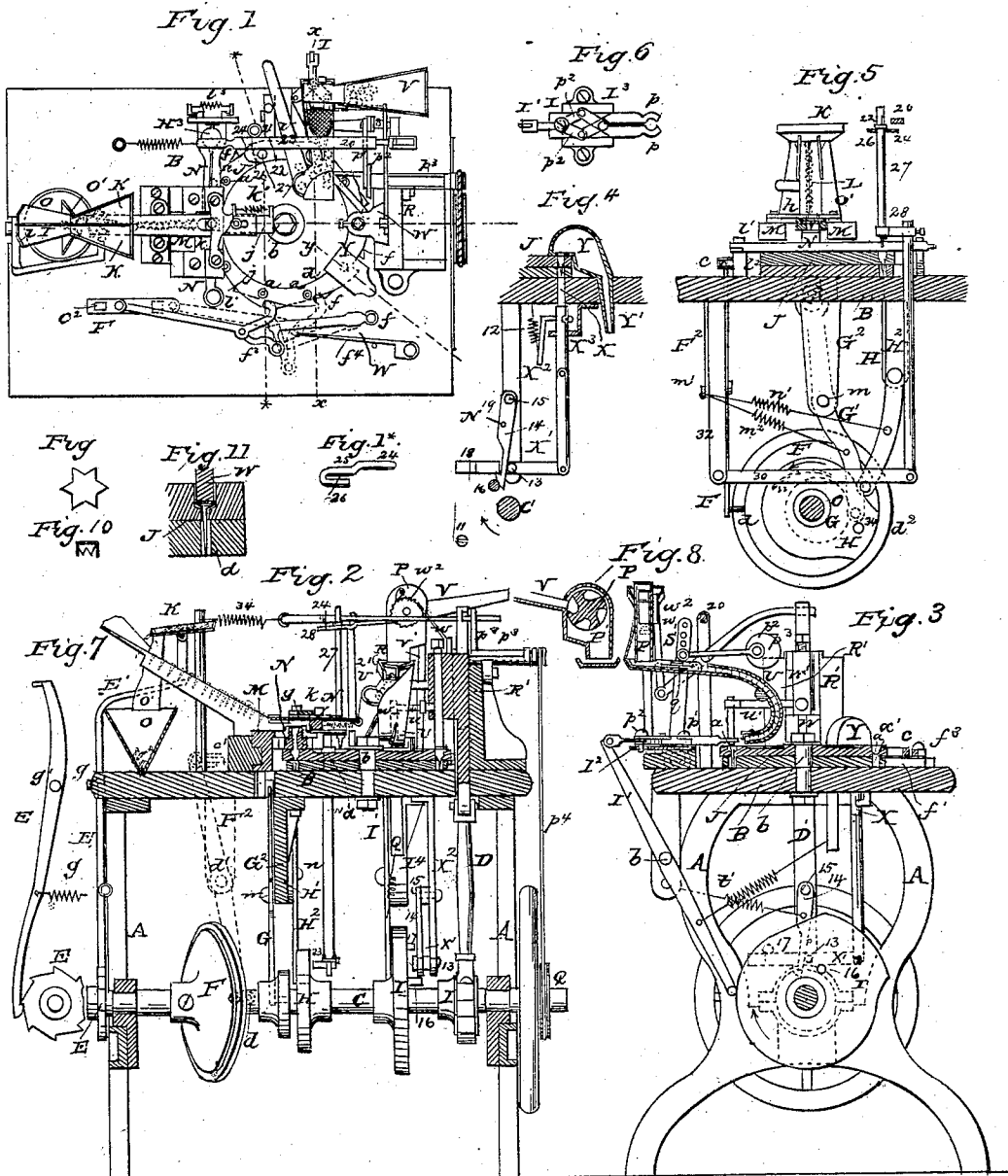


W. H. VAN GIESON.

Capping Nails.

No. 22,211.

Patented Nov. 30, 1858.



WITNESSES
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MACHINE FOR PLATING NAIL-HEADS.

Specification of Letters Patent No. 22,211, dated November 30, 1858.

To all whom it may concern:

Be it known that I, WILLIAM H. VAN GIESON, of Newark, in the county of Essex and State of New Jersey, have invented a new and Improved Machine for Plating or Covering the Heads of Nails or Tacks with other Metal; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1, is a plan of the machine. Fig. 2, is a vertical section of the same, in the plane indicated by the line *z, z*, in Fig. 1. Fig. 3, is a vertical section of the same, in the plane indicated by the line *x, x*, in Figs. 1 and 2. Fig. 4, is a vertical section of a part of the machine, in the plane indicated by the line *y, y*, in Fig. 1. Fig. 5, is a vertical section of part of the same, in the plane indicated by the line **, **, in Fig. 1. Fig. 6, is a plan of a pair of pincers which deliver the shells to the plating dies. Figs. 1*, 7, 8 and 11, are detail views which will be hereinafter explained. Figs. 9, and 10, are views explaining the construction of the shells with which the heads are plated or covered.

Similar letters of reference indicate corresponding parts in the several figures.

In this machine, the nails and the shells or caps for covering or plating their heads are conveyed singly from separate hoppers or boxes to a series of dies in an intermittently-rotating table, in which dies they are carried in rapid succession, by the rotation of the table, under a punch by which the shells or caps are closed upon the nails, and from said punch to a plunger by which the finished nails are discharged from the said dies to bring the dies in a condition to receive new nails and shells as they are severally brought by their rotating motion to the feeding devices from which the nails and blanks are supplied.

The invention consists firstly in certain means of giving motion to and stopping the intermittently-rotating table whereby it is for a time locked after every movement.

It consists secondly, in a device for receiving the nails from the nail feeder and retaining them in proper position to drop into

the dies as the latter arrive in position to receive them.

It consists thirdly in certain means of bringing the shells right side up and properly directing them to the contrivances by which they are deposited in the dies.

It consists fourthly in a certain combination of parts for depositing the shells in the dies.

It consists fifthly in a certain device for effecting the discharge of the finished nails from the dies and throwing them out of the machine so that they shall not interfere with the operation of its parts.

It consists sixthly in a stop motion for effecting the stoppage of the machine when a die fails to receive a nail.

It consists seventhly in the arrangement of the several parts of the machine, substantially as hereinafter described.

A, A, are two standards and B, a horizontal plate supported thereon, said standards and plate constituting a stationary framing upon or by which all the working parts of the machine are supported.

C, is the main shaft of the machine from which all the working parts of the machine derive motion; said shaft carrying an eccentric D, five cams, E, F, G, H, I, and a pulley Q, and being arranged to rotate in bearings in the standards A, A.

J, is the intermittently rotating table containing the dies *a, a*, in which the covering or plating of the nail heads is performed; said table being bored centrally to fit a vertical pin or axle *b*, that is secured firmly to the plate B, and having an intermittent rotary motion upon the said plate. The dies *a, a*, of which there may be any number, are at equal distances apart in a circle, described from the center of the said table. The said dies are of the form commonly employed in plating the heads of nails, viz: circular, with a slightly rounded bottom and with an opening in the bottom large enough for the body of a nail to pass through and leave its head resting on the bottom. The table J, has a series of ratchet-like teeth *e, e*, on its periphery corresponding in number with the dies, said teeth having concave faces to receive a round nosed dog *c*, which is connected by a joint *c¹, c²*, which permits

it to work horizontally, with a lever F' , which works on a fulcrum d' , secured in a rigid hanger F^2 , dependent from the plate B, the lower end of the said lever being furnished with two pins or anti-friction rollers d, d' , between which is received the sinuous flange d^2 , of the circular cam F. There is attached to the bottom of the rotating table, a circular ratchet f, f , whose teeth are of ordinary form and set the opposite way to those e, e ; and there is connected with the dog c , by a pawl f^3 , a pawl f^1 , which works on a fixed pin f^2 , secured in the plate B. The revolution of the cam F, acts, through the lever F^1 , upon the dog c , to produce the necessary intermittent rotary motion of the table, and the connection of the said dog with the pawl f^1 , by the link f^3 brings the pawl into operation upon a tooth of the ratchet f, f , just at the instant the dog c , completes a movement of the table, which is the condition represented in the drawing, thus producing a positive stop and not only preventing the table moving too far by acquired momentum, but combining with the dog to produce, while the latter is allowed to remain stationary by the form of the flange of the cam F, a positive dead lock of the table, so as to allow of the proper entrance of the punch into the die which is under it. As the dog moves back over a tooth e , the pawl is thrown directly outward from the ratchet f, f , by the link f^2 , till it reaches the position shown in red outline in Fig. 1, and does not arrive in gear again till the dog has just completed another movement of the table, the link f^3 , operating to throw the pawl during a very small portion of the movement of the dog over the tooth, and keeping the pawl nearly stationary in the condition shown in red outline in Fig. 1, till the movement of the table by the dog is nearly completed— f^4 , is a spring which acts upon the pawl f^1 , to keep the dog c , always in contact with the ratchet teeth e, e . The table J, derives one movement from the dog, in every revolution of the shaft C, such movement leaving each die in the position previously occupied by the one immediately in advance of it in their rotation.

K, is the hopper or box in which the nails to be plated are placed, said hopper or box being attached to an inclined slotted feeder L, which resembles in its general form the feeding slides employed in screw-cutting, tack-leathering, and pin-sticking machines. The said hopper or box has its bottom inclined and its lower end open so that the nails are shaken out into the feeder L, by the agitation which is produced by the hammer-like upper end of a lever E^1 , which works on a fulcrum g^1 , at one end of the machine, and which is operated by the ratchet-like cam E, and a spring g , which

draws the lever toward the said cam and causes the hammer-like end of the lever to strike rapidly-repeated blows against the side of the feeder. Fig. 7, is a view of the cam E^1 , and lever E, taken at right angles to Fig. 1. The agitation of the feeder causes the nails, which are suspended by their heads, to follow one another closely down it, as fast as they are permitted by the wedge-shaped separators h, h^1 , which are attached to a sliding carriage M, which works transversely to and at the bottom of the feeder. The nails which fail to fall into the groove i , of the feeder, by getting across it, drop into a receptacle O, as also do any surplus number of nails that may drop from the hopper on to the upper part of the feeder. The nails dropping from the feeder in this way are prevented getting among the working parts of the machine by an apron O^1 , of cloth or leather, suspended from the hopper. The wedges h, h^1 , have their points set in opposite directions, and the first one, h , in crossing the feeder, passes between the first or lowest nail and the one next behind it, and feeds the first one forward in a horizontal groove which forms a continuation of the groove i , in the inclined portion of the feeder, and, as it retreats, leaves it in a position for the wedge h^1 , in its advance, which takes place simultaneously with the retreat of h , to pass behind it and push it further along the groove and into the fork of a horizontal slide j , which is moved horizontally by the combined action of a wedge k , secured to the transversely sliding carriage M, and a spring k^1 , the said wedge acting upon an anti-friction roller k^2 , attached to the said slide and the spring connecting the said slide with the stationary portion of the feeder. As the forked slide j , with the nail suspended vertically within it by its head moves away from the feeder L, the nail is swept out of the fork by its head coming in contact with the stationary upper portion of the guide in which the slide works, and thereby caused to drop into a cavity l , provided with a pair of receiving jaws N, N, somewhat like a pair of tongs, arranged below the lower portion of the feeder and above the rotating table J, the said jaws being pivoted together by an upright pin l^1 , which also attaches them to a small post l^2 , erected on the plate B. The cavity l , which is half in each jaw and is situated directly over the path described by the centers of the dies a, a , in their revolution with the table, is large enough and deep enough to contain the whole of the nail, when the jaws are closed, as shown in Fig. 2, but not to let even the point thereof protrude below the jaws; but every time the table J, stops in its rotary motion and a die is thereby brought directly under the said cavity l , the jaws are opened to let the nail drop from said cavity into the

die by means of a wedge H^3 , operating between the said jaws, and as soon as the nail has dropped into the die the jaws are permitted by the retreat of the wedge to be closed by the spring l^3 . The sliding carriage M, above described carrying the wedges h , h^1 , and h^2 , derives its motion back and forth once during every revolution of the main shaft C, through the operation of the peripheral surface of the cam G, upon a lever G^1 , which works on a fulcrum m , in a hanger G^2 , dependent from the plate B, and which is connected with the said carriage, the said lever being kept in contact with the said cam by a spring m^2 , which connects it with an arm m^1 , secured to the hanger F^2 . The wedge H^3 , derives its motion by its direct attachment to a lever H^2 , which works on a fulcrum n , in a hanger H^1 , dependent from the plate A, and which is operated upon by the peripheral surface of the cam H, the said lever being kept in contact with the said cam by a spring n^1 , which connects it with the arm m^2 .

V, is the hopper or box in which the shells or caps are placed, having an inclined bottom, and opening at its lower end into an upright casing P' , which contains a wheel P, in which are a series of bucket-like cavities into which the shells are discharged from the hopper. Fig. 8, is a section of the casing P^1 , and wheel P, in a plane parallel with Fig. 1. The said wheel has a very slow rotary motion imparted to it, which causes the shells to be discharged from its bucket-like cavities on to the slightly inclined bottom of a trough R.

Before proceeding further with the description of this part of the machine, I will briefly describe the construction of the shells, which is illustrated in Figs. 9 and 10. They are made by first punching out star-shaped pieces of plate, as shown in Fig. 9, and then swaging the said pieces into cup form as shown in Fig. 10, the emarginated rims of the cups being intended to turn under and clasp firmly the heads of the nails, as shown in Fig. 11, which represents full size the section of a finished nail in one of the dies a , a . The hopper V, case P^1 , and trough R, are all connected together and supported in part by a spring V^1 , and in part by the upright arm S^1 , of a horizontal rockshaft S, which works in bearings on the top of the plate B, and the said arm has a very short but extremely rapid oscillating motion imparted to it by its connection by means of a rod p^1 , with an eccentric wrist p , secured in a disk p^2 , on a shaft p^3 , which works in bearings on the top of a standard R^1 , erected on the plate B, and which receives a rapid rotary motion through a belt p^4 , from the pulley Q, on the main shaft. The rapid oscillation of the arm S^1 , gives a shaking motion to the trough R, which has

its bottom covered with cloth to prevent the shells sliding too freely down it. Some of the shells will fall upon the cloth covered bottom with their rims and others with their heads upward; but the shaking motion soon brings all, without failure, with their rims upward. Across the lower part of the bottom of the trough R, there is a V-shaped bridge q , as shown in Figs. 1 and 2, and in one side of this bridge, the side to the right just large enough to permit the passage through it of one shell at a time. In the other side of the bridge, there is an opening of similar or larger size. The lower end of the trough R, is open and below it there is a stationary conductor U, so arranged as to receive the shells which pass through the opening on the right side of the bridge q , and to conduct them to a position to be taken by the pair of pincers r , r , to a position directly over the dies a , a , as the latter, after having received nails, severally become stationary near the lower end of the conductor, the said conductor being only just wide and deep enough for the shells to pass along singly, and being curved in a semicircular form or otherwise substantially in such a manner as is shown in Fig. 3, where it is represented in section, that the shells in passing down to the lower opening will be completely overturned, so that instead of having their rims upward, as when they leave the trough R, they have their heads upward. The conductor U, when the machine is in operation, is always kept filled with shells by the shaking motion of the trough R, but they are retained therein by a light spring s , which is attached to and bends over the mouth but which allows the shells to be taken one by one, as they arrive at the mouth, by the pincers r , r . A plan of these pincers is shown in Fig. 6. Their joint pin r^1 , is secured in a horizontal slide I^2 , fitted to a guide block I^3 , secured on top of the plate B, and they have a toggle connection r^2 , r^2 , with the upper end of a lever I^1 , which works on a fulcrum t , in a hanger I^4 , dependent from the plate B, and which is kept in contact with the peripheral surface of the cam I, and acting upon the pincers by a spring t^1 . The lever I^1 , operated upon by the cam I and acting upon the pincers through the toggle connection, first opens the pincers, then moves them with the slide I^2 , to a position to receive the shell, and draws them back to place the shell over the die a , which has arrived and become stationary in the proper position. The shell is deposited in the die over the head of the nail which it is to cover, by the descent of a plunger u , which is attached by an arm u^1 , to the stock W^1 , of the punch W, by which the closing of the shells upon the heads is effected, as will be presently de-

scribed, the said plunger pushing the shell from between the jaws of the pincers into the die. The rotary motion of the wheel P, before described, is also derived from the punch stock W, through the agency of a lever P², working on a fulcrum w¹, secured in a post P³, erected on the table, the said lever carrying a pawl w, which operates a ratchet wheel w², on the shaft of the said wheel. The shells which escape through the opening in the left side of the bridge g, pass down a tube U¹, into a suitable receptacle. The above-mentioned opening is only to provide for the escape of the surplus shells from the trough R, to which, in order to insure a proper supply to the dies, more than an absolutely necessary number are supplied.

W, is the punch by whose operation the closing of the shells upon the heads of the nails in the dies a, a, is effected, as the dies after having received the nails and shells, severally become stationary under it. The said punch resembles that commonly employed in the presses in which nails have heretofore been plated, fitting easily to the dies and having a concave face. It is secured in the stock W¹, before mentioned, which is fitted to slide vertically in the standard R¹. The punch stock W¹, derives the necessary movement to operate the punch through a connecting rod D¹, from the eccentric D.

X, is the plunger for throwing out the nails from the dies, as the latter severally arrive and become stationary over it, after the covering or plating of the heads has been effected, said plunger working upward for this purpose through a hole in the plate B, as shown in Fig. 4, and through a guide X³, below. To permit the operation of this plunger the openings that are provided in the table J, for the bodies of the nails below the dies a, a, are enlarged as shown at a¹, a¹, in Figs. 2, 3, and 4, to permit the entry of the plunger. As the simplest method of constructing these openings a¹, a¹, below the dies, the table J, is composed of two plates bolted together by bolts a², a², the lower plate, which rests upon the bed and has the ratchet teeth f, f, formed upon it, having the enlarged holes a¹, a¹, drilled right through it. The plunger X, requires to come up with a very quick movement so as not to push out the nails but knock them out, by striking their points, with sufficient force to cause them to strike against the top of a stationary hood Y, which is arranged closed above the table and from which there descends through the plate B, a spout or tube Y¹, into which the nails are directed by striking the curved top of the hood and down which they pass into a receptacle placed below. The quick upward movement of the plunger X, is caused by a spring 12, see Fig. 4, which connects it with the plate

B, the said spring being prevented acting on the plunger till the proper time by the connection of the latter with one end of a lever X¹, which is arranged on a fulcrum pin 13, secured in a stationary hanger X², dependent from the plate B, and which is locked so as to hold down the plunger till the proper time by means of a catch 14, which hangs on a pin 15, in the said hanger X². At every intermission in the rotary motion of the table, the catch 14, is suddenly knocked away from the lever X¹, by a pin 16, fastened to one side of the cam I, and the punch thus suddenly left under the influence of the spring which at once throws it up. The punch is drawn back again immediately after the above described action by the action of a pin 17, fastened to the cam I, on a projection 18, on one side of the lever X, which returns the lever X, to such a position as to be locked again by the catch 14, which is thrown into position to effect this by a spring 19.

I have now described the whole of the machine with the exception of a stop motion to stop it in case of any of the dies a, a, failing to receive a nail, which I will now proceed to describe.

20, is a bar fitted to slide longitudinally in a horizontal direction through a suitable guide in the post P³, and upon the top of a post 21, erected upon the plate B, the latter post having a stud 22, on the top which enters a slot 23, in the bar. This bar is intended to have attached to it a fork for shifting a belt between fast and loose pulleys on the shaft C, or on any shaft from which the machine derives motion through the agency of a belt, or else to be connected with a clutch to throw the machine in and out of gear with the driving apparatus; and the said bar has applied to it a spring 34, which exerts a tendency to move it in a direction to make it shift the belt from the fast to the loose pulley or otherwise to throw the machine out of gear and cause its stoppage.

24, (shown on the machine in Figs. 1 and 2, and by a detached view in perspective in Fig. 1*,) is a spring catch secured at one end to the under side of the bar 20. This catch springs up toward the bar 20, and is bent to form a shoulder 25, shown best in Fig. 2, which is intended, while the machine is in proper operation, to be in contact with a fixed stop 26, formed on the top of the post 21, and the said catch is provided with a slot 26*, as shown in Figs. 1 and 1*, to receive within it the upper part of an upright bar 27, which may be termed a feeling-rod, and is held in an arm 28, which is rigidly secured to a rod 29, which works through a guide in the plate B. The lower end of the rod 29, is connected with a lever 30 (see Fig. 5) which works nearly close to

the cam H, on a fulcrum 31, secured in a hanger 32, dependent from the plate B. The said lever 30, has a spring 33, attached to the side next the cam H, and there is a pin 34*, secured in the said cam, in such a position as to pass over and in contact with the said spring and thus depress the lever. The feeling-rod 27, is so arranged between the nail-feeding apparatus and the shell-feeding apparatus, that every time the rotating table J, becomes stationary, in the operation of the machine, it brings directly under the said rod a die which has passed the nail-feeding apparatus and which is on its way to the shell-feeding apparatus. It is while the table J, is stationary that the pin 34*, acts upon the spring 33, of the lever 30, to depress the said lever and thus brings down the pointed lower end of the rod 27, into the die below it, and causes a collar 28, upon the upper part of the said rod above the spring catch 24, to depress the said catch. When there is a nail in the die the descent of the rod 27, is arrested by it before the said rod depresses the catch 24 low enough to liberate it from the stop 26, on the post 21, but if it should happen that the nail-feeding apparatus has failed to supply a nail to the die, there is nothing to arrest the said rod, and its point enters the hole in the bottom of the die, and the collar 28 pulls down the spring catch 24, so far as to bring its shoulder 25 below the stop 26, which is at once drawn longitudinally by the spring 34, to a position to throw the belt on the loose pulley or throw the clutch out of gear, thus stopping the machine. When the machine stops, an attendant pushes back the bar 20, and starts it again, and, after starting it, places a nail in the empty die before it arrives at the shell-feeder. It must be observed in the construction of this stop-motion that the spring 33, must be stronger than the spring of the catch 24, so that the catch will always yield before the spring 33. It must be observed moreover that the spring of the catch must be strong enough to bear the weight of the rods 27, and 29, and part of the weight of the lever 30, without deflection.

Having thus described the construction, arrangement and individual operations of the several parts of the machine, I will briefly describe the operation of covering or plating a nail in the machine.

The nail being supplied by the nail feeding apparatus to the receiving jaws N, N, is, when the intermittently rotating table J, becomes stationary, dropped by the opening of the said jaws into the die, which is below them, and carried by subsequent movements of the intermittently rotating table J, to the shell feeding apparatus, where the shell is deposited in the die by the pincers r, r, and plunger u. From the shell-feeding appa-

ratus the nail and shell pass on to and become stationary under the punch W, which descends, and by its pressure on the crown of the shell forces the emarginated rim thereof against the rounded bottom of the die, and thereby drives the said rim under the head of the nail and closes the shell tightly upon the head. From thence the nail is carried to the discharging apparatus and thrown out. Every revolution of the shaft C, turns out a finished nail, but several nails are under operation in the machine at once, for while one is being deposited in the die, another is having the shell deposited upon it, another is having the shell closed upon its head, and another is being discharged.

I do not claim the construction of the die and punch for closing the shells upon the heads of the nails; neither do I claim the arrangement of several of such dies in an intermittently rotating table, as such construction and arrangement have been used in machines for the same purpose. Neither do I claim the inclined grooved nail-feeder with the slides at its lower end for taking out the nails one by one, as its equivalent may be found in several machines for other purposes. But

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

1. Combining the stop-pawl f^1 , of the intermittently rotating die-table J, with the dog c, which gives motion to the said table by means of a link f^3 , applied to produce the operation of the dog in combination with the pawl and the two series of ratchet teeth on the said table to lock the table substantially as herein described.

2. The pair of receiving jaws N, N, with their cavity l, to receive and retain the nail while they are closed, applied and operating in combination with the nail-feeder, and the intermittently rotating die-table, substantially as herein described.

3. The combination of a shaking apparatus for bringing the shells rim-upward and a curved conductor U, for overturning them in their passage through it, applied substantially as described to permit and insure the deposit of the shells crown upward in the dies.

4. The combination of the pincers r, r, and the plunger u, operating as described in relation with the conductor U, to take the shells therefrom and deposit them in the dies.

5. The combination of the discharging plunger X, and the stationary hood Y, having a descending spout Y', with the intermittently rotating die-table J, substantially as and for the purposes set forth.

6. The stop-motion, consisting of a feeling-rod 27, suspended from a spring catch 24, attached to the bar which throws the machine in and out of gear, and operated substantially as described by means of a cam H,

on the main shaft, acting on a spring 33, connected with the said rod, in combination with a stationary stop 26, or its equivalent, substantially as herein described.

- 5 7. The arrangement of the nail-feeding apparatus, the shell-feeding apparatus, the shell-closing punch, the discharging appa-

ratus, and the stop-motion, relatively to the intermittently rotating table, substantially as described.

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Witnesses:

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