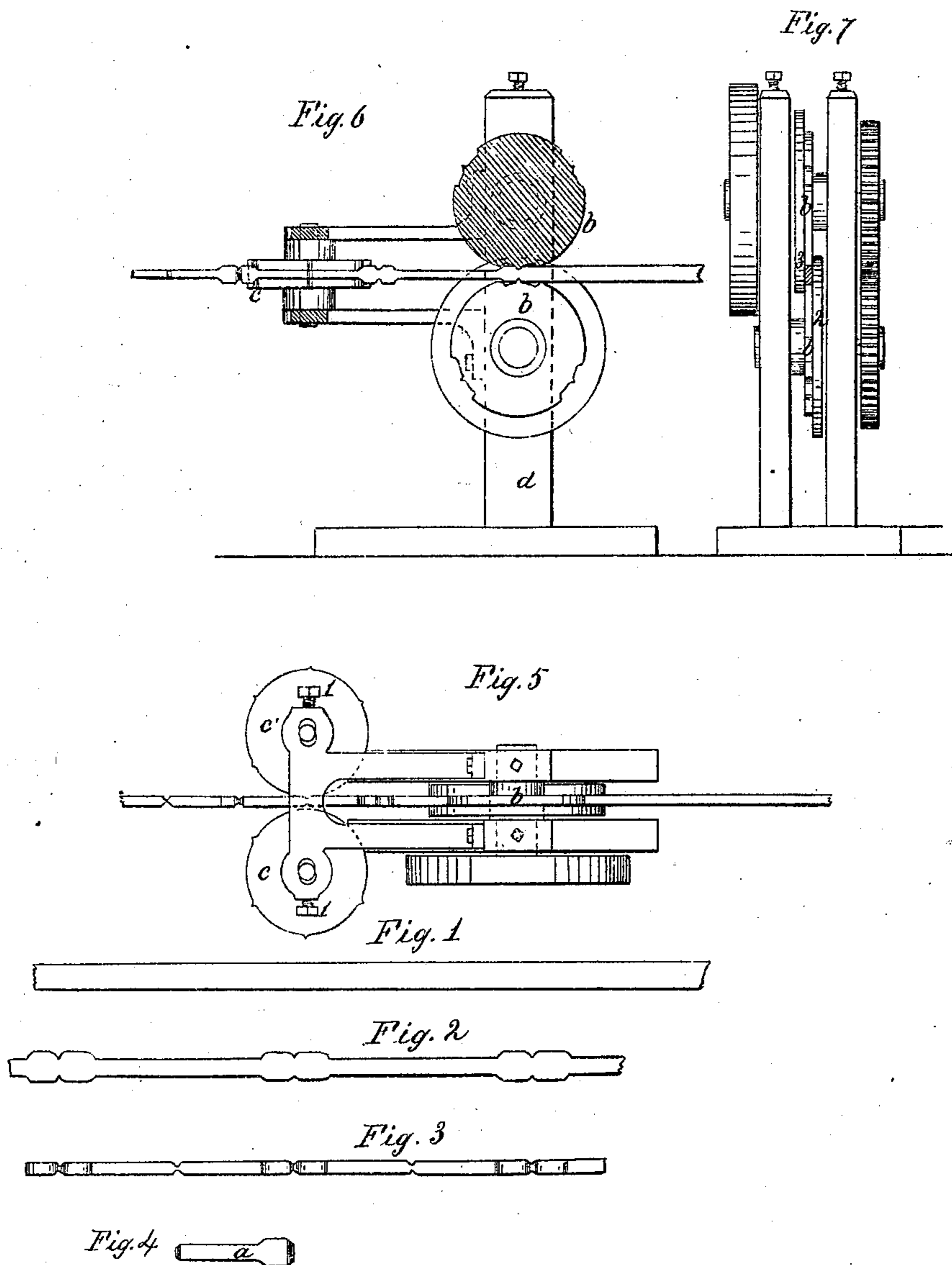


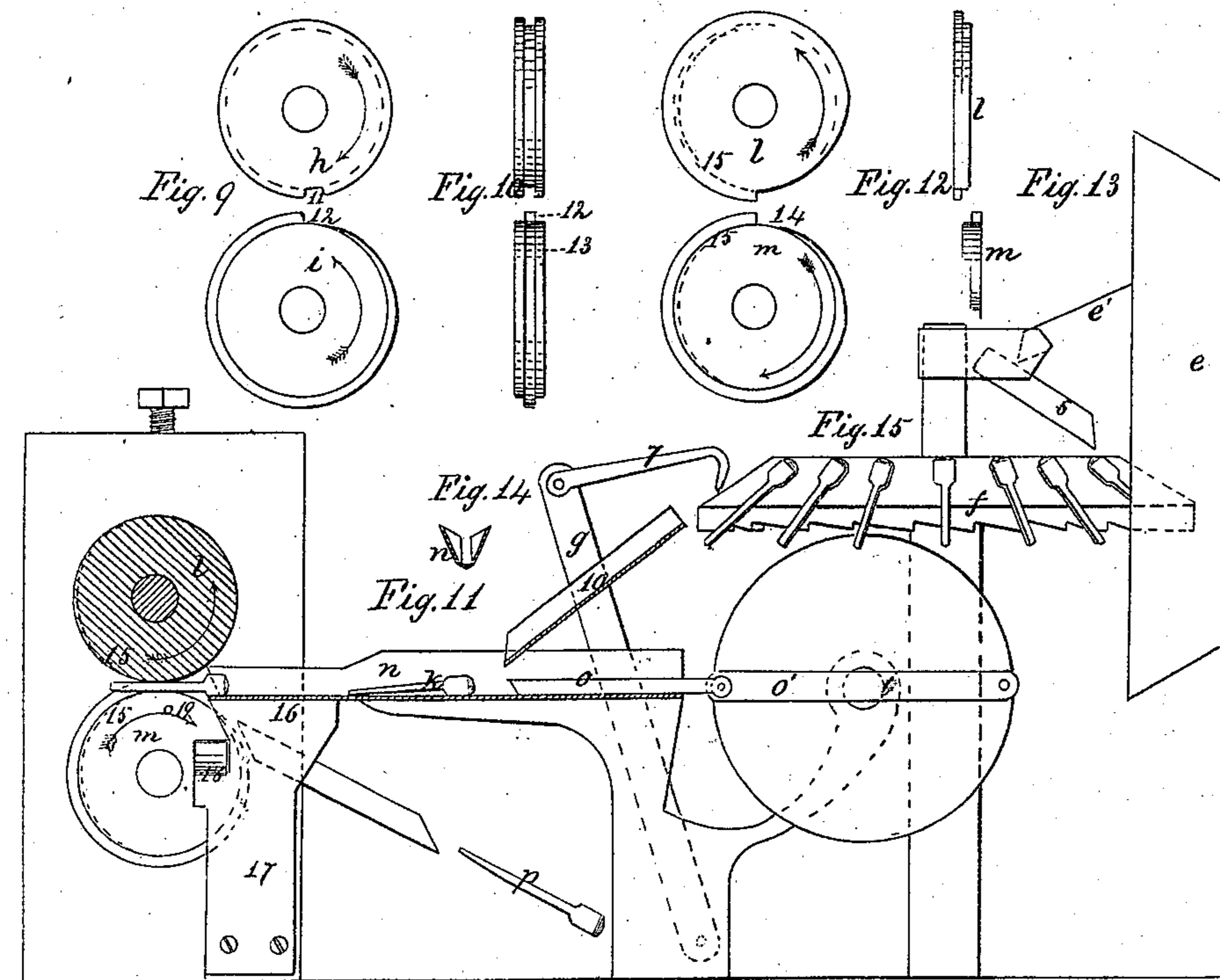
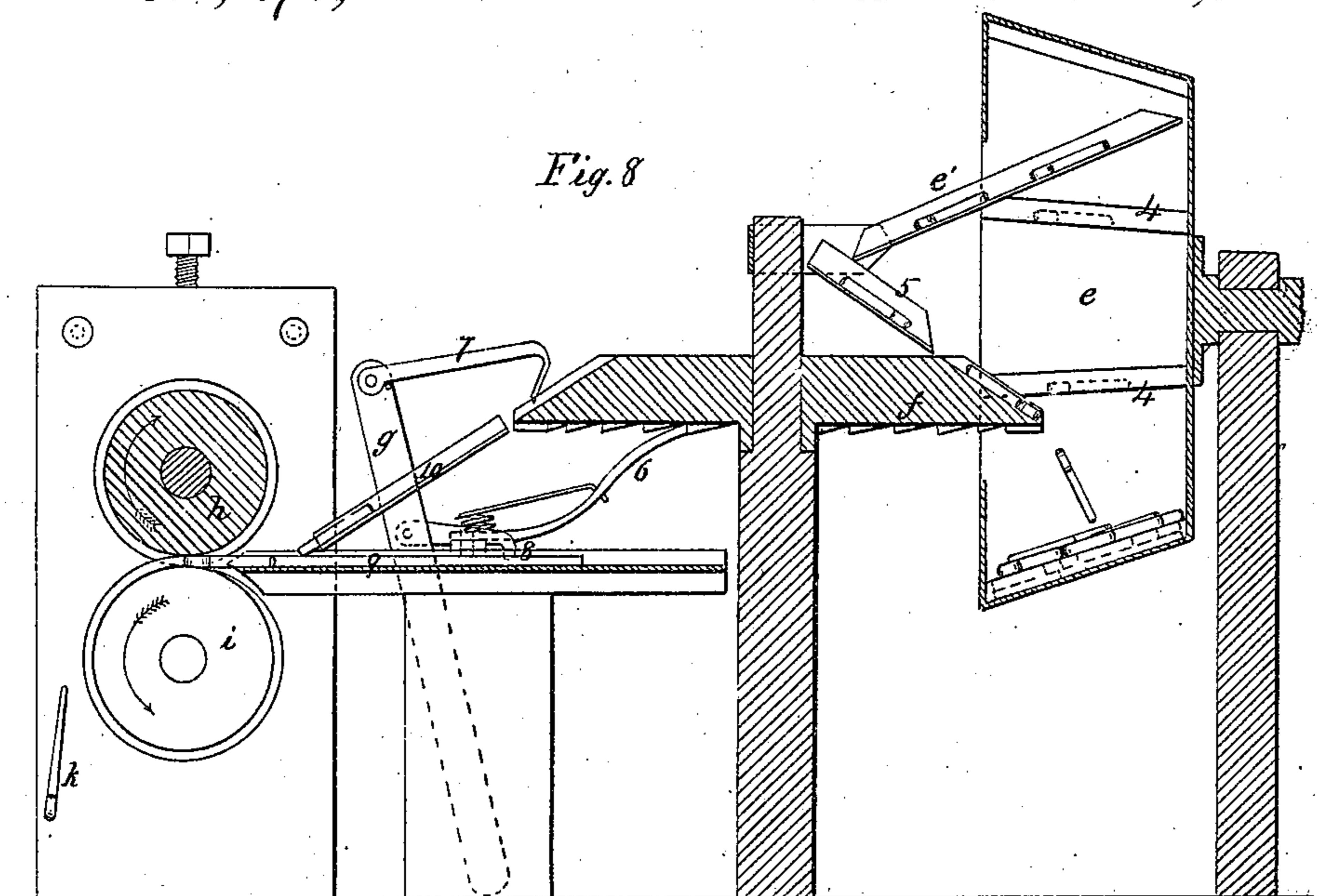
I. Fowler,
Manufacture of Horse Shoe Nails,
No. 55,270,
Patented June 5, 1866.



Witnesses
Charles French
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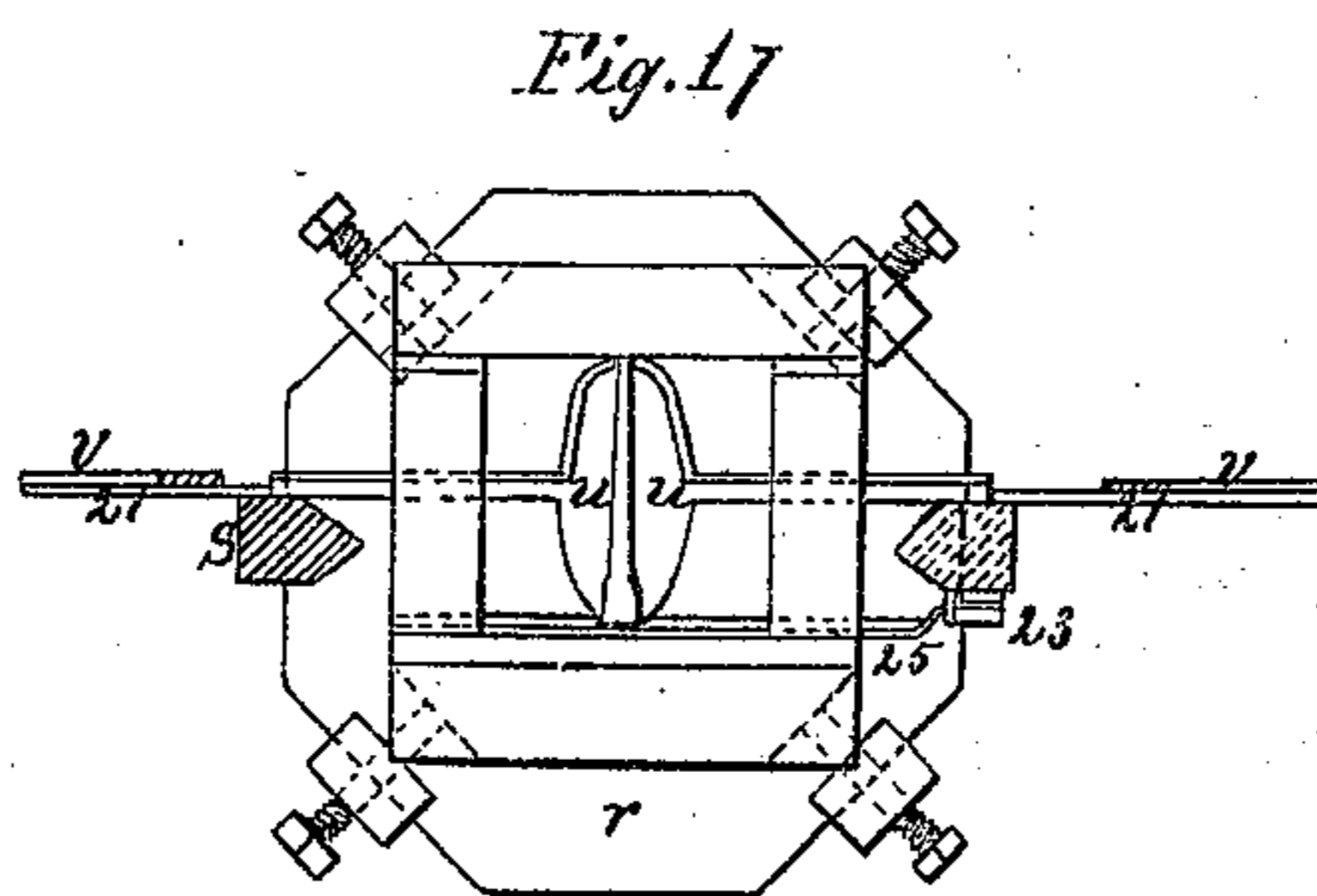
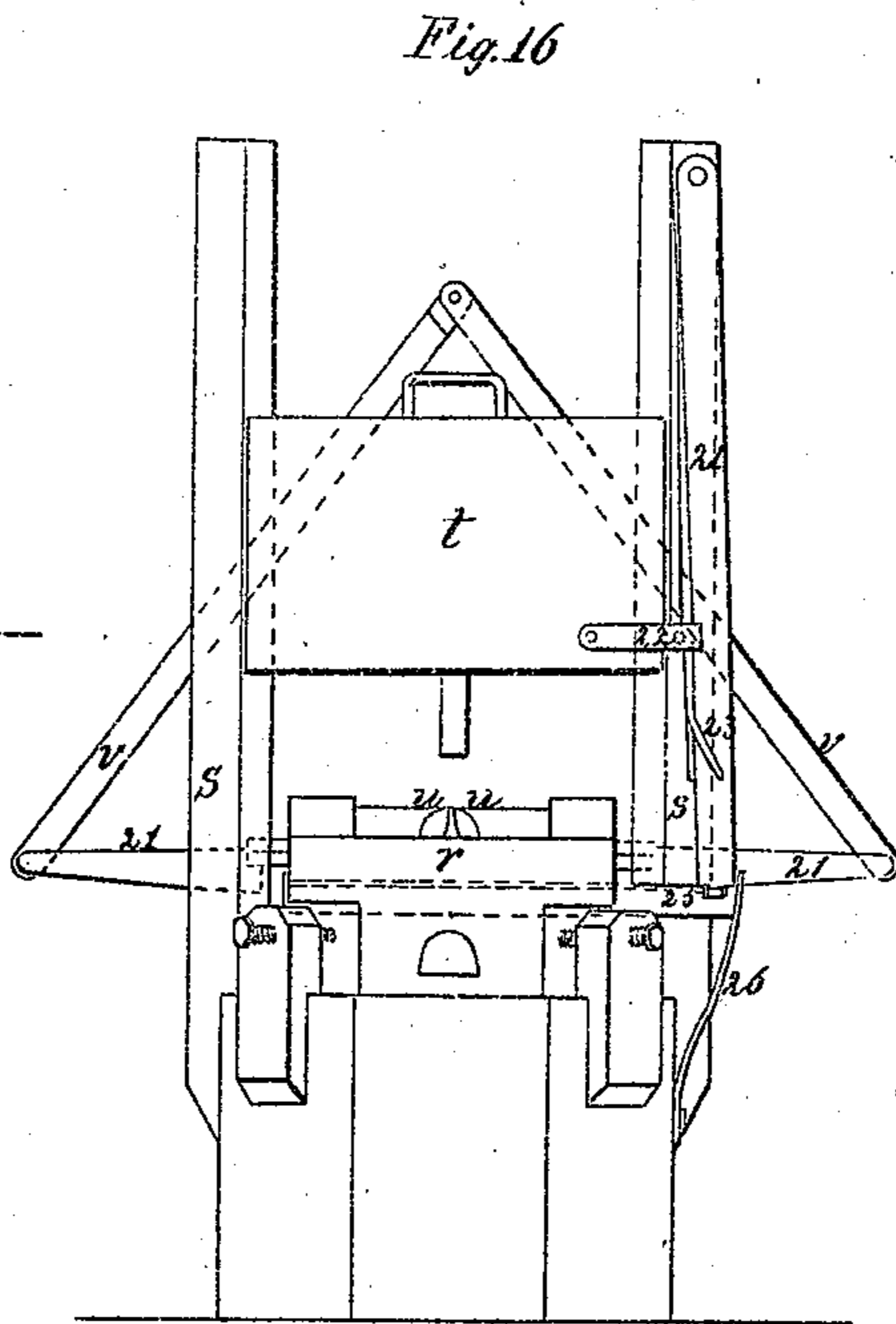
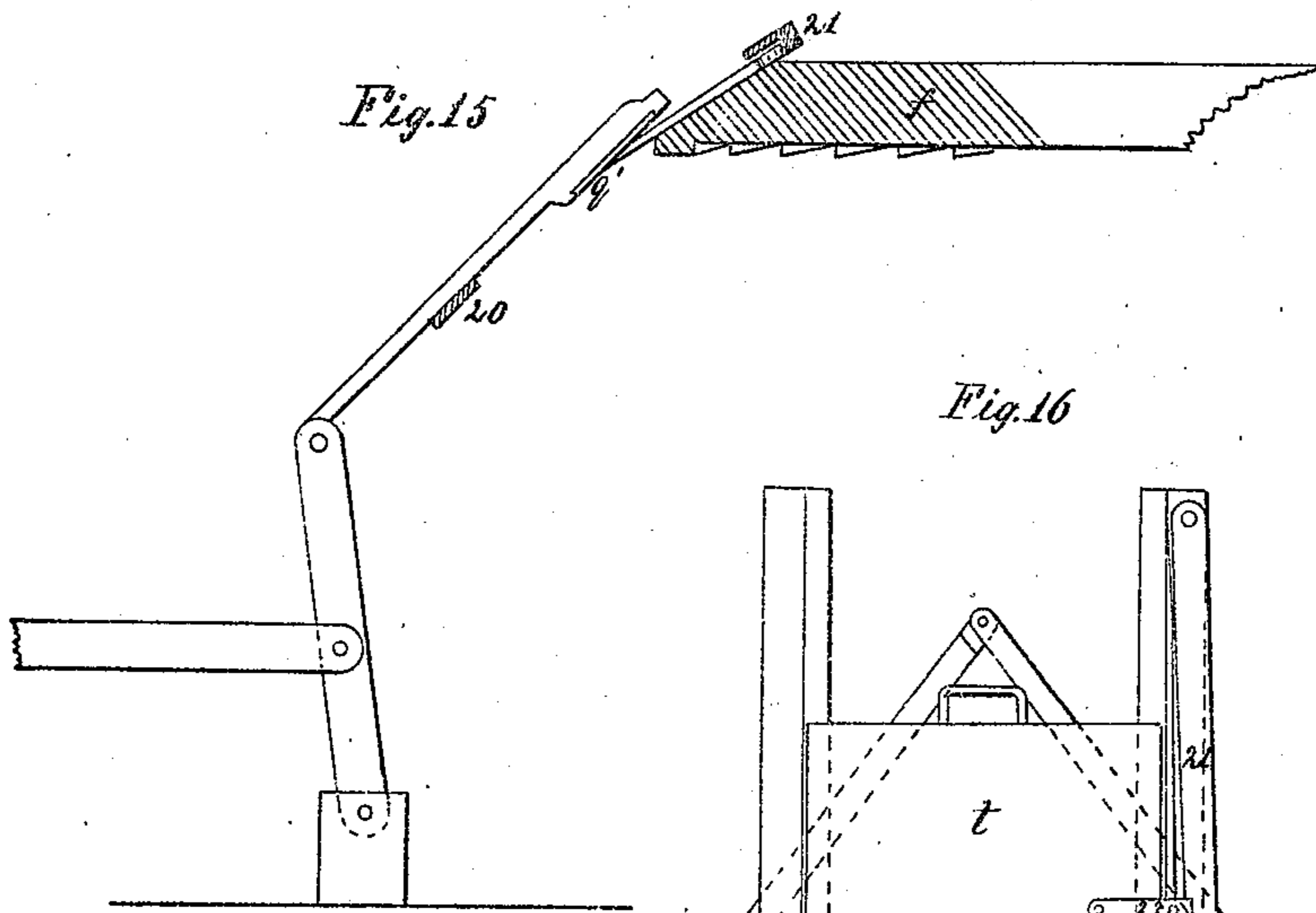
T. Fowler,
Manufacture of Horse Shoe Nails
No. 55, 270, *Patented June 5, 1866.*



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Inventor
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T. Fowler,
 Manufacture of Horse Shoe Nails,
 No. 55,270,
 Patented June 5, 1866.



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UNITED STATES PATENT OFFICE.

THADDEUS FOWLER, OF SEYMOUR, CONNECTICUT.

IMPROVEMENT IN HORSESHOE-NAILS.

Specification forming part of Letters Patent No. 55,270, dated June 5, 1866.

To all whom it may concern:

Be it known that I, THADDEUS FOWLER, of Seymour, in the county of New Haven and State of Connecticut, have invented, made, and applied to use a certain new and useful Improvement in Horseshoe-Nails; and I do hereby declare the following to be a full, clear, and exact description of the said invention, reference being had to the annexed drawings, making part of this specification, wherein I have represented the mechanism employed for performing the successive operations in manufacturing my improved nail.

Wrought nails have heretofore been made by hammering, by dies, and also by rollers.

The nature of my said invention consists in an improved horseshoe-nail possessing certain qualities not heretofore found in such nails. Hence my said nail is a new article of manufacture. I will proceed to describe the machinery and the successive operations I employ for manufacturing the said nail, and then set forth the peculiar characteristics of my said nail resulting from the mode of its manufacture.

First. A bar of iron the size of the nail-head is passed through a pair of rollers, which reduce it at certain places to form a blank of the proper size for the subsequent operations in making the nails.

Figure 1 represents the rod of iron before it is operated on. Fig. 2 represents the same after it has passed through one pair of rollers, *b b*, Figs. 5, 6, and 7, to crimp and reduce it and form double blanks, head to head, and of a length to be separated intermediately into two blanks like that shown in Fig. 4. Fig. 3 represents the bar after it has passed through a second pair of rollers, *c c*, with projecting chisel-shaped cutters coming together, that nip the said bar off between the heads and intermediately to form the said blanks *a*, Fig. 4.

At this stage of the operation the top of the nail-head is perfected, and, in consequence of the rollers *c c* acting at right angles to the rollers *b b*, the end of the head is made of a pyramidal shape, or beveled at the edges, so that the hammer, in driving the nail, will only strike upon the higher central portion of the head, and thereby the blow will be central with the nail, and cause it to drive straight, whereas nails that are either cut off or forged

square on the end of the head require to be hammered up by hand, or they are liable to drive crooked or bend.

The rollers *b b* and *c c* are sustained in any suitable frame, *d*, and driven by competent power. The rollers *c c* are to be set up toward each other by screws *1 1* or other means, so that their chisel-shaped cutters shall nip off the rod, as before mentioned, or so nearly separate the iron that the blanks *a* will fall apart in handling or when subjected to the next operation.

The rollers *b b* are formed of the proper shape for reducing the metal; but instead of being made with grooves, the shape of the half blank or nail, as heretofore usual, they are formed with flanges 2 and 3, (see Fig. 7,) which set against the sides, respectively, of the contiguous rollers, so as to leave the space for the nail-rod. By this construction each roller only has a circular right-angled recess, and the feather, if any, on the rod comes at the angle instead of the middle, and there is no possibility of the rod sticking in the groove, but it becomes entirely free as the surface of the flange on one side draws away in one direction as it rotates, while the other flange, on the other side of the rod, draws away in the other direction, and the flanges can be pressed against the sides of the adjoining rollers to keep them tightly together by set-screws or other means acting at opposite ends of the respective axes of the rollers.

Second. The blanks *a* are put into a revolving rumble, *e*, Fig. 8, in which they are agitated sufficiently to separate any of the blanks that may adhere to each other by the small filament of iron at the point of separation, and also to smooth off any feathers or burs that there may be on any part of the said blanks. When they have been sufficiently agitated they are delivered from the same rumble, or put into another for that purpose provided with elevating-buckets 4 4, that raise up the nails and cast them off upon the chute *e'*, that conveys them to the reverse incline 5, that delivers them to the inclined edge of the wheel *f*, that is filled with cavities around its edge of a shape to receive the blanks *a* with their heads downward. All those blanks not required or that present themselves incorrectly to pass into said cavities are shed off the said inclined

edge of the wheel *f* into the rumble, to be brought up again. The wheel *f* is revolved progressively by a pawl, 6, from a lever, *g*, that is vibrated by competent power in unison with and each revolution of the rollers *h i*, in order that a hook, 7, also acted on by this lever *g*, may remove the blank *a* from its notch in *f* and deliver it into a chute, 10, beneath which is a slide, 9, that is actuated by an arm, 8, also from this lever *g*, which presses the blank *a*, head first, in between the rollers *h i* as they revolve, so that the head comes against the end of a rib, 12. (See detached Figs. 9 and 10.)

The roller *h* is formed with a groove around its periphery the width of the nail-blank, and notched at 11 to receive the nail-head. The roller *i* is made as a rib fitting the groove of *h*, but cam-shaped, as seen, from 12 to 13, so that the blank *a* shall be reduced or flattened along the shank and toward its point by said cam 13, while the said body part of the nail is in the groove of *h*, and the nail then falls out or is removed from between the rollers by a stationary clearer. The nail-blank is thus formed with an elongated shank. (Seen at *k*, Fig. 8.) This operation, acting from the head toward the point with a rolling operation, extends the nail at the same time that it is consolidated and hardened.

Third. The rolling operation last described, if performed cold, will leave the body of the nail too hard for clinching. It becomes necessary, therefore, at this stage, to soften or anneal the nail-blank by heat; but if the before-described operations are performed with the metal in a hot state the nail-blank will be sufficiently soft; but it must be allowed to cool before being pointed by the next operation, in order that the point may be rendered sufficiently hard for driving.

Fourth. The blank *k* is next presented point first to a pair of pointing-rollers, *l m*, Figs. 11, 12, and 13. To deliver the nails properly to these rollers I employ a rumble and elevator, *e*, chute *e'*, incline 5, and wheel *f*, similar to those before described, only the recesses in the inclined edge of *f* are adapted to the changed shape of the nail-blank and the heads are upward. The hook 7 from the lever *g*, and the incline 10, may also be used to deliver the nail-blank *k* to the slide *n*, which is formed, as seen, endwise in Fig. 14, of a piece of sheet metal that is bent nearly in a V form where the nail falls, and the sides are bent closer together toward the rollers *l m*, so that the nail will be turned up and presented edgewise toward said rollers by the pusher *o*, actuated by the connecting-rod *o'* and crank or other suitable mechanism, that slides the blank *k* forward at the right time to pass between and be taken by the rollers *l m*, and pointed, as next shown. The rollers *l m* are each formed with a flange, similar to the rollers *b b*, the flange of one sitting against the side of the other, and said flanges are removed, as at 14, and the ends of these flanges beveled or rounded, as seen in Fig. 13, and the rollers *l* and *m* are formed eccentric or

cam-shaped at 15. It will now be seen that as the rollers rotate in the direction indicated and the blank *k* is pushed forward it will pass in between the rollers in the opening bounded by said rollers and their flanges, and that the cam-shaped portion will extend the nail, rolling the point down edgewise into a shape similar to that shown at *p*, at the same time passing the nail back toward its former position, from which it is allowed to drop by the withdrawal of a slide, 16, forming the bottom of the trough *n*. This slide 16 may be actuated by any suitable means. I have shown it upon a spring-plate, 17, from which is an incline, 18, that is acted upon by a stud-pin, 19, on *m*, running under said incline.

Fifth. I prefer that the nails (like *p*) be placed in a rumble to smooth their corners, and delivered from it in manner aforesaid to grooves in a wheel, *f*, Fig. 15, of a shape to receive said nails; but they might be deposited in any suitable receptacle by any convenient means that would present the points diagonally to the file or cutting-instrument *q'* that dresses off the side of the nail-point in order that it may drive in a curved line through the hoof of the animal and turn outward, as is required in shoeing.

I have represented a reciprocating file, *q'*, resting on the stationary bar 20, and the head of the nail as kept down by passing under flanged strip, 21.

The nail is now completely formed and shaped ready for the last and finishing operation. I employ a press that acts on the two edges of the nail to straighten the same perfectly and slightly compress it, and then a drop that acts upon the sides to slightly flatten and harden the nail, and thus insure great beauty in the finish of the nail as well as perfect uniformity, and insure the stiffness necessary for driving properly. I provide an anvil, *r*, (see elevation, Fig. 16, and sectional plan, Fig. 17,) at the sides of which is a frame, *s*, or slides, carrying a drop, *t*, actuated by any usual means. On the surface of the anvil are the compressing-blocks *u u*, actuated by bent levers 21 and links *v v*, that are drawn up by a pin projecting from the drop *t*, so that a nail dropped automatically between the dies *u u* is compressed sidewise, and then, as the hammer *t* drops, the links *v* by their weight open the dies *u u*, leaving the nail on the anvil to be struck by the projecting die of the drop and given a perfect finish on its side. As the drop rises a pin, 22, projecting from *t*, takes an incline, 23, on the hanging lever 24, the end of which is connected to the slide 25, in which is a notch, and draws said slide so that the notch presents itself on line with the nail, and the anvil being on an incline the nail slides through the opening, the pin 22 passes beyond the end of 23, and a spring, 26, returns the slide ready to retain another nail when dropped.

The blow of the drop hardens the nail sufficiently to insure its driving straight by acting upon the side of the nail to spread the lower

part of the head and the shank, as seen in Fig. 18, in order that the metal may not be liable to bend at the junction of the shank and head.

It will now be understood that my horseshoe-nail is a new article of manufacture, much better than any horseshoe-nail ever before manufactured, because in it certain peculiarities are associated which have never before been found in one horseshoe-nail. Some of these peculiarities can be the best understood by bearing in mind the mode of manufacture. For instance, it is well known that the heating of iron anneals the same, rendering it soft and tough, while on the other hand the hammering or rolling of iron stiffens it, giving to the same a greater density or hardness and stiffness; and by availing of these well-known operations I cause the different portions of my horseshoe-nail to be of the proper character for their particular duty, instead of being homogeneous, as heretofore. Thus the point is better adapted to penetrating the hoof, because it is more dense, and hence harder or stiffer than the body of the nail, in consequence of the point being rolled down after the nail has been annealed. The body of the nail is in the proper condition for clinching in consequence of being but little acted upon after being annealed. The head is less liable to bend than

heretofore, because the iron at the junction of the body and head is more dense than in the body of the nail, in consequence of being compressed at this point by the dies in the last operation; and, in addition to the aforesaid peculiarities of my said nail, I have the point beveled on one side, so as to drive properly, and I have a projection at the center of the head. These peculiarities have never before existed in any one horseshoe-nail, and hence said horseshoe-nail is a new article of manufacture.

What I claim, and desire to secure by Letters Patent, as a new article of manufacture, is—

A horseshoe-nail in which the point and junction of the body with the head are more dense or stiffer than the body portion of the nail, the point is beveled upon one side without being spread widthwise, and the head has a projection in the central parts, for the purpose and as set forth.

In witness whereof I have hereunto set my signature this 27th day of October, A. D. 1865.

THADDEUS FOWLER.

Witnesses:

CENTER FRENCH,
WM. M. FOWLER.