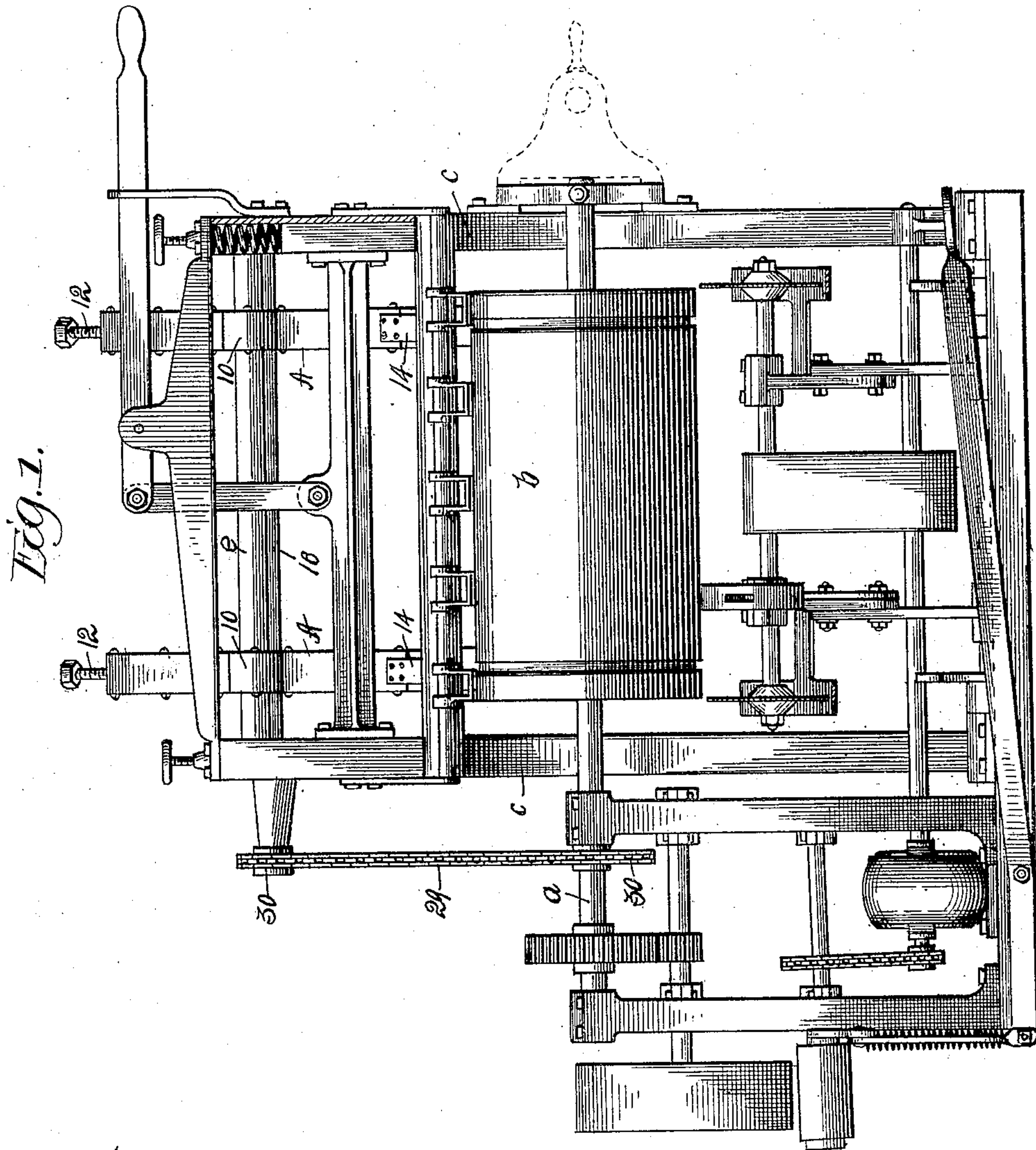


W. J. OTT.
AUTOMATIC NAILER.
APPLICATION FILED JUNE 13, 1908.

982,854.

Patented Jan. 31, 1911.

3 SHEETS—SHEET 1.



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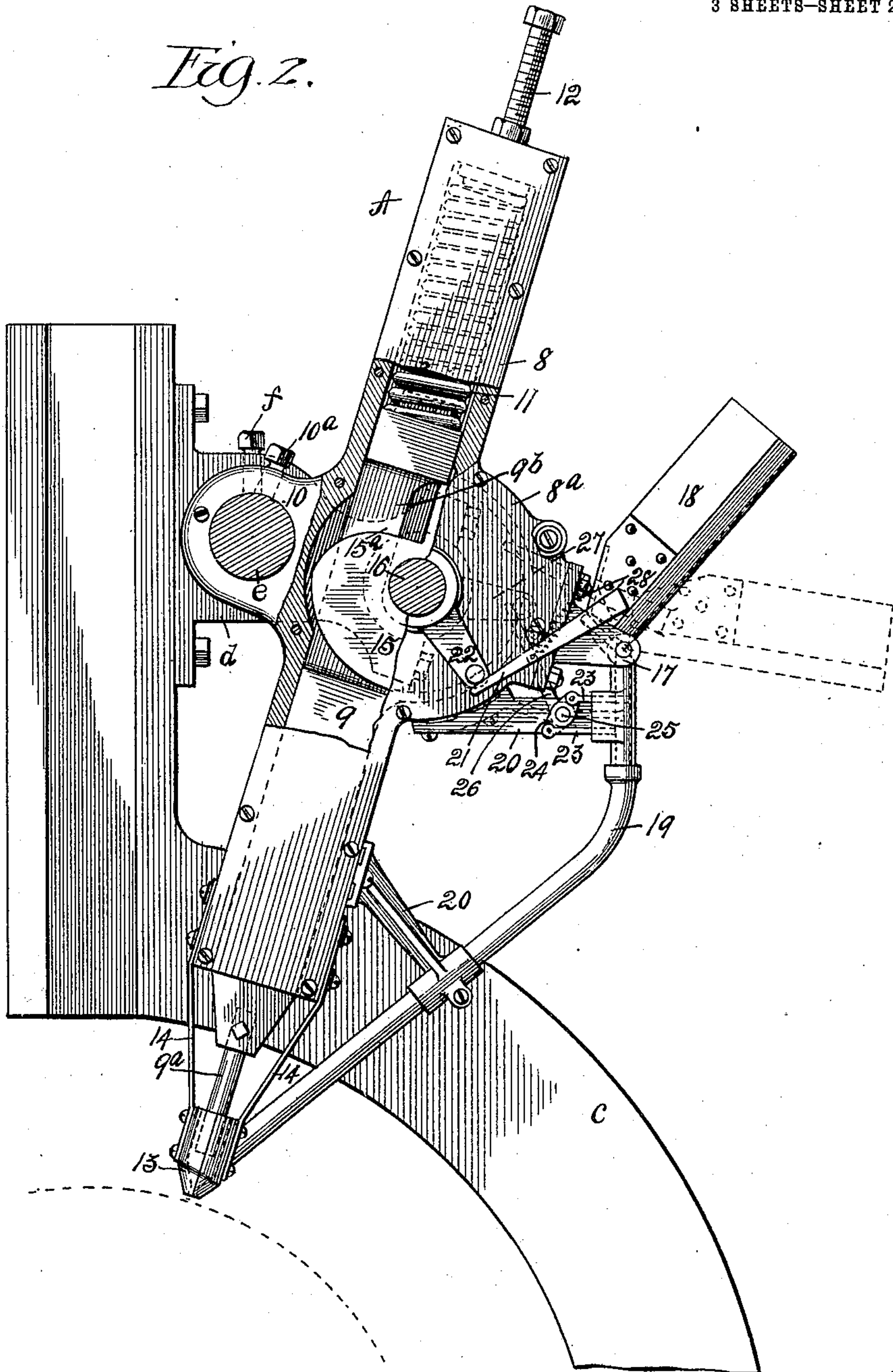
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3 SHEETS—SHEET 2.

Fig. 2.



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3 SHEETS—SHEET 3.

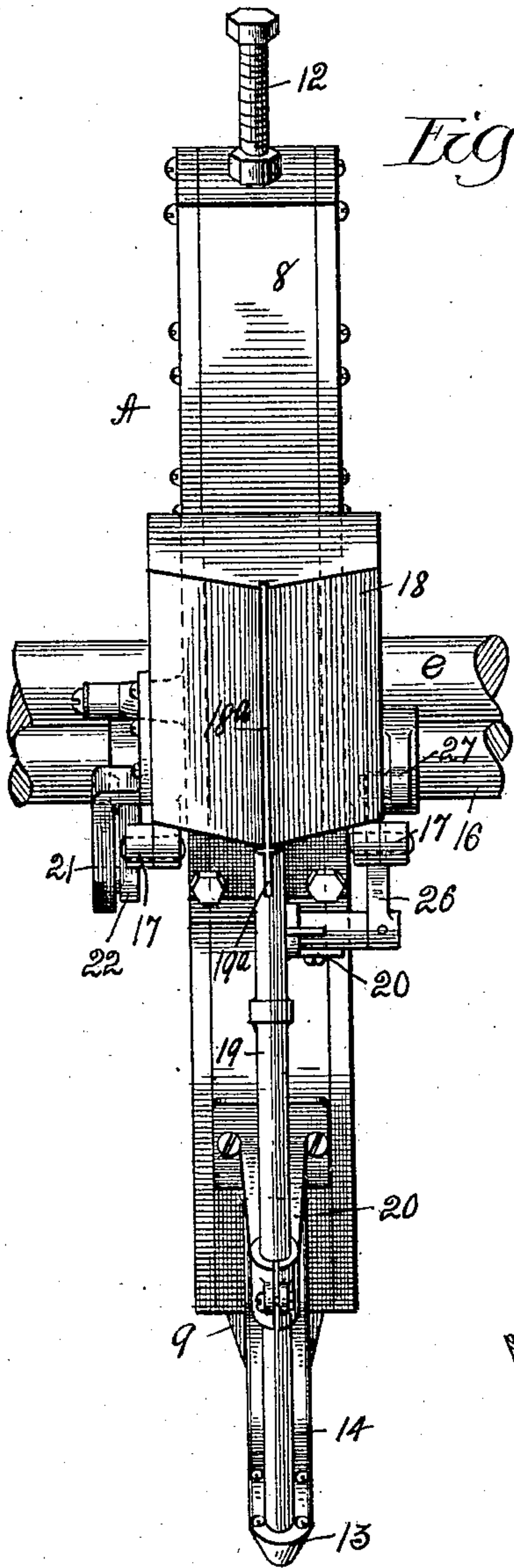


Fig. 3.

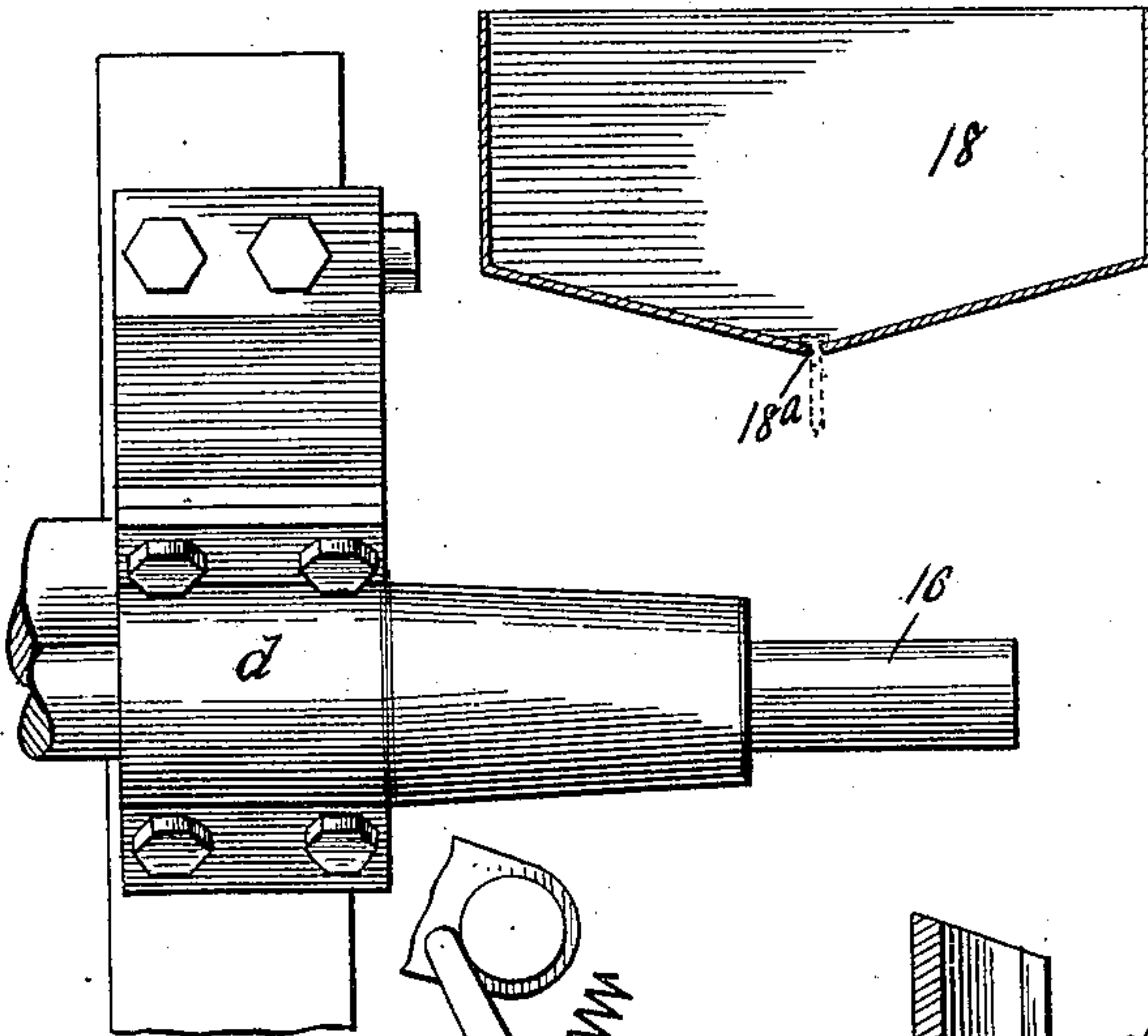


Fig. 4.

Fig. 5.

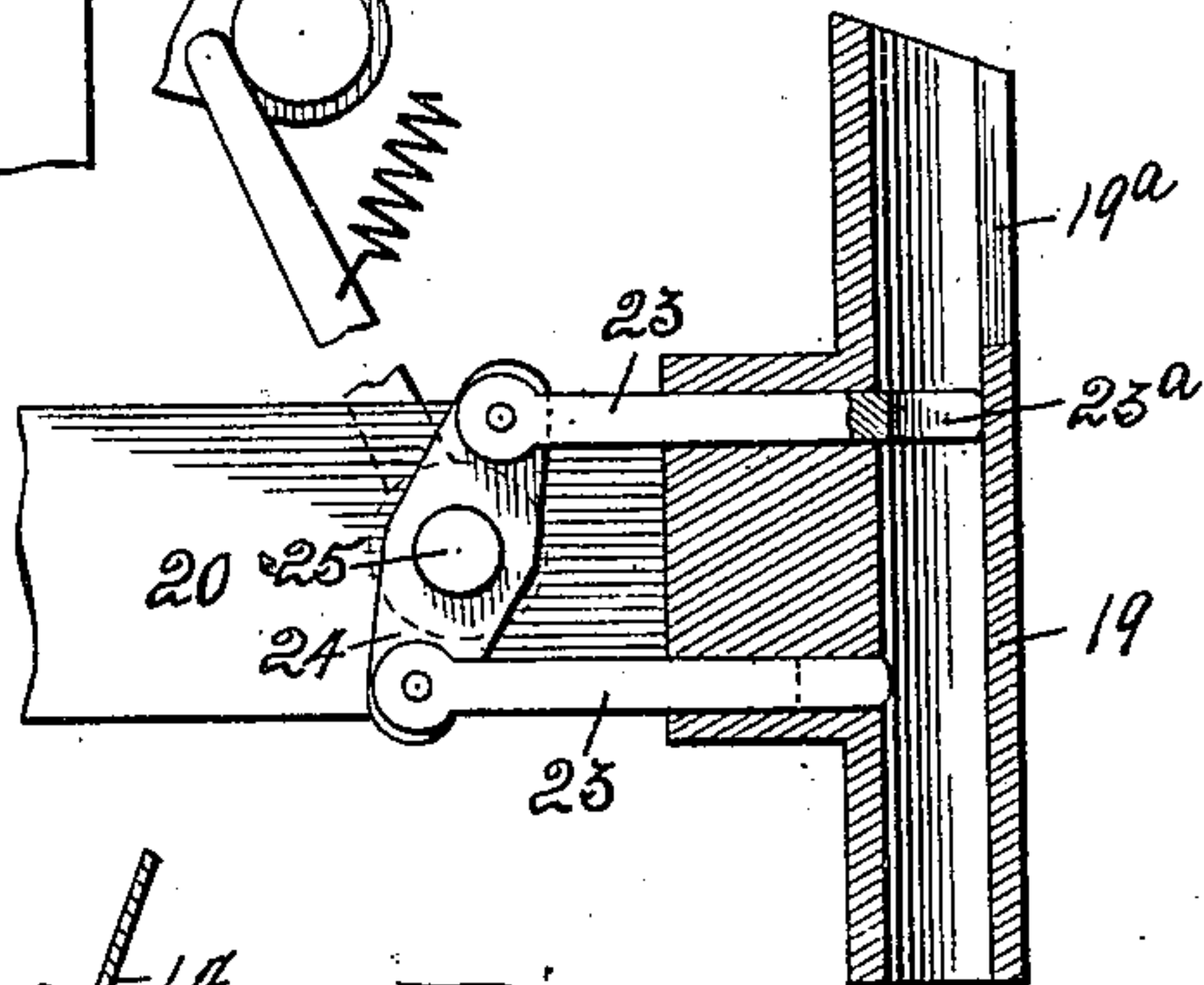
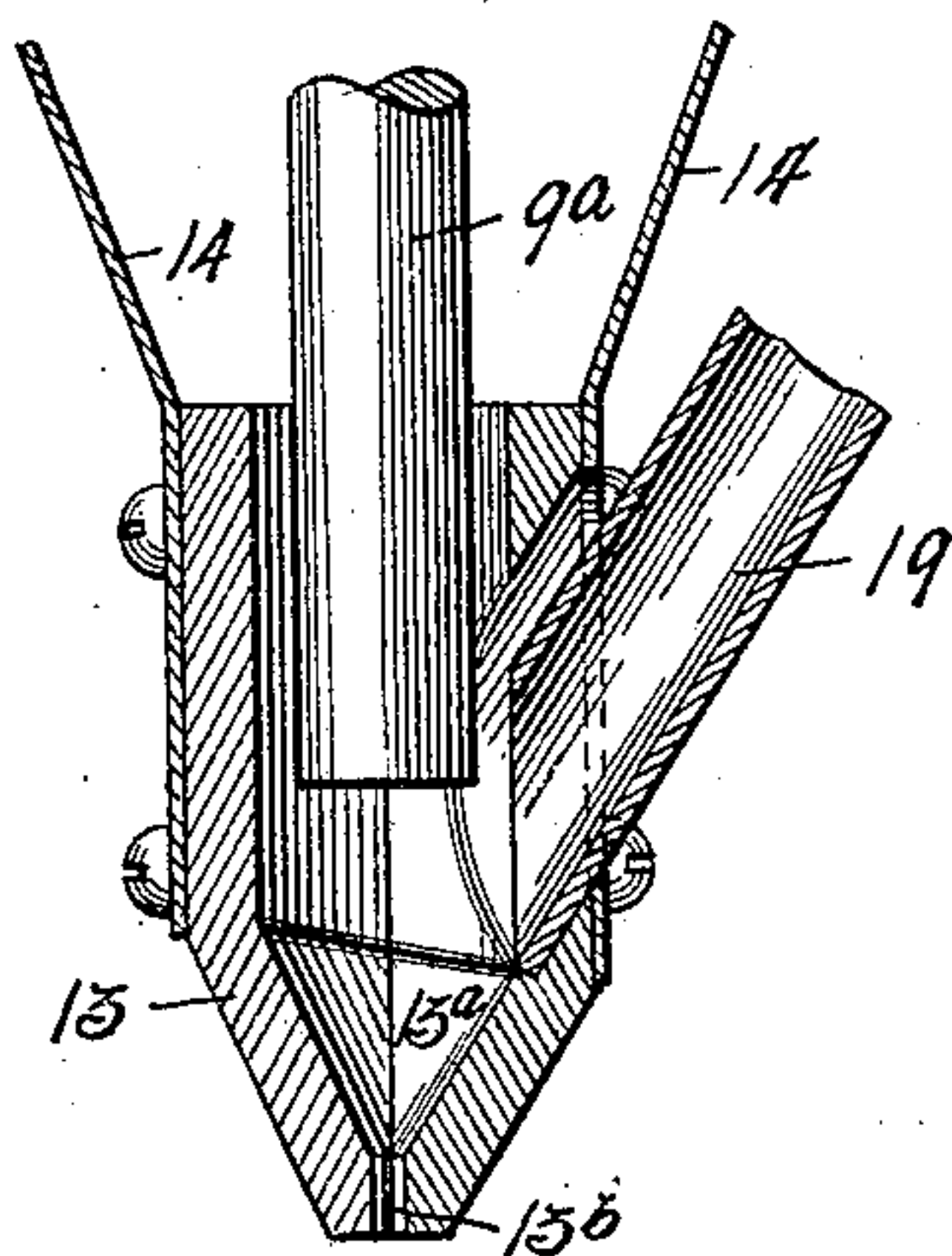


Fig. 6.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC NAILER.

982,854.

Specification of Letters Patent.

Patented Jan. 31, 1911.

Application filed June 13, 1908. Serial No. 438,313.

To all whom it may concern:

Be it known that I, WILLARD J. OTT, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Automatic Nailer; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to mechanisms for successively feeding nails to and driving them in barrels, boxes or other articles, and while it is shown in the drawings in association with a barrel making machine, it is not restricted to such use, as it may be used in any connection for which it may be appropriate or adapted.

The object of my invention, among others, is the provision of an improved apparatus of this class, which is simple and efficient in its construction and automatically operated to successively and regularly feed the nails to the driving parts and drive them into the work.

The operation, construction and arrangement of parts of the invention are fully described in the following specification, and a preferred embodiment thereof illustrated in the accompanying drawings, in which,—

Figure 1 is a front elevation of a barrel making machine equipped with my invention. Fig. 2 is a side elevation of one of the mechanisms embodying the features of my invention with a portion of the hammer case broken away. Fig. 3 is a rear elevation thereof with portions of the supporting and operating shafts broken away. Fig. 4 is an enlarged detail, partly in section, of the nail dividers or dropping mechanism. Fig. 5 is an enlarged central vertical section of the nail receiving cup at the foot of the hammer case and associated parts. Fig. 6 is an enlarged plan view of the inner or conduit end of one of the nail dropping fingers, and Fig. 7 is an enlarged cross-section of the nail box.

In Fig. 1 of the drawings is represented a veneer barrel machine of the ordinary type in which *a* designates the main or drum shaft thereof, which carries the drum or mandrel *b* and is suitably connected to a

source of power, and *c c* the main standards or uprights, which carry the parts superimposing the drum, as shown. As these parts form no part of the present invention they will not be described.

To the rear faces of the standards *c c* near their tops are secured bearing boxes *d*, in which are mounted the ends of a shaft *e*, which is made stationary in said bearings by set-screws *f* or in any other suitable manner. One or more of the apparatus comprising my invention, which are designated *A*, are shown as being carried by the shaft *e*, but it is apparent that they may be mounted in any other suitable manner as desired or as the construction of the machine to which they are applied may require.

Each apparatus *A* consists of a case or box 8 in which the nail-driving hammer or plunger 9 is mounted for longitudinal reciprocatory movement. This case is provided on one side thereof with a bearing boss 10 for receiving the shaft *e*, to which it is fixed in properly adjusted position by a set-screw 10^a or in any other suitable manner, and has its lower end open to permit the lower end of the hammer to work therethrough and its upper end closed to confine a coiled hammer-actuating spring 11 between it and the inner end of the hammer as shown. A screw 12 works through the closed end of the case against the spring 11 to enable its tension to be adjusted. The spring 11 is employed instead of a cam to actuate the hammer, as it is necessary to deliver a sudden and forceful blow on a nail in order to drive and effectually clench it, which is not possible by the use of a cam.

The hammer 9 is provided at its lower end with a nail-driving head 9^a, the free end of which projects loosely within the nail-receiving cup 13, which latter is carried by the spring-fingers 14, 14 that project from the lower end of the hammer case. This cup is longitudinally split to form two like separable parts, each of which is carried by one of the spring-fingers 14, which act thereon to hold them in yielding contact, as shown. The bore or socket of the cup 13 is conically reduced at its bottom as shown at 13^a in Fig. 5, and terminates in a restricted discharge opening 13^b, thus adapting a lowering of the hammer-head 9^a therein to effect an expansion or separation of the two cup parts against the tension of the springs

14 to permit the nail to be discharged from the cup and driven home in an alining article by the hammer.

5 A rotary cam wheel 15 is mounted in an enlargement 8^a of the case or box 8 and is carried by a shaft 16 which passes through and is journaled in the sides of said enlargement, as shown. The cam 15 has one side thereof working through a longitudinal slot
10 or incut 9^b in the hammer or plunger 9, and is itself provided with an incut 15^a, which when turned in register with the upper end of the slot or incut 9^b of the hammer permits a sudden nail-driving movement of the
15 hammer which is influenced by the action of the spring 11. The forward wall of the cam incut 15^a is made substantially straight to permit a sudden dropping of the hammer as soon as it is moved into register
20 therewith, while the rear wall thereof is preferably rounded, as shown, to effect a gradual return of the hammer to elevated or retracted position as the rotation of the cam continues.

25 Hinged for vertical movement to brackets 17, which project from the outer end of the enlargement 8^a of the hammer case laterally of the shaft 16, is the nail-box or magazine 18, which has its bottom provided with the central longitudinally-extending slot 18^a, which is of suitable width to
30 permit the shanks of the nails, but not the heads, to pass therethrough, as shown in Fig. 7. The side portions of the bottom incline outwardly from said slot to cause the
35 nails in the box to normally tend toward the same.

The slot 18^a at the inner or hinged end of the nail-box communicates with the open
40 upper end of the pipe or nail delivery conduit 19, which is carried by the brackets 20, 20 and has its lower end entering one side of the nail-receiving cup 13 through an opening in one of the parts thereof. The
45 box 18, which normally rests by gravity in reclining or horizontal position, as shown by dotted lines in Fig. 2, is automatically rocked at each revolution of the shaft 16 to effect an elevating of the outer end of the
50 box 18, due to the arm 21, which projects from its inner end, being struck by the end of the arm 22, which projects from the shaft 16. The elevating of the box both effects an agitation of the nails therein to facilitate
55 their working into the slot 18^a of the box and permits the first nail in the slot to drop by gravity therefrom into the upper end of the conduit 19, the pendent shank of each nail being permitted to pass through the
60 registering slot 19^a in the side of the upper end of the conduit as they successively pass down the box slot 18^a and enter the conduit. The progress of the nails through the conduit 19 is impeded by the action of the two
65 fingers or slides 23, which slidably enter

the side of the conduit in spaced superimposed position, the top one being approximately one nail's length below the lower end of the box slot when the box is elevated, thus preventing more than one nail entering the conduit at each elevating movement of the box, due to the succeeding nail in the slot to that discharged being held therein by reason of its lower end striking the headed end of the discharged nail, which latter is
75 supported by the upper finger 23. These fingers have their outer ends attached to opposite ends of a rocker-arm 24, which is mounted on a short-shaft 25 intermediate points of attachment thereto of said fingers, thus causing the fingers to alternately move to obstruct the passage through the conduit when the shaft 25 is rocked. This shaft is shown as being mounted in the upper conduit-carrying bracket 20 and carries an arm
85 26, which projects in position to be engaged and moved by the arm 27 at a predetermined point in each revolution thereof, said arm 27 being carried by the shaft 16 preferably on the opposite side of the case 8 to the shaft-arm 22. The arm 26 after being
90 tripped by the revolving arm 27 is actuated to return to elevated position by the coiled contraction spring 28, which has one end attached to the arm 26 and its other end
95 attached to the enlargement 8^a of the hammer case, or to some other fixed object, thus causing the upper finger or slide 23 to normally stand across the conduit passage and the lower finger 23 to stand in unobstructing position, as shown in Figs. 2 and 4. The inner ends of the fingers 23 are preferably, but not necessarily, slotted or notched, as at 23^a, to permit the shanks but not the
100 heads of the nails to pass therethrough.

The requisite rotation is shown as being communicated to the shaft 16 from the drum shaft *a* of the machine through the medium of the sprocket-chain 29 and sprocket-wheels 30.
110

In practice as the cam shaft 16 revolves with the drum shaft *a* the proper sequence of operations of the nailing mechanism at each revolution of the cam-shaft is as follows:—The nail-box 17 is first tilted to the proper position shown in full lines in Fig. 2, due to the arm 22 projecting from the shaft 16 coacting with the arm 21 of the nail-box. As the nail-box is elevated the
115 nails are agitated therein, thus assisting them to work into the delivery slot 18^a in the bottom of the box, and permitting the first nail in said slot to drop by gravity into the open upper end of the delivery-conduit 19 where it is caught by its head and held in suspended position by the upper slide-finger 23. The incut 15^a in the cam 15 now moves into position to permit a lowering or nail driving movement of the hammer or plunger
120 9 under the influence of its actuating spring
125
130

11, thus causing the hammer-head 9^a to expand the parts of the nail-receiving cup 13, eject a nail therefrom, and drive it home within the article carried by the drum 6 or other support. The sudden and powerful driving action of the hammer which is effected by the driving-spring 11 is very much more effective in driving and clenching the nail than would be the case if a driving cam were substituted for the spring. Immediately following or during the driving movement of the hammer, the shaft arm 27 has contact with the trip-arm 26, thus moving said latter arm out of normal position and effecting a consequent reversing of the positions of the two slide-fingers 23 so that the nail supported by the upper finger is dropped to the lower finger, to be held by it until the fingers again return to their normal positions when the arm 27 has passed from engagement with the drum 26. The nail on being released by the lower finger 23 on a withdrawal thereof, moves by gravity down the delivery conduit 19 into the receiving cup 13, and its shank or pointed end is guided by the conical surface 13^a into the restricted aperture 13^b by which it is held until struck by the hammer.

I wish it understood that I do not desire to be restricted to the exact details of construction and arrangement of the parts of the invention shown and described, as obvious modifications will occur to persons skilled in the art.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is,—

1. In a machine of the class described, the combination of a frame, a shaft carried thereby, a plunger box carried for oscillatory adjustment by said shaft, a nail-cup carried by the box at its lower end, a nail-driving plunger mounted within the box and mov-

able to eject a nail from said cup, means for imparting driving movements to the plunger, a cam-shaft journaled in the side of said box, means for rotating the cam-shaft, a cam carried by said shaft and adapted, when rotated, to coact with the plunger to intermittently release it to permit a driving movement thereof and then to retract it, and mechanism for feeding nails to the nail cup.

2. In a machine of the class described, the combination of a frame, a shaft carried thereby, a plunger box carried for oscillatory adjustment by said shaft, a nail-cup carried by the box at its lower end, a nail-driving plunger mounted within the box and movable to eject a nail from said cup, means for imparting driving movements to the plunger, a cam-shaft journaled in the side of said box, means for rotating the cam-shaft, a cam carried by said shaft and adapted, when rotated, to coact with the plunger to intermittently release it to permit a driving movement thereof and then to retract it, an oscillatory nail-box having an arm projecting therefrom, a conduit leading from said box to the nail-cup, means for interrupting the passage of nails through the conduit, an arm carried by the cam-shaft for engaging the arm of the nail-box to oscillate said box at each revolution of the shaft-arm, and an arm carried by the cam-shaft and adapted to actuate said latter means at each revolution of such shaft-arm, substantially as described.

In testimony whereof I have hereunto signed my name to this specification in the presence of two subscribing witnesses.

WILLARD J. OTT.

Witnesses:

GEORGE A. GAGE,
J. C. CALDWELL.