(No Model.)

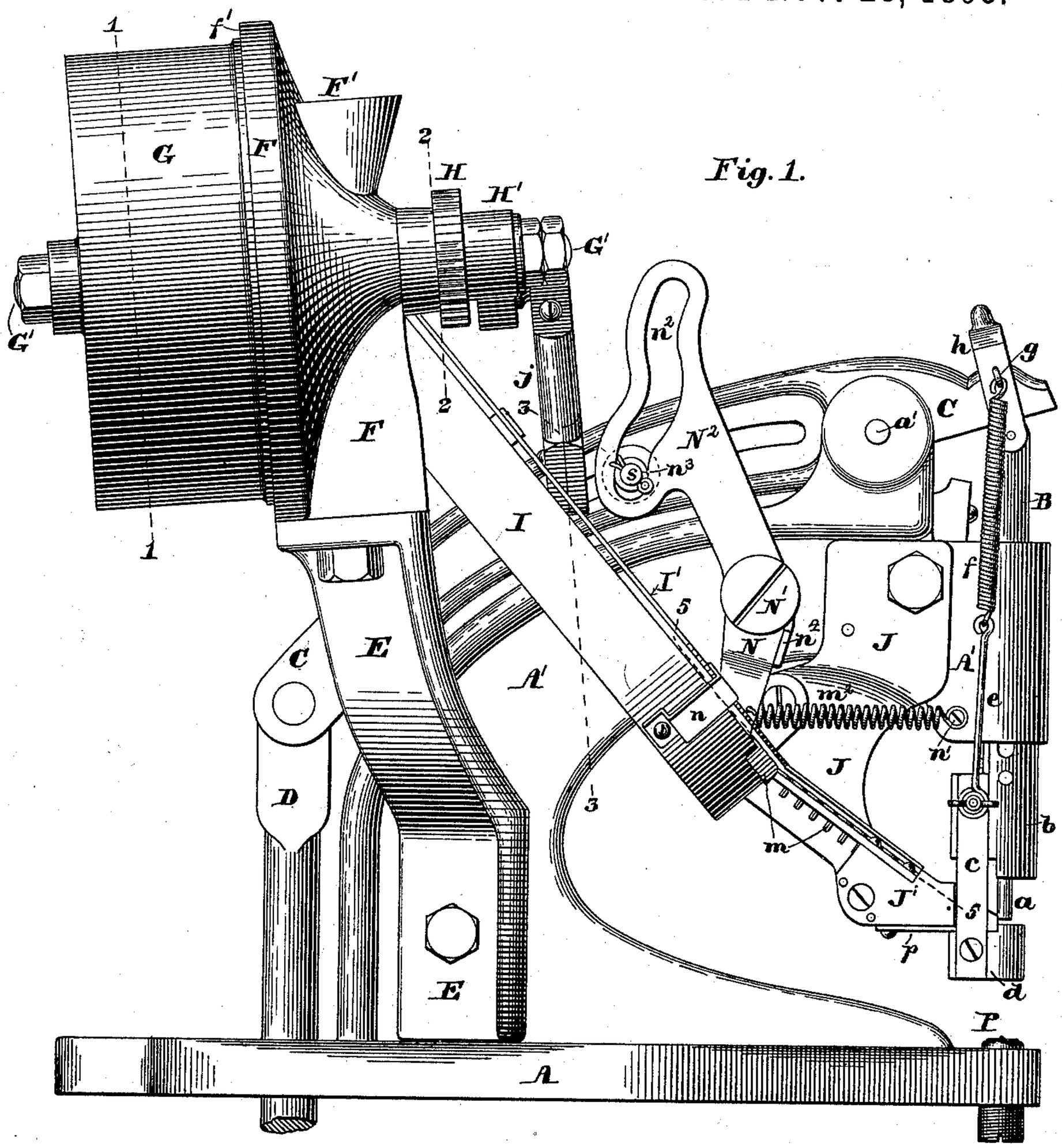
3 Sheets—Sheet 1

# E. M. POPE.

## RIVET SETTING MACHINE.

No. 509,554. Patented Nov. 28, 1893.

*Fig. 1.*




**Witnesses:**

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Herbert E. Lombard.

**Inventor:**

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(No Model.) 3 Sheets—Sheet 2.

# E. M. POPE.

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Fig. 2.

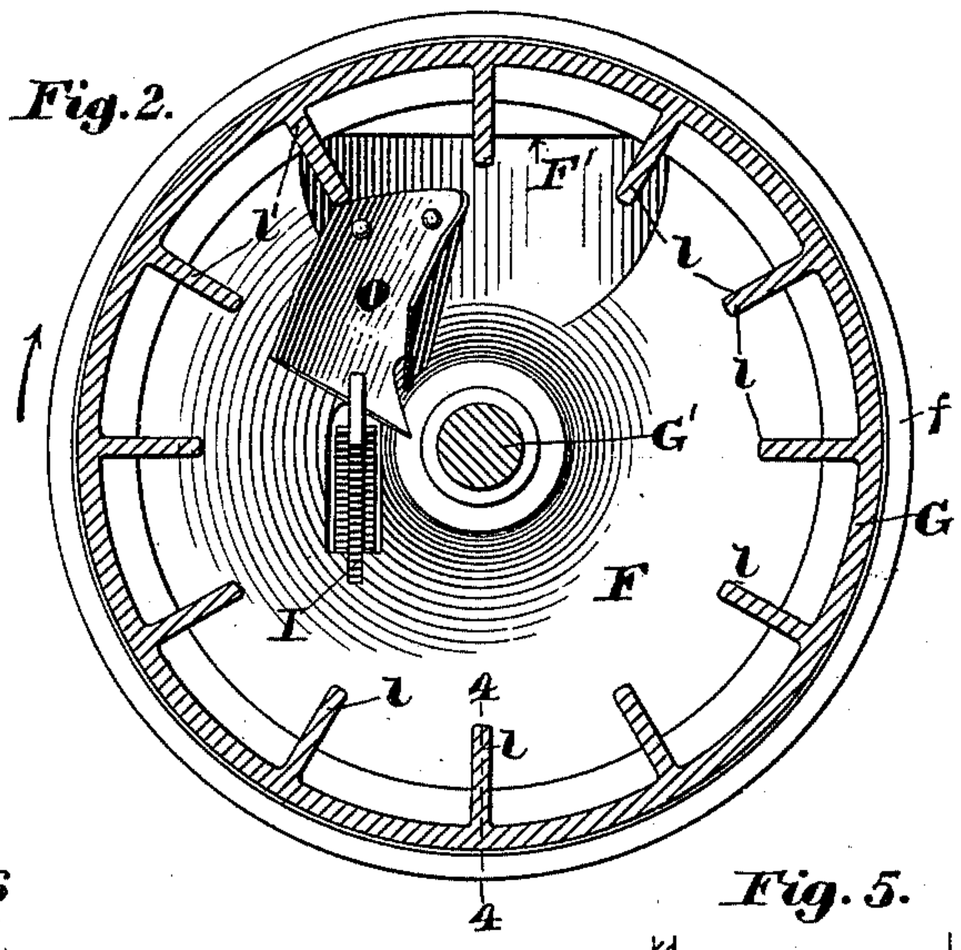


Fig. 6.

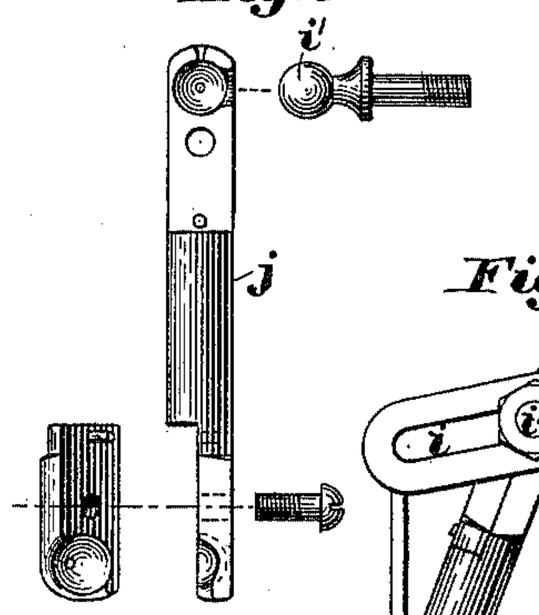


Fig. 5.

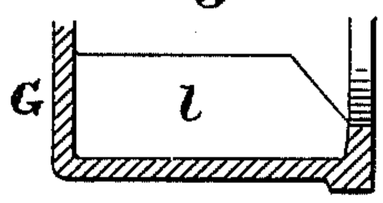


Fig. 3.

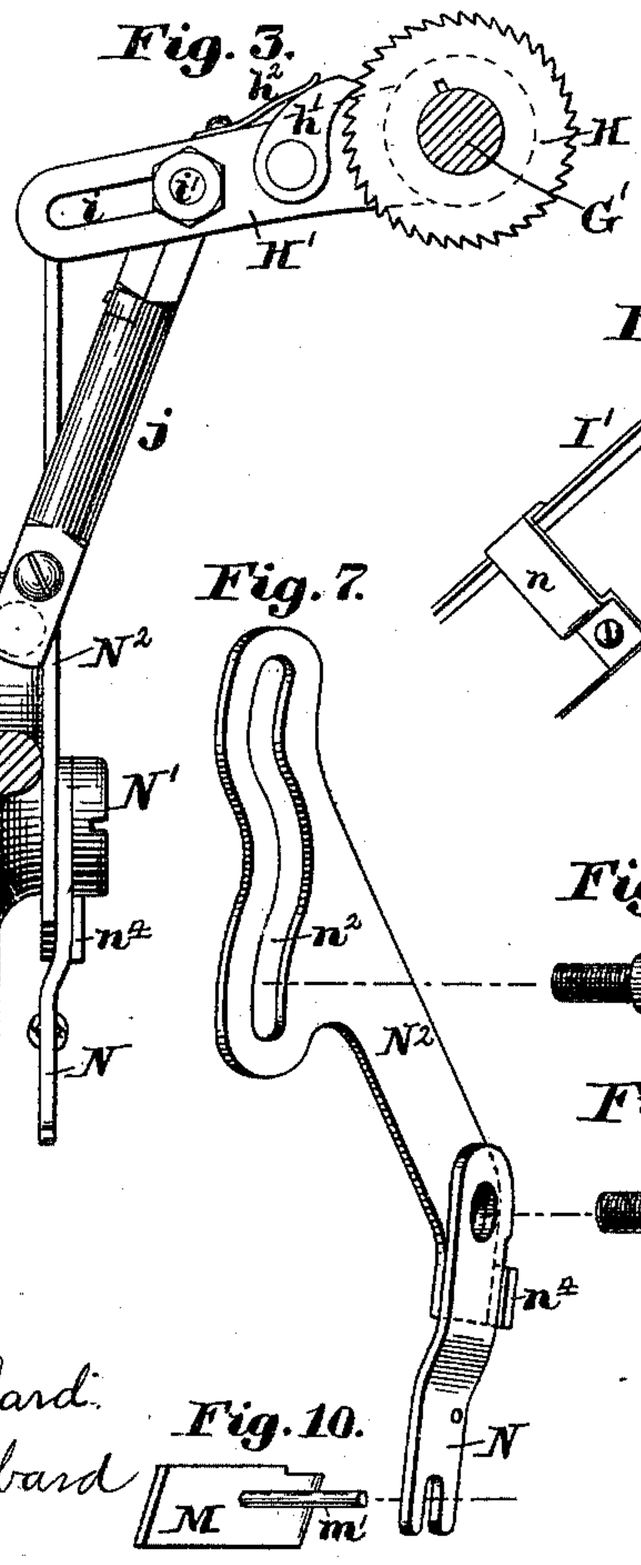


Fig. 4.




Fig. 7.




Fig. 8.


Fig. 9.

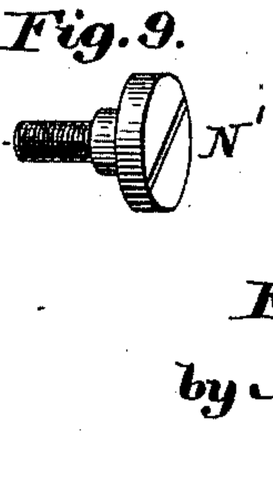


Fig. 10.




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(No Model.) 3 Sheets—Sheet 3.

# E. M. POPE.

## RIVET SETTING MACHINE.

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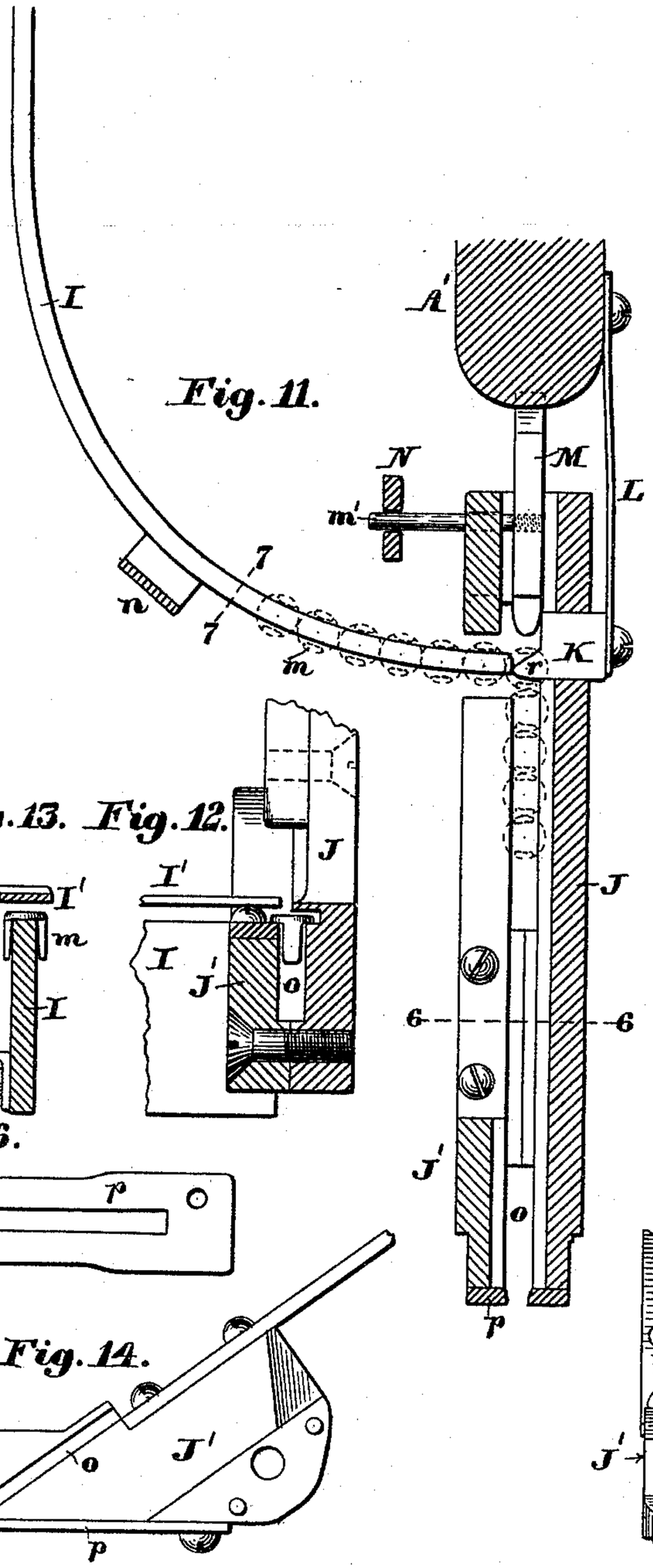


Fig. 11.




Fig. 13. Fig. 12.




Fig. 16.




Fig. 14.

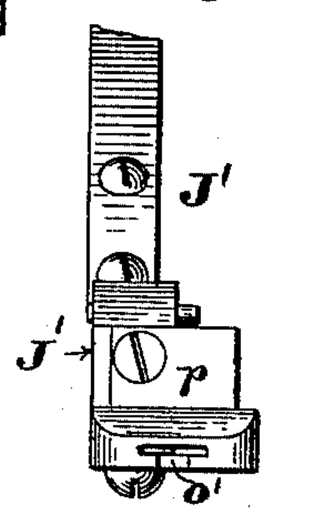


Fig. 15.

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# UNITED STATES PATENT OFFICE.

EVERETT M. POPE, OF QUINCY, MASSACHUSETTS.

## RIVET-SETTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 509,554, dated November 28, 1893.

Application filed February 25, 1893. Serial No. 463,738. (No model.)

*To all whom it may concern:*

Be it known that I, EVERETT M. POPE, of Quincy, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Rivet-Setting Machines, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to rivet setting machines, is especially adapted to setting that class of rivets which have two prongs or shanks to be inserted in the material, and it consists in certain novel features of construction, arrangement and combination of parts, which will be readily understood by reference to the description of the drawings, and to the claims hereinafter contained, and in which my invention is clearly pointed out.

Figure 1 of the drawings is a side elevation of a rivet setting machine embodying my invention. Fig. 2 is a sectional elevation of the hopper, the cutting plane being on line 1 1, on Fig. 1. and looking toward the right of said figure. Fig. 3 is a transverse section through the hopper shaft on line 2. 2. and through the operating lever on line 3. 3. on Fig. 1, and showing the mechanism for intermittently moving said hopper around its axis, in elevation. Fig. 4 is a perspective view of a portion of the upper end of the raceway and the curved guide plates for directing the rivets upon the raceway as they fall from the pockets of the rotating hopper. Fig. 5 is a partial section of the hopper on line 4. 4. on Fig. 2. Fig. 6 represents details, partly in perspective, of the link connecting the operating lever with the pawl carrying lever for operating the hopper. Fig. 7 is a perspective view of the jointed cam lever for operating the rivet feeding plunger. Fig. 8 represents perspective views of the cam truck, and stud for same, carried by the operating lever and acting upon the cam lever to vibrate it. Fig. 9 is a perspective view of the fulcrum pin for said cam lever. Fig. 10. is a perspective view of the rivet feeding plunger. Fig. 11. is a section on line 5. 5. on Fig. 1 and showing parts of the raceway and the stop or cut-off in oblique elevation. Fig. 12 is a transverse section of the lever raceway on line 6. 6. on Fig. 11. and showing a rivet in position therein. Fig. 13. is a transverse section of the upper race-way on line 7. 7. on Fig. 11 and showing a rivet in position thereon. Fig. 14 is an elevation of the inside of one half of the lower raceway. Fig. 15 is a front end elevation of the same, and Fig. 16 is a plan of the lower slotted plate and throat piece of said lower race-way.

In the drawings A is the base of the head of the machine formed in one piece with the goose-neck A′ and constructed to be mounted upon and secured to a column or table, not shown, in any well known manner.

B is the setting plunger mounted in a bearing in the front end of the goose-neck A′ so as to be movable vertically therein, has set therein the setting tool *a*, and has fitted loosely thereon the sleeve *b* to which are secured two springs *c*, only one of which is shown, to the lever ends of which are secured the two halves of the rivet receiving pocket *d* said sleeve and pocket being suspended by the rod *e* from the lower end of the spiral spring *f*, the upper end of which is connected to the screw-eye *g* set in the stirrup *h*, which connects said setting plunger to the operating lever C.

The lever C is pivoted to the goose-neck A′ at *a′*, and has pivoted to the end of its long arm the upper end of the rod D, the lower end of which is pivoted to a suitable treadle, not shown.

E is a stand or bracket bolted to the side of the goose-neck A′, and having bolted to its upper end, or formed in one piece therewith, the fixed hopper head or cover F having a circular rear face made concave and provided with an annular lip *f′* around its edge, and with a funnel like opening F′, through which the rivets to be set are introduced into the hopper G which is firmly secured upon the rear end of the shaft G′, fitted to a bearing in the head F so as to be revoluble therein, and having firmly secured thereto the ratchet wheel H, and loosely mounted thereon the pawl lever H′, as shown in Fig. 1.

The lever H′ has pivoted thereon the pawl *h′* in position to engage with the ratchet H against which it is pressed by the spring $h^2$, and the movable end of said lever has formed therein the slot *i* in which is adjustably secured the ball headed stud *i′* upon the ball of which is mounted one of the socketed ends

of the link *j* the opposite end of which is in like manner connected to the ball like head of the stud *k* set in the operating lever C all as shown in Fig. 3.

The hopper G is a cylindrical cup arranged with its axis in a nearly horizontal position and has formed in its interior a series of radial ribs *l* extending inward from its cylindrical shell, and longitudinally from its closed head to the inwardly projecting annular lip *l'* at its front end as shown in Figs. 2 and 5.

The head F has connected thereto one end of the inclined plate I which forms the raceway down which the rivets *m* slide, with a prong on each side thereof, as shown in full lines in Fig. 13. The upper end of the race plate I projects through a slot in the head F into the interior of the hopper G, and its lower end is bent laterally so that the rivets descending said race-plate turn a quarter circle and when about to leave the lower end of said race plate are moving in a direction at right angles to their movement when leaving the hopper. A guard plate I' is supported a short distance above said race and parallel to its upper edge by the brackets *n n* as shown in Figs. 1, 4, and 11.

J is a stand secured to the goose-neck A' and pendent therefrom, and having bolted thereto the plate J', between which stand and plate is formed a T shaped groove or channel *o*, extending from the lower end of the race-plate I to the pocket *d*, at right angles or nearly so to the extreme lower end of said race-plate I, so that the rivets, when discharged from said race plate I, are moved along said groove *o* with their two prongs in the same vertical plane, parallel to the direction of their movement, as shown in Fig. 12.

The under side of the plate J has secured thereto the slotted plate *p* having formed upon its front end, and in one piece therewith, the upwardly projecting block *p'* which projects over the rear portions of the two halves of the pocket *d* and has cut through it the T shaped throat *o'* through which the rivet is delivered to the pocket in a position directly beneath the setting tool *a*.

K is a stop block fitted to a bearing in the stand J opposite the lower end of the race-plate I and having formed on its inner end a tapered tooth *r* the end of which is normally in contact with the end of said race-plate I against which it is pressed by the spring L all as shown in Fig. 11.

M is a cut-off plunger fitted to a bearing in the stand J, above, or to the rear of, the lower end of the race-plate I, when in its normal position, and provided with the stud *m'* with which the forked lower end of the lever N engages to impart to said plunger a short reciprocating motion. The lever N is fulcrumed on the pin N' and has connected thereto one end of the spring $m^2$, the opposite end of which is secured to the goose-neck at *n'*, the tension of which serves to move the plunger M toward the front of the machine, thereby causing an outward movement of the stop block K, and forcing the rivet in front of said plunger into the channel *o* below said stop block.

$N^2$ is a cam lever fulcrumed upon the pin N' and having formed in its upper end the curved cam slot $n^2$ with which the flanged truck $n^3$, carried by the stud *s* set in the operating lever C, engages to impart to said cam lever a vibratory motion about its fulcrum pin N'. The lever $N^2$ projects a short distance below its fulcrum pin N' and has formed thereon the laterally projecting lug $n^4$ which engages with the front edge of the lever N to move it and the cut off plunger toward the rear of the machine against the tension of the spring $m^2$ when the upper end of said cam lever is moved toward the front of the machine by the action of the truck $n^3$ upon the cam slot $n^2$.

The head F has secured to its inner concave face and partly within the funnel opening F' the curved shield or guiding plate O which serves to direct the rivets toward the race-plate I as they fall from the pockets between the ribs *l l* as the hopper G is intermittently revolved about its axis of motion.

P is the clinching anvil set in the base A in the usual manner.

The operation of my invention is as follows: The several parts being in the positions shown in the drawings and a quantity of rivets of the kind shown in Figs. 1, 11, and 13 being placed in the hopper through the funnel F' they fall into the pockets between the ribs *l*, *l*, at the lower side of the hopper. If the treadle be operated to impart thereto a series of vibrations the hopper will be moved intermittently about its axis in the direction indicated by the arrow on Fig. 2, and the rivets will be carried upward in said pockets until the ribs *l l* upon which they rest have reached to or above the level of the axis of the hopper when they begin to fall from said pockets in doing which some of them fall upon the race plate in position to be caught thereby, while others strike the shield or guide plate O and are directed thereby toward said race plate and are caught thereby, while still others and by far the largest number fall to the lower side of the hopper and are again carried upward by some one of the succeeding ribs *l*. The rivets which fall upon the race plate I with a prong upon each side thereof so as to be retained thereby will slide down said race-plate till the first rivet is arrested by the stop block K. At each upward, and each downward, movement of the treadle and the operating lever C, the cut-off plunger M has imparted thereto a forward and backward movement, by the combined action of the spring $m^2$ and the levers N, $N^2$, and the truck $n^3$ and stud *s*, and if a rivet is in front of said plunger it will be forced down the groove *o*, the stop-block K being retracted to permit the passage thereof by the action of said plunger, or the prong of

the rivet, upon the inclined upper side of the tooth *r*. As the lever N is moved toward the front only by the tension of the spring $m^2$ it follows that if the groove *o* is full of rivets and none are to be discharged or the tube is in any way clogged the plunger M will not be moved forward notwithstanding the cam lever $N^2$ has a positive movement imparted thereto.

It will be seen that the rivets, in passing from the hopper to its position in the channel *o* turn one quarter of a revolution about their axes.

I claim—

1. The combination in a rivet setting machine of the fixed head F provided with the funnel F′; the shaft G′ mounted in a bearing in said head in a horizontal or nearly horizontal position; the hopper G provided with the series of inwardly projecting ribs *l* and firmly secured upon said shaft; the race plate I projecting through said head into said hopper and having its lower portion curved as set forth; the guard-plate I′ supported above said race plate; the stand J J′ provided with the T shaped groove or race-way *o;* the spring pressed stop block K; the cut off plunger M; mechanism substantially as set forth for intermittently reciprocating said plunger; and mechanism having provision for imparting to said hopper a step by step movement about its axis.

2. In a rivet setting machine the combination of two race-ways meeting each other at a right angle or nearly so; the stop block K; the cut off plunger M; the levers N and $N^2$ the latter being provided with the cam slot $n^2$ and the laterally projecting lug $n^4$ and both mounted upon a common fulcrum pin; the spring $m^2$; the cam truck $n^3$; and the vibrating lever C.

3. The combination, in a rivet setting machine, of two race-ways meeting each other at an angle; a spring pressed stop block; a cut off plunger movable endwise in the direction of the length of the lower race-way; a spring for moving said plunger toward the setting tools; and a cam and plunger for moving said lever in the opposite direction against the tension of said spring.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 24th day of February, A. D. 1893.

EVERETT M. POPE.

Witnesses:

N. C. LOMBARD,

WALTER E. LOMBARD.