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C. A. CHANDLER.

VISE.

No. 389,792. Patented Sept. 18, 1888.

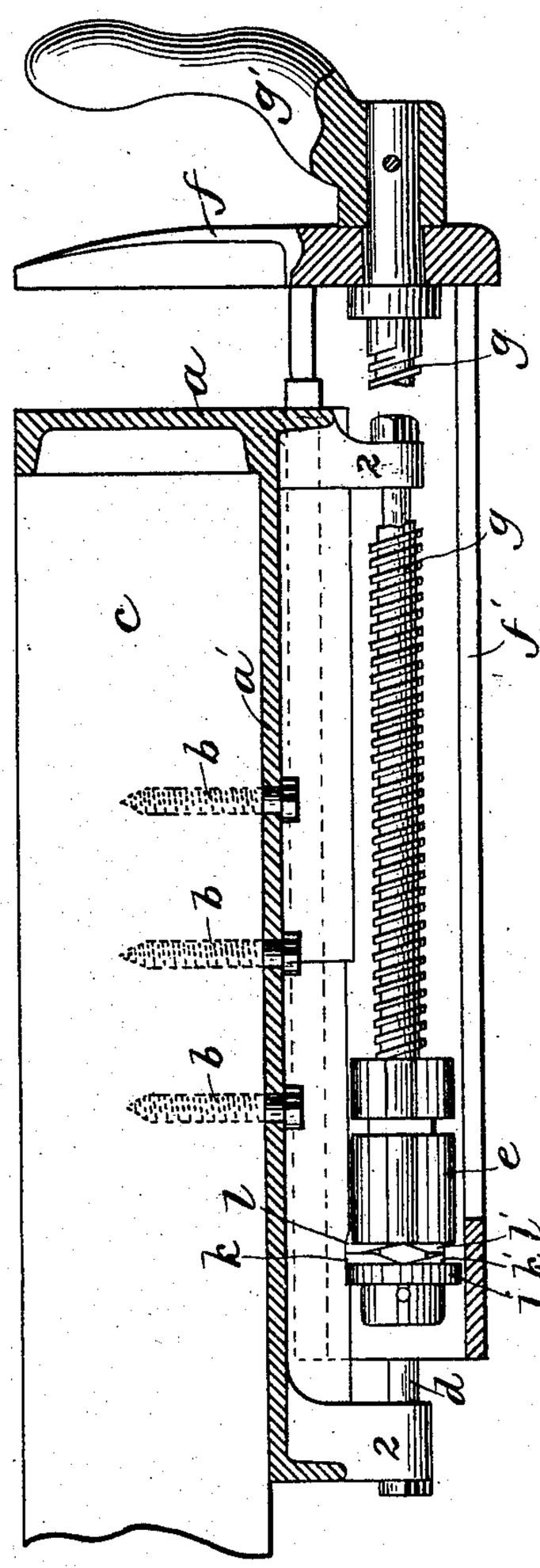

Fig. 1.

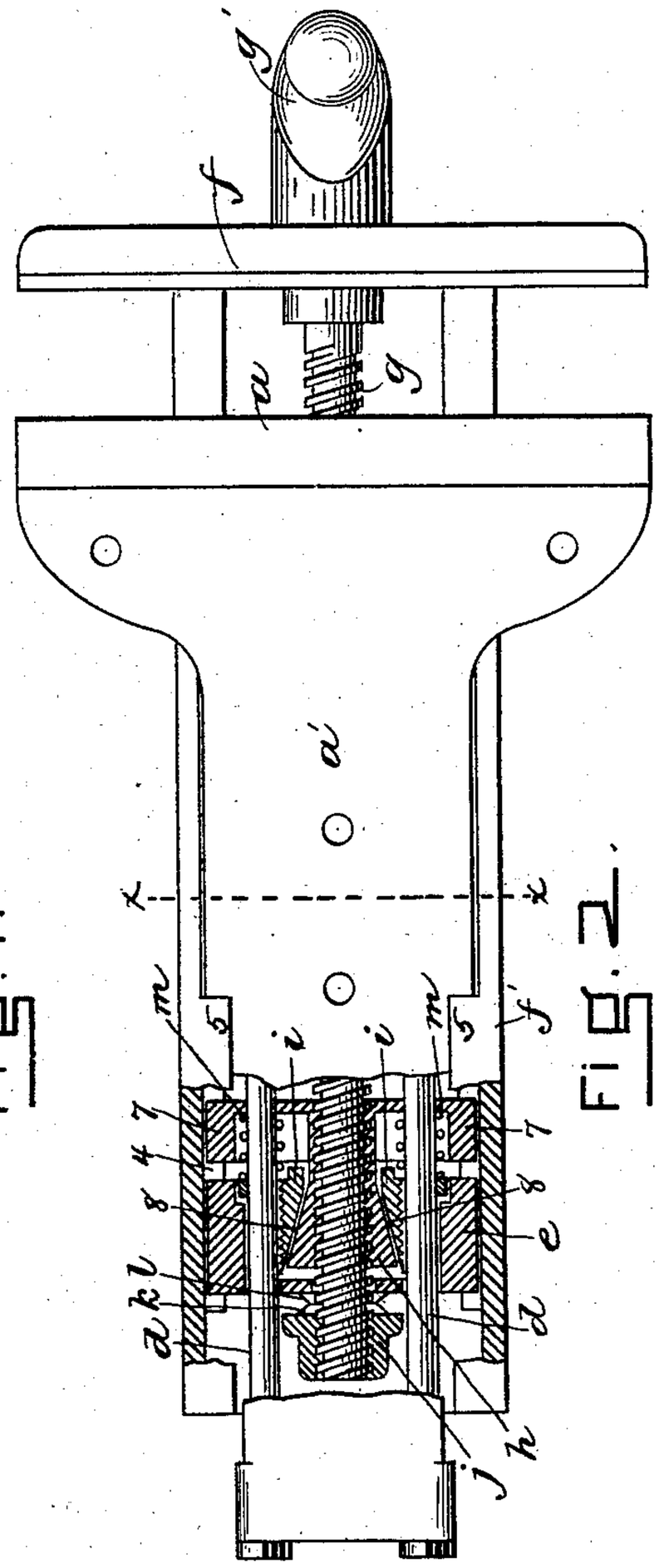

Fig. 2.

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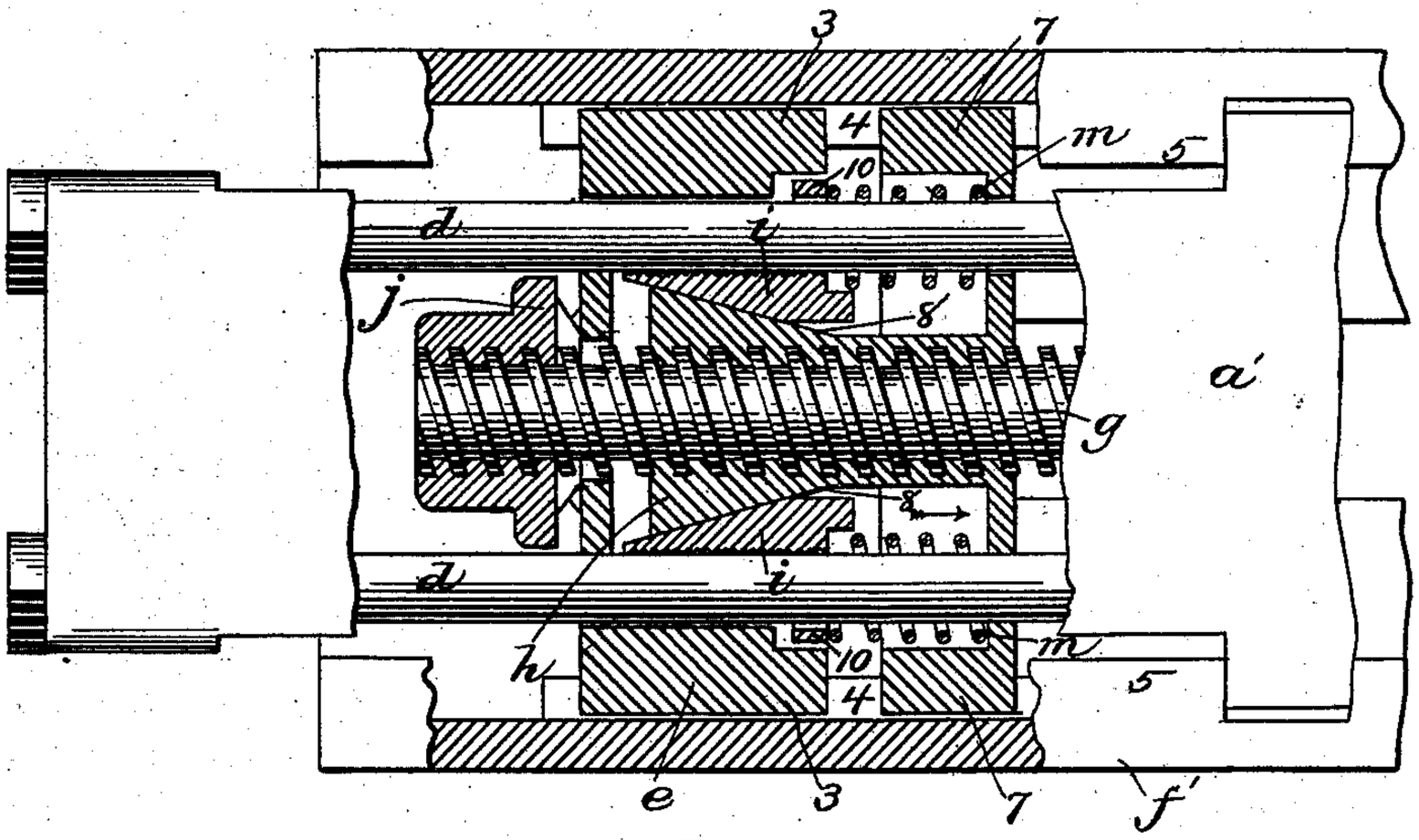

Fig. 3.

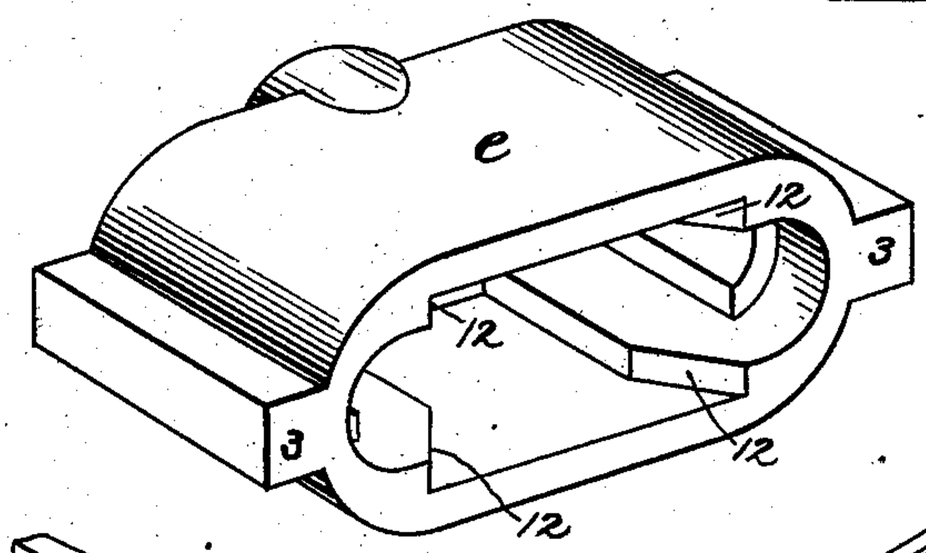

Fig. 4.

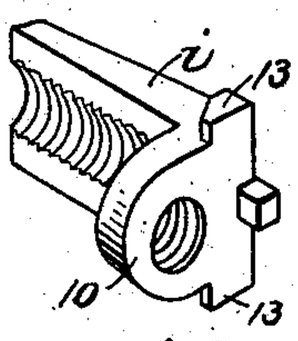

Fig. 5.

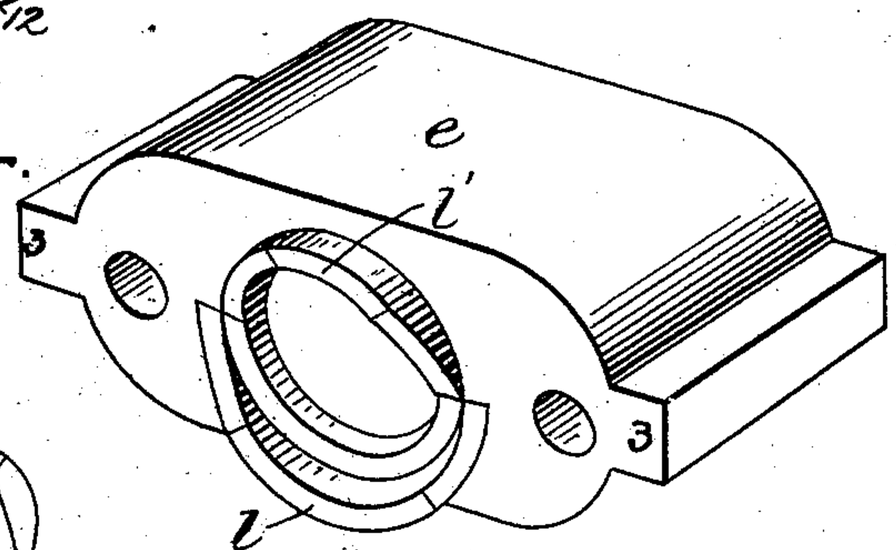

Fig. 6.

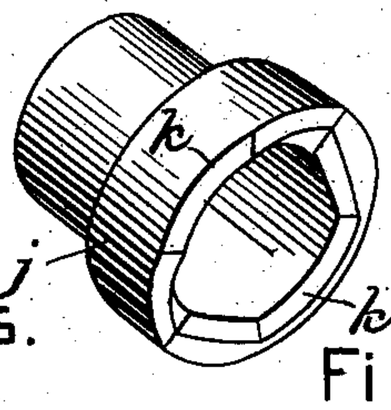

Fig. 7.

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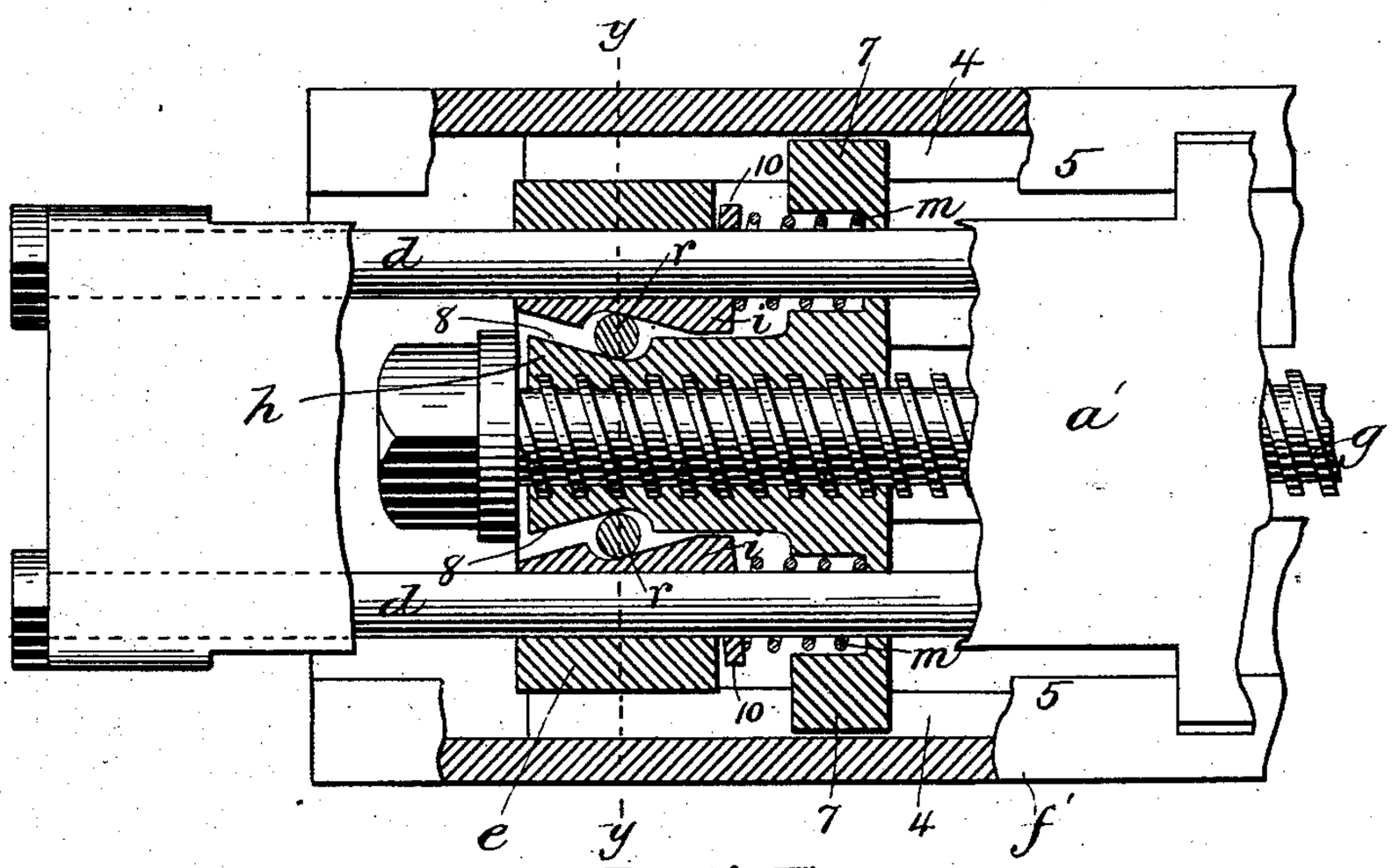

Fig. 9.

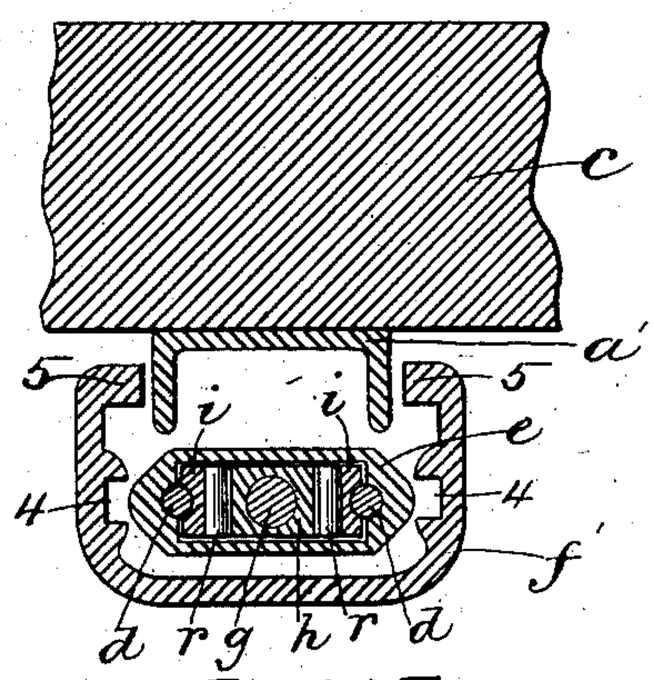

Fig. 10.

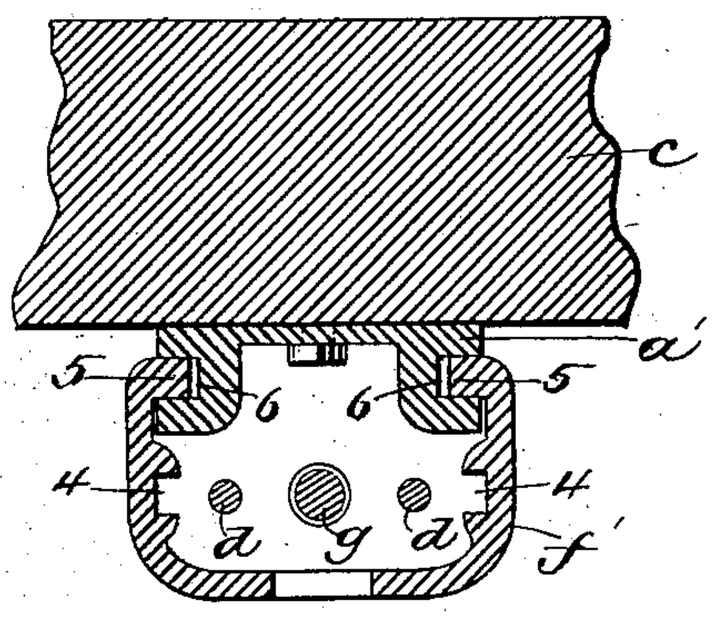

Fig. 8.

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VISE.

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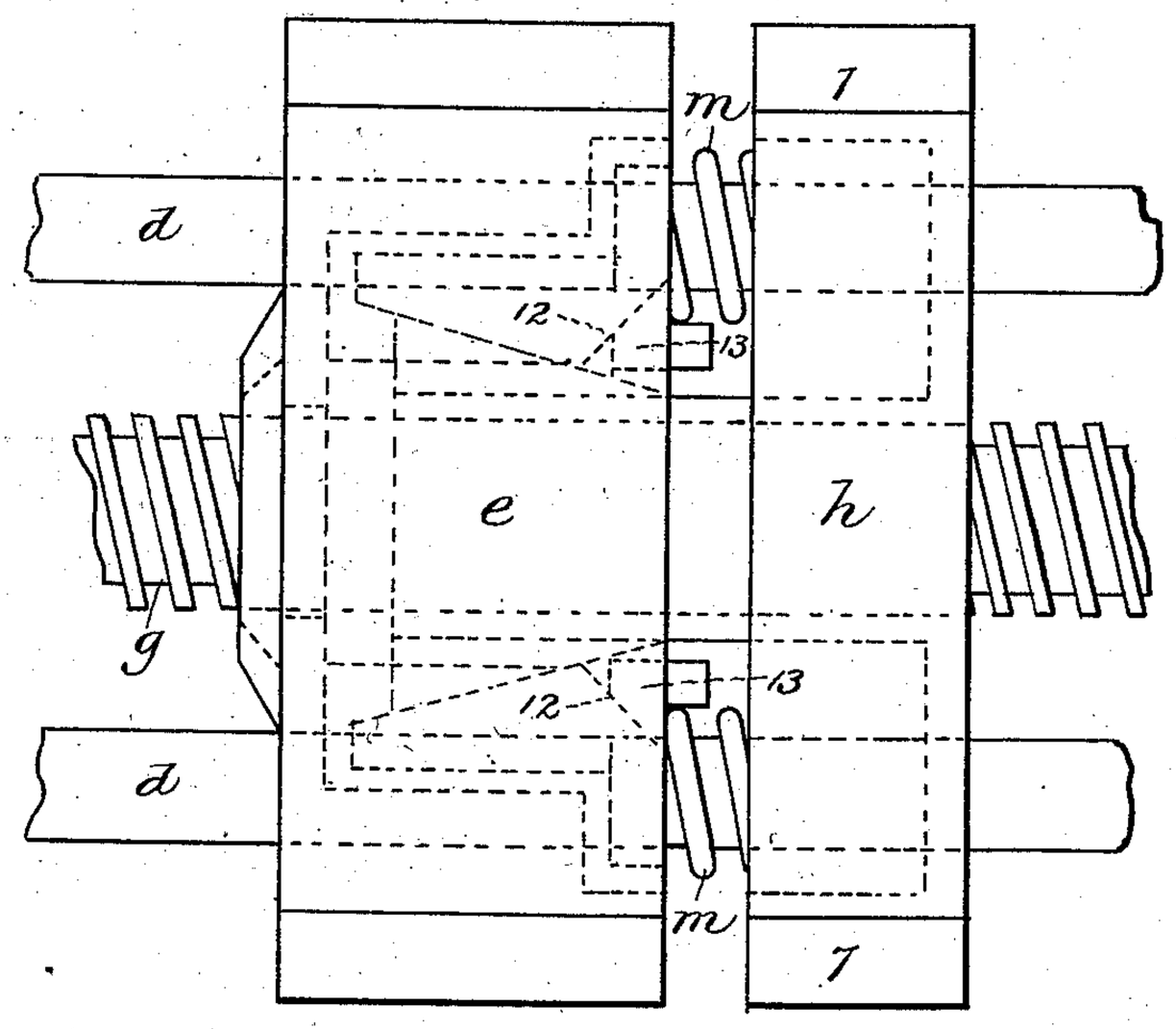

Fig. 11.

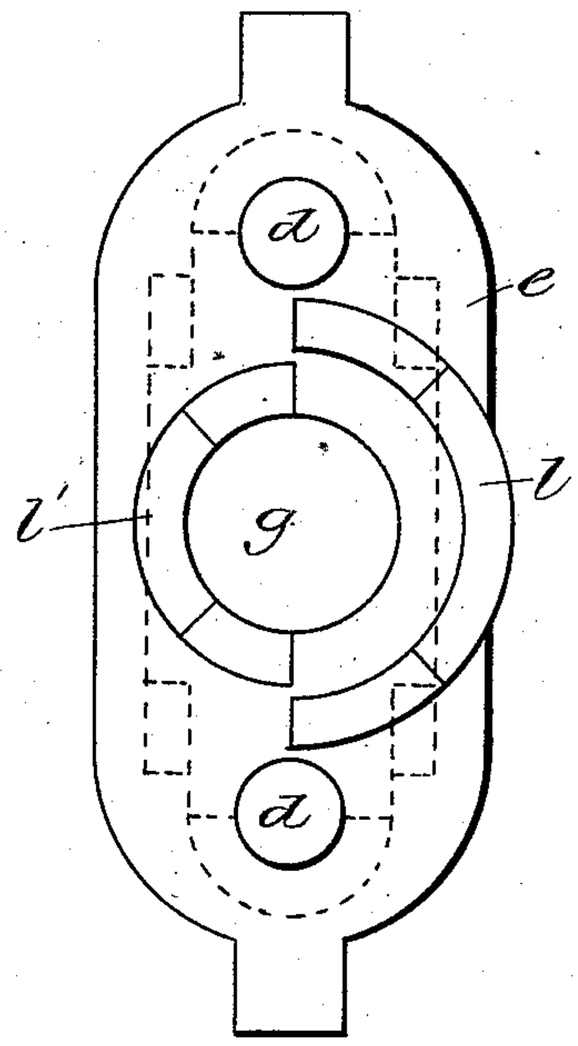

Fig. 12.

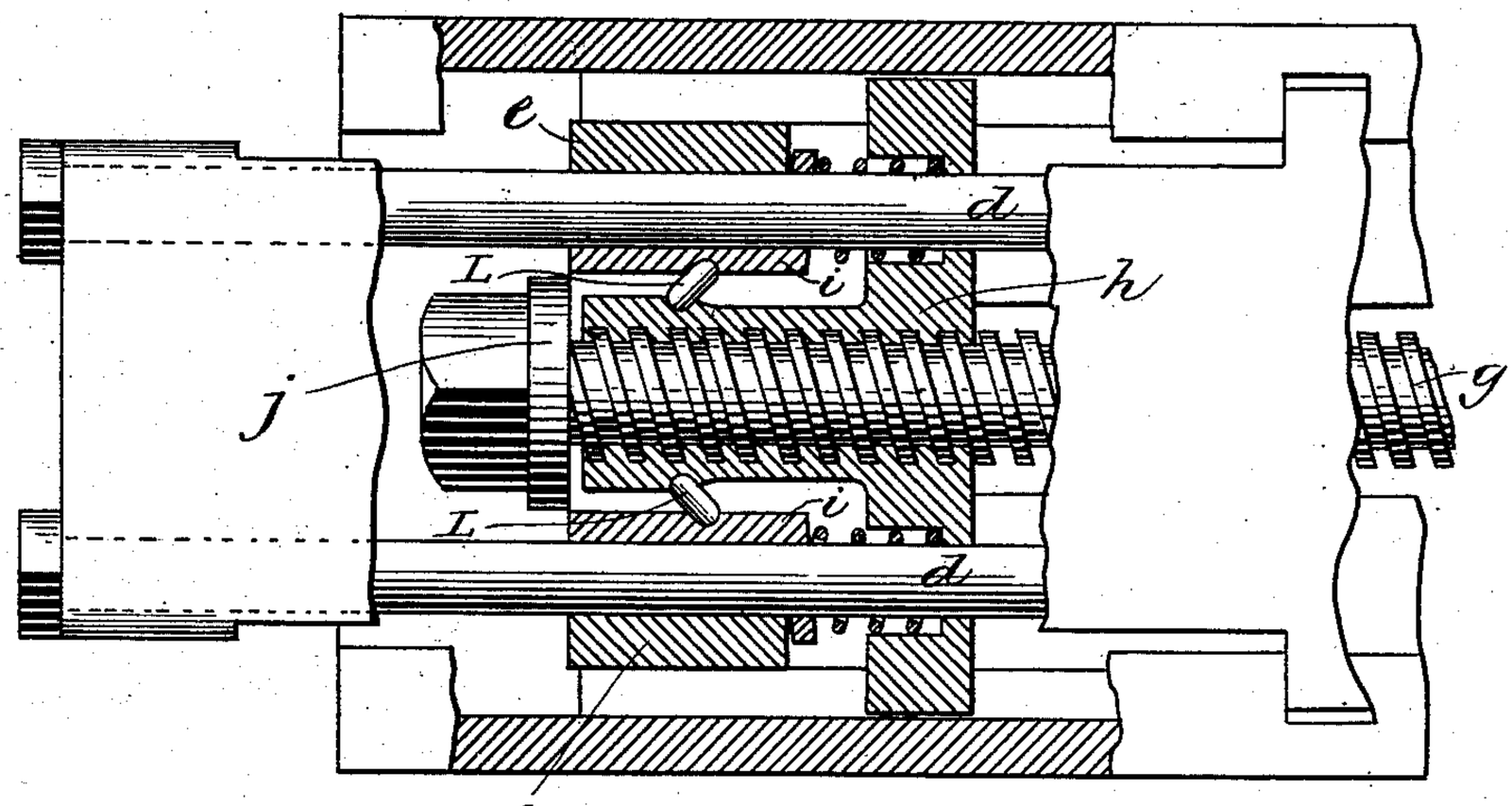

Fig. 13.

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W. B. Ramsay.

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UNITED STATES PATENT OFFICE.

CLARENCE A. CHANDLER, OF EAST BRIDGEWATER, MASSACHUSETTS.

VISE.

SPECIFICATION forming part of Letters Patent No. 389,792, dated September 18, 1888.

Application filed April 26, 1888. Serial No. 271,968. (No model.)

To all whom it may concern:

Be it known that I, CLARENCE A. CHANDLER, of East Bridgewater, in the county of Plymouth and State of Massachusetts, have invented certain new and useful Improvements in Vises, of which the following is a specification.

This invention relates to that class of vises in which the movable jaw is adapted to be quickly moved in either direction until an approximate adjustment is effected, and is then operatively held and clamped against the thing interposed between the two jaws.

The invention has for its object to provide a vise of this class in which the engagement of the rapidly-adjustable jaw with the devices that apply clamping-pressure to it shall be quick and positive, and in which the jaw shall be firmly held without the possibility of yielding; and it consists in the improvements, which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a longitudinal section of my improved vise. Fig. 2 represents a top view of the same, showing the movable-jaw locking and releasing devices in section and in the position they assume when the movable jaw is free to be rapidly adjusted. Fig. 3 represents an enlarged section of the locking and releasing devices in the position which they assume when the movable jaw is locked. Figs. 4, 5, 6, and 7 represent detail views. Fig. 8 represents a section on line *x x*, Fig. 2. Fig. 9 represents a sectional view showing anti-friction rolls, hereinafter referred to. Fig. 10 represents a section on line *y y*, Fig. 9. Fig. 11 represents a top view of the parts shown in section in Fig. 2. Fig. 12 represents an end view of the parts shown in Fig. 11. Fig. 13 represents a sectional view of a modification.

The same letters of reference indicate the same parts in all the figures.

Referring to Figs. 1 to 8, inclusive, *a* represents the fixed jaw of the vise, the same being formed on or rigidly attached to a plate or holder, *a'*, which is adapted to be attached by screws *b* or otherwise to a bench or other support, *c*. On said plate are formed ears or lugs 2 2, to which are affixed two parallel rods or bars, *d d*, extending longitudinally of the plate; or said bars may be rigidly attached to the holder in any other suitable manner.

e represents a strap fitted to slide on the rods *d d*, and having ribs 3 3 at its opposite ends, which are fitted in grooves 4 4 in the carrier *f'* of the movable jaw *f*. Said carrier is an elongated casting, preferably of a widened U shape in cross-section, and provided at its upper edges with inwardly-projecting flanges, 5 5, which are fitted in grooves or ways 6 6, Fig. 8, in the edges of the plate or fixed-jaw holder *a'*, the carrier being thus adapted to slide on said plate. On the inner surfaces of the sides of the carrier *f'* are the grooves 4 4, into which the ribs 3 3 of the strap *e* project.

g represents the operating-screw, the outer end or head of which is swiveled in the movable jaw *f*, and is provided with a handle or hand-wheel, *g'*, outside of said jaw, as shown in Fig. 1. The threaded portion of the screw extends through or nearly through the carrier *f'*, and is engaged with a peculiarly-formed nut, *h*. Said nut is provided with ears or wings 7 7, which project from opposite sides of the nut and have orifices through which the rods or bars *d d* pass and project into the grooves 4 4 of the carrier *f'*, the nut being prevented from rotating by the said grooves, so that when the screw is rotated the nut will be moved on the screw. A part of the nut projects into the strap *e*, and is therein provided with two inclined sides, 8 8, which give said portion of the nut a wedge shape, as shown in Figs. 2 and 3.

Between the inclined sides 8 8 and the rods or bars *d d* are interposed loose gibs *i i*, which are formed at their inner sides to fit the inclined sides of the nut *h* and at their outer sides to approximately fit the rods or bars *d d*, said outer sides being concaved and preferably roughened or serrated, as shown in Fig. 5.

The screw *g* is provided at its rear end with a collar or enlargement, *j*, on which is formed a curved cam, *k*, which is concentric with the periphery of the screw. The end of the cross-head is provided with a cam, *l*, of like form and arrangement, the two cams being relatively arranged so that when they do not coincide with each other one will fit the space between the

ends of the other, as shown in Fig. 3, and the strap will be pressed by springs *m m* against the cam *k* on the collar *j*, said springs being interposed between the wings 7 7 of the nut *h* and the forward ends of the gibs *i i*, and exerting pressure through said gibs on the strap *e*. When the strap is in this position, the gibs are held by the inclined sides of the nut in close contact with the rods *d d*, so that a slight rotation of the screw in the direction required to move the nut in the direction indicated by the arrow in Fig. 3 will force the gibs firmly against the guide-rods, and thus lock the movable jaw and its carrier. When the screw is turned in the opposite direction, it first moves the nut to slightly loosen the gibs, and causes the cam *k* on its collar to coincide with the cam *l* on the strap, as shown in Figs. 1 and 2, and thus forces the strap forward and moves the gibs toward the smaller end of the wedge shaped portion of the nut, thereby entirely loosening the gibs, so that they are thrown back from the rods *d d* by the conjoint action of, first, the springs *m m*, which bear on the ears 10 10 of said gibs at points outside of the rods *d d*, as shown in Fig. 3, so that they have a tendency to tip the gibs and throw their rear ends inwardly from the rods, and, secondly, inclined faces 12 12 on the strap, Fig. 4, bearing on the inclined faces of lugs 13 13 on the forward ends of the gibs, Figs. 5 and 11, said inclined faces forcing the forward ends of the gibs inwardly, so that the entire bearing-surfaces of the gibs are at once removed from the rods *d d*.

It will be seen that when the gibs and rods are separated, as last described, the movable jaw *f* and its carrier *f'* can be freely moved in either direction without the operation of the screw, the latter moving bodily with the jaw and carrier. When the movable jaw is to be locked, the screw is turned to separate the cam *k* from the cam *l* and allow the springs *m m* to force the strap backwardly against the cam *k*, the gibs *i i* being, by this movement of the strap and by their contact with the inclined sides of the nut, forced out against the rods *d d*, as already described, so that they may be locked on said rods by the described movement of the nut caused by a slight additional rotation of the screw.

In Figs. 9 and 10 I have shown the proximate inclined surfaces of the nut and jaws recessed to form spaces, in which are placed anti-friction rollers *r r*, through which pressure is communicated from the inclined surfaces 8 8 of the nut to the gibs *i i*. The operation is as already described; but the rollers, by reducing friction, obviate liability of the gibs *i i* being moved lengthwise or slipping on the rods *d d*.

I do not limit myself to the employment of the cams *k l* in all cases, as said cams may be dispensed with, as shown in Fig. 9, in which case the flat end of the collar or enlargement *j* will serve instead of the cam *k* as a stop to limit the backward movement of the strap *e* by the springs *m m*, and the gibs will be applied to the rods *d d* only by the movement of the nut caused by the rotation of the screw. I prefer to use the cams *k l*, however, since they make the operation of applying and removing the gibs to and from the rods *d d* more rapid by causing the described movements of the strap *e*. When the cams are not used, the part *j*, which acts as a stop, may be attached directly to the carrier *f'* instead of to the screw.

I have shown cams *k' l'* arranged respectively opposite the cams *k l*, as shown in Figs. 1, 6, and 7, said cams *k' l'* being arranged to bear on each other at the opposite side of the screw from the cams *k l*, as shown in Fig. 1, and thus distribute the pressure caused by the springs *m m*, so that said pressure will not be wholly supported at one side of the screw.

I do not limit myself to the details of construction herein shown, but may vary the same in various particulars without departing from the spirit of my invention.

From the foregoing description it will be seen that the movable jaw is locked by the outward pressure of the gibs *i i* against the rods *d d*, caused by the movement of the nut *h* in one direction, and released when said pressure is discontinued by the movement of the nut in the opposite direction after the strap *e* is arrested by contact with the stop *j*.

While I have thus far described the nut as adapted by its wedge shape to apply pressure to the gibs and to release the same, I desire to state that any suitable equivalent of the inclines on said nut may be employed for the same purpose. Fig. 13 shows a modification in which links L L are interposed between the nut and gibs, said links being arranged to press the gibs outwardly against the rods *d d* when the nut is moved as indicated by the arrow. When the nut is moved in the opposite direction, the strap and gibs are arrested by the stop *j*, and the pressure of the gibs against the rods *d d* is therefore at once removed, so that the sliding jaw is released.

It is obvious that an operative device may be produced by the employment of one rod or bar *d* and one gib *i* co-operating therewith, instead of two bars and gibs.

I claim—

1. The combination of the fixed jaw and its holder, the parallel rods or bars secured to said holder, the movable-jaw carrier adapted to slide on said holder, the screw supported by the movable jaw and its carrier, the wedge-shaped nut engaged with the screw and prevented from rotating therewith, as described, and the loose gibs interposed between the nut and the rods or bars and adapted to be forced against said bars by the inclined sides of the nut, as set forth.

2. The combination of the fixed jaw and its holder having rods or bars, the movable-jaw carrier adapted to slide on said holder, the screw supported by the movable jaw and its carrier, the wedge-shaped nut engaged with the screw and prevented from rotating there-

with, as described, the strap inclosing the wedge-shaped portion of the nut, and the loose gibs in said strap interposed between the nut and the rods or bars and adapted to be forced against said bars by the inclined sides of the nut, as set forth.

3. The combination of the fixed jaw and its holder having the rods or bars *d d*, the movable-jaw carrier adapted to slide on said holder, the screw movable with said carrier, the wedge-shaped nut engaged with the screw, the strap inclosing a portion of the nut, the loose gibs within the strap between the nut and rods, and the springs *m m*, whereby the strap is normally held with a yielding pressure against a suitable stop, as set forth.

4. The combination of the fixed jaw and its holder having the rods or bars *d d*, the movable-jaw carrier adapted to slide on said holder, the screw movable with said carrier, the wedge-shaped nut engaged with the screw, the strap inclosing a portion of the nut, the loose gibs within the strap between the nut and rods, the springs *m m*, whereby the strap is normally held with a yielding pressure against a suitable stop, a cam, *k*, affixed to the screw and constituting said stop, and a cam, *l*, on the strap formed to co-operate with the cam *k* in displacing the strap, and gibs to release the latter from the rods, as set forth.

5. The combination of the fixed jaw and its holder having the rods or bars *d d*, the movable-jaw carrier adapted to slide on said holder, the screw movable with said carrier, the wedge-shaped nut engaged with the screw, the strap inclosing a portion of the nut, the loose gibs within the strap between the nut and rods, the springs *m m*, whereby the strap is normally held with a yielding pressure against a suitable stop, a cam, *k*, affixed to the screw and constituting said stop, a cam, *l*, on the strap formed to co-operate with the cam *k* in displacing the strap, and gibs to release the latter from the rods, and inclines 12 12 on the strap and lugs 13 13 on the gibs, said inclines and lugs co-operating with the springs *m m* in separating the gibs from the rods, as set forth.

6. The combination of the fixed-jaw holder having the rods or bars *d d*, the movable-jaw carrier adapted to slide on said holder, the screw supported by the movable jaw and its carrier, the nut having the inclined sides and the wings 7 7, the latter being engaged with grooves in the carrier, the strap inclosing a portion of the nut and having ears, also engaged with said grooves, the loose gibs *i i* in said strap between the rods and the inclined sides of the nut, the springs *m m*, interposed between the gibs and the wings of the nut and arranged to force the gibs inwardly from the rods, and the cams *l k*, formed, respectively, on the strap and on a fixed collar or enlargement on the screw, all arranged and operating substantially as set forth.

7. The combination of the fixed-jaw holder, the rods or bars affixed thereto, the sliding carrier having the movable jaw, the screw supported by said carrier, the wedge-shaped nut engaged, substantially as described, with the screw and carrier, the gibs interposed between the nut and the rods or bars, and the anti-friction rolls *r r*, interposed between the proximate sides of the nut and gibs, as set forth.

8. The combination of the fixed jaw and its holder, a movable-jaw carrier adapted to slide on said holder, the screw supported by the movable jaw and its carrier, a nut engaged with the screw and adapted to be moved by the rotation of the latter, a strap having a yielding connection with the nut and movable therewith, a locking device or gib, as *i*, movable with the strap and adapted to be engaged with a part of the fixed jaw holder by the movement of the nut in one direction, and thereby hold the nut, screw, and sliding jaw, and a stop, as *j*, arranged to limit the movement of the strap and thereby make said locking device inoperative when the nut is moved in the opposite direction, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 14th day of April, A. D. 1888.

CLARENCE A. CHANDLER.

Witnesses:
C. F. BROWN,
A. D. HARRISON.