

No. 711,248.

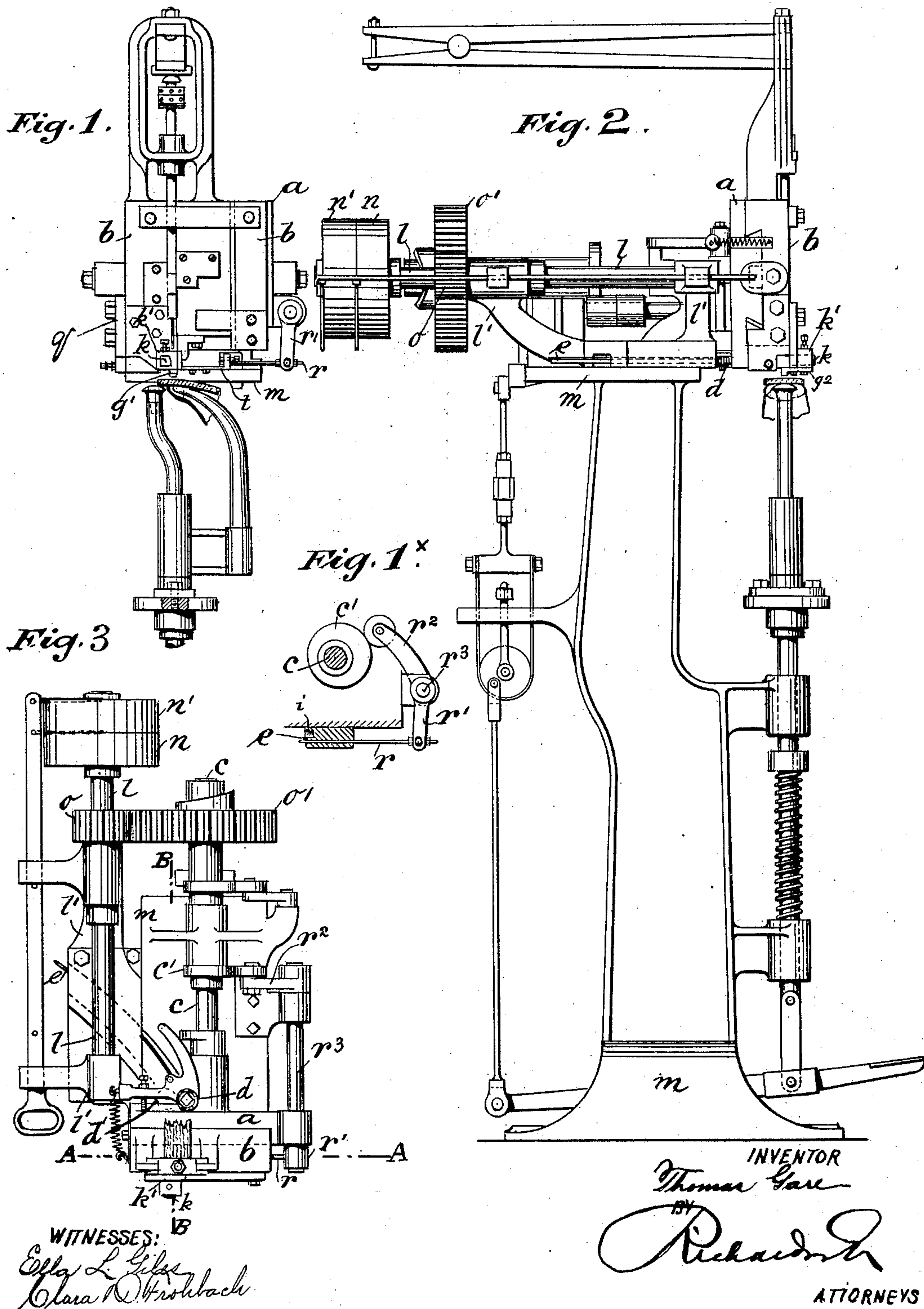
Patented Oct. 14, 1902.

T. GARE.
MACHINE FOR FORMING NAILS.

(Application filed Apr. 3, 1897.)

(No Model.)

4 Sheets—Sheet 1.



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4 Sheets—Sheet 2.

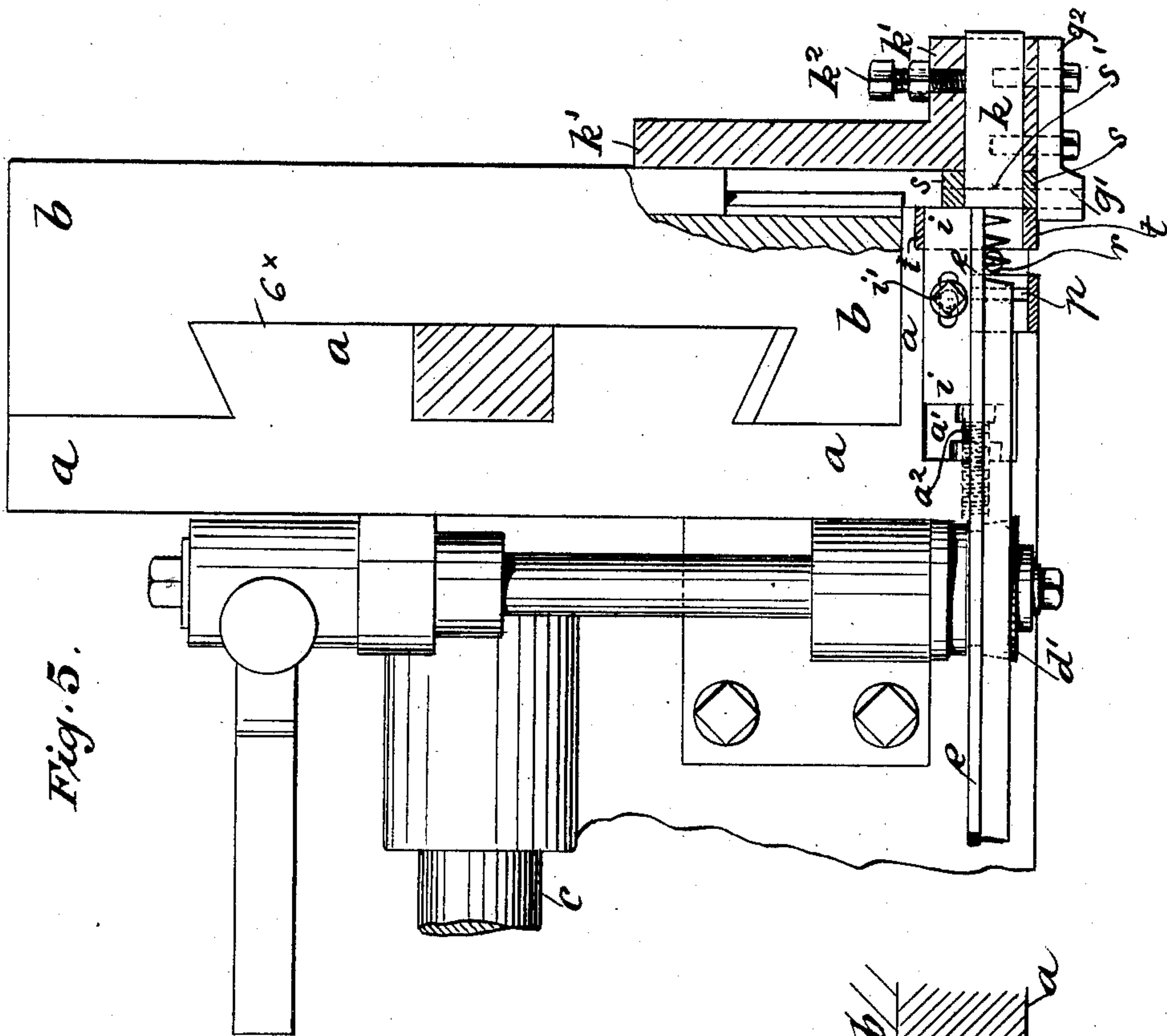
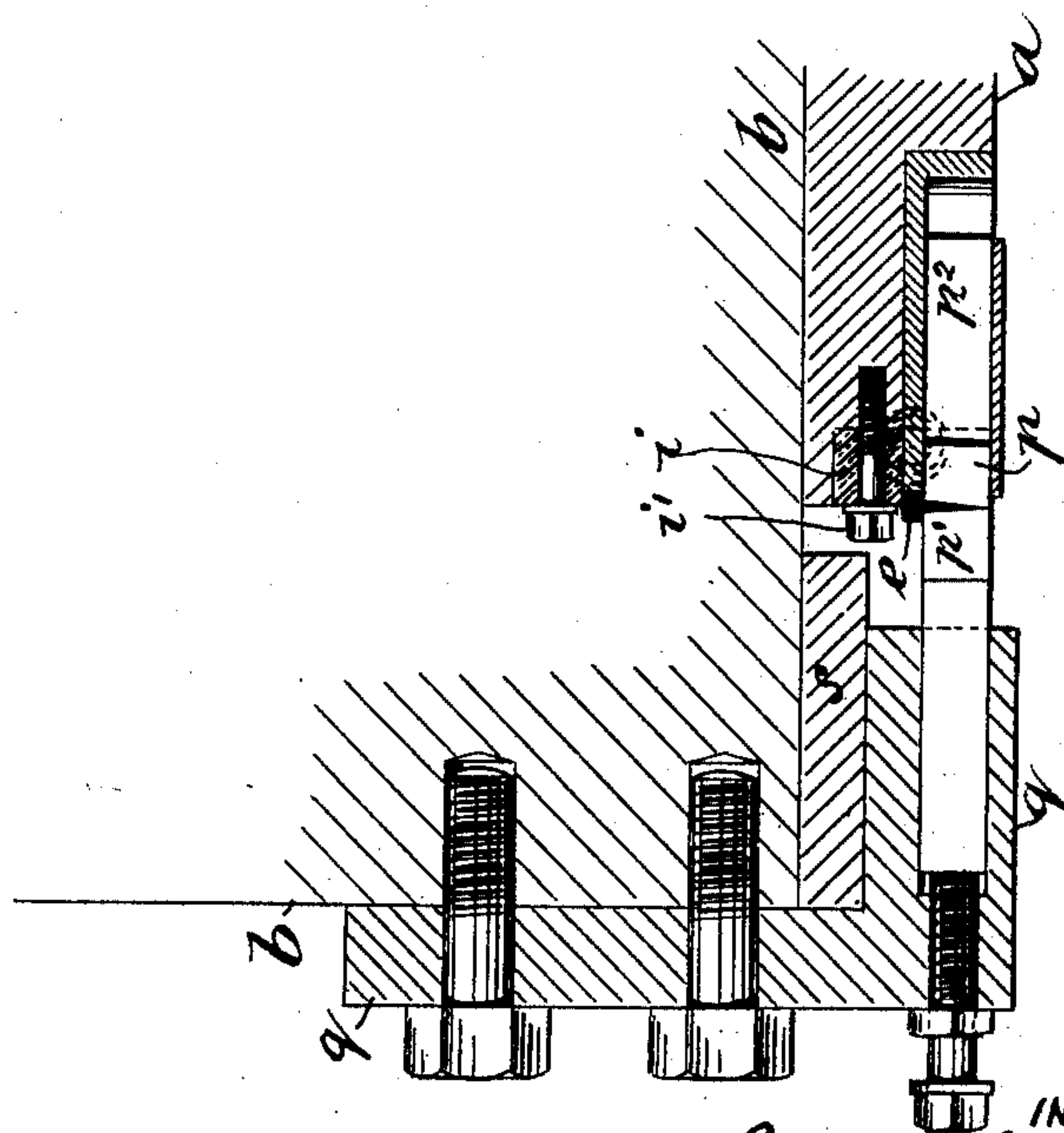


Fig. 4.



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Fig. 6.

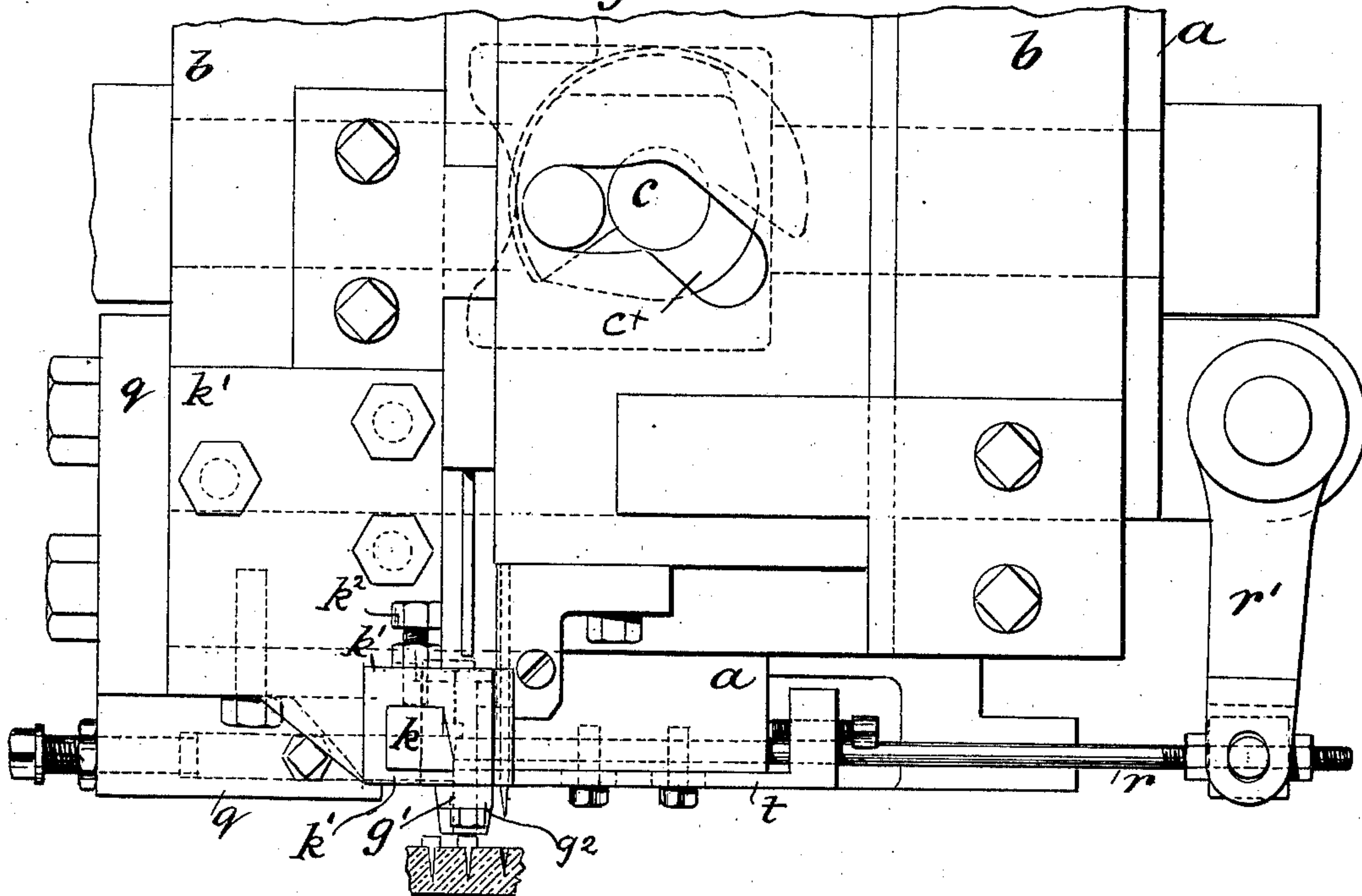
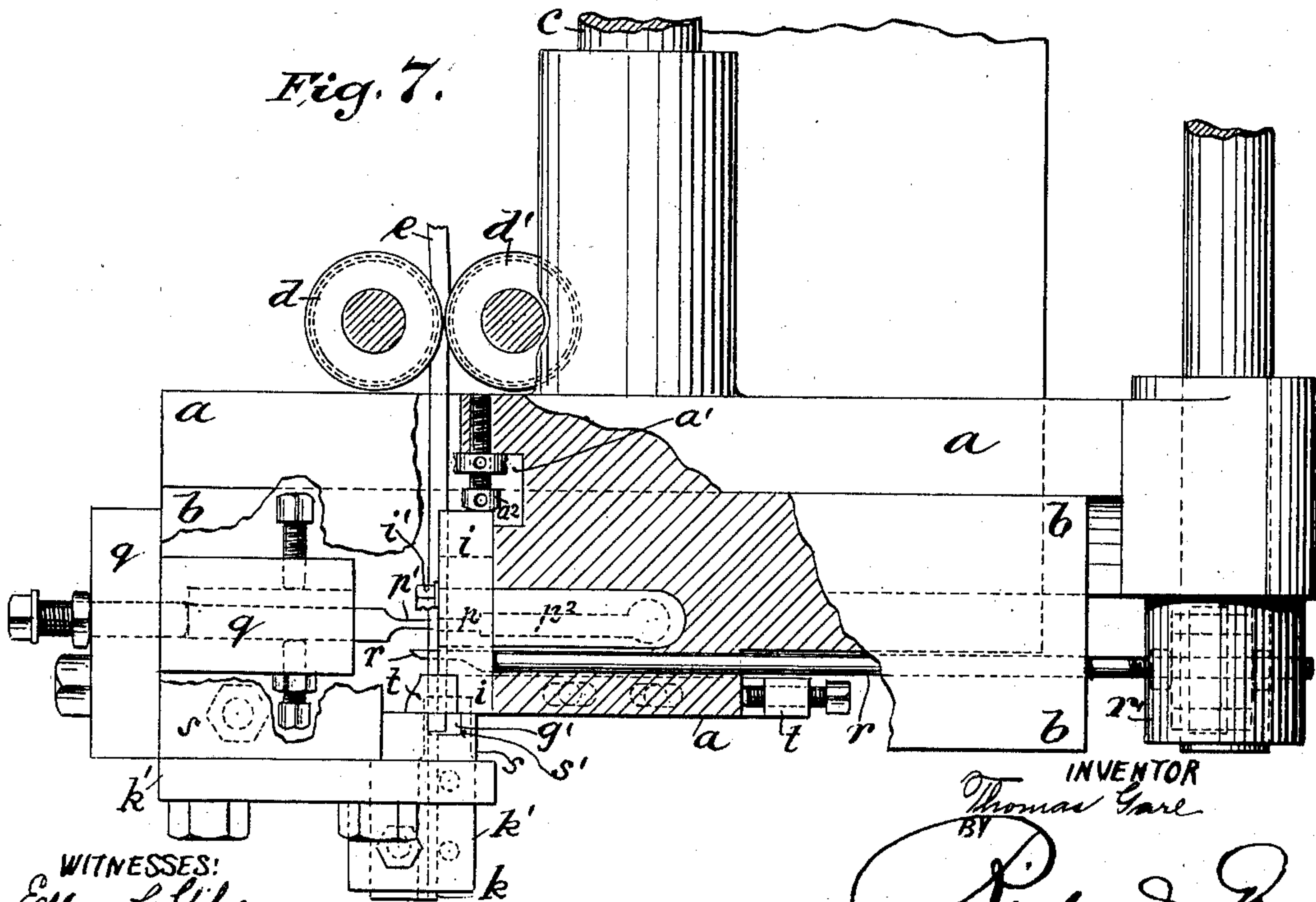


Fig. 7.



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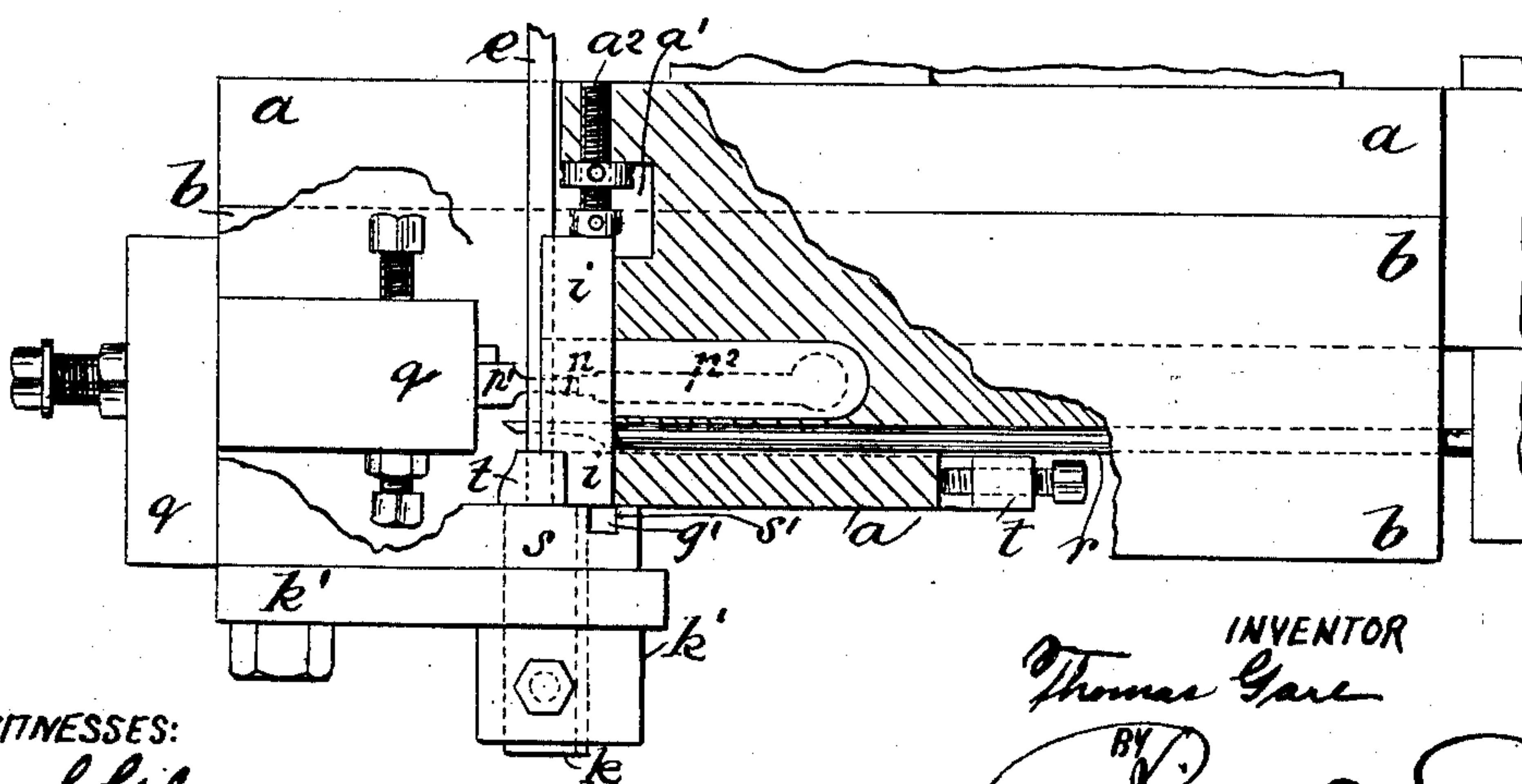
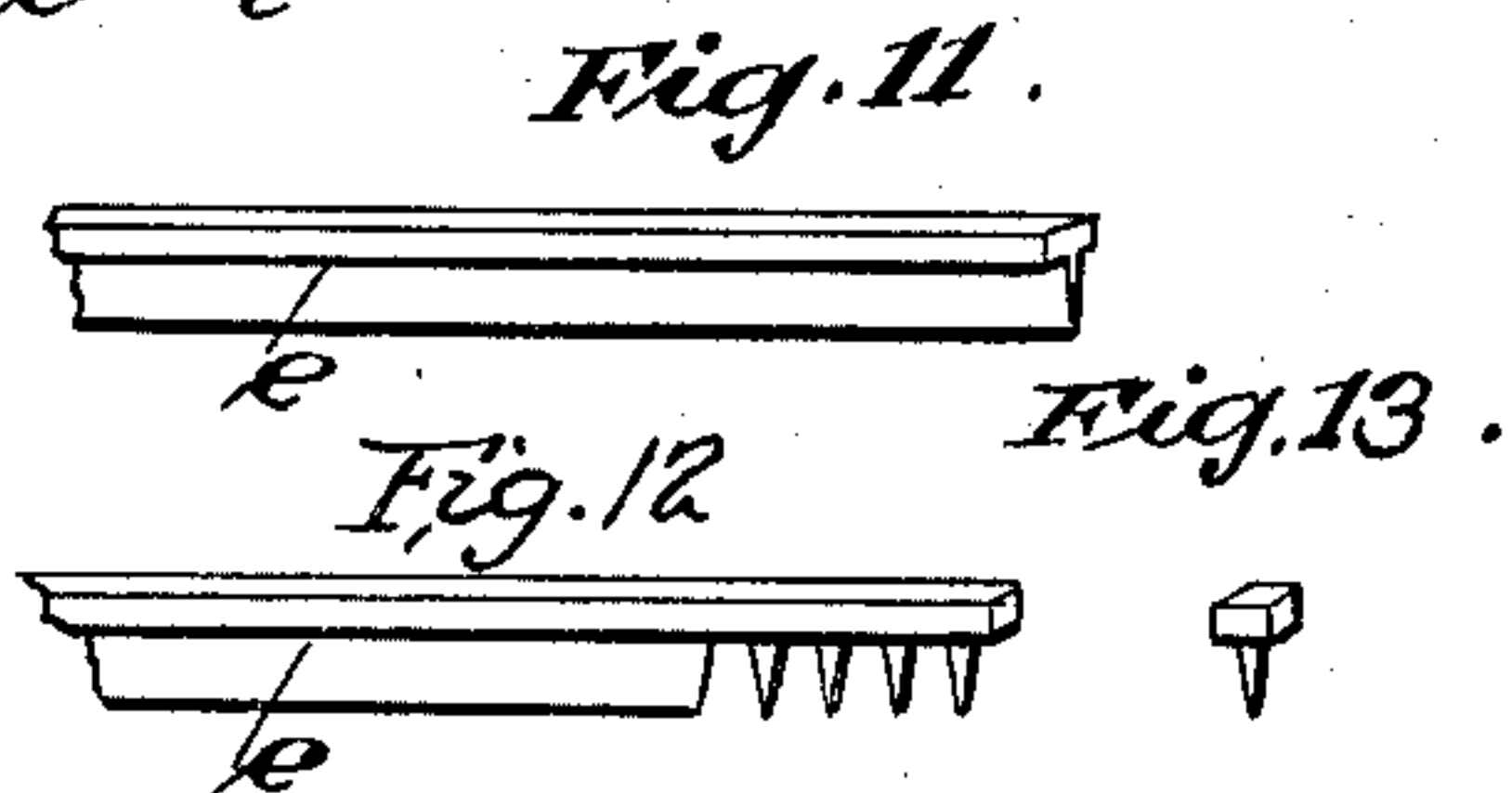
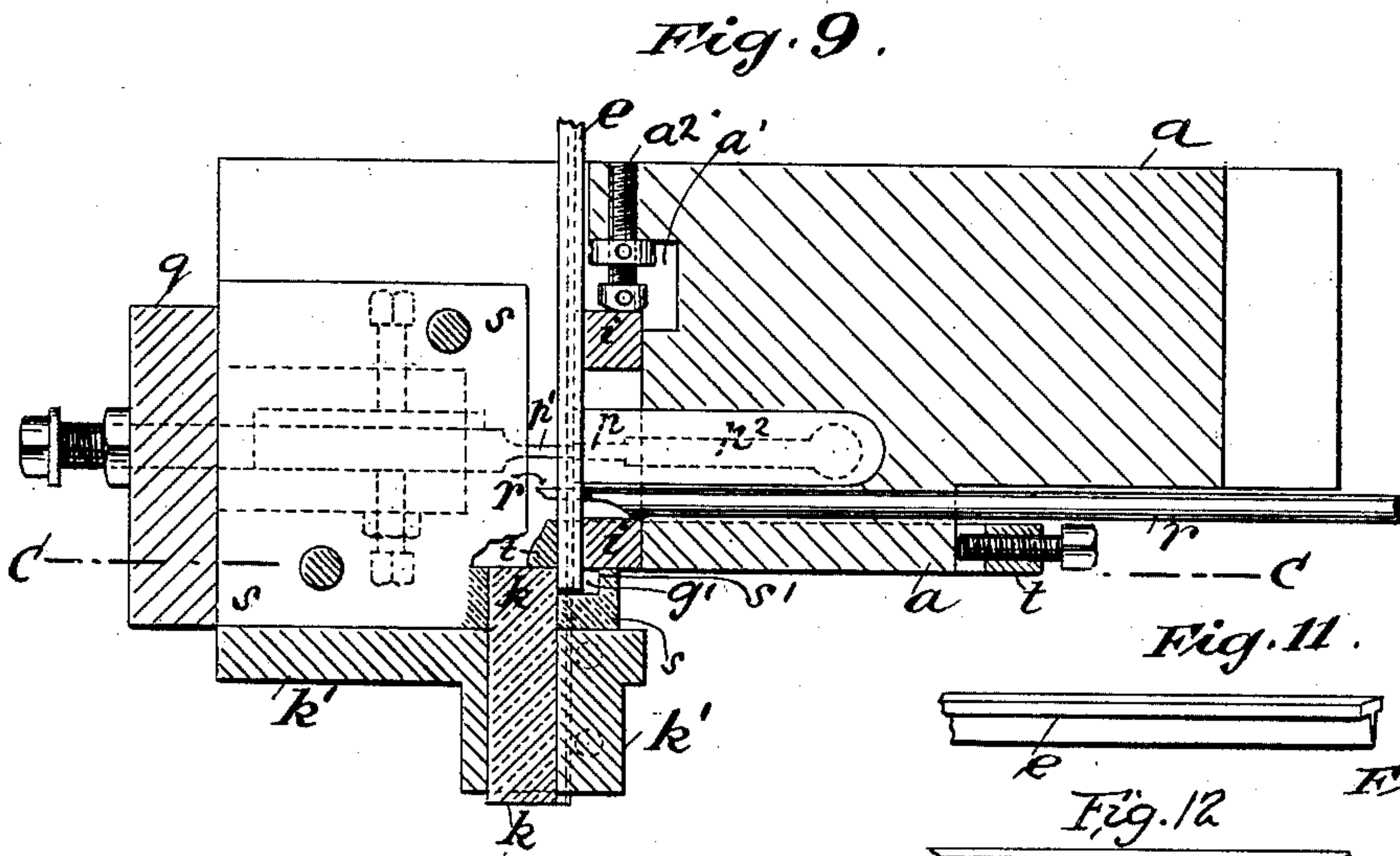
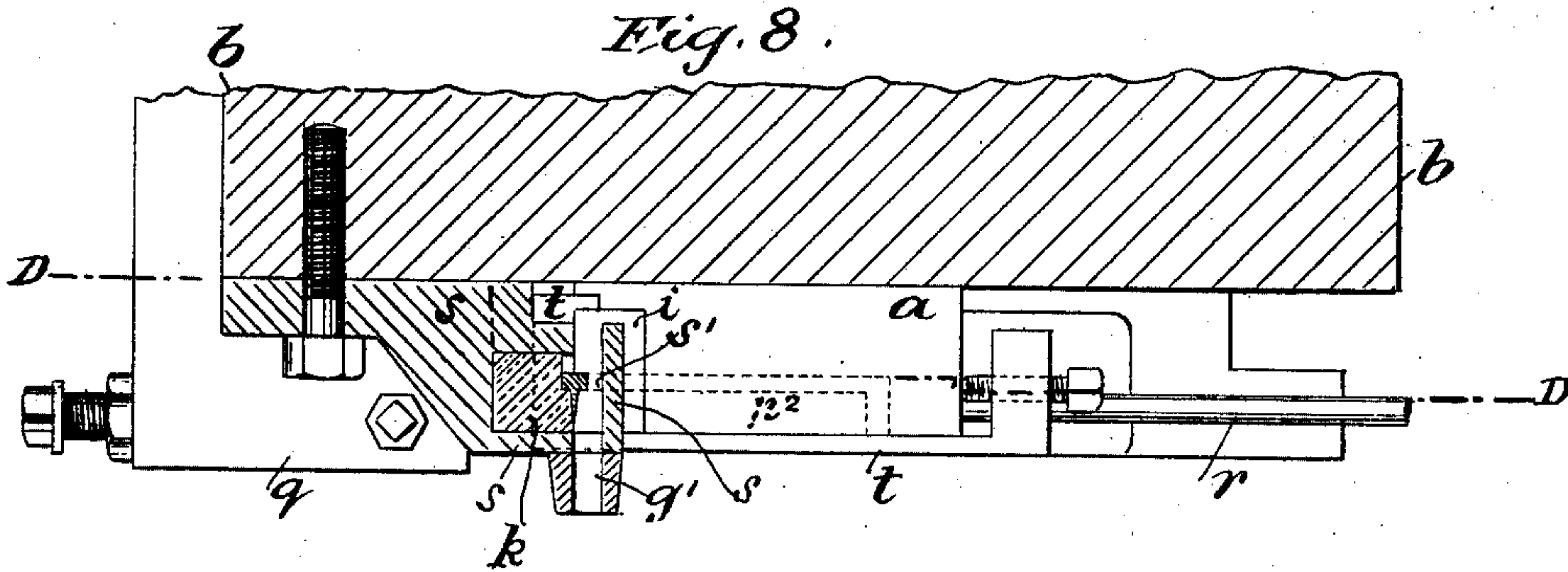
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(Application filed Apr. 3, 1897.)

(No Model.)

4 Sheets—Sheet 4.



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UNITED STATES PATENT OFFICE.

THOMAS GARE, OF NEW BRIGHTON, ENGLAND, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, AND BOSTON, MASSACHUSETTS, A CORPORATION OF NEW JERSEY.

MACHINE FOR FORMING NAILS.

SPECIFICATION forming part of Letters Patent No. 711,248, dated October 14, 1902.

Application filed April 3, 1897. Serial No. 630,643. (No model.)

To all whom it may concern:

Be it known that I, THOMAS GARE, a subject of the Queen of Great Britain, residing at New Brighton, in the county of Chester, England, (whose post-office address is Bramble Beach, Warren Drive, New Brighton, aforesaid,) have invented new and useful Improvements in and Connected with Machines for Forming Nails, of which the following is a specification.

The objects of my invention are, first, to provide means for accurately setting and locking in position the profiled metal while being cut; secondly, to improve the cutting means, so as to prevent the distortion of the profiled metal and nails produced therefrom, and, lastly, to render the cutter or shear bars adjustable, so as to be able to readily compensate for wear. I attain these objects by the mechanism illustrated in the accompanying four sheets of drawings, in which—

Figure 1 is a front view of the machine with the lower part omitted. Fig. 1^x is a view of a detail. Fig. 2 is a side view of the machine. Fig. 3 is a plan view of the head of a nail-machine provided with my improvements. Figs. 4 and 5 are respectively a sectional front view and a side view on lines A A B B of Fig. 3. These lines A A B B do not represent absolutely the line of section, but only the general direction of the section, the variations from the true section being for convenience in illustration. Figs. 6 and 7 are respectively a front view and a sectional plan of the head part and shear and punch, shown in position for shearing and punching the profiled metal. Fig. 8 is a front view of the head, showing the shear in section. Fig. 9 is a sectional plan thereof, showing both the shear and punch, Fig. 8 being on line C C of Fig. 9 and Fig. 9 on line D D of Fig. 8. Fig. 10 is a sectional plan of the head, showing both the shear and punch exposed. In Figs. 8 and 9 the shear and punch are shown in position for shearing and punching and in Fig. 10 after the profiled metal has been sheared and punched. Fig. 11 represents the profiled metal strip, and Fig. 12 represents this strip

cut to partially form the nails. Fig. 13 represents the nail as cut.

Similar letters refer to similar parts throughout the several views.

Referring to Figs. 1, 2, and 3, *a* is the stationary head; *b*, the head rendered intermittently movable in a lateral direction thereon by means of the shaft *c* (see Fig. 3) and cam *c*^x, Fig. 6, at its front, as is usual in similar types of machines—say, for instance, as shown and described in Letters Patent No. 541,201, granted to me. This lateral movement of the movable head on the fixed head is guided by the dovetailed way *b*^x. (Shown in Fig. 5.) A pair of rollers *d d'* for feeding the profiled metal or nail material *e* into the nail-machine is also provided. The reciprocating lateral movements of the head *b* bring the several parts carried thereby into position for operation or remove them from this position. *i* and *k* are the shear-bars, *i* being secured to the stationary head *a*, Figs. 4, 5, 7, and 10, and *k* to the movable head *b*. (See Figs. 1, 2, and 3.)

In lieu of actuating the shaft *c* directly by means of pulley and strap I drive the same indirectly by means of a parallel shaft *l*, mounted in a bracket *l'*, bolted to the main frame *m* of the machine and carrying at its back end a fast and loose pulley *n* and *n'*, respectively, and spur-pinion *o*, gearing into a spur-wheel *o'*, secured upon the shaft *c*, (see Figs. 2 and 3,) whereby the latter is caused to run much steadier and is capable of bearing the strain to which it is subjected, while the nails are produced from the profiled metal, which hitherto has been a source of weakness.

In order to produce nails with heads projecting on all four sides with as little strain as possible upon the said cam-shaft and movable head, I produce the said nails in the nail-machine from profiled metal in two operations—namely, I cut off the shank part of the profiled metal pieces *e* (see Fig. 12) before the metal reaches the shears *i* and *k*, so that the latter has to cut only through the head part of the metal. For this purpose I

arrange in the rear of the shears *i* and *k* a die *p*, secured to the stationary head *a*, and a punch *p'*, carried opposite thereto by a bracket *q*, secured to the movable head of the machine. The punch *p'* is formed in section correspondingly with the shape of the piece to be cut out of the shank part of the metal *e* and the die *p* with a corresponding slot *p*², widened and open at its back end for the escape of the said pieces.

In order to compensate for wear and to enable one to set the punch *p'* accurately, it is rendered adjustable in the bracket *q*, as will be readily seen from Figs. 4 and 7. Between the said punch and die and the shears I arrange a slide *r*, suitably intermittently reciprocated—say by a cam *c'*, secured upon the shaft *c*, levers *r'* and *r*², and shaft *r*³. (See Figs. 1^x, 2, and 3.) The front end of this slide is beveled off and corresponds in thickness with the spaces cut out in the profiled metal by the punch *p'* and dies *p* and *p*². The said slide is timed to enter the said spaces successively while the rollers *d* and *d'* are feeding and before the punch *p'* and shears *i* *k* have operated, so as to accurately set and hold the metal in its correct position while producing the nails, thereby causing the head of the nail to project uniformly from each side of the shank, Figs. 4, 8, and 6. To the front side of the movable head *b* is secured a bracket *k'*, in which the front shear-bar *k* is rendered longitudinally adjustable relatively to the back shear-bar *i*, by means of the screw *k*², for the purpose of being able to readily compensate for the wear. Between the stationary head *a* and the bracket *k'* is employed another bracket *s*, which is bolted to the under side of the movable head part *b* and in which the front of the shear-bar *k* is held. This bracket has a vertical slot *s'*, which, in connection with another bracket *g*², bolted underneath the shear-bracket *k'* and having a vertical hole *g'*, concentric with the said slot *s'*, forms the throat through which the nail passes from the forming mechanism.

In the recess *a'* in the left side of the stationary head *a* is arranged the inner or stationary shear-bar *i*, which for the purpose of being able to compensate for wear is also rendered longitudinally adjustable relatively to the outer or movable one *k* by means of the screws *a*² and *i'*, Figs. 4, 5, and 7. The outer side of the cutter or shears *i* and the inner side of the shear-bar *k* are shaped to conform with the profile of the metal *e*, as shown in Fig. 8, so as to support same on its whole width and cause the whole of the movable shear part to come into contact with the whole width of the metal simultaneously, and thus prevent distorting the section of the latter. This cross-sectional shape of the shear-bar or cutter *k* is shown in Fig. 8, in which it will be seen that the inner face of the bar is shaped to conform to the side contour of the strip to be cut. The outer face of the other bar *i* is

similarly shaped to conform to the other side of the strip, and Figs. 9 and 7 indicate in dotted lines the channeled face of this bar.

Fig. 8 illustrates the cross-sectional form of cutter or shear-bar *i*. The said shear-bars are so set that their faces abut when they are moved from the position shown in Fig. 9 into line with each other, and to hold the extreme end of the metal in position against the shear-bar *i* a guide *t* is secured adjustably underneath the stationary head *a*, as shown in Figs. 5, 6, and 7.

The cutting action will be clear from Figs. 8 and 9. The top wall of the slot *s'* slightly overhangs the strip and the slot *s'*. The strip is not fed in line with the throat *g'*. The slot *s'* is wider than the strip, and when the cutter *k* severs the nail said nail will leave the supporting-shoulder on the cutter *k* and then fall through the throat *g'*.

By disconnecting and rendering the punch *p'* and slide *r* inoperative nails may be produced from taper profiled metal and driven into the work, as will be readily understood.

The head *b* is moved laterally. This lateral movement brings the shear-bar *k* away from the shear-bar *i* and the shear-slots *s'* opposite the free end of the bar *e*, and after the slide *r* has been withdrawn the said end is fed into the said slot by the rollers *d* *d'* during the dwell of the head part *b*. The head part *b* returns and forces the shear part *k* and punch *p'* against the side of the metal bar *e*, thus simultaneously punching out a piece when required and cutting off the part in the slot *s'* which forms the nail.

It will be seen from an inspection of the drawings that the two cutters *i* *k* are each in the form of a bar and are arranged end to end and with their axes normally disaligned, but parallel; that the material is fed parallel with the axes of the cutters and beyond the end of one of the same, the free end of the strip passing into the slot *s'*, which end is cut off when the one cutter is moved in relation to the other.

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

1. A nail-forming machine comprising two cutters *i*, *k*, each in the form of a bar arranged end to end and with their axes normally disaligned but parallel, supporting means for the cutters and means for feeding the material parallel with the axes of the cutters alongside of one of said cutters and beyond the end of the same and a bracket having a vertical slot *s'* into which the free end of the strip passes, the bracket with said slot *s'* moving with one of the cutters and the slot being alongside of the cutting edge thereof, said cutters being adjustable longitudinally in relation to each other and means for moving the parts so that the bracket having the slot *s'* and its adjacent cutter will move laterally of the end of the other cutter, substantially as described.

2. In combination, cutters *i* and *k* having

their cutting edges disposed vertically, one of said cutters k being movable horizontally and laterally across the end of the other cutter i , means for feeding a profiled strip horizontally to the cutters alongside of the cutter i and beyond the end of the same and a bracket moving with the movable cutter k and having a vertical slot s' into which the free end of the strip passes, said bracket

moving laterally in relation to the cutters so that the slots' moves along the face of the cutter i and means for operating the parts.

In witness whereof I have hereunto set my hand in presence of two witnesses.

THOMAS GARE.

Witnesses:

ALFRED BOSSHARDT,
STANLEY E. BRAMALL.