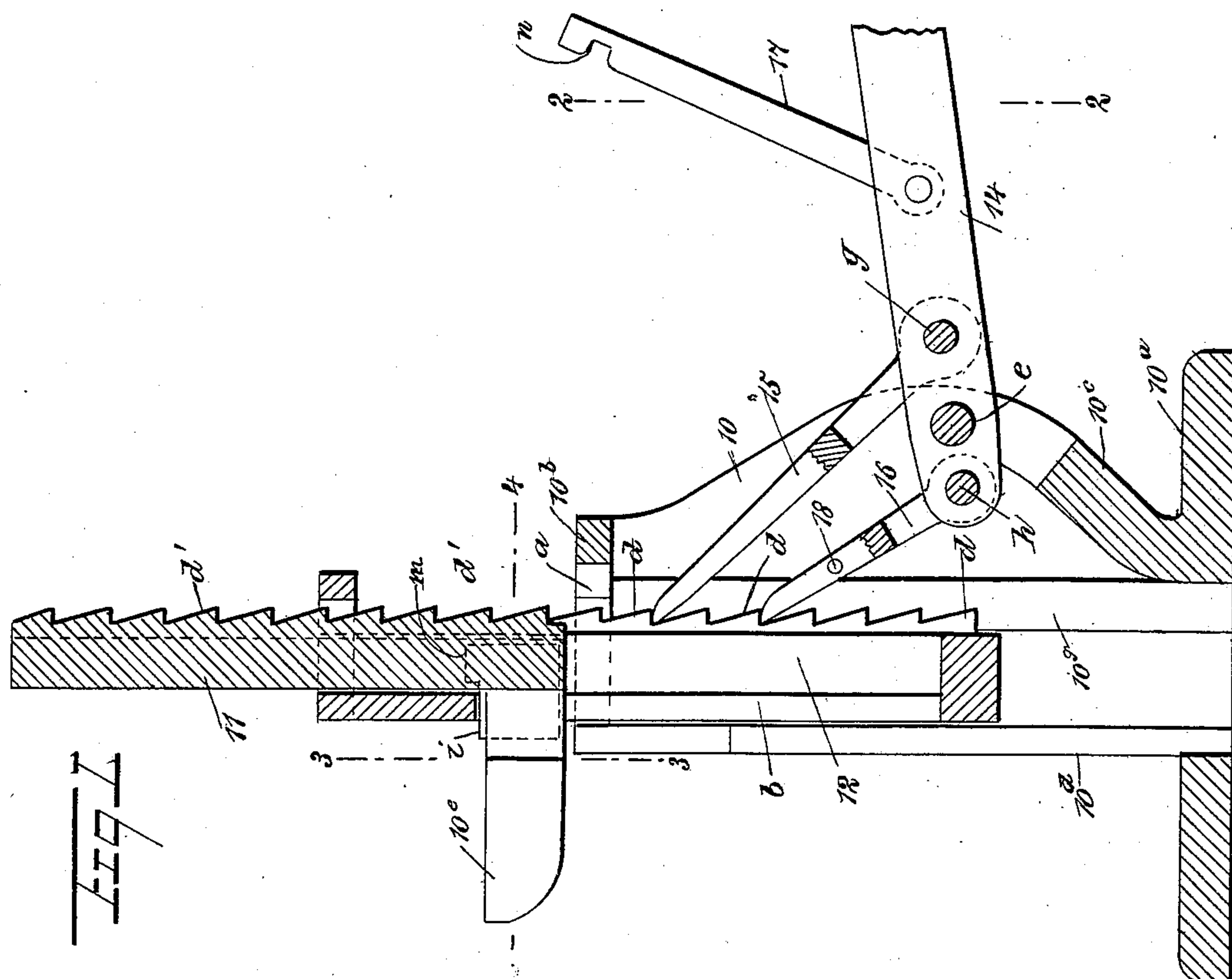
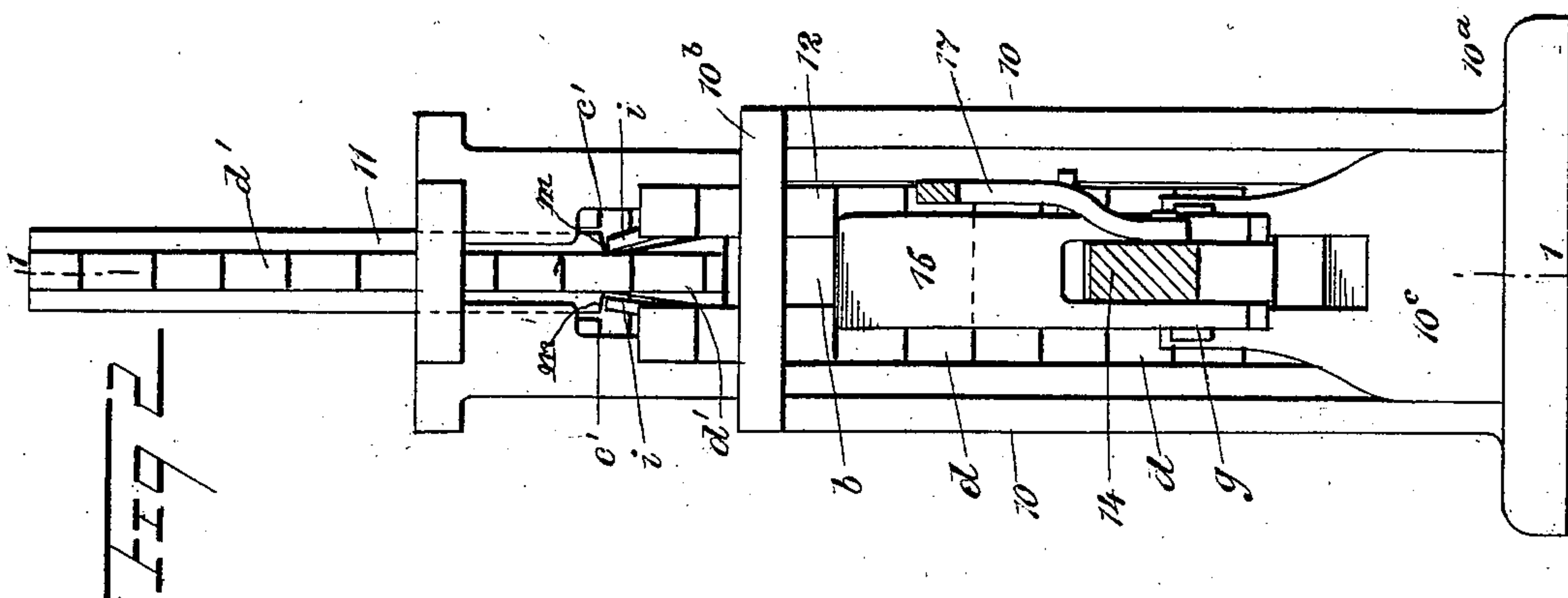
F. H. FORD.

LIFTING JACK.

Application filed Aug. 30, 1901.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

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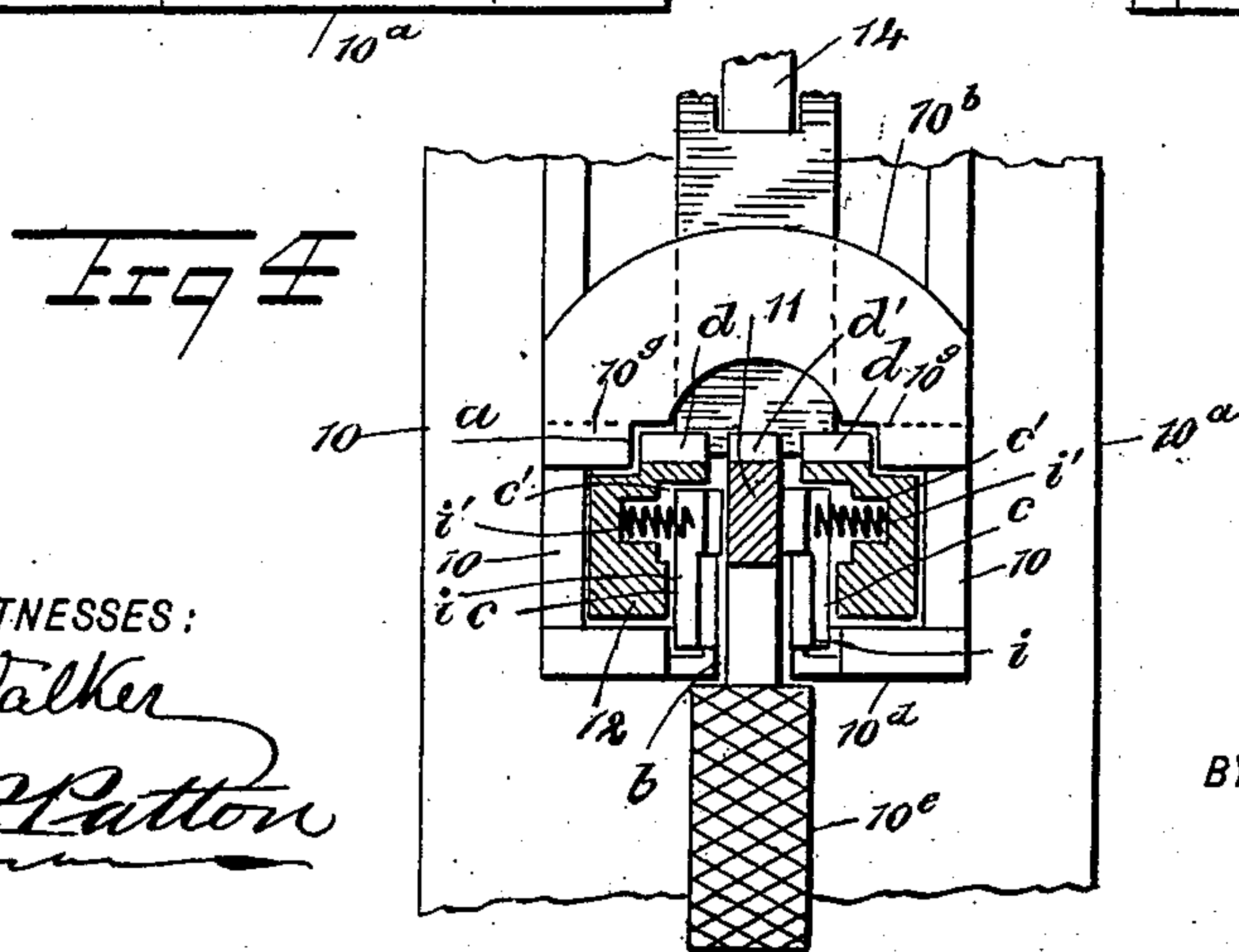
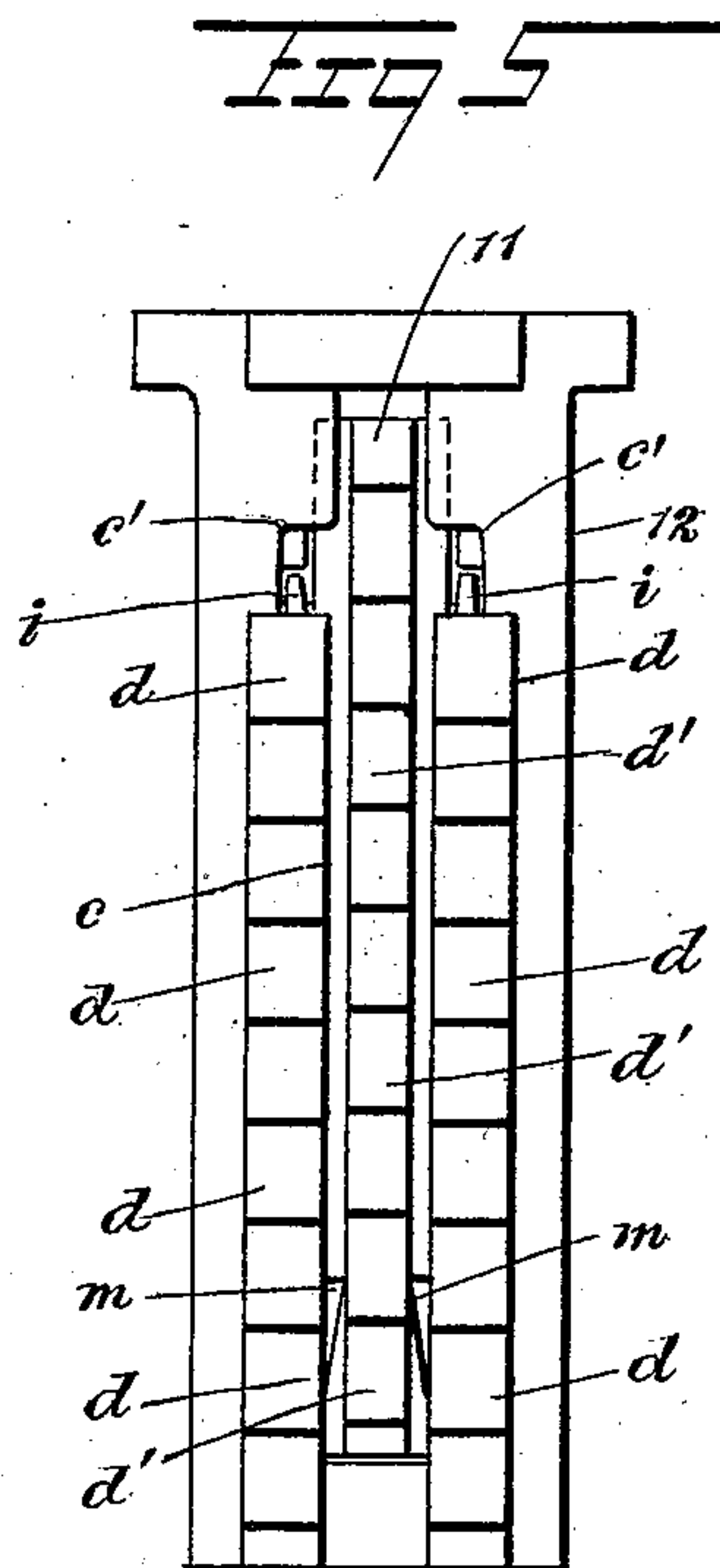
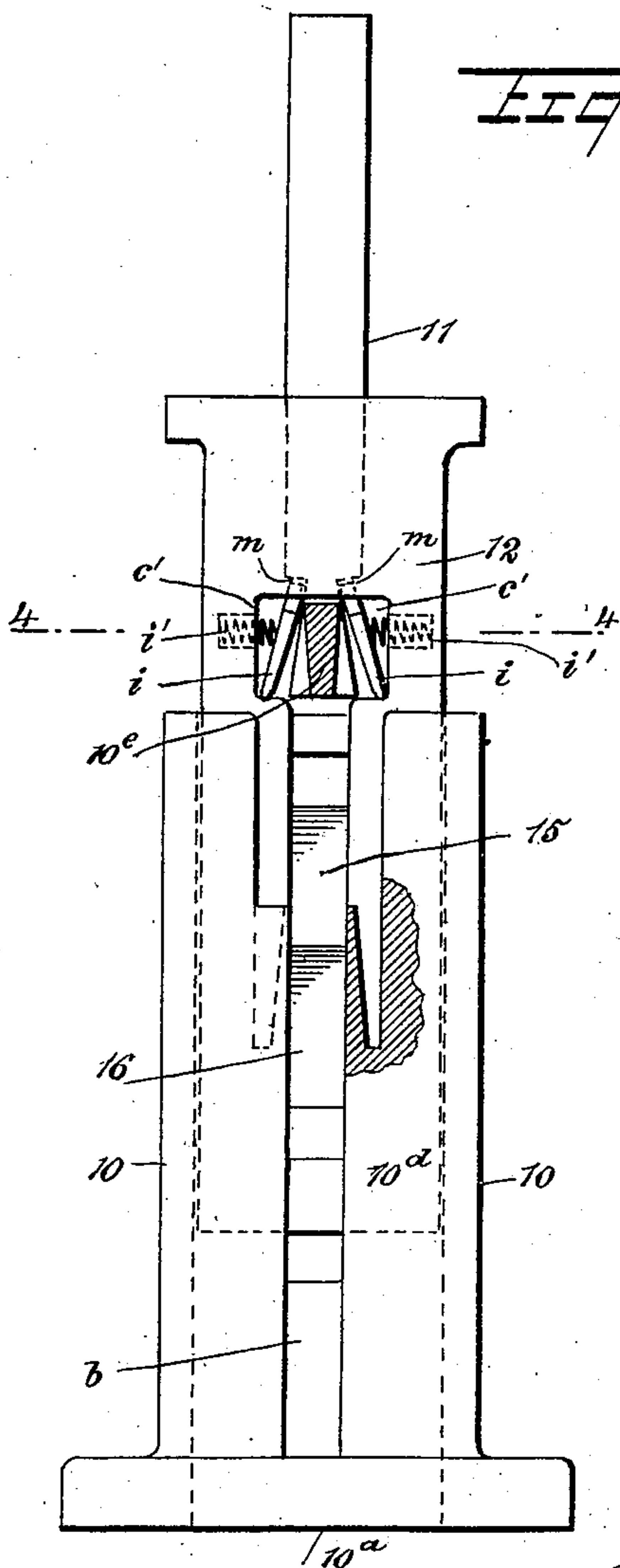
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UNITED STATES PATENT OFFICE.

FRED HURLBUT FORD, OF JACKSONVILLE, FLORIDA, ASSIGNOR OF ONE-HALF TO JOHN H. HILL, OF JACKSONVILLE, FLORIDA.

LIFTING-JACK.

SPECIFICATION forming part of Letters Patent No. 698,922, dated April 29, 1902.

Application filed August 30, 1901. Serial No. 73,785. (No model.)

To all whom it may concern:

Be it known that I, FRED HURLBUT FORD, a citizen of the United States, and a resident of Jacksonville, in the county of Duval and State of Florida, have invented new and useful Improvements in Lifting-Jacks, of which the following is a full, clear, and exact description.

This invention relates to a class of lifting-jacks especially adapted in the repairing of the track of a railroad, and has for its object to provide novel details of construction for a device of the character indicated which renders it very compact, so that while affording a considerable range of elevation the projection above the rail of the track of any part of the lifting-jack at any point in its use is much less than the like projection of lifting-jacks in present use and so that the operation of trains over track under process of repairs and the work of men engaged in such repair is made more safe from accident consequent upon such projection of the lifting-jack above the track and enables the jack to lift a heavy weight with the exertion of moderate manual effort.

The invention consists in the novel construction and combination of parts, as hereinafter described, and defined in the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a partly-sectional side view substantially on the line 1 1 in Fig. 2. Fig. 2 is a partly-sectional front elevation, the section being substantially on the line 2 2 in Fig. 1. Fig. 3 is a partly-sectional rear side elevation, the section being substantially on the line 3 3 in Fig. 1. Fig. 4 is a partly-sectional plan view substantially on the line 4 4 in Fig. 1, and Fig. 5 is a front side view of details of the lifting mechanism removed from the jack-frame.

The jack-frame comprises two side walls 10, joined at their lower ends upon a base 10^a and at their upper ends to a cap-piece 10^b, the sides being spaced apart in parallel planes by the base and cap-piece and also by the low front wall 10^c, together with the rear side wall 10^d, the latter extending the height of

the sides of the frame. An aperture *a* is formed in the cap-piece 10^b for free movement therethrough of two lifting-posts 11 12, and in the rear wall 10^d a vertical slot *b* is formed near the transverse center thereof for the free reciprocation of a footpiece 10^e, that projects outwardly from the post 11, as will hereinafter be more fully described. The lifting-post 12 is of such transverse dimension as permits it to slide freely in the frame of the jack between the sides 10 and loosely contact at its front and rear sides, respectively, with the guide-strips 10^g, that are vertically secured on the sides 10 and the rear wall 10^d. The lifting-post 12 is longitudinally slotted, as at *c*, from a point near its upper end to a point near the lower end thereof, and in said slot the lifting-post 11 is held free to reciprocate and extend above the slotted lifting-post 12, as is essential in the operation of the jack.

Upon the front face of the lifting-post 12 a series of evenly-spaced ratchet-cut teeth *d* is formed. Said teeth that hook downwardly extend across the entire width of the post, as clearly shown in Figs. 2 and 5. A corresponding series of ratchet-teeth *d'* is formed in the front face of the lifting-post 11, and said teeth extend throughout the length of the post, as shown in Fig. 1; but a suitable space intervenes between the upper tooth on the post 12 and the upper edge of said post, as shown in Fig. 5.

The relative height of the front wall 10^c on the jack-frame permits the introduction of a rockable lever 14 within the space above said wall between the frame's sides 10, and, as clearly shown in Fig. 1 at *e*, said lever is pivoted upon the sides at a suitable distance from the end of the lever that extends toward the lifting-posts 11 12. A pawl 15 is provided, which is preferably furcated at the lower end, thus producing two spaced limbs thereon, which embrace the lever 14 and are thereon pivoted, as at *g*, a proper distance outwardly from the pintle-bolt *e*. The pawl 15 has sufficient breadth at its upper end or toe to engage with the teeth *d'* successively and raise the post 11 step by step as the lever 14 is rocked upwardly and also engage with the teeth *d* on the lifting-post 12 when parts

which coact with the pawl 15 and lever 14 become active, as will now be described.

A pawl 16 is pivoted, as at *h* in Fig. 1, upon the extremity of the lever 14 which projects within the frame of the jack, and the toe of said pawl projects upwardly and rearwardly for engagement with the teeth on the lifting-posts 11 12. In the body of the lifting-post 12, at a point near the upper tooth *d'* thereon, the slot *c* is widened to produce lateral recesses *c'* at the top of said slot, as appears in Figs. 3 and 5. In the lateral recesses *c'* two similar detent-dogs *i* are held to rock by a seated engagement of each dog with the bottom of a respective recess, and the dogs at their upper ends are pressed toward and upon the sides of the lifting-post 11 by springs *i'*, and in said sides of the lifting-post two similar notches *m* are oppositely formed near the lower end thereof, producing horizontal shoulders, the use of which will be hereinafter explained.

Upon the lever 14 an elongated retracting-arm 17 is pivoted at some distance from the longer pawl 15, and on the free end portion of the arm, which may be inclined toward the lower and shorter pawl 16, a hook is formed, as shown at *n* in Fig. 1. A pin 18 projects laterally from the pawl 16, which the hook *n* may be engaged with when the arm 17 is rocked toward said pin. For efficiency in service the pawl 16 should engage with the teeth *d* or *d'* on the lifting-posts 11 12 a suitable distance below a like engagement of the uppermost pawl 15 therewith. As shown in Fig. 1, a single tooth intervenes between the toes of said engaged pawls.

In using the improved jack for rasing a portion of an old or new railroad-track, so as to permit renewal or adjustment of cross-ties or repair of ballasting between seated cross-ties, the footpiece 10^e, which projects through the slot *b* from the lower end of the lifting-post 11, is introduced below the track-rail, when both of the lifting-posts 11 12 are fully depressed in the frame of the jack, which will obviously dispose the footpiece near the base 10^a and require but little space for seating the base-piece of the frame upon the road-bed beneath the track-rail. It will be seen that if the arm 17 is rocked away from the pin 18 and the lever 14 is inclined downward toward its outer end, while the lifting-posts 11 12 are fully depressed and the footpiece in position beneath an object to be lifted, a slight elevation of the lever will facilitate an engagement of the toes of the pawls 15 16, near the upper end of the lifting-post 11, in respective positions indicated in Fig. 1, where an advanced stage of the lifting operation is shown. Now if the operator forcibly raises the outer end of the lever 14 this rocking movement of the lever will cause the toe of the pawl 15 to press upward the lifting-post 11, and as the inner end of the lever will be depressed it will be seen that the lift of the post 11 a sufficient degree will permit the

pawl 16, that has been correspondingly depressed, to rock by gravity into engagement with an appropriate tooth *d'* on the post 11. The engagement of the toe of the pawl 16 with a tooth of the lifting-post 11, as just described, defines the limit of the upward lifting movement applied upon the lever 14, and it must now be rocked downwardly, so as to permit the pawl 15 to engage with a lower tooth that has come into range, the pawl 16 now serving as a prop-brace to prevent an improper descent of the lifting-post 11. If the height the footpiece 10^e is to be elevated is within the range afforded by the lifting-post 11, the operation may be arrested when such height is attained, and the track-rail or other object lifted may be held until repairs have been made. When the track is to be lowered into normal position, this may be readily effected by engaging the arm 17 with the pin 18 and then depressing the lever 14 sufficiently to cause the pawl 16 to rock toward and press upon the pawl 15, which will release both pawls and permit the lifting-post 11 to drop into a lowermost position and of course correspondingly depress the footpiece 10^e, that has carried the track-rail, so that the rail will be seated upon the repaired road-bed. In some situations, however, it is necessary to elevate the footpiece and object it carries to a greater elevation than can be effected by the operation hereinbefore described, and it will be seen that without alteration of parts, assuming that the arm 17 is unhooked, the continued vibration of the lever 14 will enable the employment of both of the lifting-posts 11 12, the operation in detail being as follows: After the lifting-post 11 has been raised its full range the detent-dogs *i* will be pressed into the recesses *m* and interlock with the supporting-shoulders they afford. The engagement of the dogs *i*, as explained, adapts the post 11 if moved upward to correspondingly elevate the other post 12, so that the continuance of the vibratory movement of the lever 14 will without impediment transfer the engagement of the toes of the pawls 15 16 from the fully-elevated post 11 to the post 12, and, if desired, the latter-named post may be elevated its full range or the lifting operation may be stopped at any intermediate point in the height of the coacting posts 11 12, and the posts, together with the footpiece 10^e, may be permitted to descend by the means already described.

It will be observed that one peculiarity of the improved jack consists in effecting the elevation of the coacting posts 11 12 by elevating the outer end of the operating-lever 14. This is very essential, as it enables the use of the jack in situations where but a very limited depression of the lever can be had, which is particularly the case in repair of railroad-tracks that are level with the road-bed at each side of the track-rails. The improvement may also be employed in bridge repair or erection, in the repair of cars, locomotives, and

other machinery, and, in fact, it can be used wherever a compact jack that is normally of low height and affords a considerable lifting range may be advantageously utilized.

5 Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a lifting-jack, the combination with a frame, of upright posts slidable one in the
10 other, a lever pivoted on the frame, and two pawls carried by the lever and adapted to engage with teeth on the posts for their elevation successively.

2. In a lifting-jack, the combination with a
15 frame, two posts vertically slidable on the frame one within the other, teeth on said posts, a lever pivoted on the frame adjacent to one end of the lever, a pawl pivoted on the lever at one side of the pivot of said lever, and a
20 shorter pawl pivoted on the lever at the adjacent end thereof, said pawls engaging the teeth of the posts.

3. In a lifting-jack, the combination with a frame, of two posts one slidable in the other,
25 a series of teeth on each post, a lever pivoted near one end thereof between the sides of the frame, a long pawl, and a shorter pawl respectively pivoted at opposite sides of the lever-pivot, the toes of the pawls engaging separated teeth on the posts one pawl descending
30 while the other pawl pushes upon a tooth of a post.

4. In a lifting-jack, the combination with a frame, of two posts one slidable in a slot of the
35 other post, a footpiece projected from one of the posts near its lower end, a series of teeth on each post, a lever pivoted near one end thereof between the sides of the frame, a long pawl pivoted on the lever outside of the frame,
40 another shorter pawl pivoted on the lever at the end that is nearest to the posts, the pawls having engagement with the teeth of the posts but simultaneously moving in opposite directions.

45 5. In a lifting-jack, the combination with a frame, of two posts one post slidable in the

other, a footpiece extended outwardly from the post that is located in the wider post, a series of downwardly-hooking teeth on the front face of each post, a lever pivoted near one end
50 thereof between the sides of the frame, a long pawl pivoted on the lever inclining upward and toward the teeth of the posts for engagement therewith, a shorter pawl pivoted on the inner end of the lever and at the opposite side
55 of the lever-pivot from that occupied by the pivot of the long pawl, an arm pivoted on the lever and having a hook on the free end, and a pin projected at one side of the shorter pawl, whereon the hook of the arm may engage. 60

6. In a lifting-jack, the combination with a frame, two posts slidable one in the other, and together in the frame, two detent-dogs on one post adapted to engage in notches on the other
65 post near the lower end thereof, and teeth on each of the posts, of a lever pivoted on the frame, adjacent to one end of the lever, a pawl pivoted on the lever at one side of the pivot of said lever, and a shorter pawl pivoted on the lever on the adjacent end thereof, the
70 first pawl that is longest engaging the teeth of the posts above the shorter pawl, one pawl acting as a detent while the other pawl is pushing when actuated by the vibration of the lever.

7. In a device of the character described, 75 the combination with a frame, of two lifting-posts, one sliding in the other, and both posts sliding in the frame, spring-pressed dogs on one post adapted to interlock with shoulders on the other post when it is fully elevated, and
80 means to elevate one post to its limit on the other post and then raise both posts together, said means being adapted to releasably secure one post or both posts at a desired elevation on the frame. 85

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRED HURLBUT FORD.

Witnesses:

L. W. ANDERSON,

R. W. BENNETT.