

CHARLES F. JOHNSON, Jr.
 Improvement in Machines for Cutting Off Horseshoe Nails.
 No. 115,480. Patented May 30, 1871.

Fig. 1.

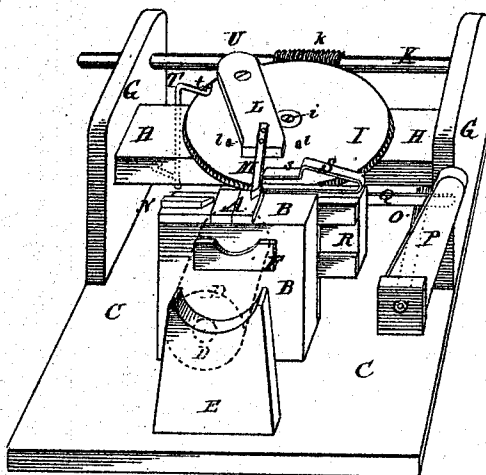
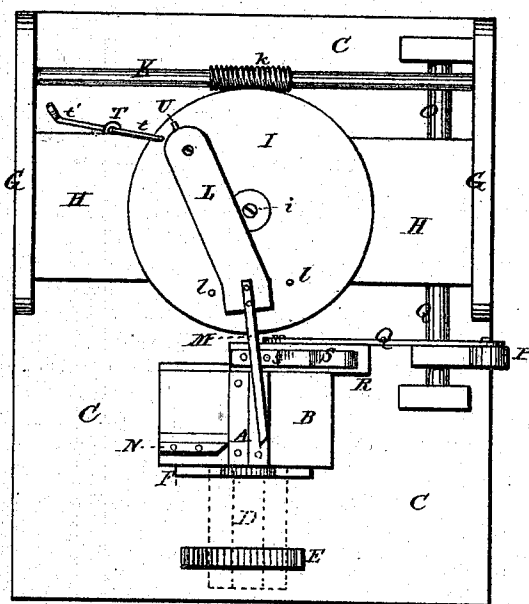


Fig. 2.



Witnesses.

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IMPROVEMENT IN MACHINES FOR CUTTING OFF HORSESHOE-NAILS.

Specification forming part of Letters Patent No. 115,480, dated May 30, 1871.

To all whom it may concern:

Be it known that I, CHARLES FRED. JOHNSON, Jr., of Owego, in the county of Tioga and State of New York, have invented certain new and useful Improvements in Cutting-off Apparatus of Horse-Nail Machines; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing making a part of this specification, in which—

Figure 1 is a perspective view of a machine containing my improvements, and Fig. 2 is a plan view of the same.

Letters of like name and kind refer to like parts in each of the figures.

In the class of machines to which my improvement is most peculiarly applicable the nails are forged continuously and automatically on the end of a rod. The rod is heated in a fire of gas or other suitable combustible, revolved so as to lie alternately on its side and on its edge, and the heated end which projects from the furnace moved laterally from one die to another, and alternately struck by two hammers, said hammers and their corresponding dies being recessed so as to form the sides and edges of the nail. When a nail is finished the rod is fed forward the length requisite to furnish stock enough for a second nail, but before the hammers can strike another blow a knife or cutter passes over the dies during that period when one hammer is up and the other is rising and the rod is being moved laterally. This cutter presses the nail against a stationary cutter on the side of the anvil, and thus shears it from the end of the rod, the motion of the cutter being so timed that it passes under the hammers between two blows, cuts off the nail, and avoids being hit itself. My invention relates simply to the movement of this cutter, and therefore the mechanism which works the hammers and moves the rod is not represented in the drawing.

In the machines to which I refer the cutter is secured to or upon a horizontal disk, which revolves upon a vertical axis and is moved in a circle through the medium of a pawl striking against the teeth of a circular ratchet on the under side of said disk, so that it is necessary to make said ratchet entirely uniform in size, and that each should represent a sufficient revolution of said disk to cause the cutter to

pass entirely across the two dies cutting off the nail. This necessitates making the disk very large and widening the whole machine. Again, it is necessary to hold the disk by means of friction so as to prevent it from driving beyond the stroke of the pawl, as from their force the blows of the pawl would destroy the teeth of the ratchet in a few days unless the machine was run at a low speed. To remedy these defects is the object of my invention, which consists, principally, in the combination of a stationary cutter, a rotating cutter, and mechanism for giving to the latter a variable velocity, so as to cause it to approach and recede from the anvil at a comparatively slow speed, and to cross said anvil rapidly, substantially as and for the purpose hereinafter specified. It also consists in the construction and combination of the several devices employed for producing such motion of the cutter substantially as and for the purpose hereinafter set forth.

In the annexed drawing, A represents an anvil or die, resting upon and secured to a suitable block, B, which in turn is secured to or upon the bed-plate C of the machine. A furnace, D, having the usual form, is placed within or upon suitable supports E and F, immediately adjoining the die, and furnishes a means whereby the nail-rod may be heated as it is passed inward upon or over said die. Pivoted within a frame composed of two uprights, G, and a horizontal cross-piece, H, is a short vertical shaft, I, having secured to or upon its upper end a circular metal disk, I, which disk is provided around its edge with suitable "worm-teeth," that engage with a corresponding screw-thread, K, formed upon a shaft, K, that it is pivoted horizontally within the uprights G, by means of which, when said shaft is caused to revolve, a relatively slow rotary motion is given to said disk. Pivoted on the face of the disk I, near its periphery, is one end of an arm, L, which, from thence extending across the said disk, has its outer or free end confined within certain limits in radial position by means of two studs, M, which project vertically upward from said disk upon each side of said arm. A cutter, N, is secured to the outer end of the arm, and extends outward from the same to a sufficient length to cause its forward or cutting end to sweep

across the die and just graze a corresponding fixed cutter, N, secured upon a block immediately adjoining the latter.

As thus constructed, the disk is caused to revolve with such speed as will bring the movable cutter in position near the nail-rod at the precise instant that a nail has been completed, so as to remove the same from said rod; but as said cutter is obliged to move rapidly across the die in order to avoid contact with the hammer or upper die, the rapid strokes of which are not suspended, the following-described means are employed for accelerating its speed.

A shaft, O, is journaled within suitable bearings attached to the bed-plate, in a line with the nail-rod, and provided with an upward-projecting arm, P, the upper end of which is connected by means of a pivoted rod, Q, with a sliding block, R, that rests within suitable ways attached to or upon the inner face of the anvil-block, the whole being so arranged as that a semi-rotary movement in opposite directions imparted to said shaft will cause a corresponding reciprocating motion of said sliding or carrier block. A spring, S, is secured at one end to or upon the upper face of said carrier-block, and, extending longitudinally forward over the same, is provided with an offset, s, which, when the cutter is in the necessary position, strikes against the same upon a forward movement of the carrier-block and moves said cutter rapidly across the face of the die. The carrier has sufficient motion only to move the cutter across the face of the die, so that said cutter is not effected by the continuous reciprocating movement of the former until it has reached the precise position intended, and by pressing downward and passing over the spring comes into engagement with its offset or shoulder, upon which the forward stroke of said carrier drives said cutter across the anvil, and separates the finished nail from its bar by pressing the same against the fixed or stationary cutter. The cutter now remains stationary upon the left side of the anvil, until, by the forward movement of the disk, the stud *l* strikes against and moves forward the pivoted arm, whereupon said cutter and disk revolve together until the former is again brought within

reach of the carrier, during which time another nail will have been completed and ready for cutting from its bar.

The nail-rod should be fed sidewise against the fixed cutter so as to bring the finished nail in the desired position for removal immediately before the operating cutter is moved across the anvil, to accomplish which result a vertical shaft, T, provided at its upper end and near its lower end with two radially-projecting arms, *t* and *t'*, respectively, is journaled within suitable bearings upon the frame in such a position as to bring the upper arm *t* within reach of a stud, U, that projects horizontally outward from the rear end of the pivoted lever L, and by the forward motion of said stud cause said arm to be carried rearward for a short distance so as to give to the shaft T a semi-rotary movement, and through suitable mechanism actuate the feeding devices.

The advantages of my improvements are that the cutter is struck but once during the formation of a nail, and, being comparatively light and entirely unrestricted in its movements across the anvil, but little wear is caused to either said cutter or the carrier by such blow.

Having thus fully set forth the nature and merits of my invention, what I claim as new is—

1. As an improvement in machines for making nails for horseshoes, the combination of a stationary cutter, a rotating cutter, and mechanism for giving to the latter a variable velocity so as to cause it to approach and recede from the anvil at a comparatively slow speed, and to cross said anvil rapidly, substantially as and for the purpose specified.

2. The revolving disk I, the pivoted arm L, the pin *l*, the anvil A, the reciprocating carrier R provided with the spring S, and the cutters M and N, when combined with each other and with suitable actuating mechanism for operating the same, substantially as and for the purpose shown.

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Witnesses:

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