

(No Model.)

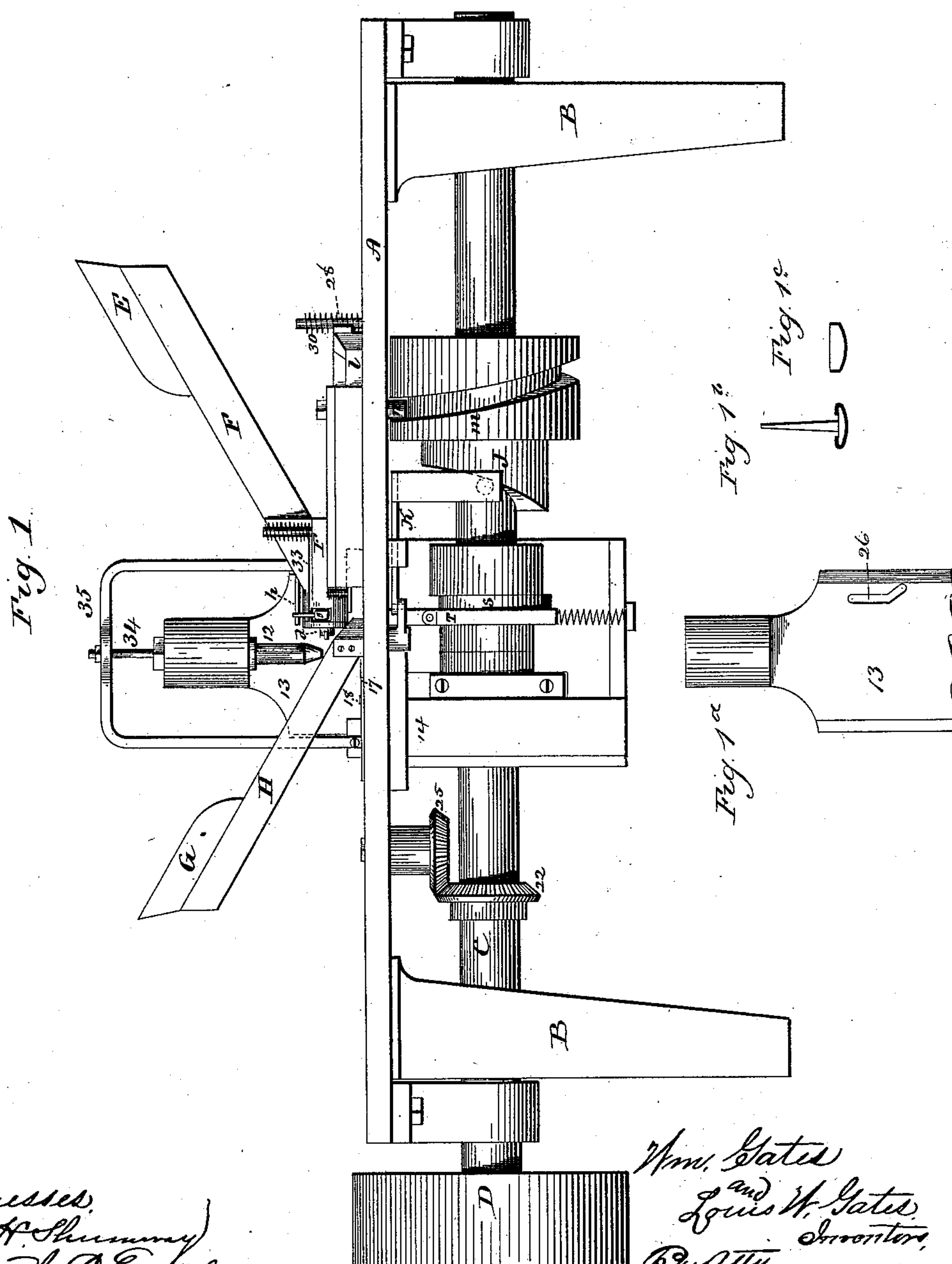
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W. & L. W. GATES.


MACHINE FOR CAPPING TACKS.

No. 373,284.

Patented Nov. 15, 1887.



Witnesses:
J. H. Shumway
F. H. C. Earle


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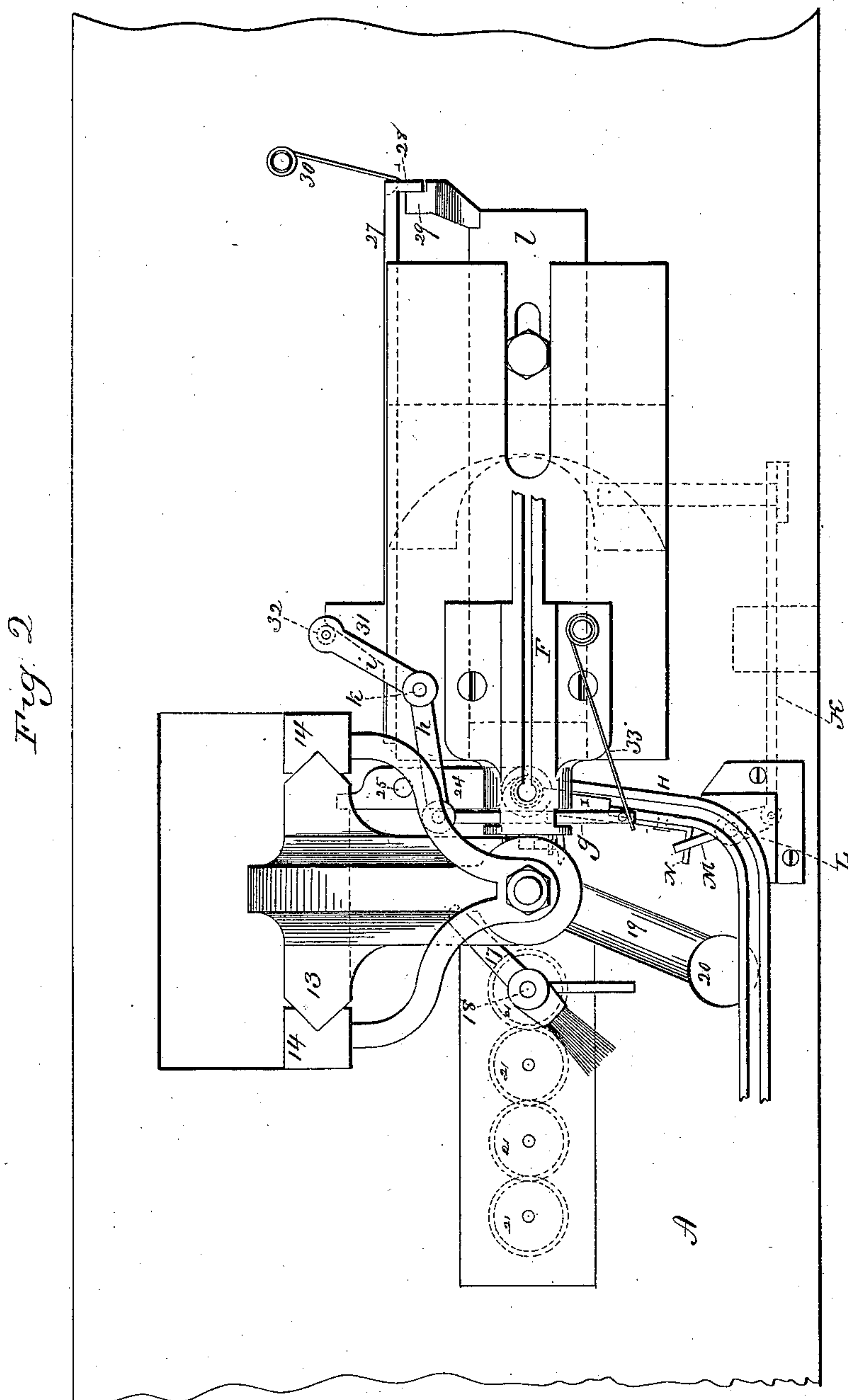
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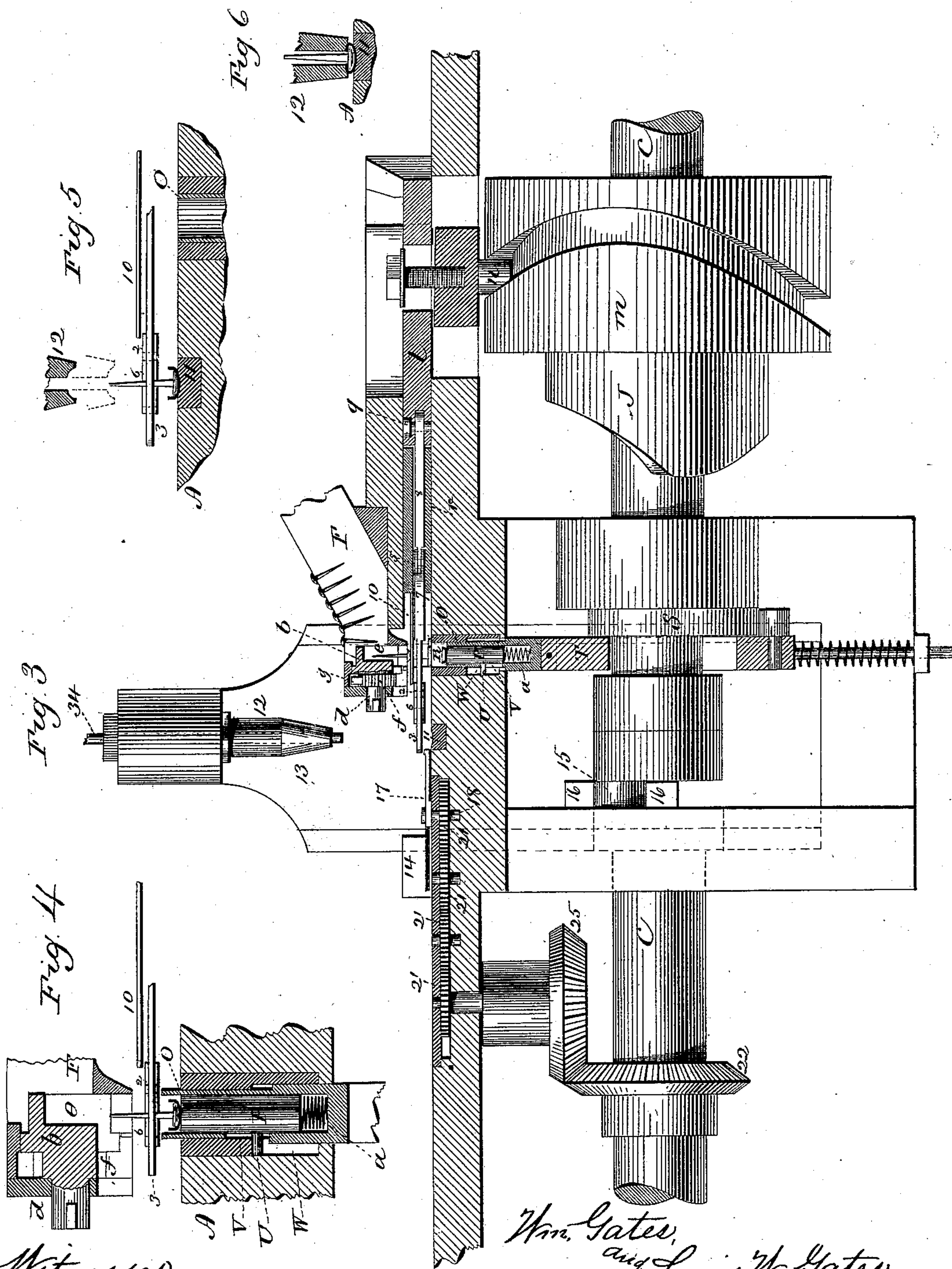
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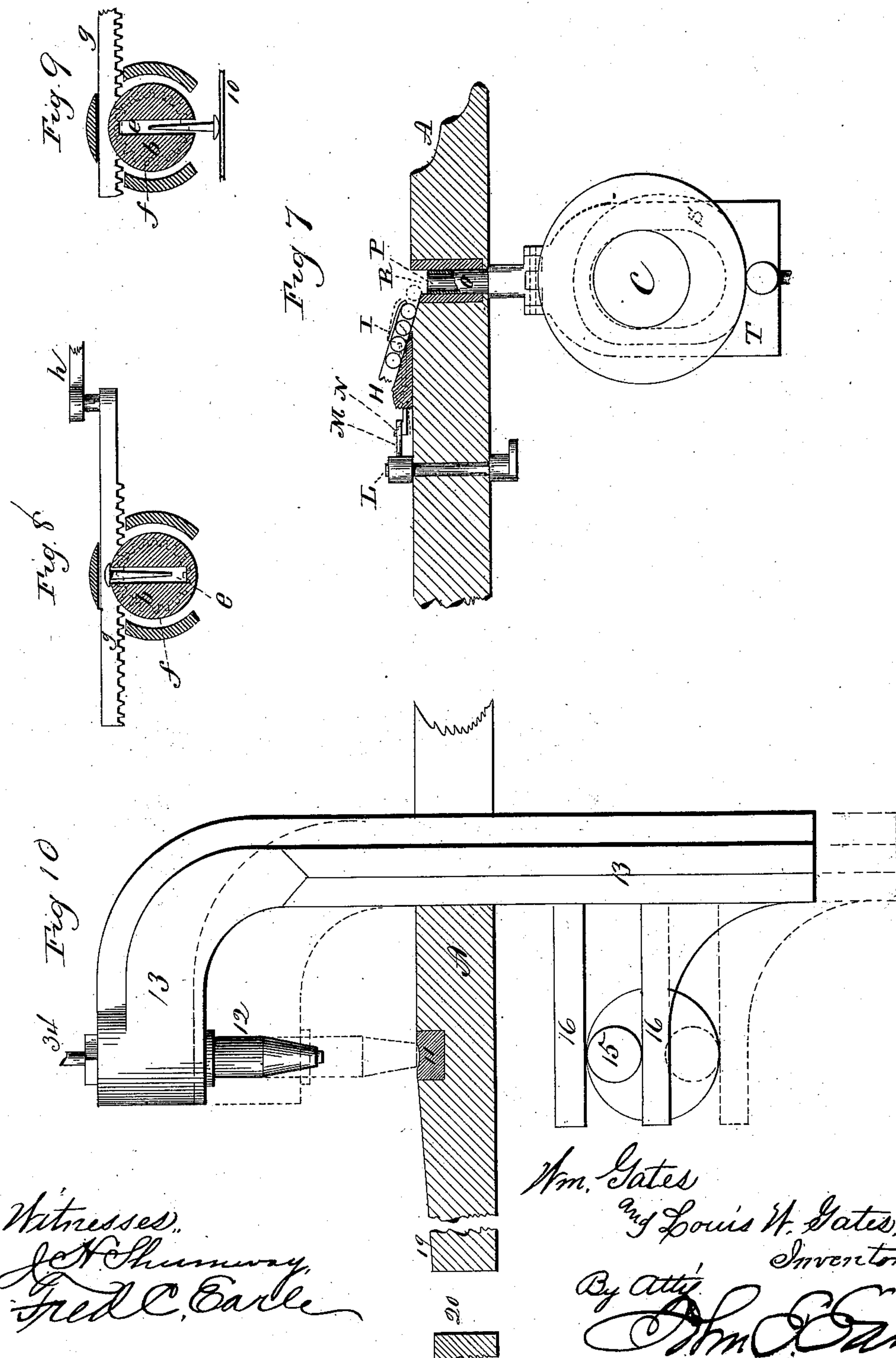
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Fig. 11

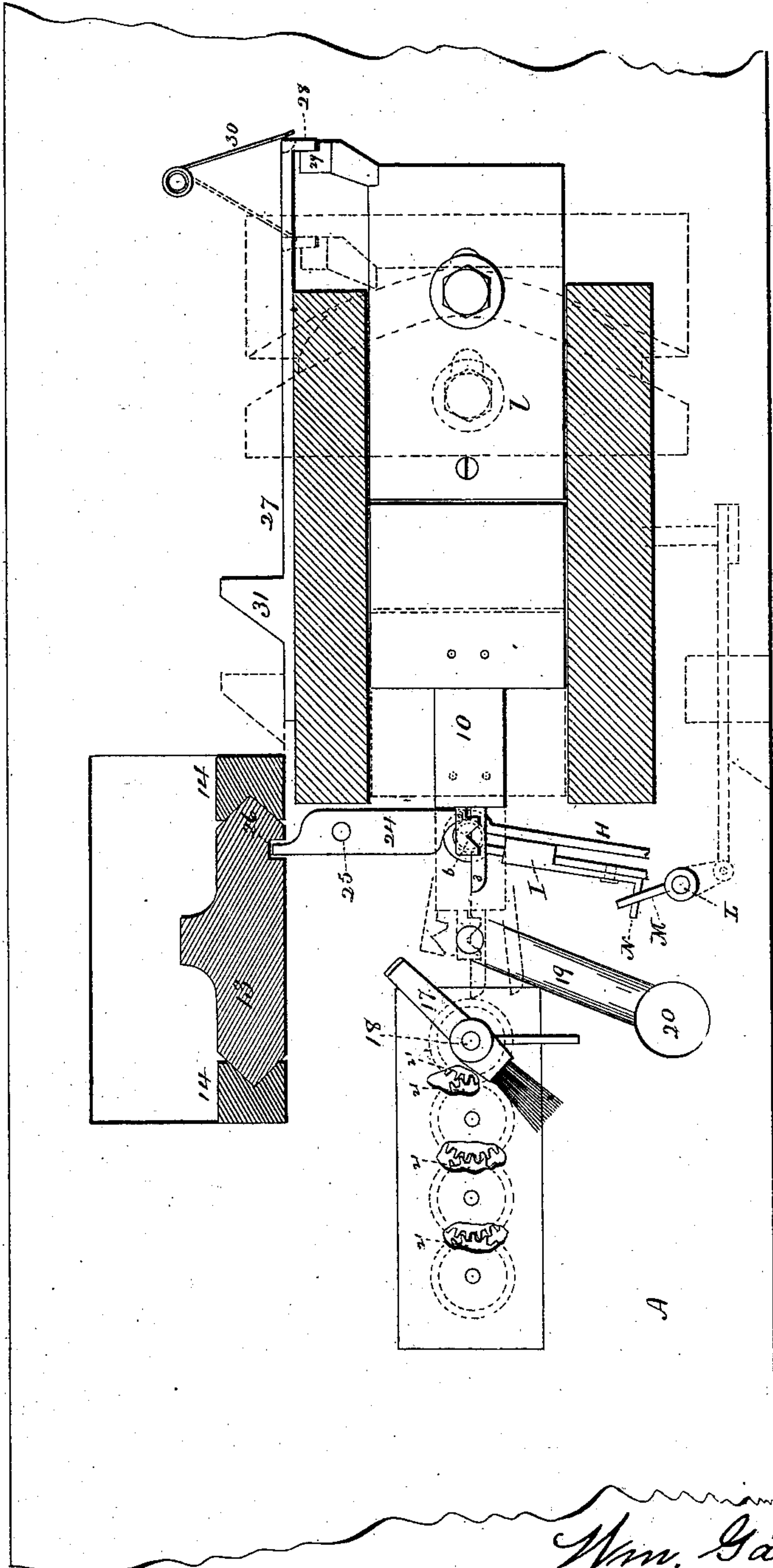


Fig. 12

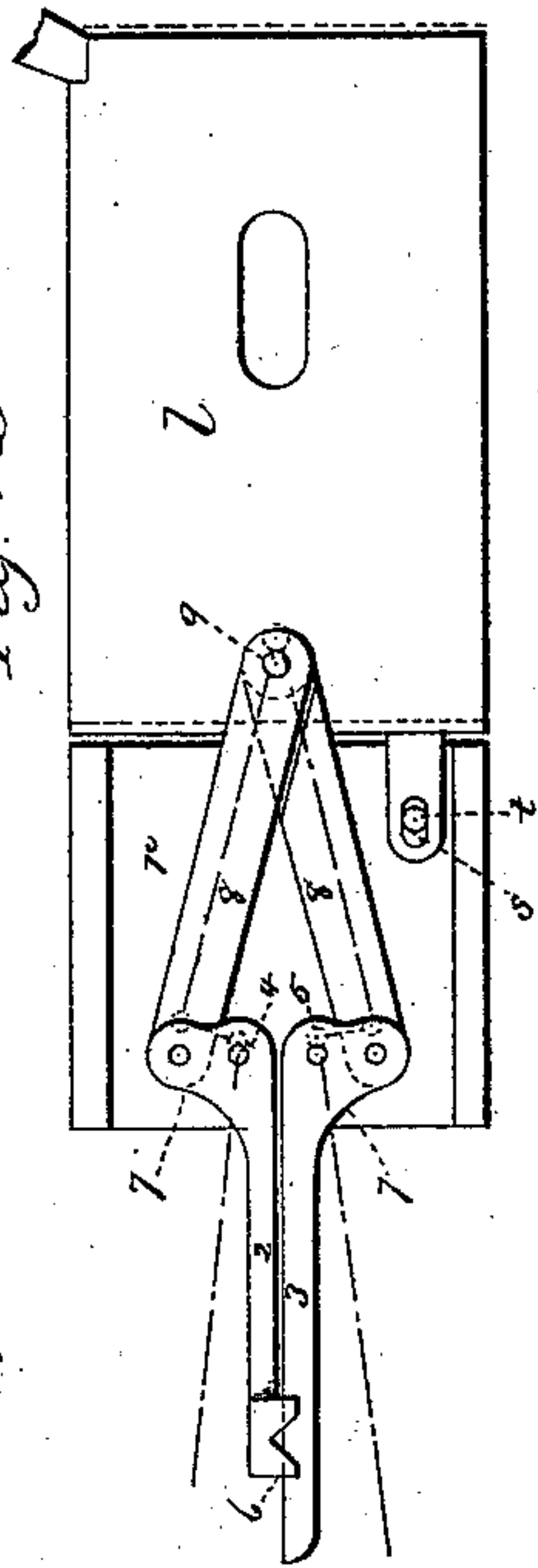
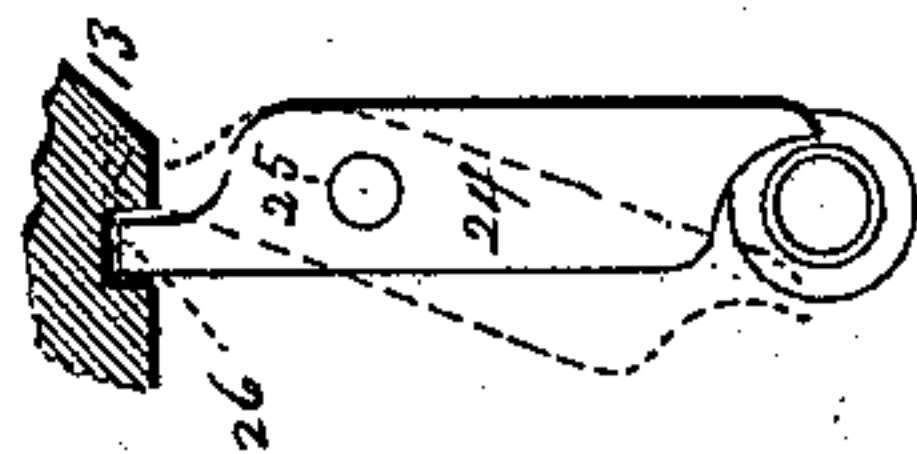


Fig. 13



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UNITED STATES PATENT OFFICE.

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ASSIGNORS TO THE C. COWLES & COMPANY, OF SAME PLACE.

MACHINE FOR CAPPING TACKS.

SPECIFICATION forming part of Letters Patent No. 373,284, dated November 15, 1887.

Application filed July 11, 1887. Serial No. 243,945. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM GATES and LOUIS W. GATES, of New Haven, in the county of New Haven and State of Connecticut, have
5 invented new Improvements in Machines for Capping Tacks; and we do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and
10 exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a front view of the machine; Fig. 1^a, a detached front view of the slide, showing
15 the cam-slot 26; Fig. 1^b, a vertical section of a headed tack; Fig. 1^c, a section of the cap such as employed for capping the tack; Fig. 2, a plan or top view of the machine; Fig. 3, a longitudinal sectional view cutting through the
20 follower and tack-channel; Fig. 4, a vertical section of the follower and tack-receiver, to illustrate their operation; Fig. 5, a partial vertical section illustrating the transfer of the tack and cup to the punch; Fig. 6, a vertical
25 section of the punch and die below, illustrating the manner of closing the cup on the head of the tack; Fig. 7, a transverse sectional view illustrating the manner of presenting the cups to the follower; Fig. 8, a transverse section
30 through the receiver, and as having received a tack from the channel; Fig. 9, the same view as Fig. 8, showing the receiver inverted as for delivering a tack; Fig. 10, a transverse section illustrating the punch and slide which carries
35 it; Fig. 11, a horizontal section cutting on the plane of the upper surface of the slide *l r*; Fig. 12, a detached view of the slide *l r* and the nippers, illustrating the operation of the nippers. Fig. 13 illustrates the operation of
40 the clearing-finger 24.

This invention relates to an improvement in machines for performing the work commonly called "capping" tacks and like articles.

Tacks and like articles as usually made necessarily have a head of more or less irregular
45 shape. For upholstering and similar purposes, where the head of the tack is to be exposed, a finished and uniform shape is desirable, and this shape has been attained by forming a cup
50 from sheet metal, setting the head of the tack into the cup, then closing the sides or flange

of the cup down upon the under side of the head, this operation being commonly called "capping."

The object of this invention is a simple machine, which, being supplied with cups and
55 tacks, will automatically apply the cup to the head and deliver the capped tack complete from the machine.

In Fig. 1^b we represent a headed tack with
60 the cap detached, and in Fig. 1^c the cup in section which is to be applied to the tack. The tacks may be any of the common and well-known constructions. The cup is also of common construction. It is made from sheet
65 metal, of a diameter and shape on its closed end corresponding substantially to the finished head. The flange or sides of the cup are of a depth to receive the head and leave sufficient
70 metal to be turned inward and closed upon the inside of the head, so as to secure the cap upon the head.

A represents the bed of the machine, supported on legs B, and which carries the operative mechanism of the machine. 75

C represents the driving-shaft supported in suitable bearings below the bed, and to which power is applied through a pulley, D, to impart a constant rotation to the driving-shaft.

E represents the hopper adapted to receive
80 the tacks and deliver them into an inclined chute, F. The channel is of a width to permit the body of the tack to pass through, with the head resting upon each side, and such a channel is used in various machines of this
85 character, the inclination of the channel, as seen in Fig. 3, being sufficient to cause the tacks to readily slide down by their own gravity as the tacks are successively removed from the lower end of the chute. 90

G represents the hopper, adapted to receive the cups; and H, the inclined channel leading therefrom, into which the cups will successively fall, the channel being in width slightly
95 greater than the depth of the cup, so that the cups will fall therein and rest upon their periphery, as seen in Fig. 7, the inclination being such that the cups will roll down the channel upon their periphery as they are successively removed from the lower end of the channel. 100

At the lower end of the channel a stop or

check is arranged, which will arrest the column of cups and hold them in suspense until the proper time for the delivery of a cup from the column. This stop is in the form of a lever, I, hung to swing in a vertical plane parallel with the vertical plane of the channel H. This check normally rests upon the lowest or last cup in the channel, as seen in Fig. 7. At the proper time the stop is raised by means of a cam, J, on the driving-shaft, which actuates a longitudinal slide, K, (see Fig. 1,) the said slide being in connection with a vertical rock-shaft, L, which extends up through the bed of the machine, (see Figs. 2 and 7,) and at its upper end carries an arm, M, which, under the oscillating movement of the rock-shaft L, acts upon a cam-like arm, N, of the lever I, so as to raise the check from the cups, as indicated in broken lines, Fig. 7, and when the check is so raised the column is free to advance. At the lower end or foot of the channel H the receiver for the cup is arranged. This receiver consists of a vertical sleeve, O, and a follower, P, within it. (See Figs. 3 and 7.) The sleeve O is guided through the bed for up and down movement, and, with the follower, normally stands below the top of the bed, so as to form a recess, R, in the bed adapted to receive a cup, as seen in Figs. 3 and 7. This sleeve receives a vertical reciprocating movement from a cam, S, on the driving-shaft, working through a stirrup, T, which is connected to the sleeve, the extent of movement of this sleeve being from the point mentioned below the bed to a point above the bed, as seen in Fig. 4. From the follower a stud, U, extends radially outward through a slot, V, in the sleeve O into a vertical slot, W, in the side of the guide in which the sleeve moves vertically. The follower P rests upon a spring, a, in the sleeve. The upper end of the slot, W, is in such position relatively to the stud U that when the follower has been raised to a position flush with the upper surface of the bed it will come to a bearing against the upper end of the slot W, as seen in Fig. 4. Then the sleeve O continues its rise to a point above, as also seen in Fig. 4.

The cups fall into the cavity R upon the follower, and naturally the closed side down. This closed side is usually rounded; but in any case the cup invariably rests the closed side down, as seen in Fig. 3. So soon as one cup has been delivered the check catches the next cup and holds back the column, the action of the check being adapted to the time of the sleeve and follower. When one cup has been thus delivered upon the follower, as seen in Fig. 3, the ascent of the sleeve and follower commences and raises the cup to the position seen in Fig. 4, where it stands, resting on the top of the follower and within the sleeve ready to receive a tack.

The tacks, as before described, pass down through the channel F. At the lower end or foot of the said channel is a receiver, b, hung upon a horizontal axis, d, parallel with the

vertical plane of the channel, and in this receiver is a radial recess, e, (see Fig. 8,) open at one end, but closed at the other. Normally, this receiver stands with the radial recess at the delivery end of the channel, so that the lowest tack may enter therein, as seen in Fig. 8. The receiver has a rotative movement imparted to it upon its axis by means of a toothed pinion, f, thereon, into which a horizontal toothed rack, g, works. A reciprocating movement is imparted to the said rack g through a two-armed lever, h i, hung upon a vertical fulcrum, k, (see Fig. 2,) and so that under the reciprocating movement of the rack g a rotative movement will be imparted to the receiver b. The means for imparting this reciprocating movement to said rack g will be herein-after described. The rotative movement imparted by the rack g inverts the recess e, which receives the tack, bringing the head downward, as seen in Figs. 3 and 9, and so that the tack is free to fall from the receiver, and when the tack is so inverted it stands directly over the cup on the follower, as seen in Fig. 3.

The rotative receiver serves as a cut-off at the end of the tack-channel to hold the column back while the one tack in the receiver is inverted and delivered into the cup below. Then when the receiver returns the column is free, and the next tack advances into the receiver.

In suitable guides, and in a plane parallel with the axis of the receiver, a longitudinally-reciprocating slide, l, (see Figs. 3 and 11,) is arranged. This slide receives its reciprocating movement from a grooved cam, m, on the driving-shaft, in which a stud, n, fixed to the slide l, works. In the same plane with the slide l, and working in the same guides, is a second part, r, the two parts r and l being connected by a slot, s, on the one and corresponding stud, t, on the other, (see Fig. 12,) so that the part l of the slide may receive a certain amount of movement independent of the part r; but when the slot s comes to a bearing upon the stud t in either direction then from that time the two parts will move together as one slide.

On the part r a pair of nippers, 2 3, are hung upon pivots 4 5, so as to swing thereon in a horizontal plane. These nippers extend forward, and are provided with grasping-surfaces 6, adapted to grasp a tack. From the hub of each of the nippers an arm, 7, extends, respectively, to the right and left, and from these arms links 8 extend, and are hung upon a pivot, 9, on the part l, as seen in Fig. 12. When the part l of the slide is in its forward position with relation to the part r, the pivot 9 is advanced toward the part r, and so as to force the nippers into their closed position, as seen in Fig. 12; but in the first part of the rear movement of the part l it will start in advance of the part r, as indicated in broken lines, Fig. 12, which movement will draw the pivot 9 away from the part r and cause the links to open the nippers, as indicated in broken lines, Fig. 12, and when the nippers

are so opened the slot *s* comes to a bearing upon the stud *t*, and the further rear movement of the part *l* will cause the part *r* and the open nippers to move with it.

5 On the part *r* of the slide is a plate, 10, (see Fig. 3,) which, when the slide is in its forward position, stands beneath the receiver *E*, and so that the head of the tack when inverted will rest thereon and be prevented from falling
10 into the recess *R* below. Then as the slide *l* moves rearward with the nippers open the plate 10 passes from beneath the tack and the tack drops between the nippers, and so as to bring its head directly into the cup, as seen
15 in Fig. 4. Now the slide *l* commences its advance, and the first part of its movement, being independent of the part *r*, causes the nippers to close upon the body of the tack and so as to grip it firmly in its vertical position.
20 At the same time the sleeve *O* drops, the follower *P* remaining in its up position under the action of its spring *a*, the nippers holding the tack immediately advance, and because the head of the tack stands within the cup the
25 cup is carried by the tack and slides on the bed or a way prepared for it from the follower, as seen in Fig. 5, to a position where the closing operation is to be performed. At this closing-point a die, 11, is set in the bed of the
30 machine, on which the cup rests, as seen in Fig. 5. Over this closing-point is a vertical punch, 12, arranged in a vertical slide, 13. (See Fig. 10.) This slide is arranged in vertical guides 14, and to it a vertical reciprocating
35 movement is imparted by a crank or eccentric, 15, on the driving-shaft, working between arms 16, projecting from the slide, as seen in Fig. 10. The punch 12 is tubular, and as it descends it passes onto the tack. As the
40 punch comes onto the point of the tack, so as to support it and prevent its displacement, the return of the part *l* of the slide commences and immediately opens the nippers, and the slide, continuing its movement, withdraws the
45 nippers from below the punch. The punch continues its descent. Its lower face is shaped to strike the flange of the cup, turn it inward, and close it upon the head of the tack, as seen in Fig. 6. This done, the tack is complete,
50 the punch 12 rises, and the tack is ready to be delivered from the machine. To insure such delivery an ejector, 17, is hung upon a vertical shaft, 18, (see Figs. 2 and 11,) to which a ro-
55 ejector is rotated in a horizontal plane, and it moves in a path close down upon the bed of the machine, or in the plane of the die upon which the closing operation is performed. This ejector in so rotating will strike the tack
60 and throw it into a discharge-chute, 19, whence it may be led through a tube, 20, to a suitable receptacle.

The horizontal rotating movement is imparted to the ejector 17 through a train of
65 gears, 21, receiving their movement from a bevel-gear, 22, on the driving-shaft, working into a corresponding bevel-gear, 23, on the first

of the said train of gearing. The ejector may be of any suitable form, preferably we apply a rigid arm, and also a brush, as shown, so as
70 not only to eject the finished tack, but to sweep the surface to remove anything foreign to the proper operation of the machine.

If, perchance, a tack should not have been delivered as described and the cup should have
75 been presented, the movements of the machine will continue, but the cup will not be thereby affected. It is therefore necessary to remove such a cup in order to make way for the next
80 cup, which would be delivered irrespective of the fact that the previous one were still on the follower. To remove such cup we provide a
finger, 24, hung upon a pivot, 25, so as to swing in a horizontal plane, the finger extending in-
85 ward to one side of the position of the cup as it is presented to receive a tack, and as seen in Fig. 11. On the other side of the pivot this
finger extends into a cam-shaped groove, 26, in the slide 13, as seen in Fig. 1^a, and so that
90 as the slide descends to perform the closing operation the finger will be turned across the plane of the cup, as seen in Fig. 13, and so as
to throw the cup from its position and out of the way of the next cup to be presented, and
95 this occurs before the follower *P* commences its descent.

After the tack and cup have been removed from the follower the continued descent of the
sleeve *O* brings it upon the stud *U* of the fol-
100 lower *P*, and so as to take the follower to its down position, as seen in Fig. 3.

The reciprocating movement of the rack *g*, before referred to, and which imparts the ro-
tative movement to the receiver, is produced by means of the slide *l*. Parallel with the slide
105 *l*, and at one side of the machine, as seen in Fig. 11, is a longitudinally-sliding bar, 27, arranged in suitable guides, and which extends to the rear or outer end of the slide *l*. On the
110 rear end of the slide 27 is an inward projection or shoulder, 28, and at the end of the slide is a corresponding projection, 29, which stands forward of the projection 28 on the slide 27,
and so that as the slide retreats the projection
115 29 will strike the projection 28 and force the slide 27 to its rear position, as seen in Fig. 11. A spring, 30, is arranged tending to force the
slide 27 forward or resist the action of the re-
treating slide.

From the slide is an outward cam-shaped
120 projection, 31, which is adapted to act upon a downwardly-projecting stud, 32, from the arm *i* of the rack-lever, and so that as the slide 27 advances the said projection 31 acts upon the
lever *i h* and turns it, so as to impart an ad-
125 vance rotative movement to the receiver, as before described. On the return of the slide *l* the slide 27 is positively returned with it; but as the lever *h i* and the rack are independent
of the retreating movement of the slide 27, we
130 provide a spring, 33, (see Fig. 1,) which acts upon the rack, tending to impart to it the re-
treating movement.

The two springs 30 and 33 are opposed to

each other; but the power of the spring 30 is so much greater than the power of the spring 33 as to overcome the resistance of the spring 33 and impart to the rack *g* through the slide 27 the required advance movement, the retreating movement of the slide *g* being produced by the spring 33 alone.

To prevent the possibility of a capped tack sticking in the punch we provide a stationary follower, 34, which extends through the tubular follower and is supported by a bracket, 35. (See Fig. 1.) The length of this follower is such that when the punch is in its up position, as seen in Fig. 3, the follower will project through the punch, and so as to insure the clearance of the punch from all obstruction.

We have described and illustrated the invention as for capping upholsterers' tacks; but this description and illustration will be sufficient to enable others skilled in the art to apply substantially the same mechanism to the capping of other classes of tacks or nails or screws.

Parts of our invention, as we have described and illustrated it, are applicable to similar machines independent of other parts of this machine, as, for illustration, the receiver for cutting off the column of tacks and inverting the tack may be utilized in machines in which other mechanism is employed for applying the cap; or the channel and receiver by which the tack is inverted may be used to present the tack or headed article for various purposes other than capping. Again, the sleeve and follower, with the channel for presenting the cups, may be employed with other known tack-delivering channels than that which we have described.

The transfer-nippers which we have described may be employed to transfer tacks and cups delivered to them by other known channels and feeding devices. We therefore do not wish to be understood as limiting our invention to the combination of all the specific devices which we have described.

We claim—

1. The combination of an inclined channel adapted to receive and successively present a column of tacks, a rotating receiver hung upon an axis at the lower end of said channel, said receiver constructed with a radial cavity to receive the lowest tack of the column, the axis of said receiver being parallel with the plane of said channel, and whereby said receiver serves as a cut-off for said channel, an inclined channel adapted to carry the cups for the tacks, a follower below and in line with the tack in the receiver, said cup-channel being adapted to deliver the cups singly upon said follower, a reciprocating punch, and mechanism, substantially such as described, adapted to transfer the said tack and cup to a position in line with said reciprocating punch, substantially as and for the purpose described.

2. The combination of the tack-channel *F*, the rotative receiver *b*, having a radial recess in its face adapted to receive a single tack

from said channel and invert it, the vertical reciprocating sleeve *O*, follower *P* within said sleeve, said sleeve and follower arranged below and in line with the said recess, a cup-channel, *H*, arranged to deliver cups singly upon said follower, a slide arranged to reciprocate between said receiver and said sleeve and follower, a plate, 10, on said slide extending beneath said inverted recess in the receiver, a pair of nippers on said slide, also extending between said recess and said follower, and a vertically-reciprocating punch, 12, with mechanism, substantially such as described, to impart movement to said parts, and substantially as described.

3. The combination of a channel, *F*, rotating receiver *b*, constructed with a radial recess, *c*, opening from one side and in line with the tack-channel, toothed pinion on said receiver, a corresponding reciprocating rack arranged to work in said pinion, a vertically-reciprocating follower beneath and in line with said recess, a reciprocating slide, a pair of nippers on said slide extending between said recess and said follower, a cup-carrying channel arranged to deliver cups singly upon said follower, and a vertically-reciprocating punch, substantially as described, said nippers being adapted to transfer a tack and cup to said punch.

4. The combination of the vertically-reciprocating sleeve *O*, spring-follower *P* in said sleeve, a stop to arrest the ascent of said follower before the sleeve reaches its up position, a cup-channel adapted to present cups singly upon said follower within said sleeve, mechanism, substantially such as described, adapted to deliver tacks singly and head downward upon said cup, a vertically-reciprocating punch, and mechanism, substantially such as described, to transfer a tack and cup into line with said punch, substantially as specified.

5. The combination of a vertically-reciprocating follower, a cup-channel arranged to present cups singly upon said follower, a tack-channel, mechanism, substantially such as described, to present the tacks singly and head downward to the cup on the follower, a vertically-reciprocating punch, mechanism, substantially such as described, to transfer the tack with the cup to a position below the punch, and a revolving ejector working in a plane at right angles to said punch, substantially as described.

6. In a tack-capping machine, the combination of the vertically-reciprocating sleeve *O*, follower *P*, the cup-channel *H*, the tack-channel *F*, rotative receiver *b*, punch 12, mechanism, substantially such as described, between said receiver and follower, adapted to transfer the tack and cup to said punch, and the clearing-finger 24, substantially as described.

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