

(No Model.)

J. ERNST.  
VISE.

No. 434,541.

Patented Aug. 19, 1890.

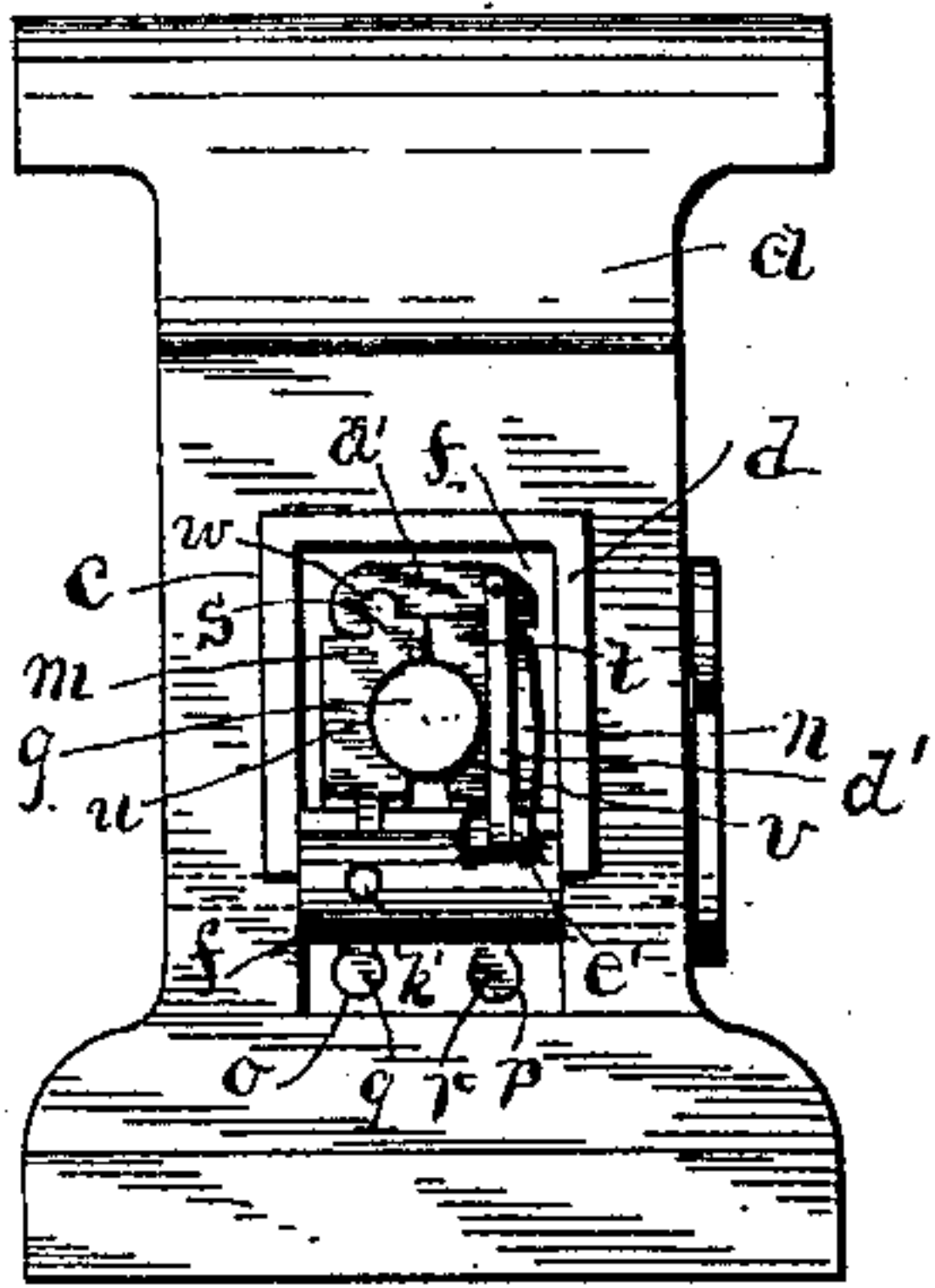


Fig. 1.

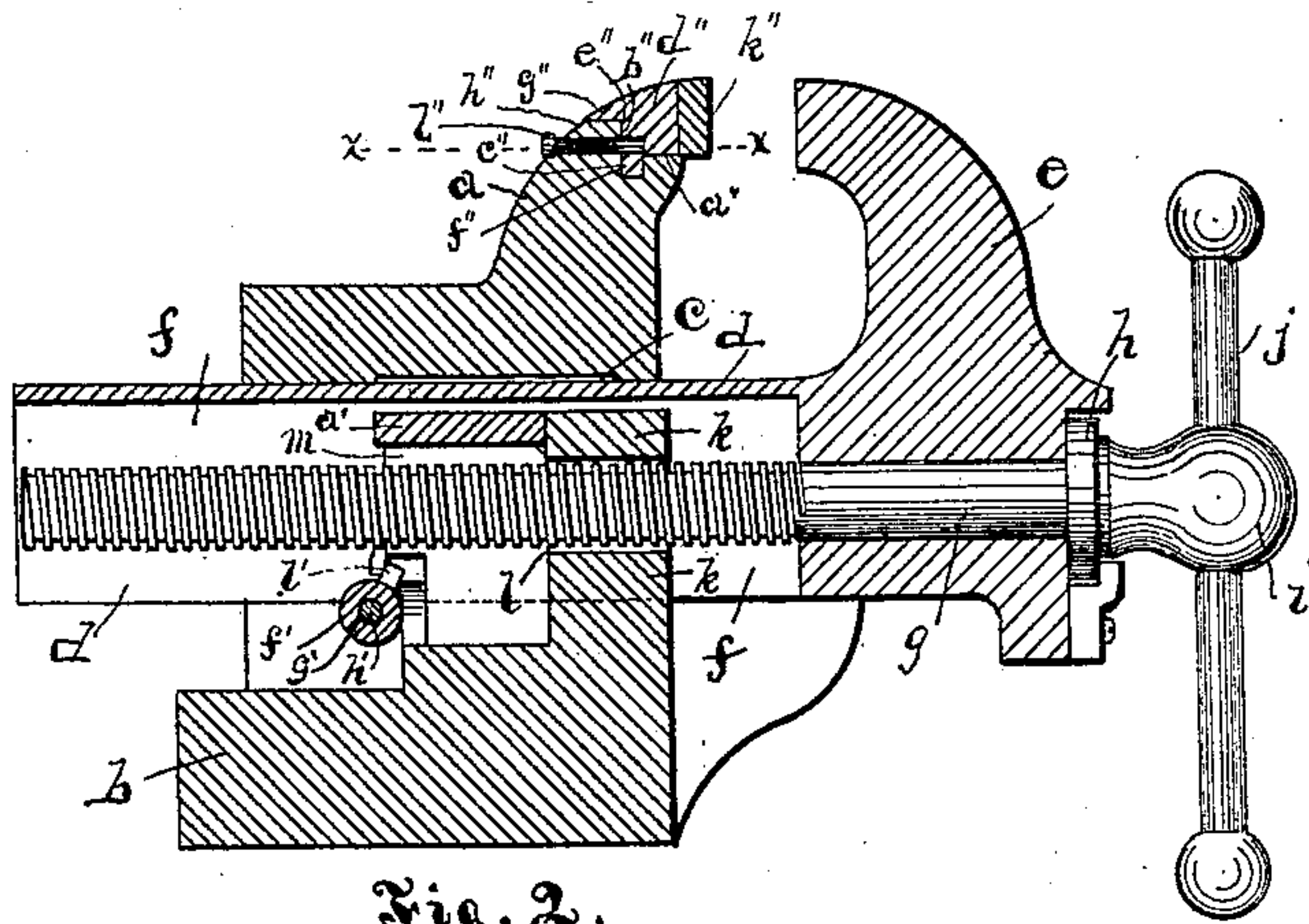


Fig. 2.

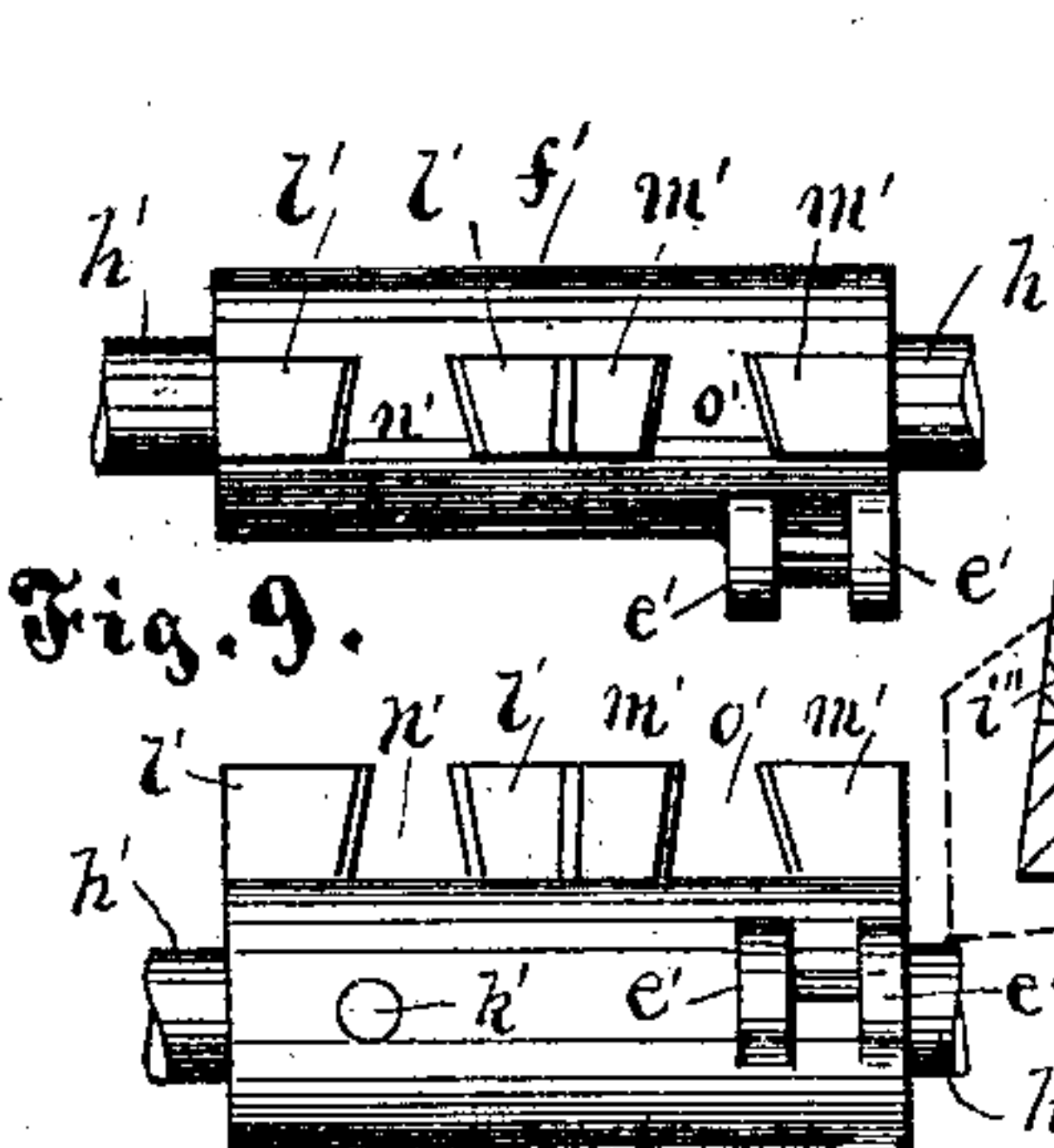


Fig. 8.

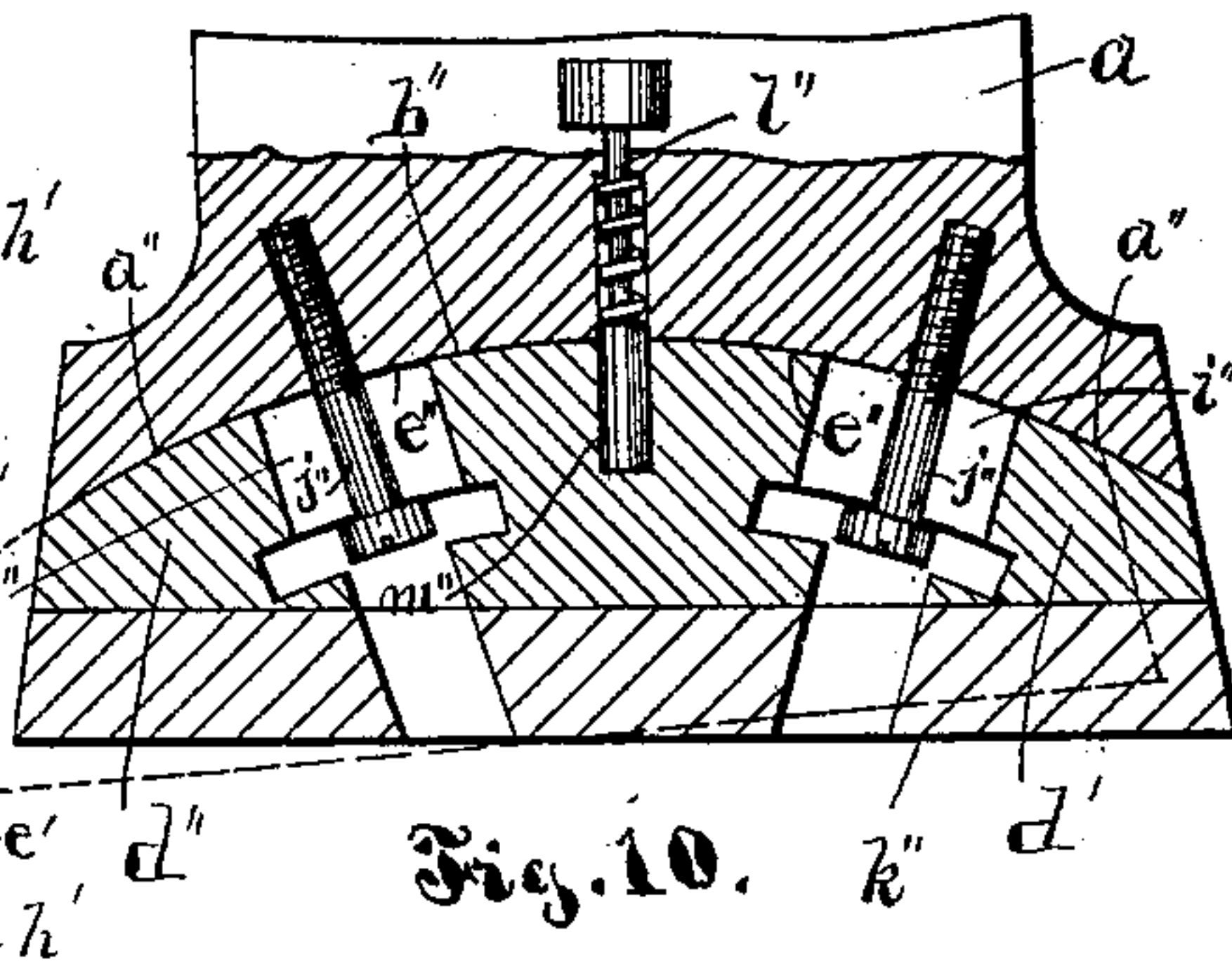


Fig. 10.

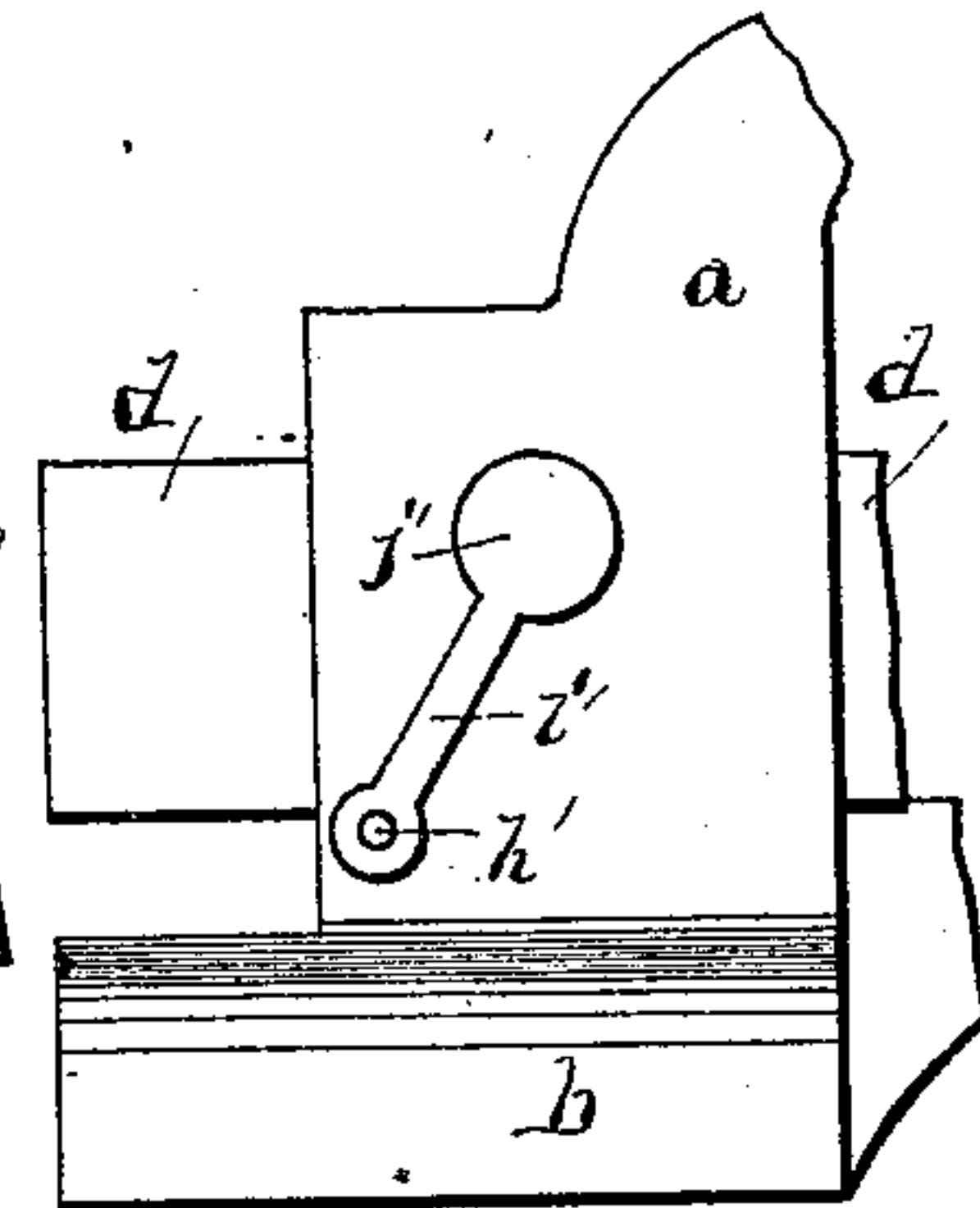


Fig. 3.

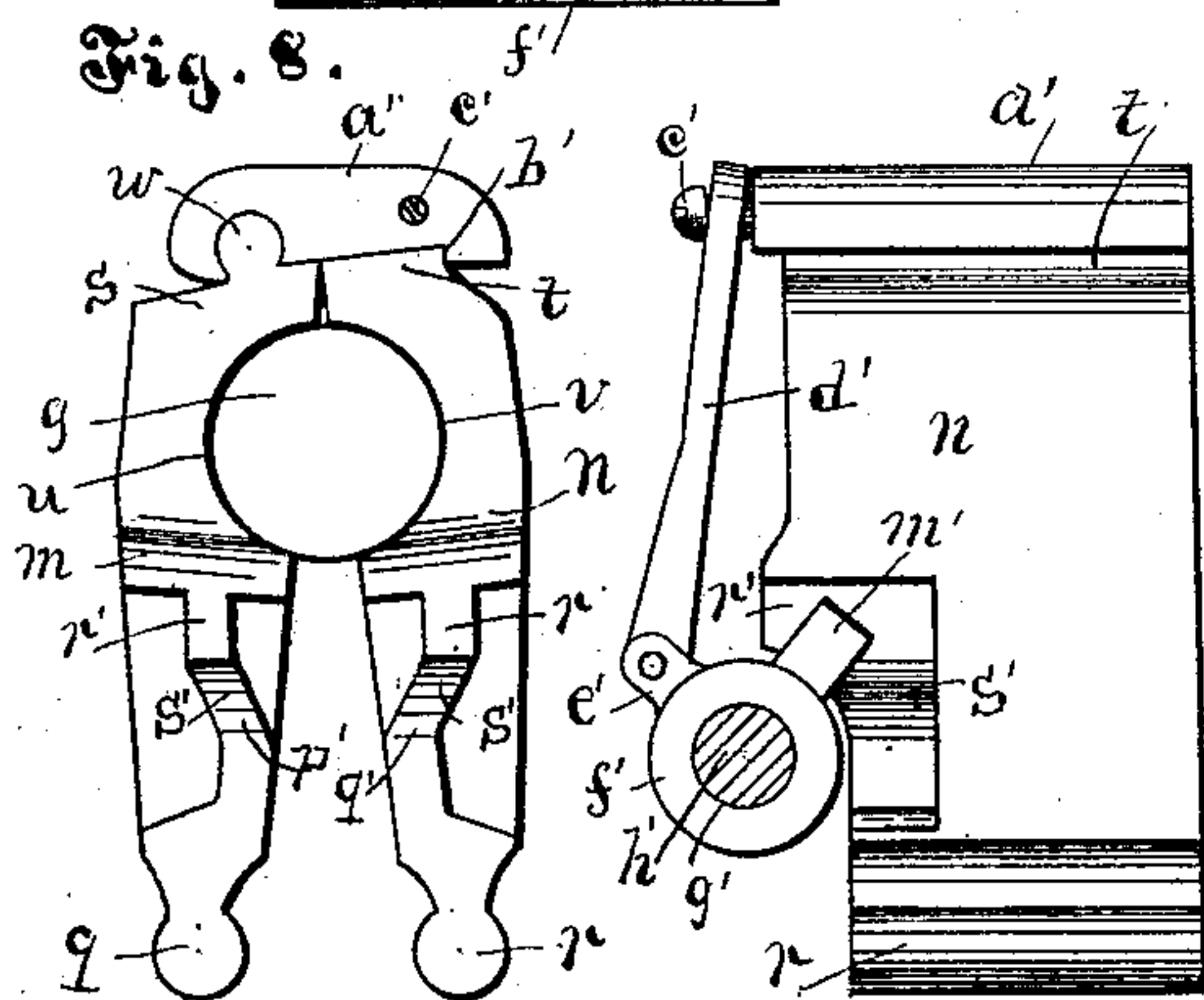


Fig. 4.

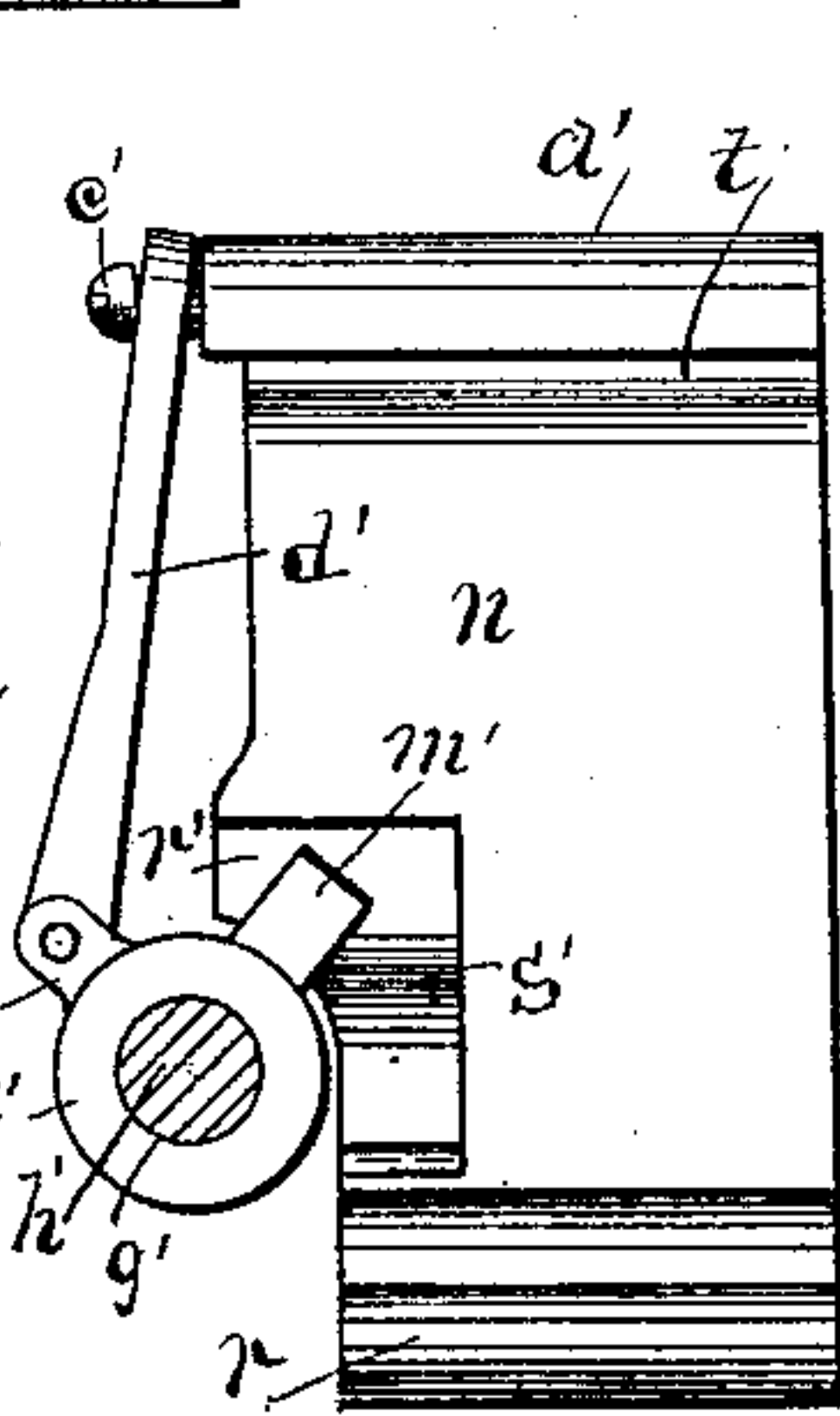


Fig. 5.

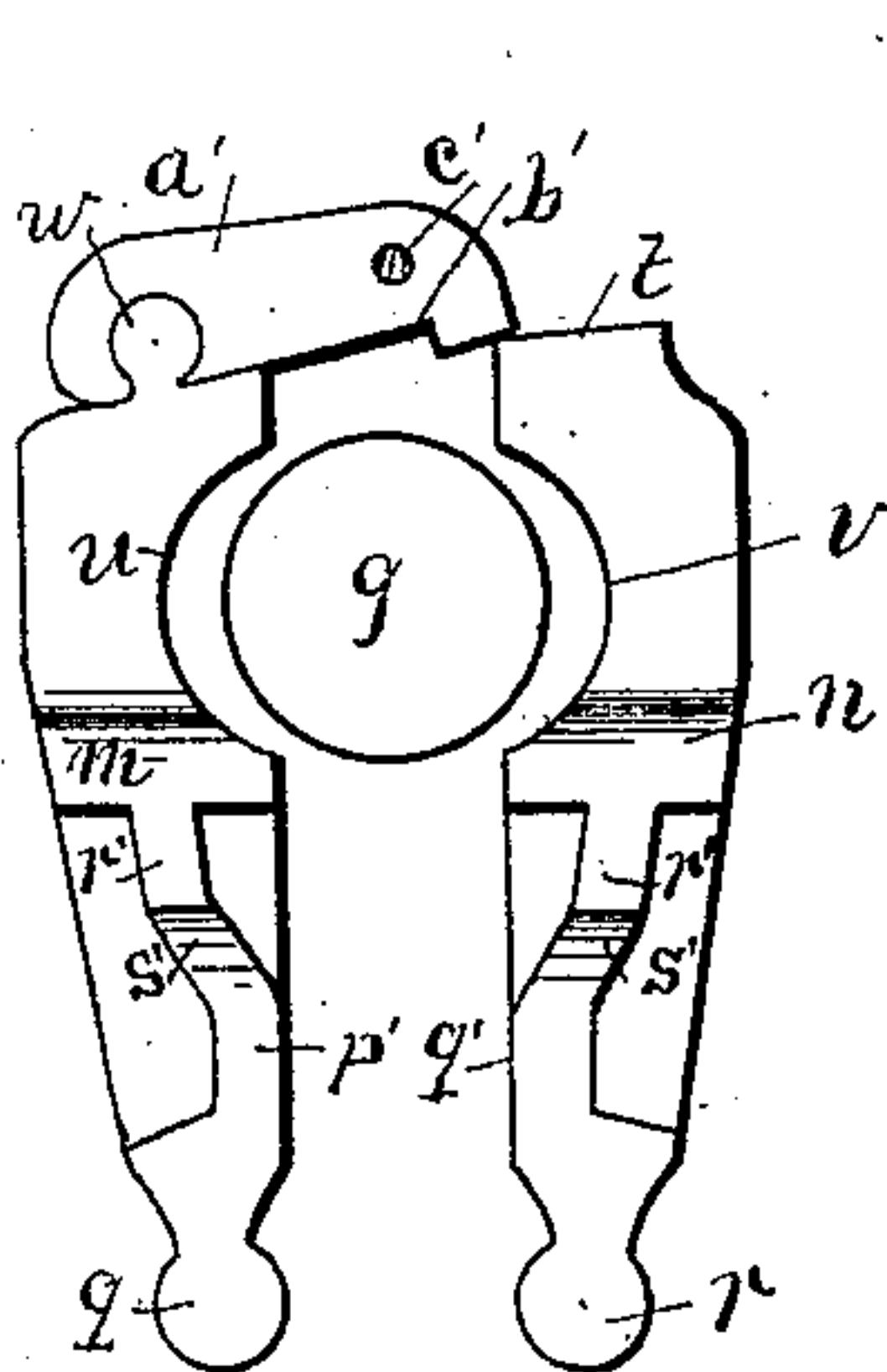


Fig. 6.

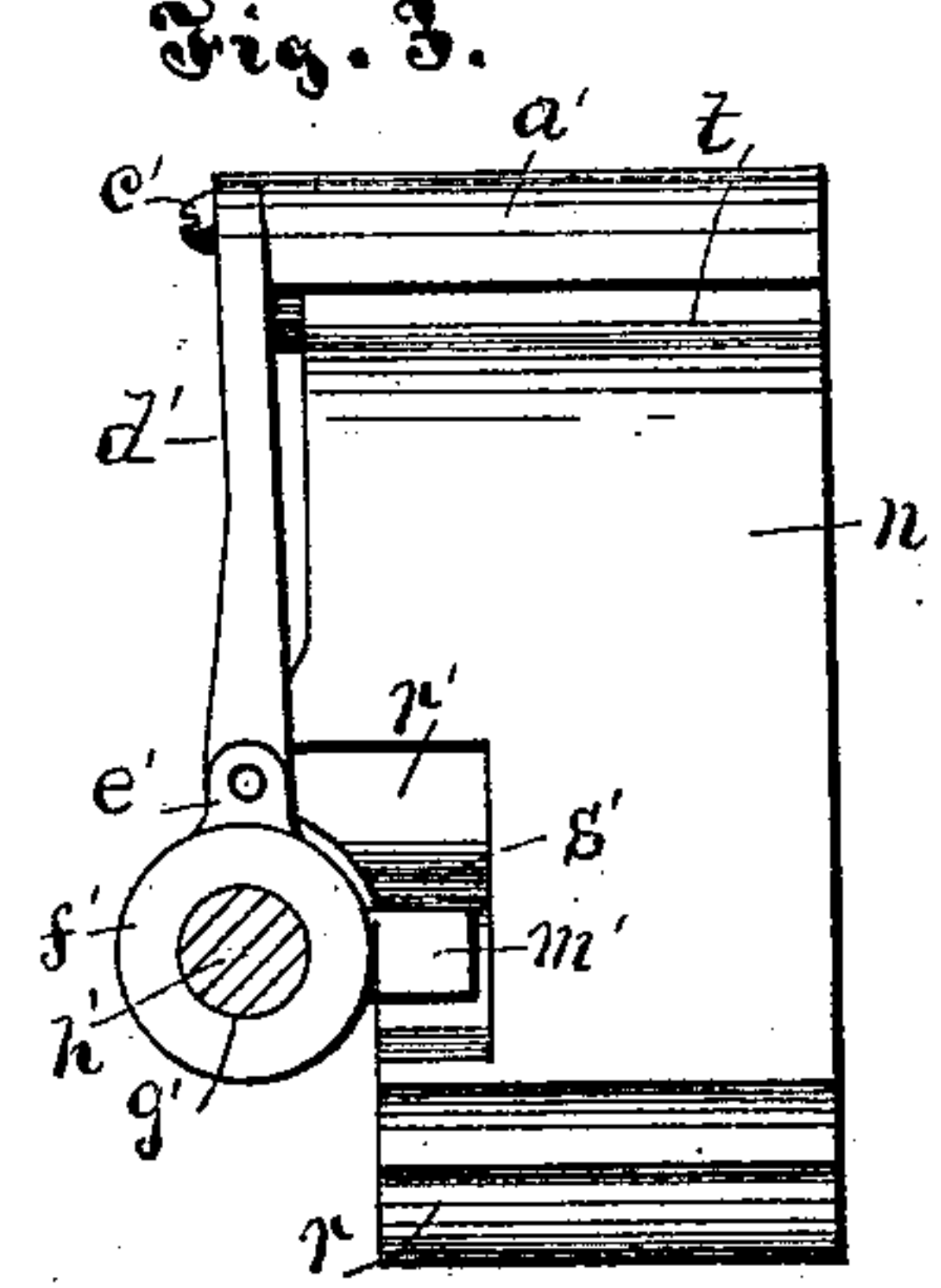


Fig. 7.

ATTEST:

J. Fred. Beckhisinger.  
J. F. Maub.

INVENTOR:

John Ernst.  
By Jas. E. Thomas Atty.



# UNITED STATES PATENT OFFICE.

JOHN ERNST, OF BAY CITY, MICHIGAN.

## WISE.

SPECIFICATION forming part of Letters Patent No. 434,541, dated August 19, 1890.

Application filed June 20, 1890. Serial No. 356,083. (No model.)

### *To all whom it may concern:*

Be it known that I, JOHN ERNST, a citizen of the United States, residing at Bay City, in the county of Bay and State of Michigan, have invented certain new and useful Improvements in Vises; and I do 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 ap-  
10 pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in  
15 vises, and pertains to improvements in that class of vises in which a divided or sectional nut is used as a means of providing for an expeditious method of moving the screw to a great distance in either direction; and the  
20 invention consists in the arrangement, construction, and combination of the various elements and contrivances which I use in the formation of the device, and which I shall presently describe in detail, and also specifically point out in the claims of this specifi-  
25 cation.

The object of the invention is to provide a cheap and reliable means of opening and closing the sections of a two-part nut of a vise  
30 and to so arrange and construct the mechanism as to provide an easy and effective means of operating the nut whereby great strength of the parts is provided when subjected to a heavy strain, and simplicity and cheapness  
35 are attained in the manufacture. The devices by which I attain this object will be found illustrated in the accompanying drawings, in the several views of which will be found the same letters of reference indicating the same  
40 parts.

Figure 1 represents a rear view in elevation of a device containing my improvement. Fig. 2 is a longitudinal vertical section of the same. Fig. 3 is a side view in elevation of the rear  
45 portion of the same. Figs. 4 and 5 are a rear and side view in elevation of the nut-sections detached and showing the parts in position when the nut-sections are closed for engaging with the screw. Figs. 6 and 7 are the same, showing  
50 the position of the parts when the nut-sections are open and the screw free to move. Figs. 8 and 9 are views in different positions

and detached of the sleeve for operating the two nut-sections. Fig. 10 is a section of Fig. 1, taken at  $x x$ .

$a$  represents the rear or stationary jaw of a machinist's vise, and  $b$  is the base thereof, which is secured to the bench in any convenient manner, and from front to rear of the jaw above the base is formed an opening  
55  $c$ , into which is passed a hollow arm  $d$ , to the outer end of which is attached or formed integral therewith the upwardly-extending movable jaw  $e$ , while through the lower portion of the jaw  $e$  and longitudinally through  
60 the chamber  $f$  in the arm  $d$  is passed a screw  $g$ , provided on its outer end with a collar  $h$  and head  $i$ , through which is passed a screw-lever  $j$ , after the usual form of vises of this  
65 character.

Within the front portion of the opening  $c$   
70 is a piece  $k$ , formed integral with the base  $b$ , and projects upwardly from the base into the chamber  $f$ , and through this portion  $k$  is provided an opening  $l$  for the screw and serves  
75 to retain the screw in a central position in the chamber, and also serves to support the sections  $m$  and  $n$  of a two-part nut, which are placed directly in its rear within the opening  
80  $c$ , in the bottom or base of which is arranged the parallel grooves  $o$  and  $p$  in suitable positions, and into these grooves are passed the lower ends  $q$  and  $r$  of the pieces  $m$  and  $n$ , which compose the two-part nut. These ends  
85  $q$  and  $r$  are of a suitable form to allow the ends to oscillate in the grooves, so that the upper ends  $s$  and  $t$  of the sections may be thrown apart or brought together, as desired, and the middle portions of the sections are provided with threaded cavities  $u$  and  $v$ , which,  
90 when the two sections are closed together, fit over the threaded portions of the screw and engage with the threads thereon, but when the two sections are thrown apart are freed from engagement with the screw, so that the  
95 screw will freely pass to and fro between them. The upper end  $s$  of the piece  $m$  is pivoted at  $w$  to one end of a tie piece or plate  $a'$ , while the opposite end of the plate reaching over the upper end  $t$  of the part  $n$  is provided on  
100 its under side with a notch  $b'$ , which catches over the end  $t$  and serves to securely retain the two sections of the nut, together with the threads thereof, in engagement with the screw,



so that the action of the parts when in this position are practically the same as if the nut were solid.

On the rear side of the plate  $a'$ , and near its free end, is pivoted by a bolt or screw  $c'$ , or in any other convenient manner, the upper end of a lifting-rod  $d'$ , while the lower end of the rod is pivoted to the ear-pieces  $e'$ , projecting upwardly from a sleeve  $f'$ , which is placed across the opening  $c$ , and through a central longitudinal opening  $g'$  in the sleeve, and also through openings in the lateral sides of the jaw  $a$  is passed a shaft  $h'$ , and upon the outer projecting end of the shaft is secured the lever  $i'$ , projecting upwardly and provided with a weight  $j'$  upon its free end, while the sleeve is secured in position against turning upon the shaft by a pin  $k'$  passed transversely through the sleeve and shaft.

Upon the inner side of the sleeve are arranged the lugs or arms  $l'$  and  $m'$  in pairs, with a space  $n'$  and  $o'$  between each pair, and in these spaces  $n'$  and  $o'$  rest the longitudinal flanges  $p'$  and  $q'$ , which project rearwardly from the nut-sections  $m$  and  $n$ ; and these flanges are each provided with a straight upper portion  $r'$  and with an inwardly-sloping lower portion  $s'$ , so that as the sleeve is oscillated by the lever  $i'$  the arms  $l'$  and  $m'$  move over the flanges, and bearing against the inclined portions thereof operate to move the nut-sections to or from each other, as the case may be, while the rod  $d'$ , as the lever  $i'$  is thrown toward the front of the jaw, is moved upward by the oscillation of the sleeve and lifts the free end of the tie-plate  $a'$  until the notch  $b'$  is free from engagement with the end  $t$  of the nut-section  $n$ , and during this time the arms  $l'$  and  $m'$  have moved over the straight portions  $r'$  of the flanges and the nut-sections remain in the same position; but on the tie-plate being raised the arms  $l'$  and  $m'$  then move over the sloping portions  $s'$  of the flanges and cause the upper ends of the nut-sections  $m$  and  $n$  to be thrown apart to free the screw, as shown in Figs. 6 and 7, while the reverse movement of the lever to oscillate the shaft in the opposite direction causes the arms  $l'$  and  $m'$  to move over the flanges in the opposite direction and bring the nut-sections together while the arms are moving over the inclined portions of the flanges, and to cause the tie-plate to resume its original position and engage the notch  $b'$  with the end  $t$  while the arms move over the straight portions  $r'$  of the flanges, so that the nut-sections are quickly freed from engagement with the screw by the oscillation of the lever  $i'$ , whereby the jaw  $e$  may be freely moved inwardly or outwardly, as required, and the parts are as easily thrown into engagement again by oscillating the lever in the opposite direction, while the weight upon the lever moving beyond the pivotal point of the lever in either direction holds the parts in position either when the nut-sections are open or closed.

As shown in Figs. 1 and 10, the jaw  $a$  is

provided with an offset  $a''$ , having a rear wall  $b''$ , of a concave form, and the offset is provided also with a groove  $c''$  in its bottom side of a circle coinciding with the circle of the concave side wall  $b''$ , and in the offset is fitted a jaw portion  $d''$ , with a convex rear side  $e''$ , and provided with a lip  $f''$ , fitted into the groove  $c''$ , while the upper back portion of the piece is provided with a lip  $g''$ , projecting backward over the upper end  $h''$  of the jaw. The portion  $d''$  is provided with slots  $i''$ , cut horizontally through from front to rear, and through these slots are passed the bolts  $j''$ , with their inner ends tapped into the jaw  $a$ , so that while the bolts remain stationary the piece  $d'$  may be moved either right or left, whereby the curved portion on its rear side causes the front face  $k''$  of the jaw to take a position inclined relative to the opposing jaw-face, and through the jaw  $a$  is passed a spring-actuated bolt  $l''$ , with its inner end reaching into an opening or recess  $m''$  in the central portion of the rear curved side of the piece  $d''$ , which serves to hold the piece  $d''$ , with its face  $j''$ , parallel with the face of the front jaw; but by the withdrawal of the bolt  $l''$  from engagement with the piece  $d''$  the piece may then be turned in its bed to allow the jaws to fit upon the tapering pieces, &c.

It will be observed that by the particular construction and location of the parts nut-sections  $m$  and  $n$  are passed into position from the rear, and that when the sleeve  $f'$  and shaft  $h'$  are in position, the sleeve coming in contact with the rear side of the nut-sections serves to retain all of the parts in position against withdrawal, while the portion  $k$ , against the front side of the nut-sections, forms a solid and reliable support for the nut against a heavy strain from the screw when a piece is solidly clamped between the jaws.

Of course it will be understood that while I have shown my device as applied to an ordinary machinist's vise, the sections of the two-part nut and their operating devices, which constitute the principal features of my invention, can be as well applied to any other common form of vise. Therefore I do not limit my invention to the particular form of vise; but

What I claim, and desire to secure by Letters Patent, is—

1. In a vise, the combination, with the movable and stationary jaws provided with openings for the screw, a screw passed through the said openings, and the nut-sections  $m$  and  $n$ , pivotally secured by their lower ends to the rear portion of the stationary jaw below the screw, and with their upper ends extending above on opposite sides of the screw and provided with threaded recesses fitting over and engaging with the threads of the screw, of a tie-plate pivotally secured by one end to the upper end of one of the said nut-sections, and provided on the under side of its opposite free end with a notch, as described, reaching over and engaging the upper end of the



other nut-section, and devices for raising the free end of the plate to release the notch, substantially as set forth.

2. The combination of the stationary and 5 movable jaws of a vise, a screw passed through the jaws, a two-section nut with the lower ends of the sections pivotally secured to the rear side of the stationary jaw below the screw, and with their upper ends extending above on 10 opposite sides of the screw and provided on the inner side of their middle portions with threaded recesses engaging with the threads of the screw, a tie-plate with one end pivoted to the upper end of one of the nut-sections 15 and having on the under side of its opposite free end a notch catching over the upper end of the other nut-section, with a sleeve  $f''$  journaled to the stationary jaw in rear of and transversely with the nut-sections and pro- 20 vided with ear-pieces  $e'$  projecting from its side, a lifting-rod  $d'$ , with its lower end pivoted to the said ear-pieces and with its upper end pivoted to the outer free end of the said tie-plate, and a lever for oscillating the said 25 sleeve, substantially as set forth.

3. In a vise, the combination, with the stationary and movable jaws, and the screw passed through the said jaws, of the nut-sections in rear of and pivotally secured by their lower 30 ends to the stationary jaw and with their upper portions extending above on opposite sides

of the jaw, and provided on their rear side edges with the flanges  $p'$  and  $q'$ , having the sloping portions  $s'$  and the straight portions  $r'$ , as described, a tie-plate  $a'$ , pivoted by one end 35 to the upper end of one of the nut-sections and having a notch on the under side of its opposite end catching over the upper end of the other nut-section, a sleeve  $f'$ , journaled to the stationary jaw transversely with and below 40 the screw, and provided with the arms  $l' l'$  and  $m' m'$ , projecting from its side and on the opposite sides of the said flanges  $p'$  and  $q'$ , respectively, and means for oscillating the said sleeve, substantially as set forth. 45

4. In a vise, the combination of the rigid jaw  $a$ , provided with an offset  $a''$ , having a curved rear wall  $b''$  and a groove  $c''$ , a piece  $d''$  in the said offset and provided with a curved rear side  $e''$  and a curved lip  $f''$  within 50 the groove  $c''$  and provided with transverse horizontal slots  $i''$ , the bolts  $j''$ , passed through the said slots and tapped into the jaw  $a$ , and the spring-actuated bolt  $l''$ , passed through the jaw  $a$  and reaching into the piece  $d''$ , sub- 55 stantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN ERNST.

Witnesses:

G. P. THOMAS,  
JAS. E. THOMAS.