

(No Model.)

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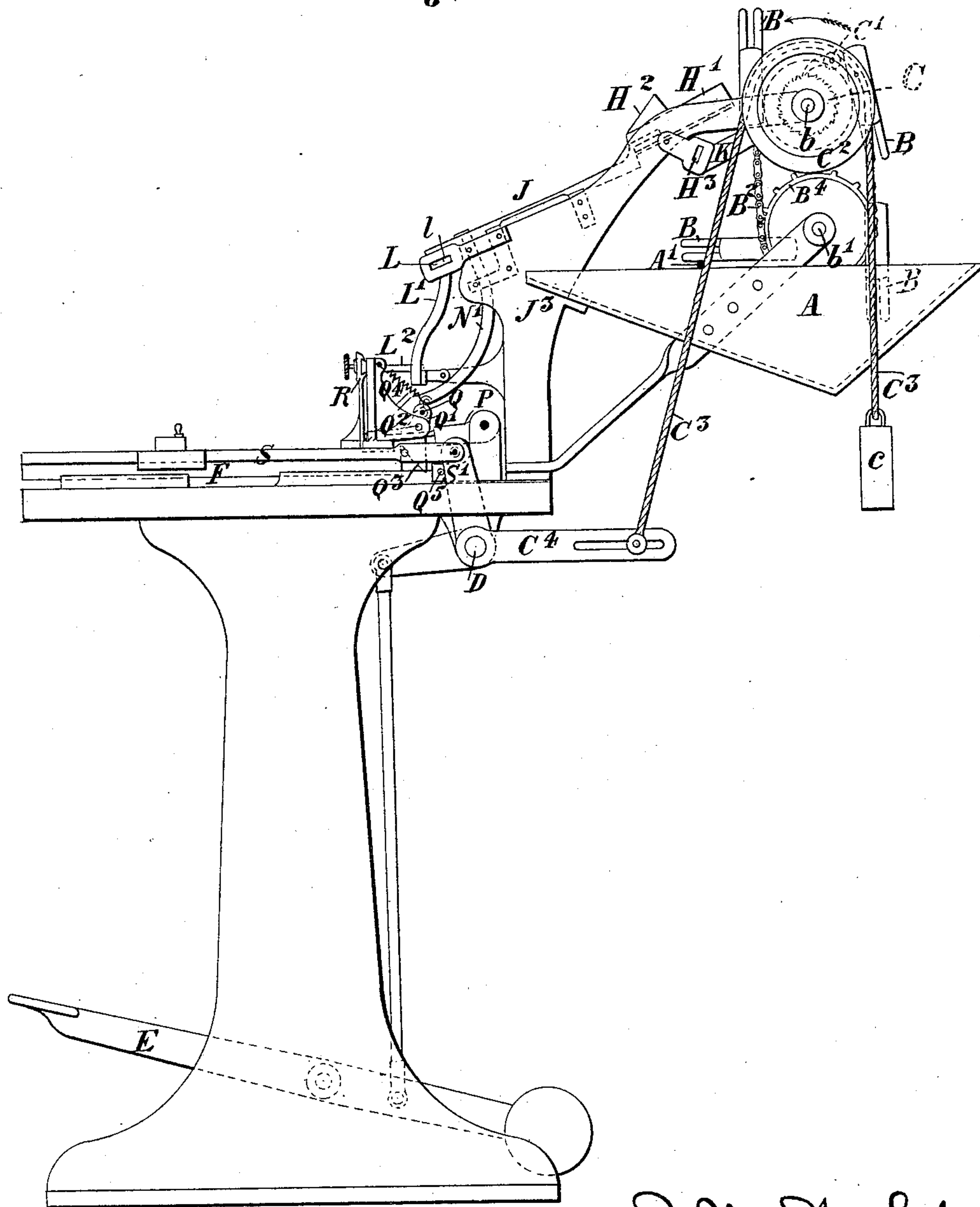
J. M. WEBSTER.

APPARATUS FOR FEEDING NAILS TO BOX NAILING MACHINES.

No. 451,349.

Patented Apr. 28, 1891.

Fig. 1.



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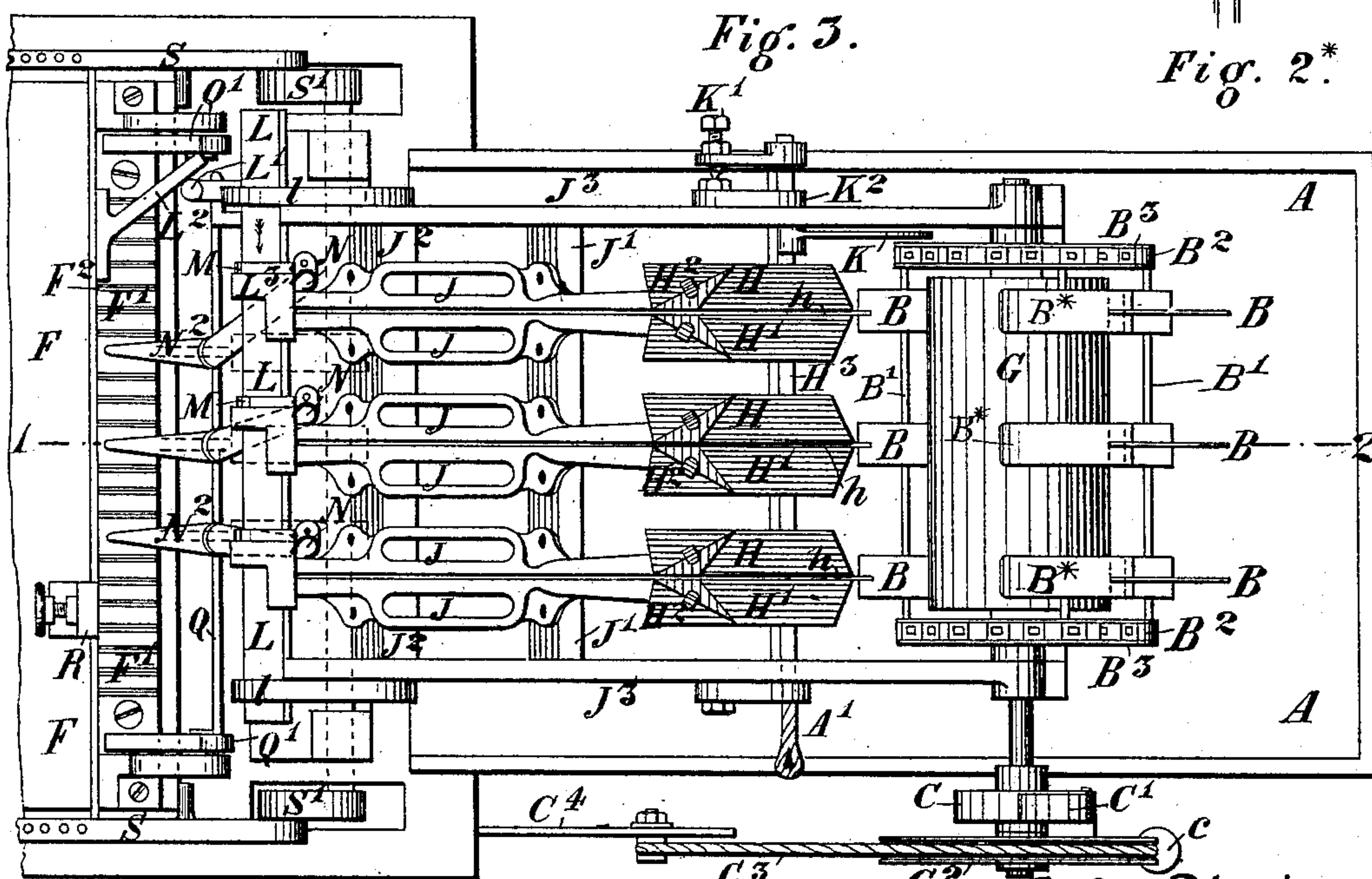
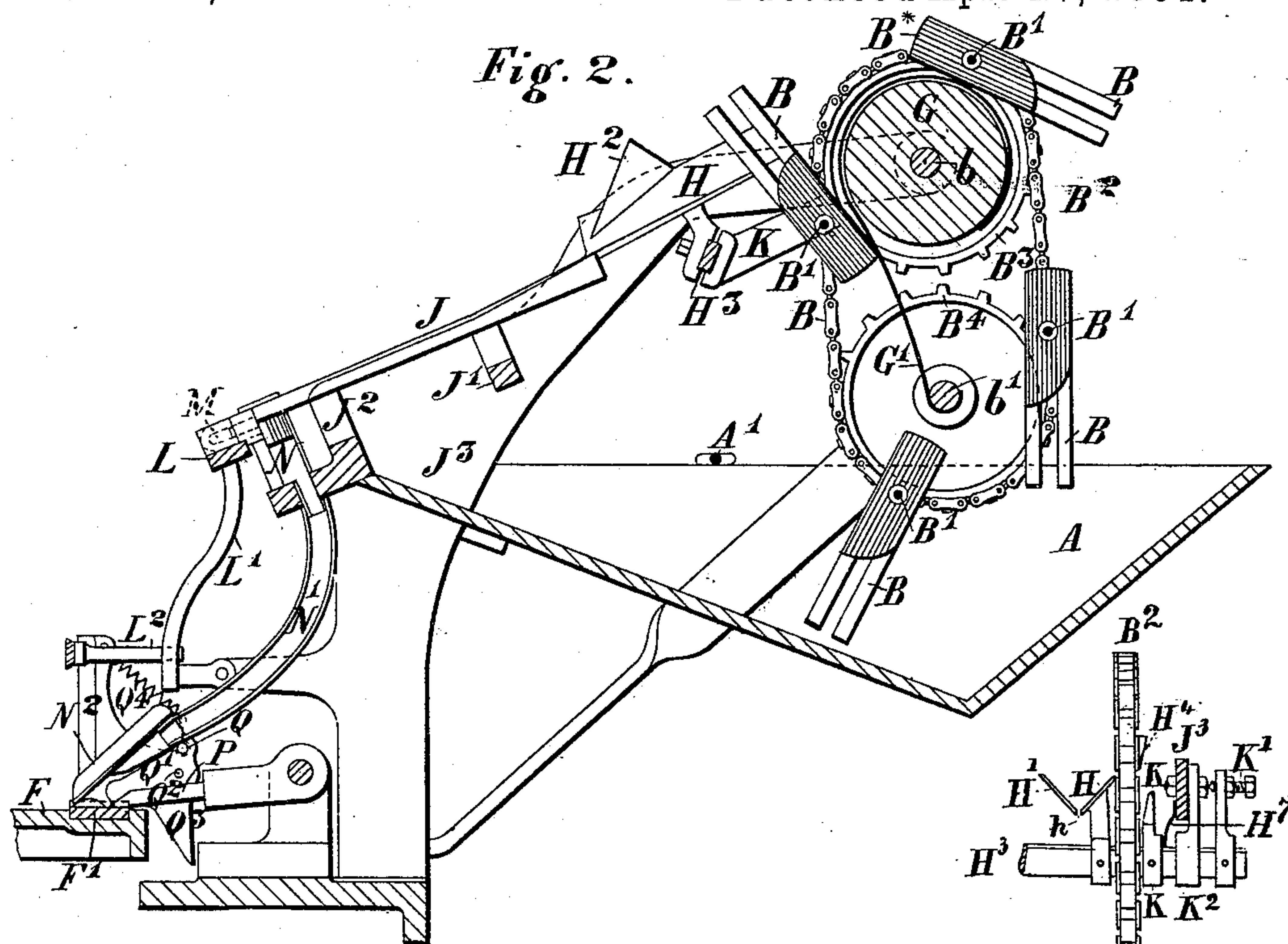


Fig. 2.*

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3 Sheets—Sheet 3.

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Fig. 4.

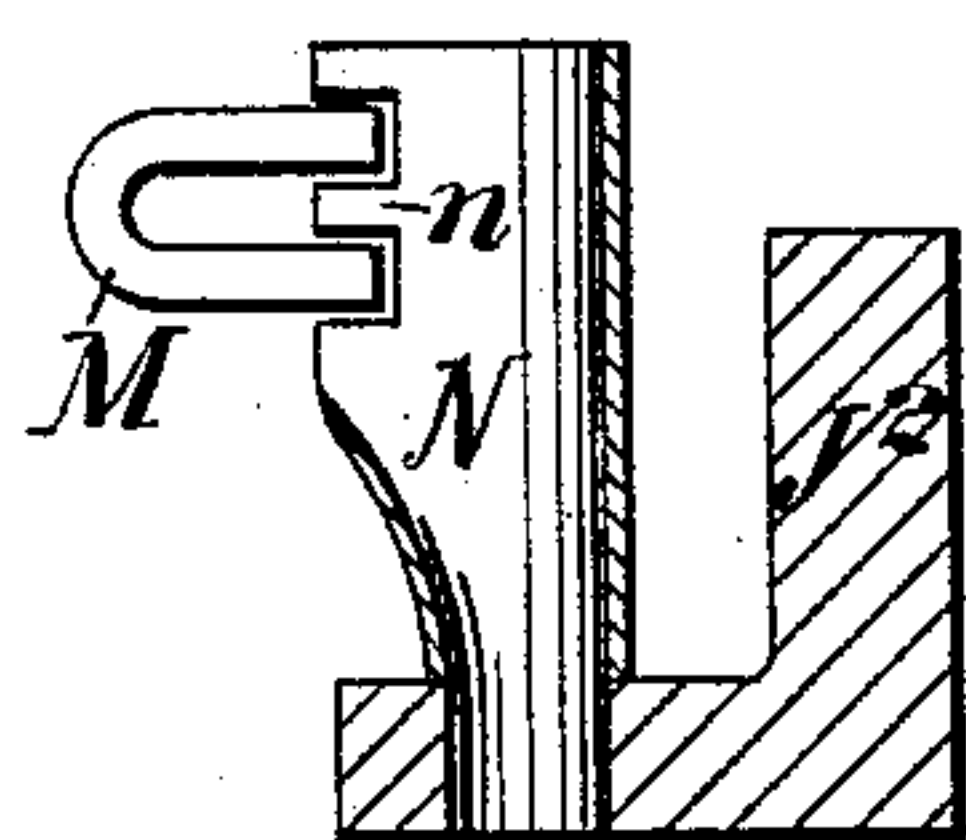


Fig. 5.

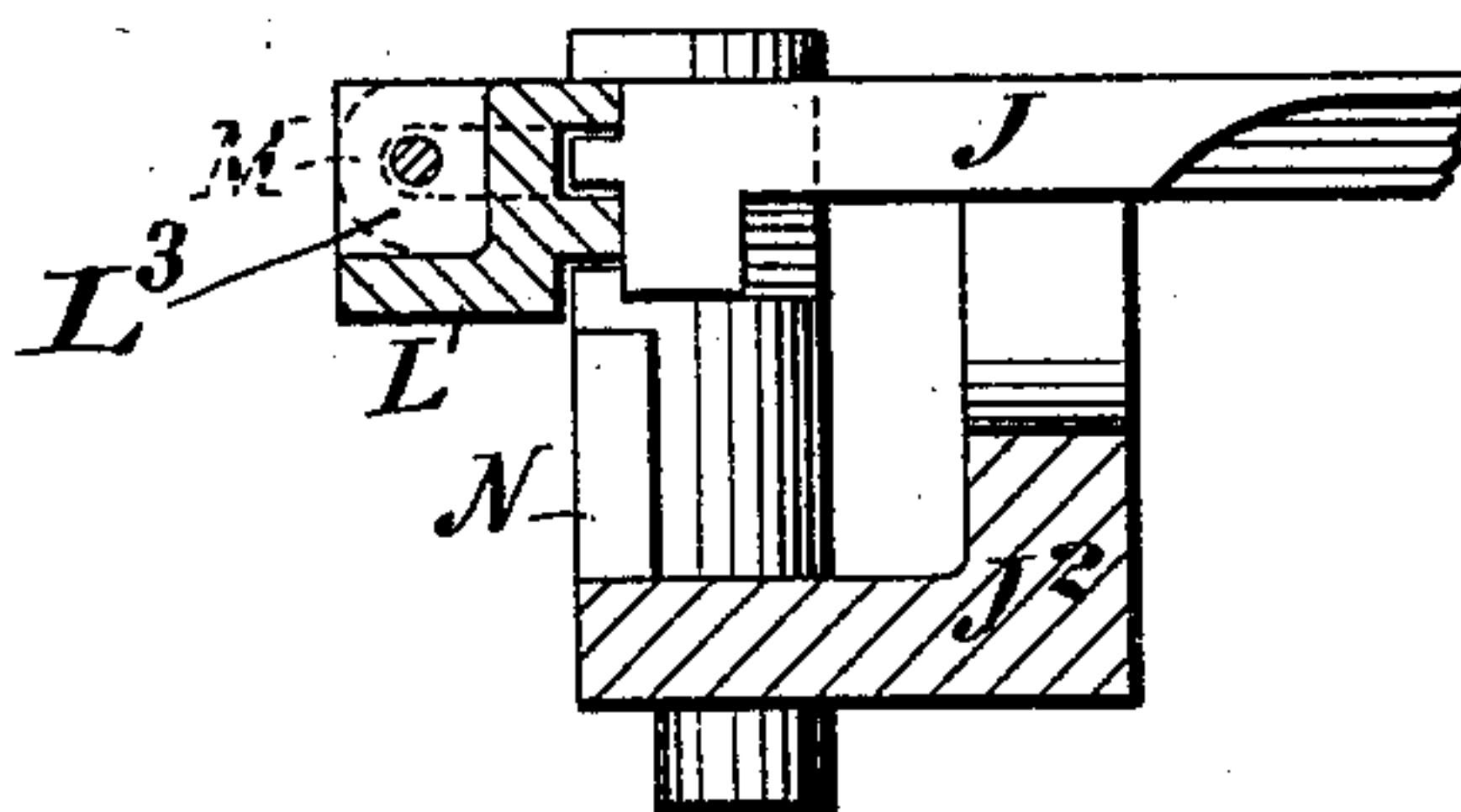


Fig. 6.

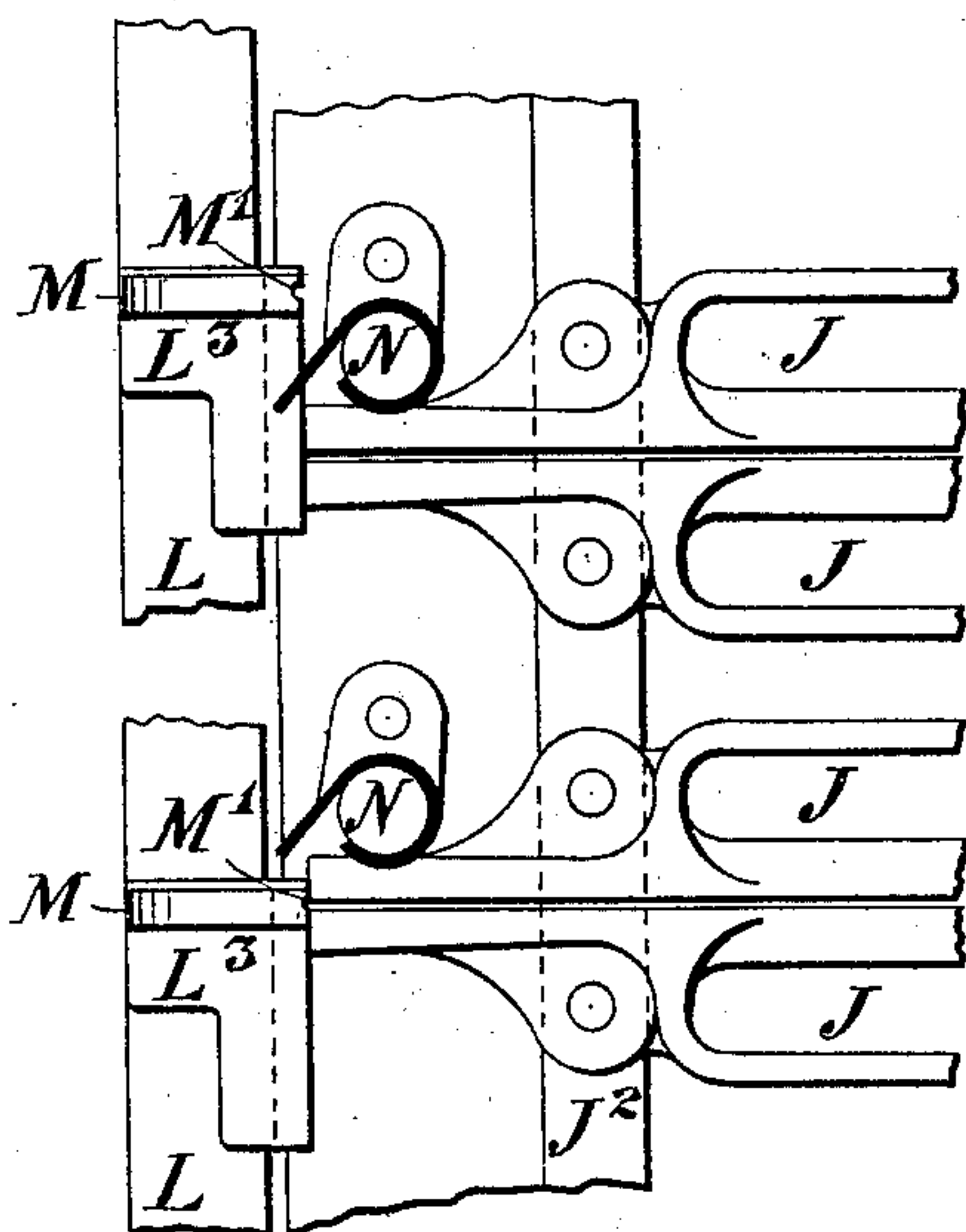
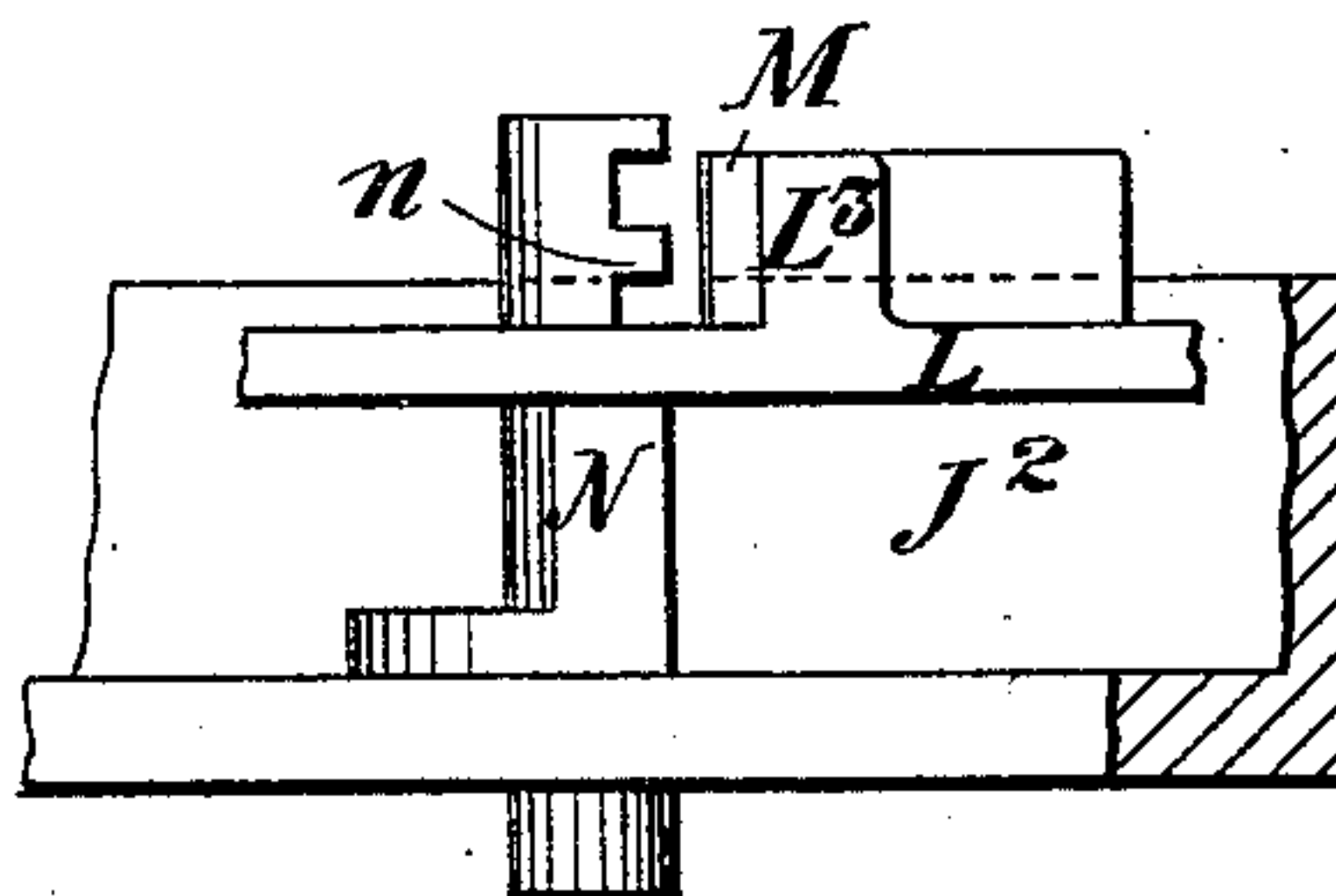


Fig. 7.



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UNITED STATES PATENT OFFICE.

JOSEPH MARCH WEBSTER, OF LIVERPOOL, ENGLAND.

APPARATUS FOR FEEDING NAILS TO BOX-NAILING MACHINES.

SPECIFICATION forming part of Letters Patent No. 451,349, dated April 28, 1891.

Application filed October 6, 1890. Serial No. 367,293. (No model.) Patented in England December 13, 1889, No. 20,034, and in France September 22, 1890, No. 208,368.

To all whom it may concern:

Be it known that I, JOSEPH MARCH WEBSTER, a subject of the Queen of Great Britain and Ireland, residing at Liverpool, in the county of Lancaster, Kingdom of Great Britain and Ireland, have invented a certain new and useful Apparatus for Feeding Nails to Box-Nailing Machines, (for which I have obtained Letters Patent in Great Britain, No. 20,034, dated December 13, 1889, and in France, No. 208,368, dated September 22, 1890,) of which the following is a specification.

This invention has reference to apparatus for feeding nails to a box-nailing machine into which nails are removed from a suitable receptacle by a traveling magnet or magnets by which they are delivered uniformly into an inclined slot, chute, or tube which conveys them to their respective receptacles on the nailing-machine, as I will now proceed to describe more fully by reference to the accompanying drawings, in which is shown so much of a box-nailing machine as is necessary to illustrate the application thereto.

Figure 1 is a side elevation showing nail-feeding apparatus according to this invention. Fig. 2 is a sectional elevation (to a larger scale) taken on line 1 2 of Fig. 3, the feeding-magnets being shown in a different position to that shown in Fig. 1. Fig. 2* is a detail view of means for regulating width of the slots between the sides of the stripping-chute. Fig. 3 is a plan or top view. Figs. 4, 5, and 6 are enlarged detail views of the automatic delivery-magnets, nail-releasers, and connected parts. Fig. 7 is a front elevation, also enlarged, showing the delivery-magnets and nail-releaser.

A is a receptacle for the iron nails to be fed. B B are permanent magnets by which nails are removed from the receptacle and discharged into chutes, as hereinafter described. These magnets are preferably horseshoe in shape, and each is attached to a non-magnetic swinging holder or block B*, pivoted to one of a set of cross-bars B'. These cross-bars B' are carried by a pair of endless sprocket-chains B², that work over pairs of chain-wheels B³ B⁴.

C is a ratchet-wheel fixed to the upper shaft *b* and into which takes a pawl C', pivoted to

a grooved pulley C². Over this pulley passes a rope C³, one end of which is attached to one arm of a lever C⁴, secured to a rocking shaft D, the other arm of the lever being connected to a weighted foot-lever E. By depressing this lever E the rope C³ will be caused to partly revolve the pulley C², ratchet C, and wheels B³ B⁴, thus causing the magnets B B to travel a given distance for each depression of the foot-lever. A weight *c*, attached to the other end of the rope C³, serves to return the pulley and pawl to the starting position when the foot-lever is released. By this arrangement the rope will slip over the pulley C² should either of the magnets become fixed from any cause.

Upon the driving-shaft *b* and between the chain-wheels B³ is a fixed wooden roller G, over which the magnets travel. This roller is partly covered with a strip G' of sheet metal, that extends over the inner side of the roller to the lower shaft *b'*, and is shaped, as shown, so as to guide the magnets B and prevent them dropping too suddenly into the opening left between the two sides of the inclined V-shaped stripping-chutes H H'. By this means the exposed ends of the magnets are lowered slowly into and are drawn with a sliding motion between the sides of the chute, so that the nails are disengaged from the magnets by which they were held and received by the stripping-chute H H', wherein they are suspended by their heads, their shanks then extending through the slot *h*, left between the side bars of which the stripping-chute is made.

A top guide H² may be connected to and above the lower end of each chute H H', as is shown in Figs. 1, 2, and 3. These guides guide the nails down into the slots between parts H H', and prevent the nails sliding downwardly from the chute except between said guides. One side H' of each of the stripping-chutes is fixed to or made in one with a fixed chute J, while the opposite side H is secured to a bar H³ that may be moved endwise periodically through a short distance for the purpose of moving the sides H from the sides H', and thus widen the slot *h* between them, so that the accumulation of nails and any imperfect nails in the chute that

might interfere with the working of the apparatus can fall away. The transverse movement of the bar H^3 in one direction can be effected by a small wedge or inclined piece H^4 projecting from and carried by one of the endless chains B^2 , and arranged to travel past and against an arm K , connected to the bar H^3 , as shown in detached end view, Fig. 2*, thus sliding the arm K and bar H^3 sufficiently to one side to admit the nail-heads passing through, the return movement being effected by a spring H^7 (see Fig. 2*) or its equivalent. The normal width of the slots h , between the sides H and H' of the stripping-chute, can be regulated by means of a regulating set-screw K' , the end of which catches against the fixed slide-bracket K^2 , as shown in Figs. 2* and 3.

A' is a flexible cord extending across the machine and onto which the ends of the magnets fall, as shown in Fig. 1, so as to thereby prevent them from dropping so heavily among the nails in the box A as to scatter or bend them.

The nails, while suspended by their heads in the stripping-chutes H H' , are caused by the combined action of gravity and the vibration of the machine to slide down into delivery-chutes, each formed of two fixed plates J J' , placed at an angle to each other and at a suitable distance apart to admit of the shank of the nails sliding between them. These plates J are fixed to cross-bars J' J^2 , secured to the side frames J^3 of the machine, as shown. The lower end of each of these chutes J is alternately opened and closed in an automatic manner and at fixed times by a projection L^3 , carried by a bar L , adapted to slide in fixed guides l . This slide-bar is caused to move endwise in one direction by a bent bar L^2 , that is secured to the work-table F and acts against an arm L' on the slide-bar when the work-table moves toward the grooved nail-plate F' . The motion of the bar in the other direction when moving backward is effected by a spiral or other spring. (Not shown, but arranged directly beneath the slide-bar.) Thus the slide-bar L is operated positively in one direction, but should a defective nail become jammed between the projection L^3 and the end of the chute J the spring will not withdraw the bar and cause injury to the apparatus.

In the arrangement shown the bar L is provided with three projections L^3 , one for each chute J , and to each of which is secured a U-shaped delivery-magnet M . Each delivery-magnet slides to and fro past the lower end of its corresponding chute J and acts as follows: When the foot-lever E is free, as shown in Fig. 1, the bar L and magnets M are in the position shown in the upper portion of Fig. 6 and the lower end of each chute J is closed. By depressing the foot-lever the bent bar L^2 forces the bar L in the direction of the arrow, Fig. 3, and into the position shown in the lower portion of Fig. 6, in which the central portion

of each magnet M is opposite the lowermost nail in the chute J opposite to which it is brought. The nail is attracted by the magnet and enters a vertical groove M' therein of a size to receive one nail only. Upon releasing the foot-lever the bar L and magnets M , with magnetically-held nails, are drawn back by the before-mentioned spring into their original positions shown in the upper portion of Fig. 6. During this movement the nail held by each magnet M is removed by the finger n of a tubular releaser N and dropped through this releaser into a flexible tube N' below, which conveys the nails into a funnel-shaped pipe N^2 , (hereinafter called a "nozzle,") by which the nail is delivered onto the grooved bar F' , which is fixed on the table F , in front of the drivers or hammers P . The point of each nozzle N^2 rests by its own weight in the bottom of the groove, above which it is placed to prevent the falling nail shooting beyond the edge F^2 of the grooved bar F' . The upper end of each nozzle is pivoted and supported by a rod Q , carried by levers Q' , pivoted at Q^2 , and have downward extensions Q^3 ; also springs Q^4 , connected to the upper ends of the levers Q' , serve to normally keep the lower ends of the nozzles forward and in contact with the grooved bar F' . By this arrangement, as the table advances toward the drivers or hammers P , the lever-extension Q^3 will be brought into contact with a fixed pin Q^5 , so that the levers will turn on their centers and the lower ends of the nozzles will be raised from the grooved nail-plate F' to permit the nail-head to clear. Thus by alternately depressing and releasing the foot-lever E , nails will be lifted by the magnets B from the box A and delivered into each of the chutes H H' , where they will slide down into the chutes J , from each of which they are taken, one at a time, by a magnet M , from which each nail is removed by a releaser N and allowed to fall by gravity through a flexible tube N' and nozzle N^2 onto the grooved nail-bar F' , in readiness to be forced into the pieces of wood to be nailed together when these pieces of wood are driven toward them.

R is an ordinary guide-fence.

S S are draw-bars jointed to the levers S' on the shaft D , and by means of which the table F is operated by the foot-lever.

As will be obvious, the shape of the magnets can be varied, if necessary, to suit different kinds of iron nails to be delivered.

What I claim is—

1. In apparatus for feeding nails to a nailing-machine, the combination of a receptacle for nails, a chute open at its bottom and by which nails delivered therein are delivered forward to the nailing-machine, a magnet or magnets, and means for causing said magnet or magnets to travel within said receptacle in contact with nails therein and afterward to pass through the bottom of said chute, substantially as herein described, for the purpose set forth.

2. In apparatus for feeding nails to a nail-
ing-machine, the combination of a receptacle
for nails, a nail-chute having a slot or open-
ing through its bottom, endless chains mount-
ed to run over chain-wheels, a series of mag-
nets carried by said chains, and mechanism
for operating said endless chains, said mag-
nets being so arranged as to pass through
said receptacle and through the bottom of
said chute, substantially as herein described,
for the purpose specified.

3. In apparatus for feeding nails to a nail-
ing-machine, the combination, with a magnet
provided with a swinging holder, endless
chains by which said magnet is carried, and a
chute having an open bottom through which
said magnet passes at one part of its travel,
of a roller over which the magnet passes, and
a strip or part, such as G', against which the
free end of said balance-piece works during
part of the downward motion of said magnets,
substantially as herein described, for the pur-
pose specified.

4. In apparatus for feeding nails to a nail-
ing-machine, the combination, with a sus-
pended magnet or magnets and means for
causing the same to travel, of a chute having
a slot through its lower side and constructed
in parts, and mechanism for causing said parts
to open at intervals, substantially as herein
described, for the purpose specified.

5. In apparatus for feeding nails to a nail-
ing-machine, a nail-chute the sides of which
are made in two parts longitudinally and ar-
ranged with their lower ends at a short dis-
tance apart to form a slot or opening, one of
said sides being fixed and the other movable,
a traverser-bar to which said movable side is
secured, and mechanism for intermittently
reciprocating said bar, substantially as herein
described, for the purpose specified.

6. In apparatus for feeding nails to a nail-
ing-machine, the combination, with a nail-
chute, of a magnet arranged in proximity to
the delivery end of said chute, a nail-releaser,
a nail-tube arranged below said releaser, and

means for moving said magnet from the de-
livery end of said chute to a position past
said nail-releaser, said releaser having a fin-
ger or part to extend into the path of a nail
carried by said magnet, substantially as here-
in described, for the purpose specified.

7. In apparatus for feeding nails to a nail-
ing-machine, the combination, with a nail-
chute, of a magnet formed with a nail-groove,
a projection or part, such as L³, adapted to
close the delivery end of said nail-chute, a
bar by which said magnet and projection or
part L³ are carried, means for reciprocating
said bar, and a tubular nail-releaser having a
projection or finger extending into the path of
a nail carried by said magnet, substantially as
herein described, for the purpose specified.

8. Apparatus for feeding nails to a nailing-
machine, comprising a series of permanent
magnets provided with a swinging holder, end-
less chains for carrying and operating said
magnets, a nail-receptacle through which said
magnets pass, mechanism, substantially as
described, for operating said endless chains
and magnets, chutes H H', each having a slot
through its lower side and made in parts,
means, substantially as described, for inter-
mittently moving one of said parts from the
other, chutes J, each in line with one of said
chutes H H', projections or stops L³, arranged
at the delivery ends of said chutes and each
carrying a delivery-magnet M, a bar L, by
which said projections or stops L³ are carried,
mechanism, substantially as described, for
reciprocating said bar with said magnets, and
projections at right angles to the delivery
ends of said chutes J, and tubular releasers
N, each provided with a finger n, arranged to
extend into the path of a nail carried by the
delivery-magnet that passes it, substantially
as herein described.

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