Sheet 1 - 2 Sheets

# T. Carpenter,

## Horseshoe Nail Machine,

No. 20,141. Patented May 4, 1858.

Fig. 8.

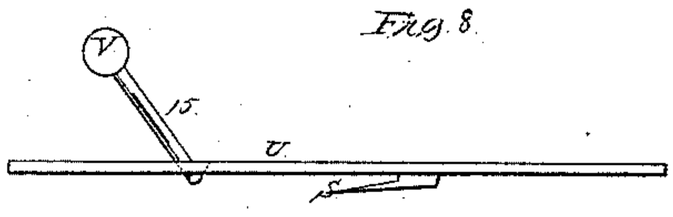
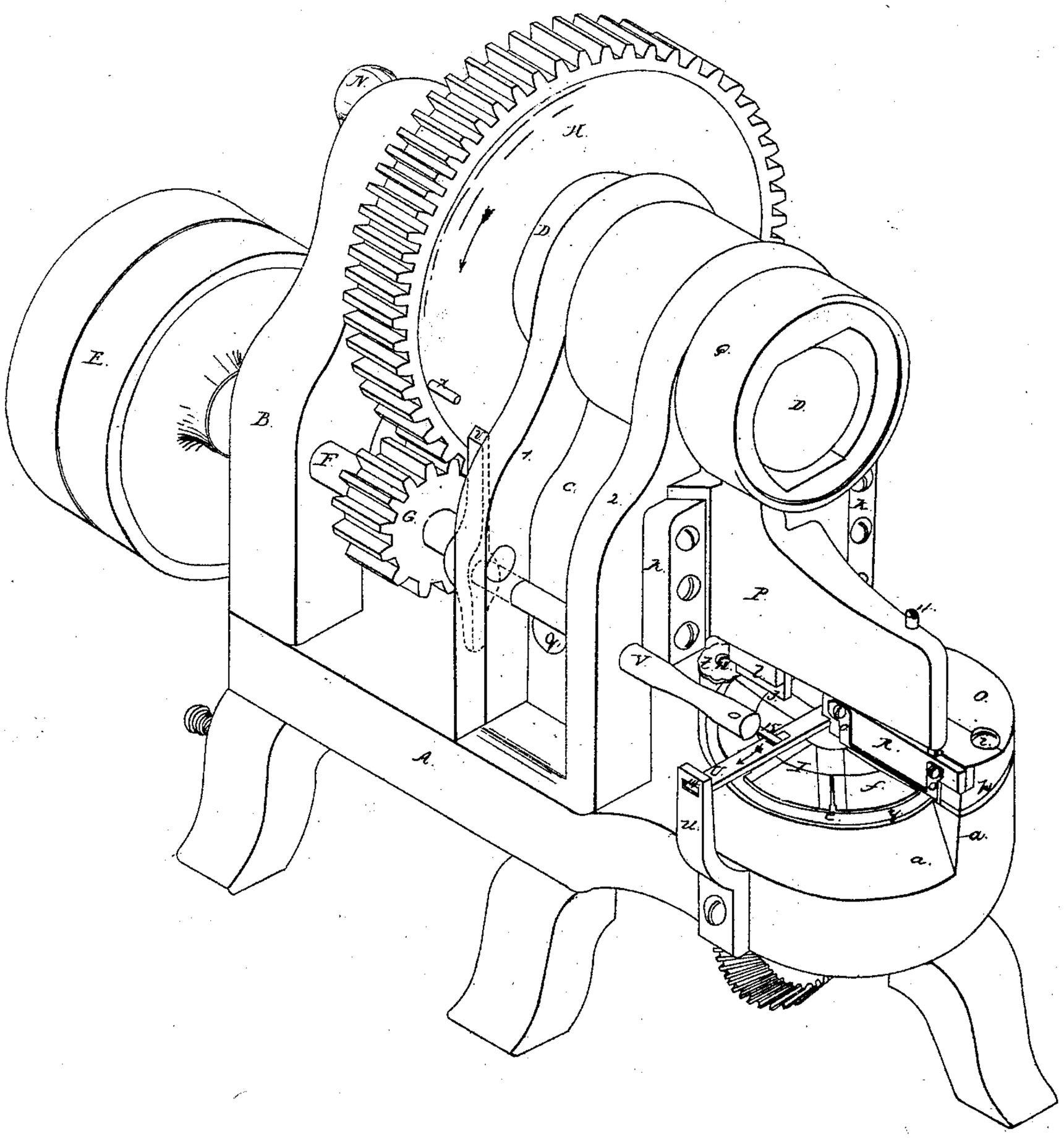



Fig. 1.



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# T. Carpenter,

## Horseshoe-Nail Machine,

No. 20,141. Patented May 4, 1858.

Fig. 1.

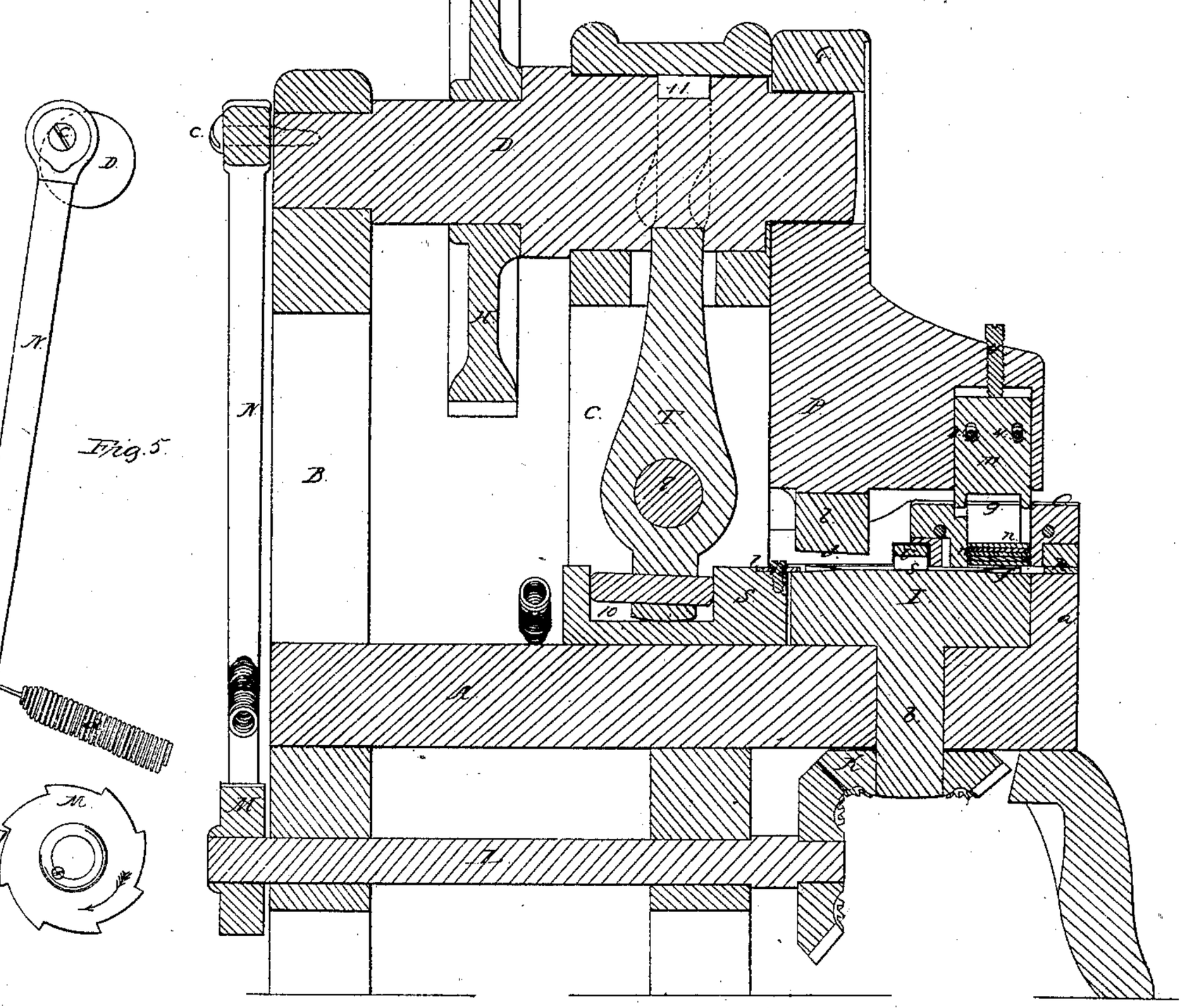
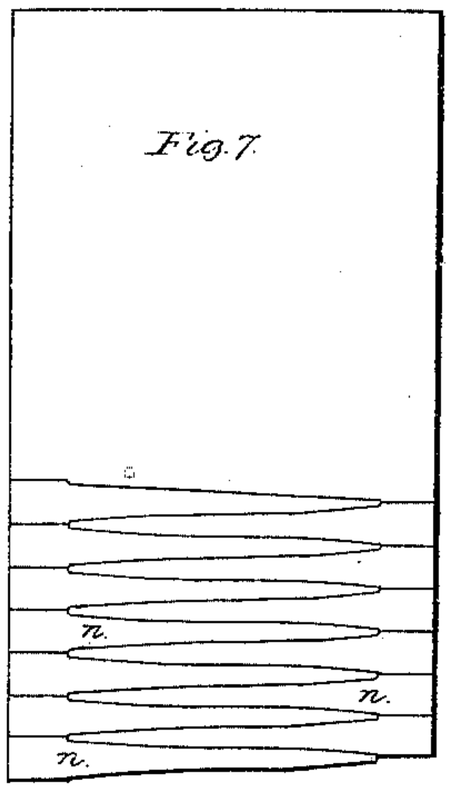



Fig. 5.

Fig. 7.



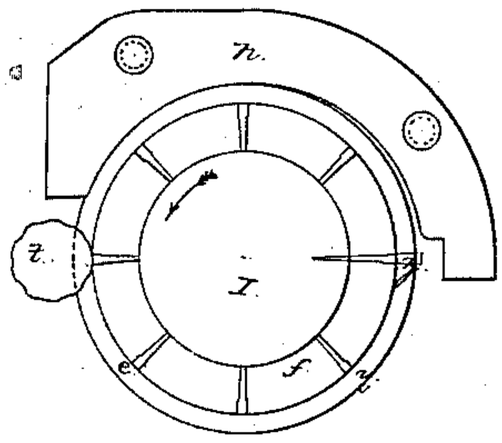




Fig. 6.

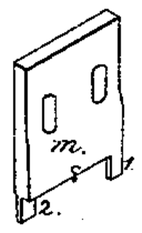



Fig. 3.

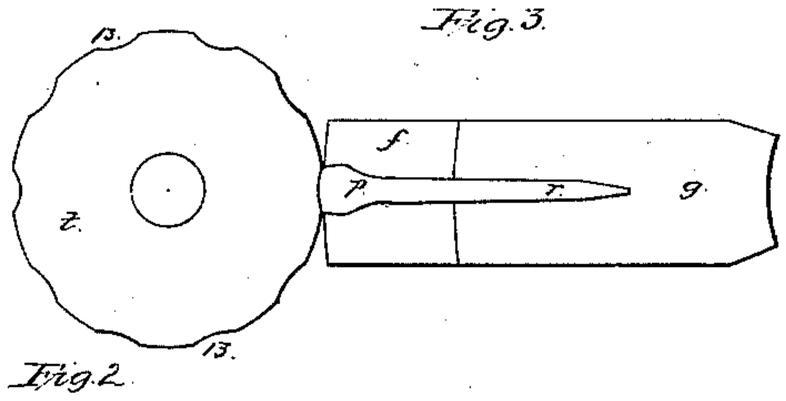



Fig. 2.

# UNITED STATES PATENT OFFICE.

T. CARPENTER, OF PROVIDENCE, RHODE ISLAND.

## MACHINE FOR MAKING HORSESHOE-NAILS.

Specification of Letters Patent No. 20,141, dated May 4, 1858.

*To all whom it may concern:*

Be it known that I, TISDALE CARPENTER, of Providence, in the county of Providence and State of Rhode Island, have invented a new and useful Machine for Making Horseshoe-Nails, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a perspective view of the machine. Fig. 2 a longitudinal vertical section through the same. Figs. 3, 4, 5, 6, 7, 8, details to be referred to hereafter.

That others skilled in the art may understand and use my invention I will proceed to describe the manner in which I have carried it out.

In the drawings A is the bed of the machine from which rise the standards B and C, the latter, as shown in Fig. 1, of an arched form having a recess or panel in its side and two projecting ribs 1 and 2. These standards B and C carry in suitable bearings in their upper parts the shaft D, by which the various parts of the machine are operated. Motion is communicated to it from the pulley E on a shaft F, which has its bearings in one side of the standard B and in the part 1 of the standard C. This shaft carries a gear G, which engages with the cog wheel H on the shaft D, and drives it in the direction of its arrow. The bed A rises a little at one end at *a*, and is formed into a circular box which receives the die table I, (seen in plan Fig. 4). A shaft *b* descends from this table through the bed A, and carries at its lower end a beveled gear K, which engages with a similar gear on the end of a shaft L. This shaft is carried in suitable bearings in the frame of the machine beneath the bed A. It has secured to its outer end a ratchet wheel M. (See Fig. 5. A pawl N is pivoted at *c* eccentrically to the end of the shaft D, and is held in contact with the wheel M by a spring *d* attached to the frame of the machine. Thus at each revolution of the shaft D the shaft L and table I are revolved a distance corresponding to one notch of the wheel M. The table I has formed on its face a ring *f*, which does not extend quite out to the periphery of the table and is beveled from its outer toward its inner edge (as in Fig. 2). It has cut in it dies *e*, the number of which corresponds to the number of teeth on the ratchet wheel M. The ring *f* and table I may be of hard metal or radial pieces as *g* Fig. 3 of steel may be inserted in the table. A cap O, covers a portion of the table I and is screwed down onto the part *a* of the bed A, and holds between it and the bed a semicircular guide plate *h*, (see Fig. 4) the office of which will be hereafter explained. The screws *i* which secure the cap O pass through slots or larger holes in the guide *h*, so that this plate may be adjusted eccentrically to the table I. A heavy arm P projects over the table I and receives an up and down motion at each revolution of the shaft D from an eccentric cam on the end of this shaft revolving in a box Q, to which the arm is hung. The beveled ways *k* on the standard *c'* serve for the arm to slide in; this arm carries on its under side a swage *l*, the face of which at 3 (Fig. 2) is inclined to give the required taper to the nail. A shear *m*, (detached in Fig. 6,) is inserted in a suitable recess in the outer end of the arm D. It is attached and made adjustable by screws 4, the shear *m* having slots 5. The blank is cut from the sheet of metal Fig. 7 by the edge 8 of this shear *m* and the edge 9 of the cap O, as the arm P descends, the blank *n*, Fig. 7, falling into a receptacle which will now be described. A box R is attached to the straight side of the cap O. It has formed in it on the side next to the cap a recess of the proper size and shape to receive the blanks *n* Fig. 2, which lie flat in it and are piled up one on top the other for the depth of the box. A spring *o* is attached to the front of the box and has a lip which turns down under the lower edge of the box and prevents the lower blank from falling out onto the table I until another one is pressed in at the top of the box by the shear *m*. (The position of the shear *m* can be regulated to suit the thickness of the blank).

The dies *e* in the ring *f* are of a proper form and size to make the upper part of the nail as at *p*, Fig. 3, the outer edge of the ring *f* being of the proper thickness, the bottom of the die and the face of the swage *m* being relieved a little to give the proper thickness to the head when the metal is upset to form it. The lower part or point of the nail *r*, Fig. 3, extends in toward the center of the table beyond the ring *f*, and receives there the direct pressure of the swage *l*, which flattens it down to a point

(the blank being sufficiently narrow the other way) and at the same time that the swage performs this operation it acts as a clamp to hold the blank from being thrust endwise toward the center of the table as the head is upset. The upsetting is performed by the following device: A carriage S, Fig. 2, slides toward and from the table I in suitable ways on top of the bed A and in a recess formed in the arched standard C. It is moved back and forth at the proper intervals by the vibrations of a lever T hung on a horizontal shaft *q*, which has its bearings in the two sides of the standard C, and lies transversely across the machine; the lower end of the lever T enters a recess 10 in the carriage S, and the upper end enters a cam shaped groove 11 on the shaft D, by which the vibrations are given to the lever T at the proper intervals. The carriage S has attached to its front end a circular swage *t* (shown full size in Fig. 3). The swage is secured to the carriage by a screw 12 which allows it to be readily removed or to be turned around to bring a fresh portion of its edge in line with the center of the table I. As one portion is worn, the edge has formed in it a series of indentations 13, Fig. 3, which correspond to the required form of the top of the head of the nail.

After the nail is formed some means is required for removing it from the die *e*, for this purpose I make use of the following device. A clearer U, Fig. 1 and detached in Fig. 8, slides horizontally in a slot cut through the cap O and a slot 14 in a short standard *u*, attached to one side of the bed A. This piece U has on its lower side a claw S, the point of which rests on the table I, near the center of it, and as the clearer is moved at intervals in the direction of its arrow, this point strikes under the point of the nail which occupies the die *e* immediately beneath the clearer, and drives it endwise out of the die. Motion is given to the clearer U in the following manner: A light shaft V has its bearings in the two parts 1 and 2 of the standard C. It carries at one end a pin 15, which enters a slot in the clearer U, and at the other end a dog *v*, (partially dotted in Fig. 1,) a spring *w*, (Fig. 2) is fastened to the lower end of this dog and to the frame of the machine. A pin *v* on the side of the wheel H strikes the dog *v* at each revolution of the shaft D, and through the shaft V and pin 15 slides the piece U, in the direction of its arrow. As the table I is revolved a portion of a circle at each turn of the shaft D as before explained, the dies *e* are brought in succession beneath the clearer U, and the finished nail is ejected from the die. The table I may be furnished with a suitable stop to insure its stopping with the dies in the proper position. When the blank drops from the box R onto the table I, it enters the die *e*, which is beneath the box, and rests with the portion intended to form the head on the rim *y*, and the point of it on the table within the ring *f*, as it is necessary that so much only of the head of the blank should project beyond the ring *f* as will suffice when upset to fill the die. I use the guide plate *h* (see Fig. 4) to adjust the blank. The inner edge of this plate is placed eccentric to the table I, so that as the table revolves in the direction of its arrow the blank will be pressed endwise into the die the proper distance.

The blanks *n* are cut from a sheet of soft iron, Fig. 7, the shear *m* cutting them of the form shown, which I have found is a convenient one to give the proper proportion of metal where it is wanted without waste. The shear *m* (detached in Fig. 6) has two stops 1 and 2 projecting down below its edge. The stop 2 is set back a little way from the cutting edge. They serve as guides to determine the amount of metal to be cut off at each descent of the arm P to form a blank.

The operation of this machine is as follows: The workman feeds the plate Fig. 7 to the shear *m*, turning it over at each cut so that the heads of the blanks are all in one direction when they fall into the box or receiver R. The spring *o* prevents them from falling out until the box is full, when the descent of the shear *m* as it forces in a blank at top forces out one at the bottom (the spring *o* yielding to it). The blank thus forced out drops into the die *e*, which is beneath it (as at *z*, Fig. 4). Then as the table revolves a portion of a turn at each revolution of the shaft D a fresh die is brought under the box R. As the die with the blank in it is carried around, the head of the blank is pressed in by contact with the edge of the guide *h*, (see Fig. 4,) leaving the proper amount of metal projecting; when the blank has been carried around beneath the swage *l*, the latter descends and reduces the point of the nail to the required taper. While the blank is thus held by the swage *l* from moving longitudinally in the die the carriage S is brought up toward the table and the circular swage *t* upsets the metal and fills the die forming the head and body of the nail as in Fig. 3. The next partial revolution of the table carries the finished nail from under the swage and a fresh blank is brought up to be operated upon. When the die containing the nail has come around beneath the clearer U, the pin *x* on the wheel H strikes the dog *v* and revolves the shaft V a portion of a turn. This slides the piece U in its slots in the direction of its arrow and the point of the claw S (see Fig. 8) strikes under the point of the finished nail and drives it endwise out of the die *e* and the nail falls out of the

machine. The sheet of metal, Fig. 7, is fed into the machine cold, a soft tough iron being used for this purpose. The finished nails may be afterward annealed if it is found requisite.

In practice I use the iron cold but it is evident that it may be used hot if preferred.

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

1. The above described machine for making horse shoe nails consisting essentially of the revolving die table I, arm P, carrying the swage *l*, and shear *m*, the carriage S with its swage *t*, constructed and operating in the manner substantially as set forth.

2. I claim the receiving box R with its retaining spring *o* substantially as described.

3. I claim in combination with the table I the guide *h* arranged and operating as set forth.

TISDALE CARPENTER.

Witnesses:

SAM. COOPER,

P. E. TESCHEMACHER.