

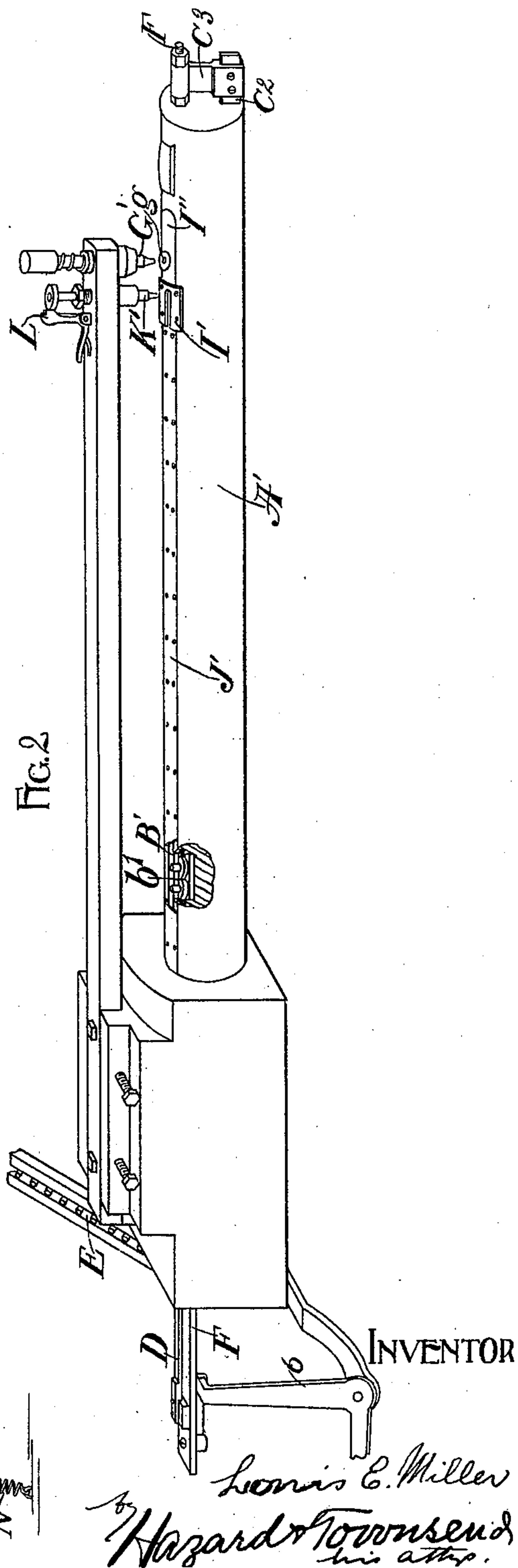
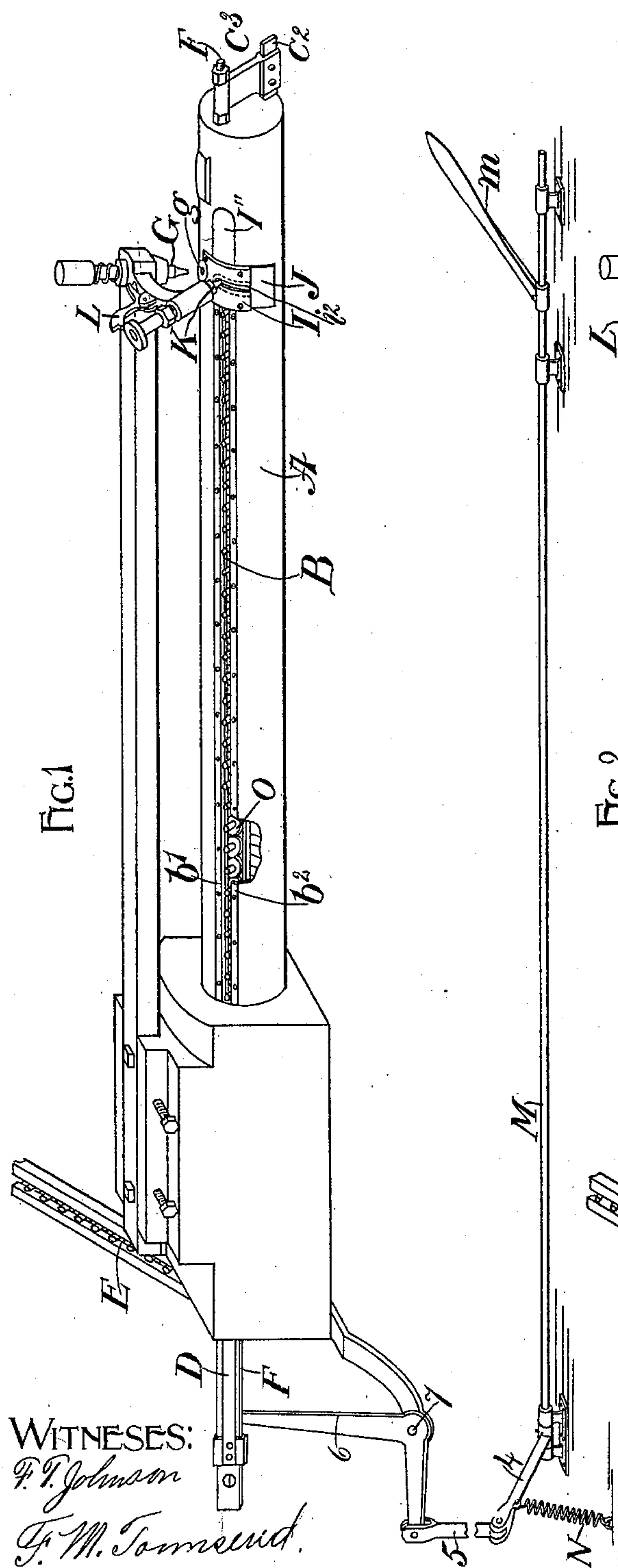
(No Model.)

3 Sheets—Sheet 1.

L. E. MILLER.  
RIVET STICKING MACHINE.

No. 602,139.

Patented Apr. 12, 1898.



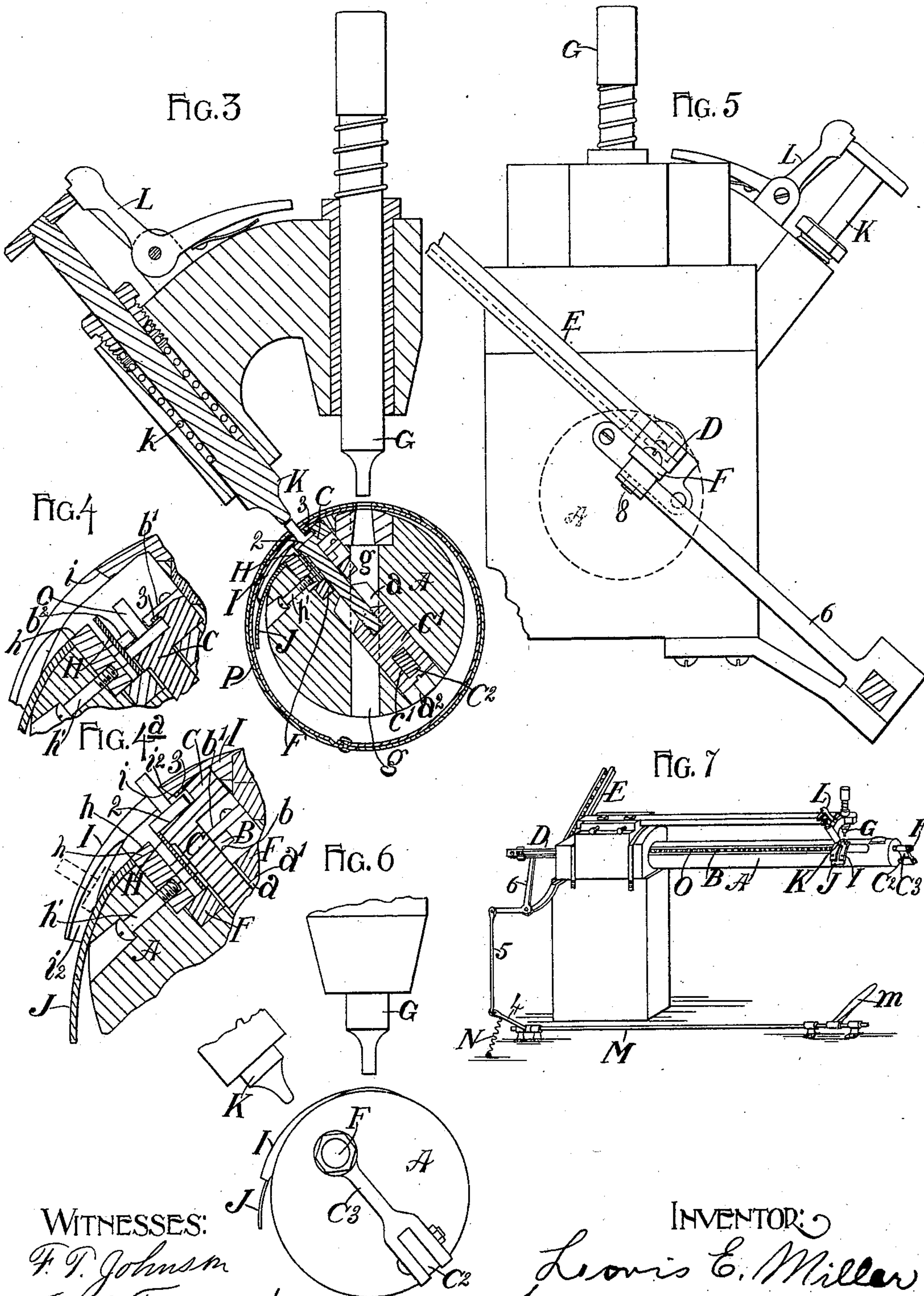
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WITNESSES:  
F. T. Johnson  
F. M. Townsend.

INVENTOR:  
Lewis E. Miller  
by  
Hazard Townsend  
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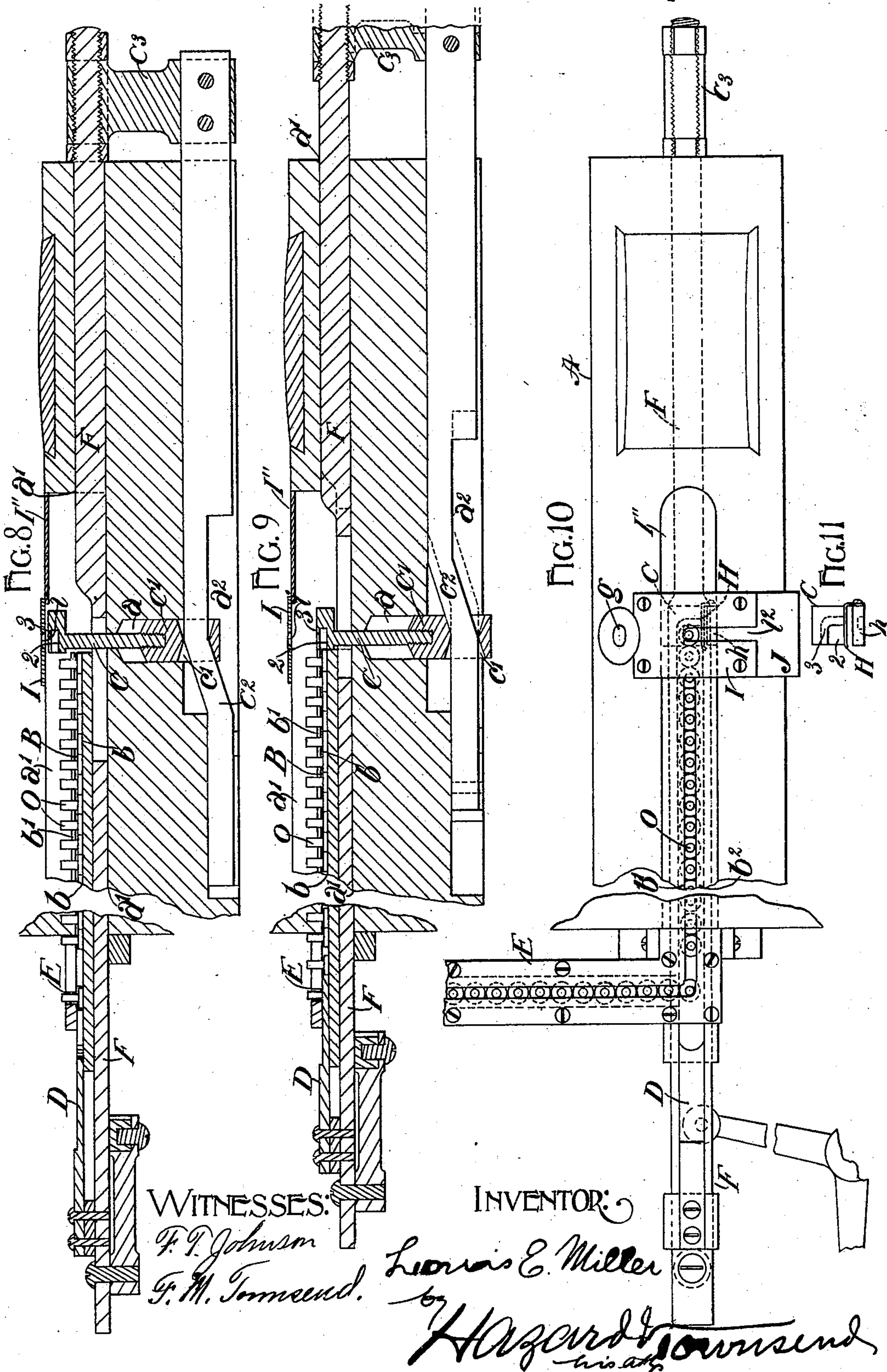
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F. P. Johnson

F. M. Townsend

INVENTOR:

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# UNITED STATES PATENT OFFICE.

LOUIS E. MILLER, OF LOS ANGELES, CALIFORNIA, ASSIGNOR OF ONE-HALF  
TO WILLIAM LACY, JR., AND RICHARD H. LACY, OF SAME PLACE.

## RIVET-STICKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 602,139, dated April 12, 1898.

Application filed February 7, 1896. Serial No. 578,362. (No model.)

*To all whom it may concern:*

Be it known that I, LOUIS E. MILLER, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Rivet-Sticking Machine, of which the following is a specification.

My invention applies to rivet-sticking machines to be used in the manufacture of wrought-iron riveted pipe.

One object of my invention is to avoid these difficulties.

Another object is to provide a small and inexpensive rivet-sticking machine of great effectiveness and of great ease and convenience of operation which will be completely automatic, so that the complete operation of sticking the rivet is the result of one complete movement of a treadle or other lever.

By using this machine the length of each joint of pipe is limited only by the width of sheet that can be had, and the operator at the same time he punches the rivet-hole can stick a rivet in the hole he has punched, thus saving a great deal of time in the manufacture of pipe.

The principle of my invention is applicable both for round seaming and for straight or long seaming.

In the machine as adapted for round seaming it is an object of my invention to space the holes and guide the pipe so that the rivets will be set at uniform distance and the seam will be true—that is, the rivets will all be set in a plane at right angles to the pipe.

My invention comprises the rivet-sticking machine and the several parts and combinations hereinafter described and claimed.

The accompanying drawings illustrate my invention.

Figure 1 is a fragmental perspective view of a rivet-sticking machine embodying my invention as applied for round seaming. Fig. 2 is a fragmental perspective view illustrating the application of my invention in a machine for straight seaming. Fig. 3 is a cross-section cut through the stake, rivet-carrier, rivet-hole punch, and rivet-hole-centering pin of the round-seaming machine. The punch is not sectioned, and the pipe is shown in position with a rivet inserted through one

rivet-hole and with another rivet-hole ready punched, so that the pipe is ready to be turned to remove the rivet from beneath the hole-centering pin and to bring the other rivet-hole above the carrier to receive a rivet. Fig. 4 is an enlarged fragmental detail on same line of section as Fig. 3, but shows the carrier in the position shown in Fig. 9. Fig. 4<sup>a</sup> is an enlarged detail with carrier in the position shown in Fig. 3. Dotted lines show a rivet passing out. Fig. 5 is fragmental elevation of the rear end of the machine. Fig. 6 is a fragmental elevation of the front end of the stake, with lower portions of the punch and the hole-centering pin. Fig. 7 is a perspective view of the machine. Fig. 8 is a fragmental sectional view of the stake. The section is taken along the midline of the rivet-runway. The rivets are shown in position in the runway, but not in section. In this view and in Figs. 1 and 3 the parts are shown in the position occupied when the machine is at rest and after the pipe has been turned to bring a rivet-hole into position to receive a rivet. The position of parts shown in this view is that which obtains both before the movement shown in solid lines in Fig. 9 and after that shown in dotted lines in the same figure. The pipe is shown only in Fig. 3. Fig. 9 is a fragmental section taken on the same line as that of Fig. 8, but showing the parts in position for the rivet-moving means to move the line of rivets, so as to push the end rivet onto the rivet-carrier. Dotted lines indicate the position of the parts when a farther movement of the slide has completed the operation of seating such rivet upon the rivet-carrier. The position thus shown in dotted lines is the one which obtains when the foot-lever which operates the machine is fully depressed, while the position shown in full lines is that which obtains at one moment of the downward movement of the foot-lever. Fig. 10 is a fragmental plan of the round-seaming machine, looking down upon the rivet-runway. Fig. 11 is a plan of the rivet-carrier and the clamping-spring and block.

My newly-invented rivet-sticking machine comprises the combination of the stake A, having a rivet-runway B therealong, means for moving rivets along the runway, a rivet-



carrier C, adapted and arranged for receiving the rivet from the end of such runway and moving it toward the face of the stake, and means for operating such carrier. The means shown for moving the rivets along the runway consist of a plunger or rivet-slide D, arranged at the rear end of the runway to reciprocate into and out of the runway across the mouth of a chute E, through which the rivets are fed into the end of the runway. The rivet slide or plunger D is operated by suitable means which I will hereinafter describe.

The means for operating the rivet-carrier consist of a suitable rivet-carrier block C', provided with a slideway  $c'$ , and the bent slide C<sup>2</sup>, arranged to play through the slideway to reciprocate the carrier-block and the carrier C, which is mounted thereon. Suitable means are provided for operating the bent slide C<sup>2</sup>, and the means shown for this purpose consist in a reciprocating slide F, with which the carrier-slide C<sup>2</sup> is connected by a suitable brace C<sup>3</sup>. This reciprocating slide F extends from end to end of the stake and is operatively connected at its rear end with the rivet plunger or slide D and is also operatively connected with means arranged for reciprocating the slide F. The stake A is provided with the transverse bore  $a$  for the carrier-block and is provided on one side with the slideway  $a'$ , extending from the rear end to the front end of the stake across such cross-bore  $a$ , and is also provided with the guideway  $a^2$ , extending from the front end to and beyond the transverse bore to receive the bent slide C<sup>2</sup>, which is operatively connected with the carrier by suitable means—viz., the carrier-block to reciprocate the carrier. At the front end of the stake the slideway  $a'$  is a round bore and at the cross-bore  $a$  and from there to the rear end of the stake such slideway is a channel. The round-seaming machine is provided with a rivet-hole punch G, arranged vertical, as with ordinary stakes, and the stake is provided with the ordinary bur-hole  $g$ , which, in the stake as shown, passes down through the transverse bore  $a$ , which serves as a guide for the rivet-carrier block C', and such bore  $a$  is arranged at a suitable angle to such bur-hole, so that at the face of the stake the space between the rivet-carrier and the bur-hole will be equal to the distance desired between the rivets.

The rivet-carrier C is provided with a rivet-head seat 2, which is flush with the floor  $b$  of the rivet-runway B when the carrier-block is in its retracted position, and is also provided with a rivet stop and guide 3, arranged to engage the stem of the rivet on the front side and upper side of the carrier—that is to say, upon the side of the carrier opposite the rivet-runway and upon the side of the carrier which is toward the rivet-hole punch.

H is a spring set stationary with relation to the stake at the under side of the path of the carrier and arranged to press upward to-

ward the carrier in the direction of the rivet-hole punch. The outer edge of this spring is practically in the same plane with the rivet-seat 2 of the carrier when the carrier is fully thrown out to stick a rivet. The rivet-seat 2 of the carrier and the rivet stop and guide 3 on the upper side of the carrier opposite the spring are so arranged with relation to each other that when the rivet is seated upon the rivet-seat of the carrier and the carrier is in its retracted position the guide will engage the stem of the rivet, while the lower edge of the rivet-head projects beyond the lower side of the rivet-seat, so that when such carrier is in position and the rivet is pushed thereupon from the rivet-runway the rivet-head will be engaged by the rivet-clamping spring H, as shown in Fig. 4<sup>a</sup>, and the rivet will be clamped between the spring and the upper stop and guide 3 on the carrier until the carrier has been moved sufficiently toward the face of the stake to insert the rivet into the rivet-hole, and when this is done the rivet-seat is flush with the top of the spring and the rivet is above and therefore released from the spring H. The rivet-clamping spring H is fastened to a spring-holding block  $h$ , which is seated in the stake and secured by a screw  $h'$ .

The lower portion of the rivet-runway is wider than the head of the rivet, and guideways  $b'$   $b^2$  are arranged one along each side of the runway to engage the stems of the rivets and hold them in a right line and direct them to and onto the rivet-carrier when the carrier is retracted—that is to say, in its lowest position.

I is a rivet-guide fastened to the stake and arranged above the carrier to allow the stem of the rivet to pass through such guide when the carrier is moved downward. The guide opens downward away from the punch and is closed at its upper end, and the under side of the guide is provided with a beveled face  $i$ , against which the end of the rivet may strike when the rivet is pushed outward by the carrier. This beveled face, the spring, and the upper part of the guide 3 of the carrier are arranged in such relation that when the rivet clamped by the spring is pushed upward by the carrier its end will first engage the beveled face  $i$  of the guide and will thereby be moved downward slightly. The upper end of the guideway  $i^2$  of the guide I is closed and is in exact position to register with the upper edge of the centering-pin and the upper edge of the rivet-hole which has been punched at the moment the pipe is in position for the succeeding rivet-hole to be punched, so that when the pipe is in position for the succeeding hole to be punched the operation of the carrier will serve to force the rivet into the hole which has been punched.

J is a rivet-support arranged along and beneath the rivet-guide and extending downward, as shown in Fig. 3, to carry the rivet below the point where it would drop out of its hole after being inserted therein—that



is to say, to the position in which the stem of the rivet will be horizontal or inverted.

K indicates the rivet-hole-centering pin adapted and arranged to be moved toward 5 and from the stake in the extended path of the rivet-carrier. It reciprocates axially to enter the rivet-hole and to be withdrawn therefrom.  $k$  indicates the spring which forces this pin toward the stake, and when the pipe 10 is placed upon the stake the pin K is spring-pressed against the pipe, so that when a rivet-hole has been punched by the punch G and the pipe turned the pipe P will be engaged by the pin K until the upper edge of the rivet-hole registers with the upper end of the rivet-guideway  $i^2$ , and at that instant the spring-pressed rivet-hole-centering pin K will be forced into such rivet-hole, thus stopping the rotation of the pipe and holding the pipe in 20 position for another rivet-hole to be punched, and also in position for the insertion of the rivet from beneath. Then when the machine is operated to force the rivet up into the rivet-hole in the pipe the end of the rivet-stem will engage the centering-pin and carry it up out of the rivet-hole and thus leave the pipe free to be again turned after the succeeding rivet-hole has been punched. When the pipe is thus turned, it slides the rivet off from the 30 carrier and out from under the centering-pin (which immediately engages the surface of the pipe ready to enter the next rivet-hole when it comes under it) and along the guide and over the rivet-spring and the rivet-support until the succeeding rivet-hole comes beneath the centering-pin. Then the pin enters such hole and the operation just described is repeated.

L indicates a catch for holding the centering-pin away from the stake when it is desired to remove the pipe from the stake or place thereupon a joint of pipe.

M is a rocking shaft provided with the foot-lever  $m$  at the front end of the stake and extending back to the rear of the stake, where 45 it is connected by suitable means 4, 5, 6, 7, and 8 with the reciprocating slide F. A spring N is arranged to hold the rocking shaft in position to hold the slide F fully retracted to the left, and thus to hold the carrier C in its raised position, such as shown in Figs. 3, 4<sup>a</sup>, and 8. The downward movement of the foot-lever against the action of this spring throws the slide F to the right from the position 55 shown in Fig. 8 and into the position indicated in solid lines in Fig. 9, thus to retract the carrier so as to bring its seat flush with the floor of the runway, as shown in Figs. 4 and 9, and a further and final downward movement of the foot-lever operates the slide or plunger D sufficiently to force the rivets forward and seat the front rivet onto the carrier.

In the operation of the machine the chute E will set one rivet at a time in position to 65 enter the runway B, and at each forward movement of the plunger D this rivet is carried forward, this carrying the line of rivets

O forward and seating the front or end rivet, as above stated, upon the carrier. The foot-lever is arranged so that it does not complete 70 its downward movement until the plunger D has moved the line of rivets fully the width of a rivet-head, and there is provision for additional downward movement, so that the movement of the foot-lever is always stopped 75 by the engagement of the rivet with the rivet stop and guide 3 of the carrier.

In practical operation of the round-seaming machine the workman fits the two pipe-joints together ready for round seaming and 80 places them upon the stake and brings the joint or lap of the two ends in place beneath the punch. He then strikes the punch with a hammer and punches a rivet-hole in the pipes. Then he turns the pipes to the left until stopped by the rivet-hole-centering pin K, 85 which enters the rivet-hole as soon as it comes beneath it. The workman then strikes the rivet-hole punch again and at the same movement operates the foot-lever  $m$  with his foot, 90 thus sticking a rivet in the first rivet-hole. Then he relieves the foot-lever and allows the spring N to bring the machine to its first or normal position, and at the same time he turns the pipe and from thence the operation 95 is the same as that just described until the circle of rivets is complete. Then the pipe is withdrawn sufficiently to allow the workman to hammer the rivets and finish the joint.

In the straight-seam machine the rivet-hole 100 punch G' and the rivet-hole-centering pin K' are arranged in line parallel with the stake, and in sticking rivets for straight seaming the operation is the same as that above described, except that instead of turning the 105 pipe the workman pushes the pipe onto the stake the space between two rivet-holes each time a hole is punched and a rivet stuck.

J' indicates a rivet rest and shield above the rivet-runway B' of the straight-seam machine. 110

In the straight-seam machine the rivet-guide I' extends along instead of across the stake, and the rivet-support J is dispensed with, its office being performed by the rivet-rest J'. 115

In both the round and the straight seam machines the punch and the rivet-hole-centering pin are arranged in the plane in which the seam is to be made. In the round seam 120 this plane is at right angles to the stake and in the straight seam it is parallel with the stake.

Now, having described my invention, what I claim as new, and desire to secure by Letters 125 Patent, is—

1. A rivet-sticking machine comprising a stake having a reciprocating rivet-inserting carrier, and a spring-pressed rivet-hole-centering pin adapted and arranged to be moved 130 in the extended path of such carrier, substantially as set forth.

2. In a rivet-sticking machine having a stake and a rivet-carrier within the stake for



moving a rivet toward the face of the stake, a rivet-hole-centering pin adapted and arranged to be moved toward and from the stake in the extended path of such rivet-carrier.

3. In a rivet-sticking machine the combination of the stake; a rivet-hole punch; a rivet-hole-centering pin arranged in a plane with the punch common to the plane in which the seam is to be made; and means for moving a rivet toward such pin along the extended axis thereof.

4. In a rivet-sticking machine the combination of the stake having a rivet-runway therealong; a rivet-carrier arranged at the end of the runway to seat a rivet; a rivet stop and guide at one side of the carrier; means for moving the carrier toward the face of the stake; and a spring connected with the stake and arranged to press against the head of the rivet to force the rivet against the stop and guide and having its upper edge practically flush with the rivet-seat of the carrier when the carrier is fully thrown out to stick a rivet.

5. The combination set forth of the stake provided with a runway along the stake; means for moving rivets along such runway; a reciprocating rivet-inserting carrier arranged at the end of such runway to move in a path transverse to such runway; a reciprocating slide operatively connected with the carrier to reciprocate the same and also operatively connected with the means for moving the rivets along the runway, to operate such means; and means for operating the slide.

6. The combination of the stake; the rivet-guide closed at one end and open at the other end and arranged transverse the stake; the rivet-carrier arranged beneath the closed end of such guide and provided with a seat to seat a rivet; means for moving the carrier toward the guide; a spring arranged to press upon the head of the rivet when thus seated and to force it toward a point below the closed end of the guide; and a stop and guide to prevent the point of the rivet-stem from passing beyond the guide.

7. The combination of the stake; the rivet-head-engaging spring; the rivet-carrier arranged to move back and forth by the side of such spring and provided with a rivet-seat which is brought flush with the outer edge of the spring when the carrier is thrown out to stick a rivet and a rivet-stop arranged to hold the rivet so that its head will engage with the spring while the carrier moves.

8. In a rivet-sticking machine the combination set forth of the stake; the rivet-guide open at one end and closed at the other end; the rivet-carrier adapted and arranged to re-

ceive and seat a rivet and to move it upward toward the closed end of the rivet-guide; means for retaining the rivet on the carrier-seat while it is moving toward the rivet-guide; a rivet-support arranged along and beneath the guide and sloping downward from such carrier; and the means for operating the carrier.

9. In a rivet-sticking machine the combination set forth of the stake; the rivet-runway along the stake; a chute for supplying the runway with rivets; a plunger for moving the rivets along the runway; a rivet-carrier at the end of the runway; means for reciprocating the rivet-carrier transverse the runway; a slide connected with such means and with the rivet-moving plunger to operate them, and means for reciprocating the slide.

10. In a rivet-sticking machine the combination set forth of the stake; the rivet-runway along the stake; a chute for supplying the runway with rivets; a plunger for moving the rivets along the runway; a rivet-carrier at the end of the runway; means for reciprocating the rivet-carrier transverse the runway; a slide connected with such means and with the rivet-moving plunger to operate them; means for operating the slide; a rivet-hole punch; and the reciprocating rivet-hole-centering pin arranged in a common plane with the punch and the seam to be riveted.

11. The combination of the stake; the rivet-guide having on its under side a beveled face to receive the end of the rivet-stem; a rivet-carrier arranged beneath the beveled face of the guide and provided with a seat to seat the head of the rivet; a spring arranged to press upon the head of the rivet when thus seated and to force it toward a point below the beveled face of the guide; and the stop and guide arranged to prevent the end of the rivet-stem from passing beyond such point.

12. In a rivet-sticking machine the combination of the stake provided with a transverse bore and provided on one side with a channel extending from such bore to the rear end of the stake, and with a slideway extending from end to end of the stake, and also provided with a guideway extending from the front end to and beyond the transverse bore; a slide arranged in the slideway; the rivet-carrier arranged in the transverse bore; and the bent slide operatively connected with the carrier by suitable means to cause its reciprocation in the transverse bore, substantially as set forth.

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Witnesses:

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