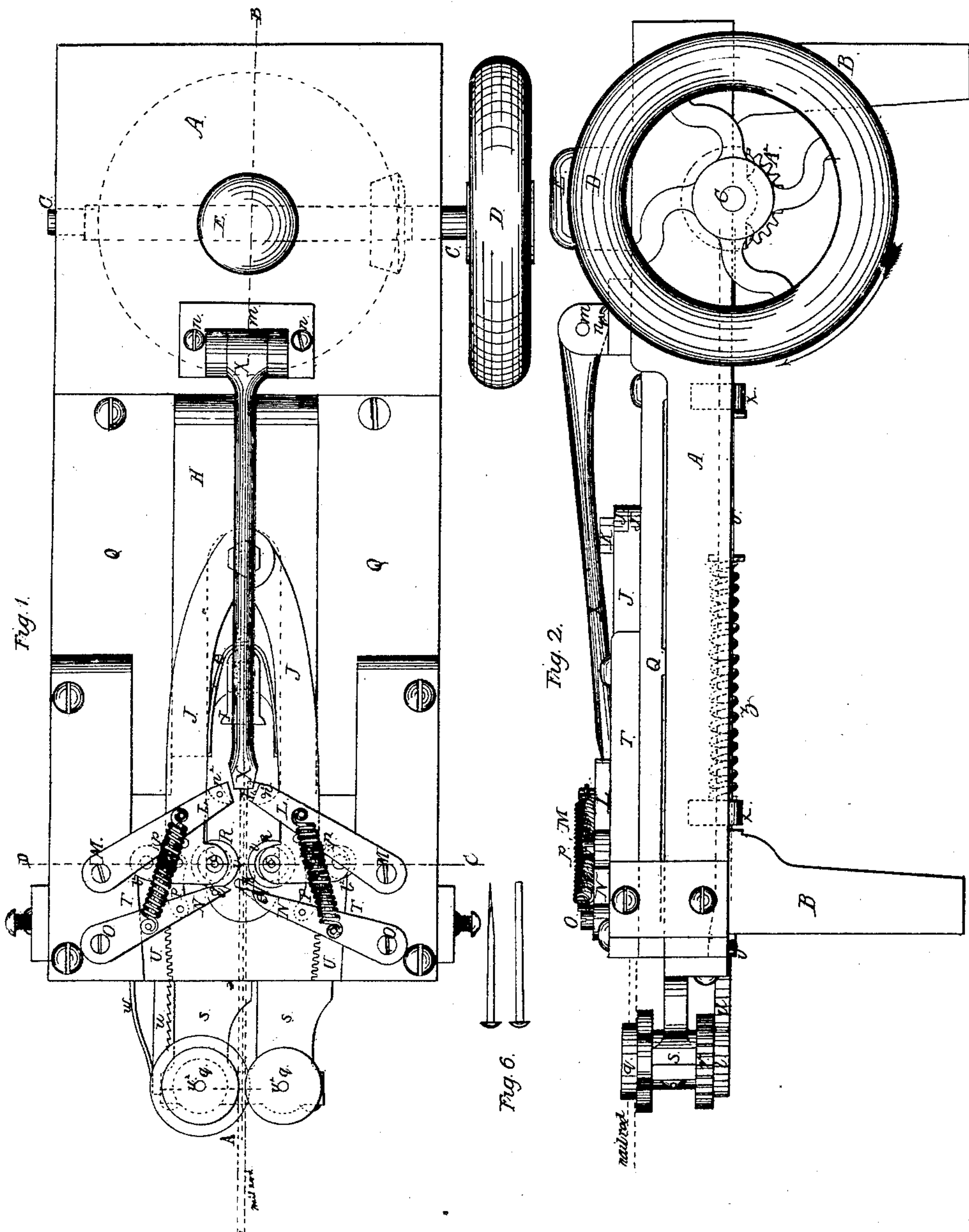


E. W. SCOTT & A. M. GEORGE.  
MACHINE FOR MAKING WROUGHT NAILS AND SPIKES.

No. 17,523.

Patented June 9, 1857.



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Fig. 4.

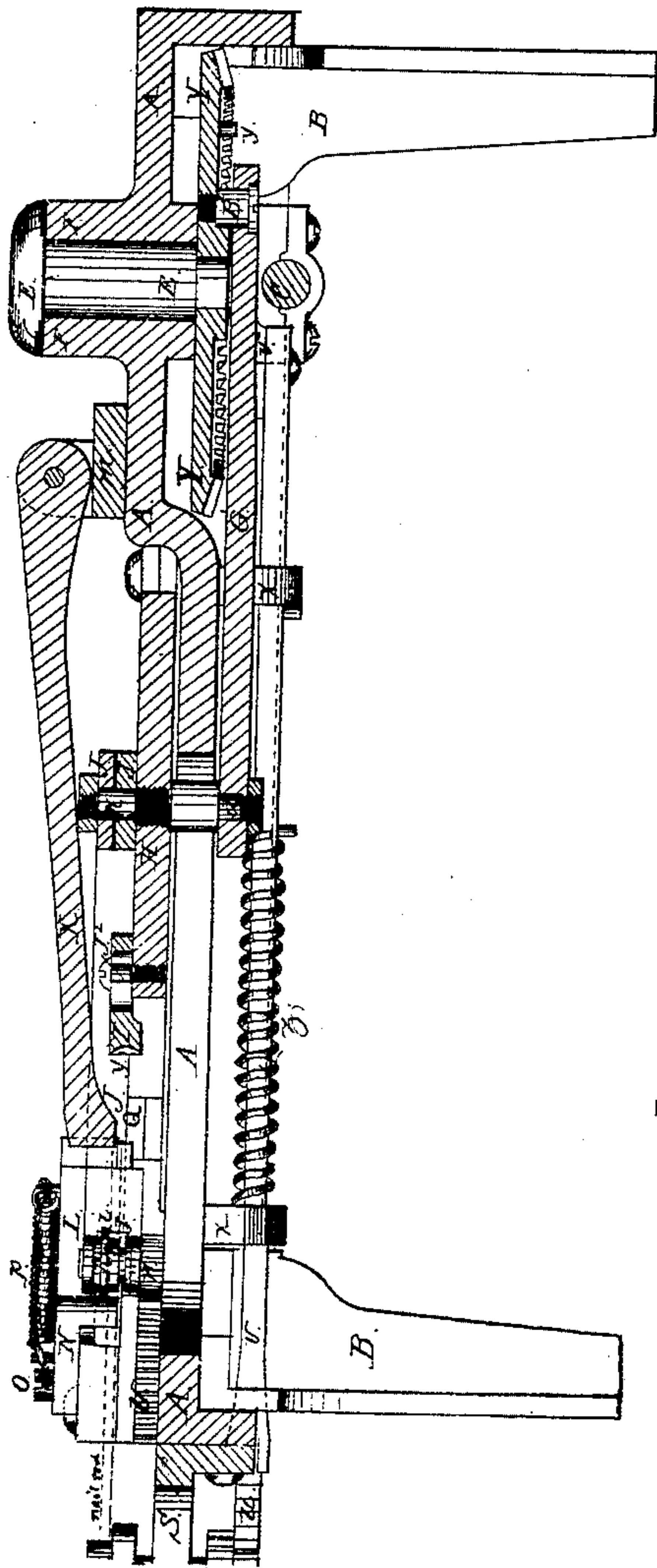


Fig. 5.

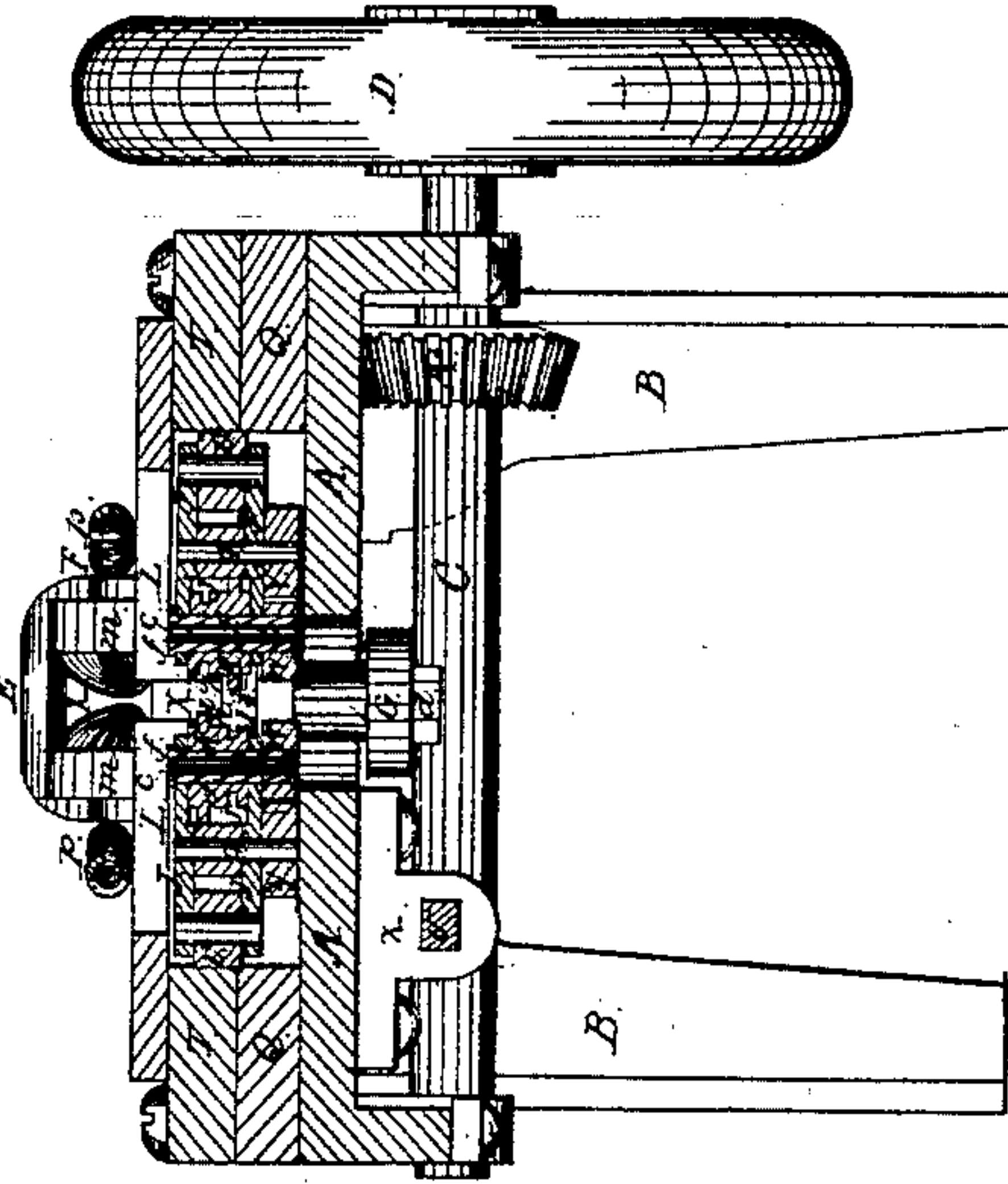
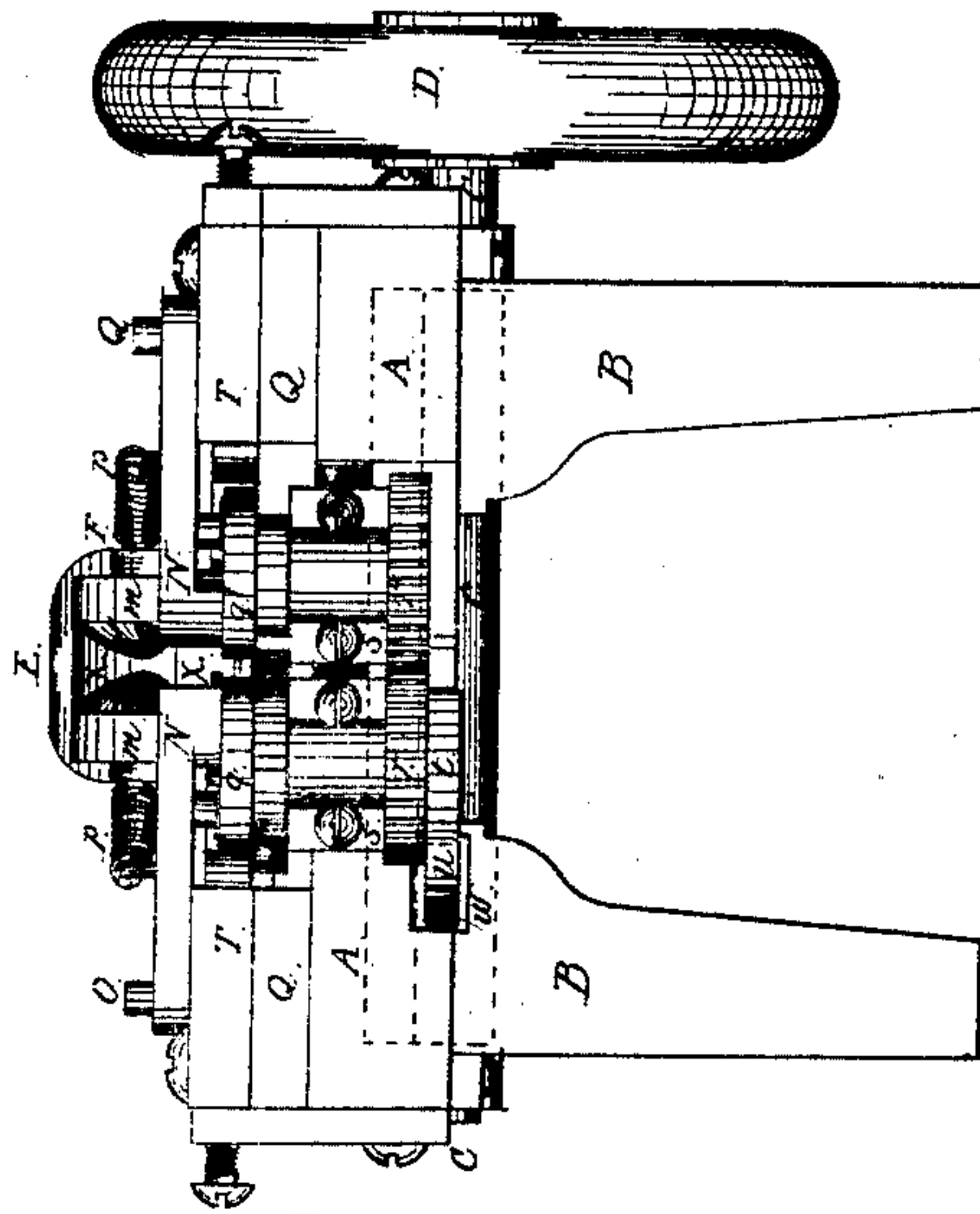


Fig. 3.





# UNITED STATES PATENT OFFICE.

E. W. SCOTT, OF LOWELL, MASSACHUSETTS, AND A. M. GEORGE, OF NASHUA, NEW HAMPSHIRE.

## NAIL-MACHINE.

Specification of Letters Patent No. 17,523, dated June 9, 1857.

*To all whom it may concern:*

Be it known that we, ELHANAN W. SCOTT, of Lowell, in the county of Middlesex and State of Massachusetts, and AMNI M. GEORGE, of Nashua, in the county of Hillsboro and State of New Hampshire, have invented a new and useful Machine for Making Wrought Nails, Spikes, &c.; and we hereby declare that the following is a clear, lucid, and exact description of the construction and operation of the same when taken in connection with the accompanying drawings, letters, figures, and references thereof.

Of the said drawings, Figure 1, denotes a plan, Fig. 2, a side elevation, Fig. 3, an end elevation, Fig. 4, a longitudinal and vertical section at A, B, of Fig. 1. Fig. 5 denotes a transverse and vertical section at C, D, of Fig. 1. Fig. 6 are two views of a finished nail.

The nature of our invention consists of a machine hereafter described, in which wrought nails are made by first heating the rods of iron from which the nails are to be made, of sufficient temperature, then place or feed these rods into the machine by means of hollow feed rolls filled with water, and having an intermittent motion, the machine being in operation, and the rod being first cut, then gripped and then pointed by the pointing rolls which are so constructed and operated that they are forced to revolve as well as to move forward. By this means a regular beautiful and smooth point is formed and the nail rod which forms the body of the nail is not drawn out nor broken which would be sure to be the case if the rolls were not forced to revolve as they advance, using the device hereafter shown to turn these rolls, or any substantially similar contrivance, the feed rolls, pointing rolls, cutters, and grippers all being made hollow near where they come in contact with the heated rod, and into and through these recesses or hollows we pass a stream of water to keep these several parts from getting overheated during the operation of the machine.

To enable others skilled in the art, to make and use our invention we will describe the same as follows. We construct a frame of iron as seen at A, A, which is firmly supported on four iron legs as seen at B, B. To the frame A we properly sus-

pend a wrought iron shaft C, in substantial bearings. To the out end of this shaft we attach a balance wheel seen at D, and on this same shaft C we firmly secure a bevel pinion A<sup>2</sup> which gears into and drives the large bevel gear Y, this gear being firmly fitted and secured to the perpendicular shaft E, a hub or projection being formed on the top of the frame as seen at F, to receive the shaft E, and constitute its bearing. Into the large gear Y, we place a wrist as seen at B<sup>2</sup>, to this we fit one end of the wrought iron connecting rod G, and the opposite end we fit to a corresponding wrist as seen at d this wrist being firmly secured to the vibrating or sliding plate H, this being so constructed as to slide back and forth freely in the iron ways Q by operation of the before described gears.

On the top of the sliding plate H we firmly secure a stud as seen at K, and to this we fit the back end of both the iron arms J, J, so that they will turn or swing together or apart as may be necessary. To the out end, and forward end of each of these arms, we attach steel or iron friction rolls i<sup>2</sup> i<sup>2</sup> so fitted to these arms as to freely revolve in them, the outward faces of the rolls coming in contact with each of the faces of the incline planes T, as the arms J, J, are moved forward by operation of the gears and connecting rod before described. We also properly fit the steel rolls R R for pointing the nails, to the forward end of these arms J, J, and firmly attach each of them to the shaft on which they are placed as seen at f so as they will be revolved by them. We have found by actual experiment that the pointing rolls will not operate to point the nails with any success when these rolls are left free to revolve or not, by themselves coming in contact with the nail rod, when the rolls are being forced along, with the arms, J, J. The converging of these rolls R, R, as they advance to do the pointing of the piece of iron for the nail causes them to stop revolving or turning as they advance, and then they commence forcing the rod apart between the gripping jaws L, and the end of the rod and breaks them before the point can be formed thereon, so that it is found by us, by actual experiment to be necessary to revolve or turn the pointing rolls R, R, the right speed as they are forced forward, as well as to advance, or force



them forward, by this operation of the rolls R, R, there is no draw of the iron except the pointing, of which the nail is being formed, and a most perfect point is formed on the nail, and of any length desired by adjusting the plates T, T.

We make use of the following means to revolve or turn the rolls R, R, as they advance. We firmly secure an iron rack as seen at U, on each side of the plates T, T on the same angle as the inner face of the inclined portion of the plates T, T, and to the lower end of each of the shafts or centers *f* of the pointing rolls, we firmly secure a gear as seen at W. To each outside of the gears W we fit a corresponding intermediate gear V, which revolve on the studs *g*, and these gears gear into the aforesaid stationary rack, U, U, and are for the purpose of turning the rolls R, R, in the right direction when the machine is in operation. The rolls R R, we construct of steel with the central parts of them hollow seen at *c c* through which a stream of water is forced, to keep them cool, as seen in the drawing, and by forming a face as seen at *h*, and forming a lip or flange *i*, on one side of this face *h*, and at the opposite side we form a recess J, to receive the flange *i*, of the opposite roll so as they will revolve or turn together and keep the nail exactly of the same width while it is being pointed and also at the same time to prevent fins forming on the corners of the nail.

Both the rolls for pointing the nails in our machine as shown in the accompanying drawings are constructed alike but it may be more advisable to construct them by turning a groove into one of them the size of the body of the nail, and forming the other roll so as to fit the groove in the first one, for it is necessary to have the guide to keep the nail the desired width, formed on and constitute a part of the rolls themselves so as they will revolve together and thereby create no friction, which would be the case were stationary dies used above and below these rolls to keep the nail rod the proper thickness it being necessary to press stationary dies against the upper and under surfaces of the rolls sufficiently hard to prevent fins forming on the nails, in which case it would be impossible to force the rolls R, R, through between such dies if used in that way.

At N, N, can be seen the steel cutters, through the cutting ends of which a stream of water is passed as seen at *e*<sup>2</sup> to keep the cutting edges cool as they operate to sever the nail rods the desired length of the nail, at each operation of the machine, these cutters being connected to and operated by the arms J, J, and connecting rods P on the principle of the toggle joint thus applying great power to them, their turning points

being seen at O, O. There is a projection or lip as seen at K formed on the lower part of one of the cutters to prevent the nail rod from dropping below them as it is fed into the machine.

At L, L, can be seen the steel gripping jaws which turn on the centers M, M. These jaws are for the purpose of holding the nail firmly while the heading and pointing is being done, they being in the form of an arch which gives them great strength while holding the nail rod, and these jaws are drawn more closely and firmly together until the nail is completed, by means of the spiral springs *p, p*, which are connected to the cutters as seen in the drawing. The gripping jaws L, L, are made hollow near their ends seen at *n*<sup>2</sup>, *n*<sup>2</sup>, where they hold the nail rod and these hollows or cavities *n*<sup>2</sup>, *n*<sup>2</sup>, are filled with water so as to keep them cool while in operation for holding the heated rods. A projecting lip I is formed on one of these jaws, to sustain the nail rod, jointly with the lip on the cutters, and the jaws are recessed the same shape of the rod so as to receive this rod and firmly hold the same without forming fins on the nails where they are being held by the jaws, L, L.

At I is seen the header which is attached to the sliding plate H, by means of the set screw J<sup>2</sup>. The operating end of this header is properly recessed seen at *j*<sup>2</sup> so as to give the desired form to the head of the nail. We place a spring as seen at *e* between the arms J, J, for the purpose of pressing them apart as they are moved backward to discharge the nail.

At X, can be seen the gage which gives the proper length to the nail, and it is constructed of metal and attached to the plate A, by means of the stand *m*, and screws *n*, the forward end of this gage rises out of the way during the heading operation, and descends to the required position, to gage the length of the nail, when the jaws L, L, are fully opened.

It will be seen that the friction rolls *i*<sup>2</sup>, *i*<sup>2</sup>, press against the faces of the angular surface or edge of the plate T, T, which causes the pointing rolls R, R to converge gradually and easily together to point the nails, these pointing rolls having flanges formed on them to keep the point of the nail of equal width, and the said friction rolls *i*<sup>2</sup>, *i*<sup>2</sup>, taking the main pressure which causes little or no friction on them and the other working points or parts during the making the nails or spikes.

At *q, q*, can be seen the two hollow feed rolls through which a current of water is passed seen at *v*<sup>2</sup> *v*<sup>2</sup> to keep them cool, when the heated rods are forced into the machine between them. It will be understood that it will not answer to allow a stream of water to run on to, or come directly in contact with



the outside of the several parts that come in contact with the heated rod, for the reason that a part of this water would come directly in contact with the nail rod itself and consequently cool it so much as to prevent finishing the nail, the rods of which the nails or spikes are made being so small.

At *r, r*, can be seen the gears at the end of the feed rolls, and at *s, s*, can be seen the stands which support these feed rolls.

At *t*, can be seen the ratchet gear by which the intermittent motion is applied to them, and at *u*, can be seen the rack or ratchet which moves or turns the feed rolls, and which is connected to the bar *v*, by a joint so as to swing as desired. The rack *u* being kept up against the ratchet gear by the spring *w*, the bar *v*, sliding in the stands *x*, which are firmly secured to the plate A, of the machine, and the bar *v*, being operated by the stud *y*, which is firmly secured to the large bevel gear Y as seen in the drawing, the bar *v* is kept forward by the spring *z*. Thus explaining the method of making and constructing our invention, and the peculiarity of the same we will proceed to describe the operation of the same as follows.

To operate our machine we set it running in the direction that the arrow points, by means of any of the known motors, and

then place the heated rods between the feed rolls *q, q*, by which the rod is carried along by the turning, or intermittent motion given these feed rolls until the aforesaid nail rod strikes the gage X. Then the gripping jaws L, seize and hold this rod, and then the cutters as seen at N, N, in the accompanying drawing, sever the nail rod by being moved together by the connecting rods P, P, of sufficient length for the nail, after which the pointing is performed and after this the heading is done, and finally the nail is discharged from the machine, completed and ready for use.

It will be understood that the operation for making spikes is the same as for making nails.

Having thus described the construction and operation of our invention what we claim therein as new, and for which we desire to secure by Letters Patent is—

We claim forcing the pointing rolls to revolve, and advance at the same time, to point the nails or spikes, substantially as specified.

E. W. SCOTT.  
AMNI M. GEORGE.

Witnesses:

BENJA. ROBINSON,  
N. C. LOMBARD.