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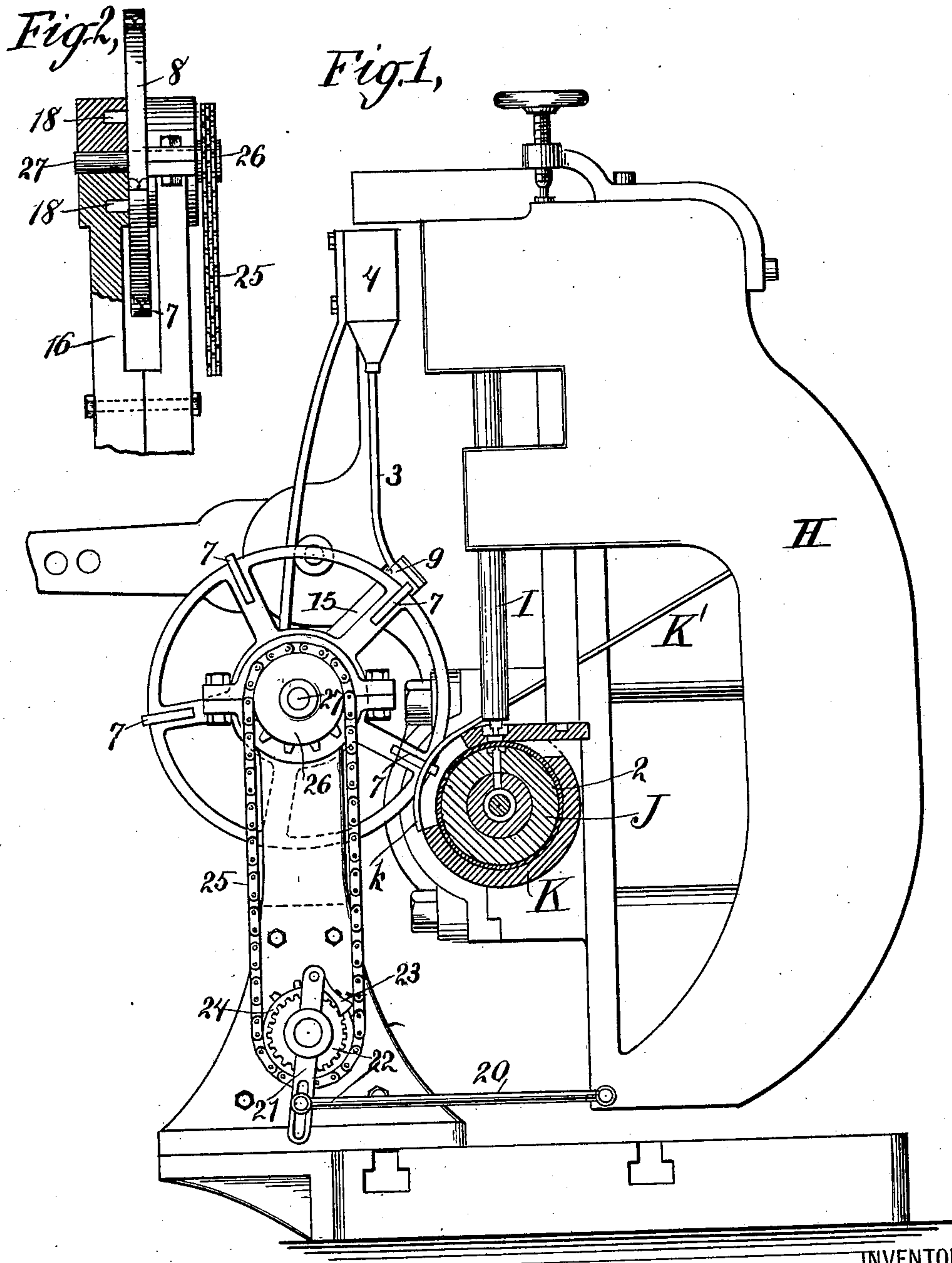
Patented July 2, 1901.

F. W. STAFF.
RIVET FEEDING APPARATUS.

(Application filed Feb. 19, 1901.)

2 Sheets—Sheet 1.

(No Model.)



WITNESSES:

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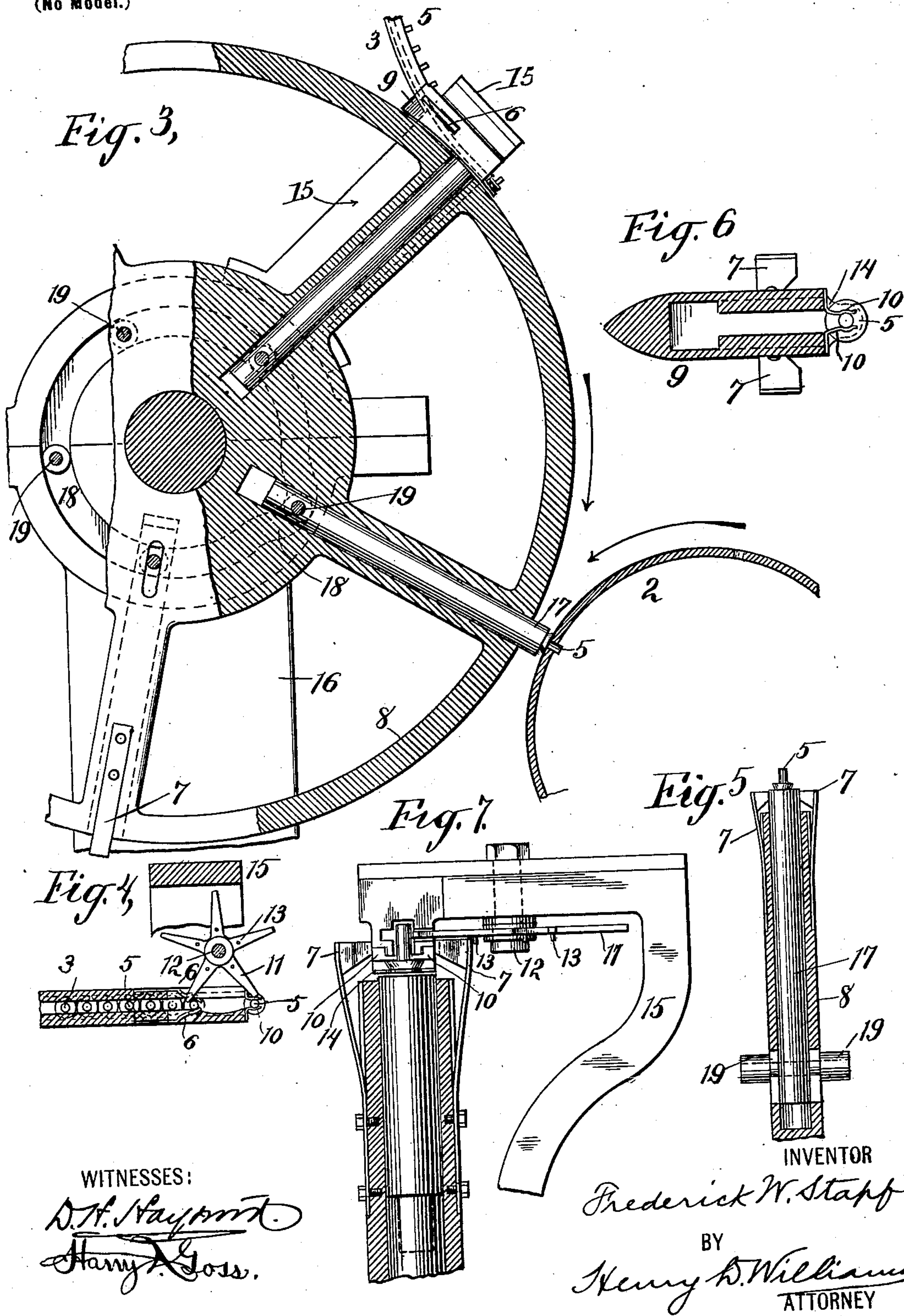
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UNITED STATES PATENT OFFICE.

FREDERICK W. STAPF, OF BROOKLYN, NEW YORK, ASSIGNOR TO JOHN A. WILBUR, OF BOROUGH OF MANHATTAN, NEW YORK, N. Y.

RIVET-FEEDING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 677,711, dated July 2, 1901.

Application filed February 19, 1901. Serial No. 48,027. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK W. STAPF, a citizen of the United States, and a resident of the borough of Brooklyn, in the city of New York, State of New York, have invented new and useful Improvements in Rivet-Feeding Apparatus, of which the following is a specification, reference being had to the accompanying drawings, forming part thereof.

This invention relates to rivet-feeding apparatus; and it consists in the provision of improved automatic means for inserting the rivets singly into rivet-holes formed in pipes or blanks.

According to my invention a carrier is provided which receives the rivets singly and conveys them to the point of insertion.

My invention also consists in the provision of a chute for the rivets and means for delivering the rivets singly from the chute to the carrier.

My invention further consists in means for discharging the rivets from the carrier at the point of insertion, and thereby inserting them in the pipe or blank; also, the provision of a separator for positively forcing the rivets from the chute into position to be engaged by the carrier; also, the provision of one or more clamps upon the carrier and a spreader for opening them to receive the rivets.

My invention further consists in various improvements in construction and combinations of parts.

I will now describe a construction of rivet-feeding apparatus embodying my invention illustrated in the accompanying drawings and will thereafter point out the novel features in claims.

Figure 1 is an elevation, partly in section, of a portion of a spiral-jointed pipe-making machine, showing a rivet-feeding apparatus embodying my invention combined therewith. Fig. 2 is an end elevation, partly in section, of the rivet-carrier and adjacent parts. Fig. 3 is an enlarged part side elevation and part section of the rivet-carrier and adjacent parts. Fig. 4 is a sectional view of the spreader and lower end of the rivet-chute, also showing the separator. Fig. 5 is a section of a portion of the rivet-carrier, showing the jaws of a clamp opened by a plunger to

deliver a rivet to the pipe. Fig. 6 is a section, further enlarged, of the spreader and clamping-jaws, the clamping-jaws being held open by the spreader. Fig. 7 is an end elevation of the same, also showing the separator and other parts.

The pipe-making machine partly illustrated in Fig. 1 is the well-known machine described in patent to John B. Root, No. 271,740, of February 6, 1883, and the rivet-feeding apparatus shown in the drawings is constructed for feeding the rivets to a spiral-jointed pipe while it is being formed and made in such a machine. The pipe 2 is formed upon the mandrel J and held thereon by the cylindrical former K, and the punch I punches the rivet-holes therein. The oscillating frame H of the machine oscillating upon the axis of the mandrel imparts motion to my rivet-feeding apparatus.

The rivet-feeding apparatus is constructed to separately insert the rivets as required into the successive rivet-holes in the pipe 2 as the pipe is intermittently rotated with or upon the mandrel J, the rivets being inserted therein at the opening k in the cylindrical former K, where they have formerly been inserted by hand.

A hopper is provided which is charged with rivets and from which they are supplied to a chute 3, down which they are fed by gravity. The particular construction of the hopper forms no part of the present invention, and any well-known construction may be employed adapted to supply the rivets to the chute with their heads engaged therein. I have therefore merely indicated the outline of such a hopper 4, and from this hopper the rivets feed downwardly through the chute, with their heads engaged by the walls of the chute 3. The rivets form a column in this chute and are sustained therein by spring-fingers 6 at the lower end of the chute. (See Fig. 5.) From the chute 3 the rivets are delivered into rivet-carrying clamps, each formed of spring clamping-jaws 7 7, held in a rotating carrier 8, secured upon a shaft 27, fitted to rotate in bearings at the upper end of a standard 16, and this carrier is shown as provided with five of such clamps. For the purpose of opening the jaws 7 of the clamp

I have provided a spreader 9, located in the path of the jaws and at the bottom of the chute 3 and shown as secured to an arm or bracket 15, projecting upwardly from the standard 16, and this spreader is shown as tapering at its rear end, which is the end thereof presented to the jaws, and the front portions of the jaws are inclined so that the jaws are opened by the spreader (see Fig. 6) and held open until they move clear thereof.

For the purpose of delivering the rivets from the chute 3 to the jaws 7 I have provided a separator which separately and successively forces the rivets out of the spring-fingers 6 at the bottom of the chute and into spring-fingers 10 at the front end of the spreader 9. These last-mentioned fingers 10 need only be sufficiently strong to hold a single rivet, whereas the spring-fingers 6 at the bottom of the chute 3 should be sufficiently strong to sustain the column of rivets therein. This separator consists of a star-wheel 11, fitted to rotate on a stud 12 and located at one side of the chute 3, with its arms projecting into the chute. This star-wheel 11 is actuated by one of the jaws 7, such actuation being shown as effected through pins 13, projecting from the lower face of the star-wheel and successively engaged by the jaw 7 on the same side of the spreader 9 at which the star-wheel is located as this jaw is moving in contact with the spreader. When the separator is thus actuated, one of its arms will engage the bottom rivet in the column of rivets in the chute and will force it out of the chute-fingers 6 and into the spreader-fingers 10, and it will be held therein by light pressure and supported on the shelf 14, ready to be taken up by the rivet-carrying jaws 7. As the rivet-carrying jaws 7 move clear of the spreader 9 they will spring toward each other and will close upon and grasp the rivet 5, lightly held in the spreader-fingers 10, and will firmly seize the rivet and force it out of the spreader-fingers 10 and carry it forward toward the pipe 2. As the rivet-carrying jaws 7 approach the pipe 2 the pipe is also rotated so that the rivet-hole therein in which the rivet is to be inserted approaches the rivet-carrying jaws, and as the rivet thus approaches the hole into which it is to be inserted the plunger 17 within the rivet-carrying jaws and against the outer face of which the head of the plunger rests is moved outwardly and forces the rivet out of the jaws and into the rivet-hole. This actuation of the plunger 17 is shown as accomplished by stationary cam-grooves 18, formed in the bearings of the rotating carrier 8, at each side thereof, and engaging cam-rollers 19, mounted on studs projecting outwardly from the plunger 17, at the inner end thereof, these studs passing through slots in the sides of the carrier. The cam-groove 18 is properly shaped to cause this outward movement of the plunger 17, and thereby to insert the rivet in its proper rivet-hole in the pipe and thereafter to return the plunger to nor-

mal position, and thus to permit the rivet-carrying jaws 7 to close again.

The actuation of the rivet-carrier is shown as effected from the oscillating frame H of the pipe-making machine through a connecting-rod 20, pivotally connected at one end to such oscillating frame and at the other end to the oscillating lever 21, this latter connection being slotted for adjustment and the oscillating lever 21 being pivotally mounted upon the standard 16 concentrically with a ratchet-wheel 22 thereon and having at its upper end a pawl 23 engaging such ratchet-wheel. The intermittent rotation imparted thereby to the ratchet-wheel 22 is transmitted to the rivet-carrier 8 through a sprocket-wheel 24, secured to the ratchet, a chain 25, and a sprocket-wheel 26, secured upon the shaft 27 of the rivet-carrier.

It is evident that various modifications may be made in the construction shown and above particularly described within the spirit and scope of my invention.

What I claim, and desire to secure by Letters Patent, is—

1. In a pipe-making machine, the combination of a rivet-carrier, a pipe-carrier, and means for rotating the rivet-carrier and the pipe-carrier toward each other to insert a rivet in a rivet-hole of the pipe, substantially as set forth.
2. In a pipe-making machine the combination of a rivet-carrier, means for delivering rivets singly to the rivet-carrier, a pipe-carrier, and means for rotating the rivet-carrier and the pipe-carrier toward each other to insert a rivet in a rivet-hole of the pipe, substantially as set forth.
3. In a pipe-making machine, in combination, a rivet-carrier having one or more rivet-holding clamps thereon, means for delivering the rivets singly to the clamp or each of the clamps, a pipe-carrier, means for rotating the rivet-carrier and the pipe-carrier toward each other to insert a rivet in a rivet-hole of the pipe, and means for forcing a rivet out of the clamp or each of the clamps and into a rivet-hole in the pipe, substantially as set forth.
4. In a rivet-feeding apparatus, the combination of a carrier, having one or more rivet-holding clamps thereon, a spreader for temporarily opening the clamp or each of the clamps for the reception of a rivet, and means for delivering the rivets into position to be separately engaged by the clamp or clamps as the clamp or each of the clamps is closed after having been opened by the spreader, substantially as set forth.
5. In a rivet-feeding apparatus, the combination of a chute, a carrier having one or more rivet-holding clamps thereon, a spreader constructed to temporarily open the clamp or each of the clamps for the reception of a rivet, and a holder arranged to separately receive the rivets from the chute and arranged to hold the rivets, one at a time, in position to be separately engaged upon the closing of the clamp

or one of the clamps at a time after having been opened by the spreader, substantially as set forth.

6. In a rivet-feeding apparatus, the combination of a chute, a carrier, a holder constructed to separately hold the rivets in position to be engaged by the carrier and a separator constructed to convey the rivets separately from the chute to the holder, substantially as set forth.

7. In a rivet-feeding apparatus, the combination of a chute, a carrier having one or more rivet-holding clamps thereon, a spreader for temporarily opening the clamp or each of the clamps for the reception of a rivet, and a separator constructed to convey the rivets singly from the chute into position to be engaged by the clamp or one of the clamps as the clamp or each of the clamps is closed after having been opened by the spreader, substantially as set forth.

8. In a rivet-feeding apparatus, the combination of a chute, a carrier having one or more rivet-holding clamps thereon, a spreader constructed to temporarily open the clamp or each of the clamps for the reception of a rivet, a holder constructed to separately hold the rivets in position to be engaged upon the closing of the clamp or one of the clamps at a time after having been opened by the spreader, and a separator constructed to separately convey the rivets from the chute to the holder, substantially as set forth.

9. In a rivet-feeding apparatus, the combination of a chute, a carrier having one or more rivet-holding clamps thereon, a spreader constructed to temporarily open the clamp or clamps, a holder for retaining rivets in the chute, a second holder constructed to separately hold the rivets in position to be engaged upon the closing of the clamp or each of the clamps, and a separator for separately conveying the rivets from the first-mentioned holder to the last-mentioned holder, substantially as set forth.

10. A rivet-feeding apparatus comprising a rotating carrier and means for actuating the same, a plurality of rivet-holding clamps thereon having jaws constructed to close upon and engage the rivets, means for presenting the rivets to the jaws and means for discharging the rivets from the jaws, substantially as set forth.

11. In a rivet-feeding apparatus the combination of a rotating carrier, means for actuating the same, a plurality of rivet-holding clamps thereon, means for separately opening the clamps and separately holding the rivets in position to be engaged upon the reclosing of the clamps, and means for discharging the rivets from the clamps, substantially as set forth.

12. In a rivet-feeding apparatus, the combination of a rotating carrier and means for actuating the same, a plurality of rivet-holding clamps on the carrier, a spreader located in the path of the clamps, means for deliver-

ing the rivets into position to be separately engaged by the clamps as the clamps are successively moved clear of the spreader, and means for discharging the rivets from the clamps, substantially as set forth.

13. In a rivet-feeding apparatus, the combination of a chute, a rotating carrier, and means for actuating the same, a plurality of rivet-holding clamps on the carrier, a spreader located in the path of the clamps, a holder arranged to separately receive the rivets from the chute and separately hold the rivets in position to be engaged by the clamps as the clamps are successively moved clear of the spreader, and means for discharging the rivets from the clamps, substantially as set forth.

14. In a rivet-feeding apparatus, the combination of a chute, a rotating carrier, and means for actuating the same, a plurality of rivet-holding clamps on the carrier, a separator constructed so as to be actuated by the clamps, successively, to convey the rivets separately from the chute into position to be engaged by the clamps, and means for discharging the rivets from the clamps, substantially as set forth.

15. In a rivet-feeding apparatus, the combination of a chute, a rotating carrier, and means for actuating the same, a plurality of rivet-holding clamps on the carrier, a spreader located in the path of the clamps, a separator constructed so as to be actuated to convey the rivets separately from the chute into position to be engaged by the clamps as the clamps are successively moved clear of the spreader, and means for discharging the rivets from the clamps, substantially as set forth.

16. In a rivet-feeding apparatus, the combination of a chute, a rotating carrier, and means for actuating the same, a plurality of rivet-holding clamps on the carrier, a spreader located in the path of the clamps, a holder for retaining rivets in the chute, a second holder located so as to separately hold the rivets in position to be engaged by the clamps as the clamps are successively moved clear of the spreader, a separator constructed so as to be actuated by the clamps, successively, to convey the rivets separately from the first-mentioned holder to the last-mentioned holder, and means for discharging the rivets from the clamps, substantially as set forth.

17. A rivet-feeding apparatus comprising a carrier, and means for actuating the same, a plurality of spring rivet-holding clamps thereon, a spreader located in the path of the clamps and adapted to successively open the same, and means for separately presenting the rivets in position to be engaged by the spring-clamps as they are successively closed, substantially as set forth.

18. A rivet-feeding apparatus comprising a carrier and means for actuating the same, a plurality of spring-clamps thereon, each adapted to hold a rivet, a spreader located in

the path of the clamps and adapted to successively open the same, a chute and a separator for separately conveying the rivets from the chute into position to be engaged by the
5 spring-clamps as they are successively closed, substantially as set forth.

19. A rivet-feeding apparatus comprising a carrier and means for actuating the same, a plurality of spring rivet-holding clamps thereon, a spreader located in the path of the
10 clamps and adapted to successively open the same, a chute, a holder for retaining rivets in the chute, a second holder located so as to separately hold the rivets in position to be
15 engaged by the clamps as they are successively closed, and a separator for separately conveying the rivets from the first-mentioned holder to the last-mentioned holder, substantially as set forth.

20. A rivet-feeding apparatus comprising a rotating carrier, means for actuating the same, a plurality of rivet-holding clamps thereon, means for separately presenting the rivets to the clamps, discharging-plungers, one for
25 each clamp, constructed to open the jaws of the clamp and force the rivet out of the same, and means for actuating each of the plungers at a predetermined point in the revolution of the carrier, substantially as set forth.

21. A rivet-feeding apparatus comprising a rotating carrier, means for actuating the same, a plurality of spring rivet-holding clamps thereon, a spreader located in the path of the
35 clamps and adapted to successively open the same, means for separately presenting the rivets in position to be engaged by the spring-clamps as they are closed after having been opened by the spreader, discharging-plungers, one for each clamp constructed to open
40 the jaws of the clamp and force the rivets out of the same, and means for actuating each of the plungers at a predetermined point in the revolution of the carrier, substantially as set forth.

22. In a rivet-feeding apparatus, in combination, a rotating carrier having thereon a plurality of spring rivet-holding clamps each consisting of the spring-jaws 7, 7, means for successively opening the jaws to separately
45 receive the rivets and for separately presenting the rivets in position to be engaged by the jaws as they are closed, discharging-plungers 17, one for each clamp, cam-rollers 19 thereon and cams 18 cooperating therewith,
55 substantially as set forth.

23. In a rivet-feeding apparatus, in combination, a rotating carrier having thereon a

plurality of rivet-holding clamps, each consisting of spring-jaws 7, 7, a spreader 9 located in the path of the jaws and constructed
60 to open the same, means for separately presenting the rivets in position to be engaged by the jaws as they move clear of the spreader, discharging-plungers 17, one for each clamp, the outer ends of which are located within
65 the jaws and which are movable outwardly to force the rivets out of the jaws, and means for actuating the plungers at a predetermined point in the revolution of the carrier, substantially as set forth. 70

24. In a rivet-feeding apparatus, in combination, a rotating carrier having thereon a plurality of rivet-holding clamps each consisting of the spring-jaws 7, 7, a spreader 9 located in the path of the jaws and constructed
75 to open the same, a chute 3 having its delivery end at the spreader, a spring-holder 6 for retaining rivets in the chute, a second spring-holder 10 located so as to separately hold the rivets in position to be engaged by the jaws
80 as they move clear of the spreader, a rotating separator constructed to be successively actuated by the jaws 7 to separately convey the rivets from the spring-holder 6 to the spring-holder 10, and means for discharging
85 the rivets from the jaws at a predetermined point in the revolution of the carrier, substantially as set forth.

25. In a rivet-feeding apparatus, in combination, a rotating carrier having thereon a
90 plurality of rivet-holding clamps each consisting of the spring-jaws 7, 7, a spreader 9 located in the path of the jaws and constructed to open the same, a chute 3 having its delivery end at the spreader, a spring-holder 6 for
95 retaining rivets in the chute, a second spring-holder 10 located so as to separately hold the rivets in position to be engaged by the jaws as they move clear of the spreader, the rotating separator 11 constructed to be success-
100 sively actuated by the jaws 7 and having arms adapted to engage the lower rivet in the spring-holder 6 and move the same into the spring-holder 10, and means for discharging
105 the rivets from the jaws at a predetermined point in the revolution of the carrier, substantially as set forth.

Signed at New York, N. Y., this 11th day of February, 1901.

FREDERICK W. STAPF.

Witnesses:

JOHN A. WILBUR,
HENRY D. WILLIAMS.