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PATENTED JUNE 18, 1907.

E. F. BEUGLER.
BARREL HOOP NAILING MACHINE.

APPLICATION FILED MAY 26, 1905.

3 SHEETS—SHEET 1.

Fig. 2.

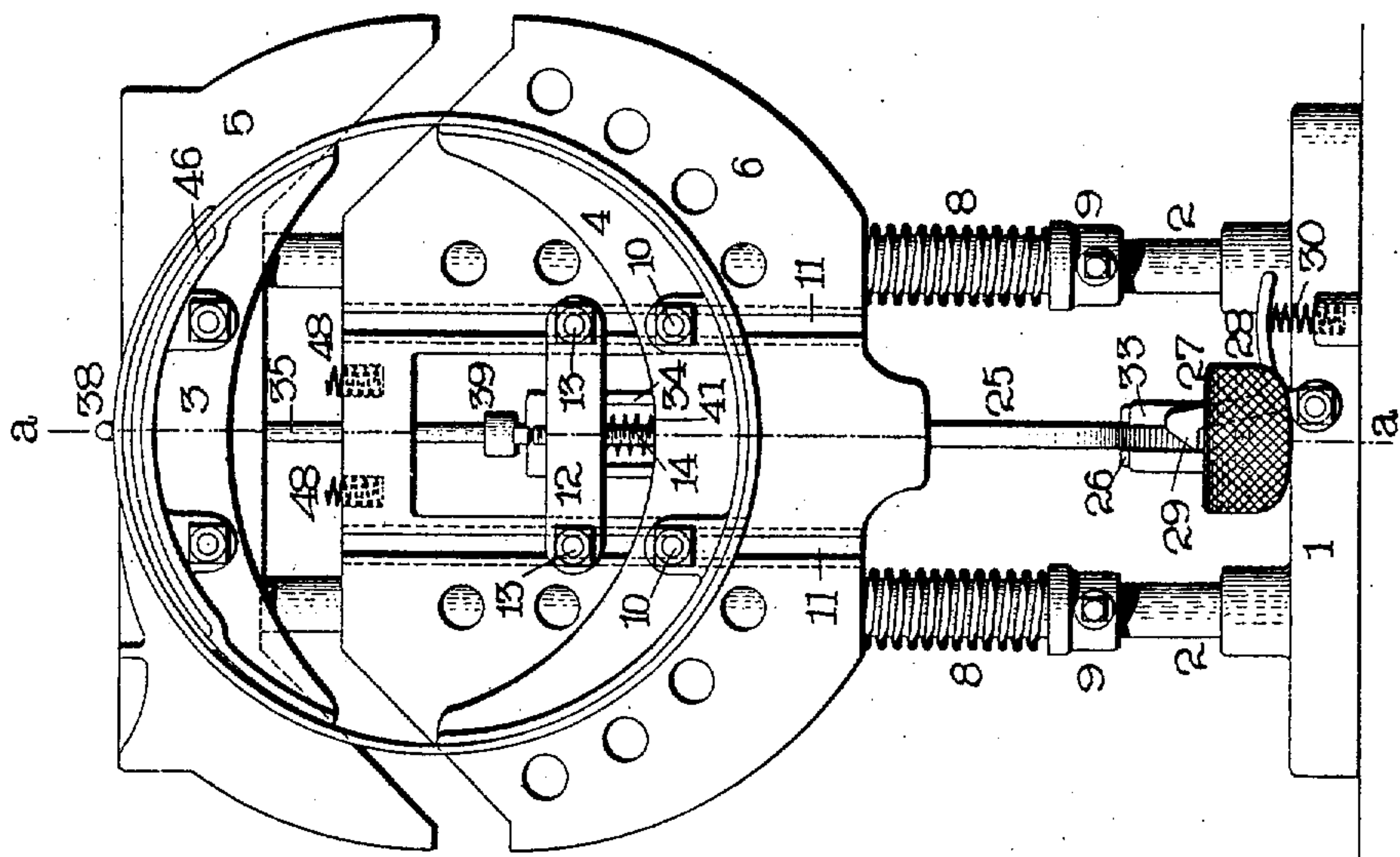
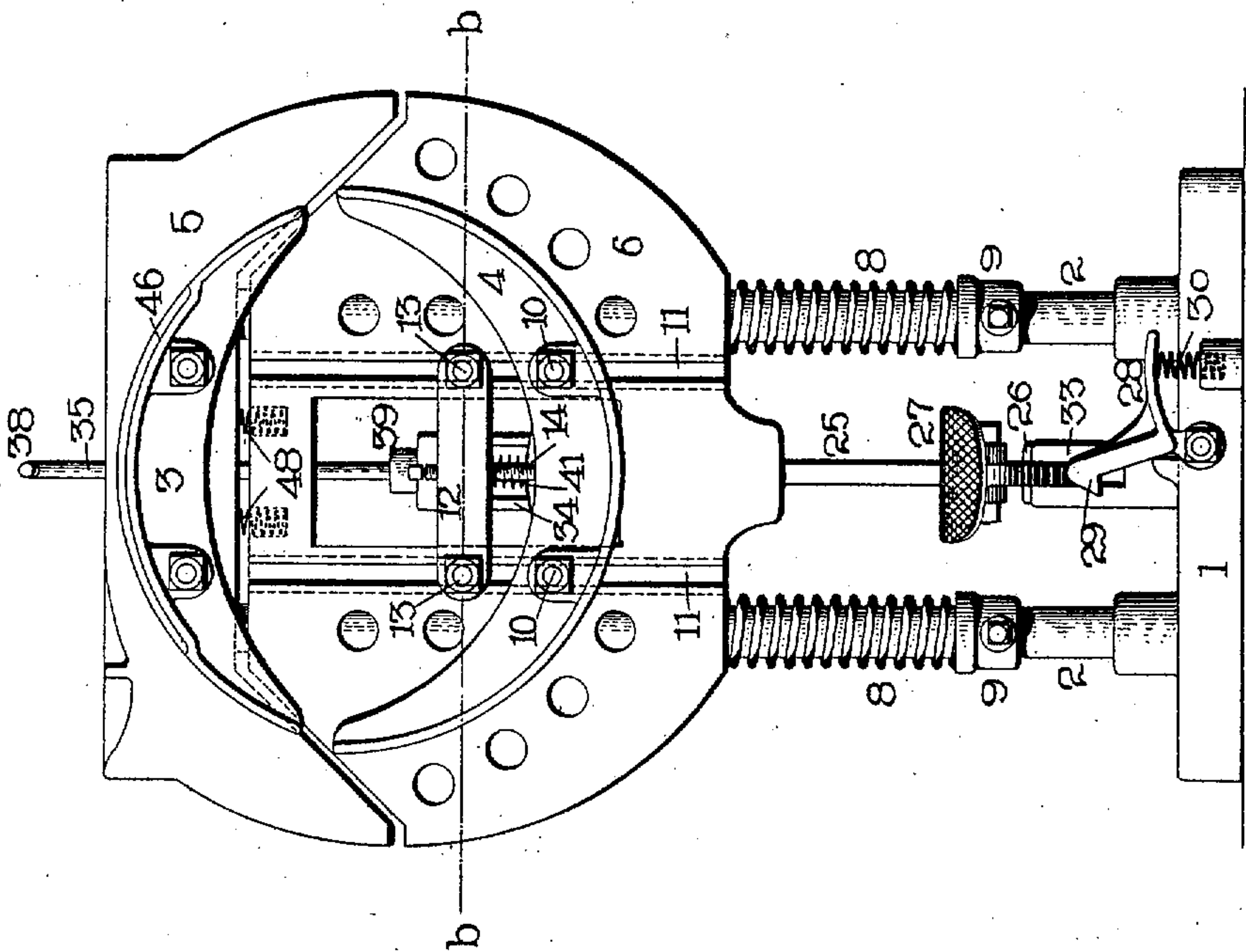


Fig.



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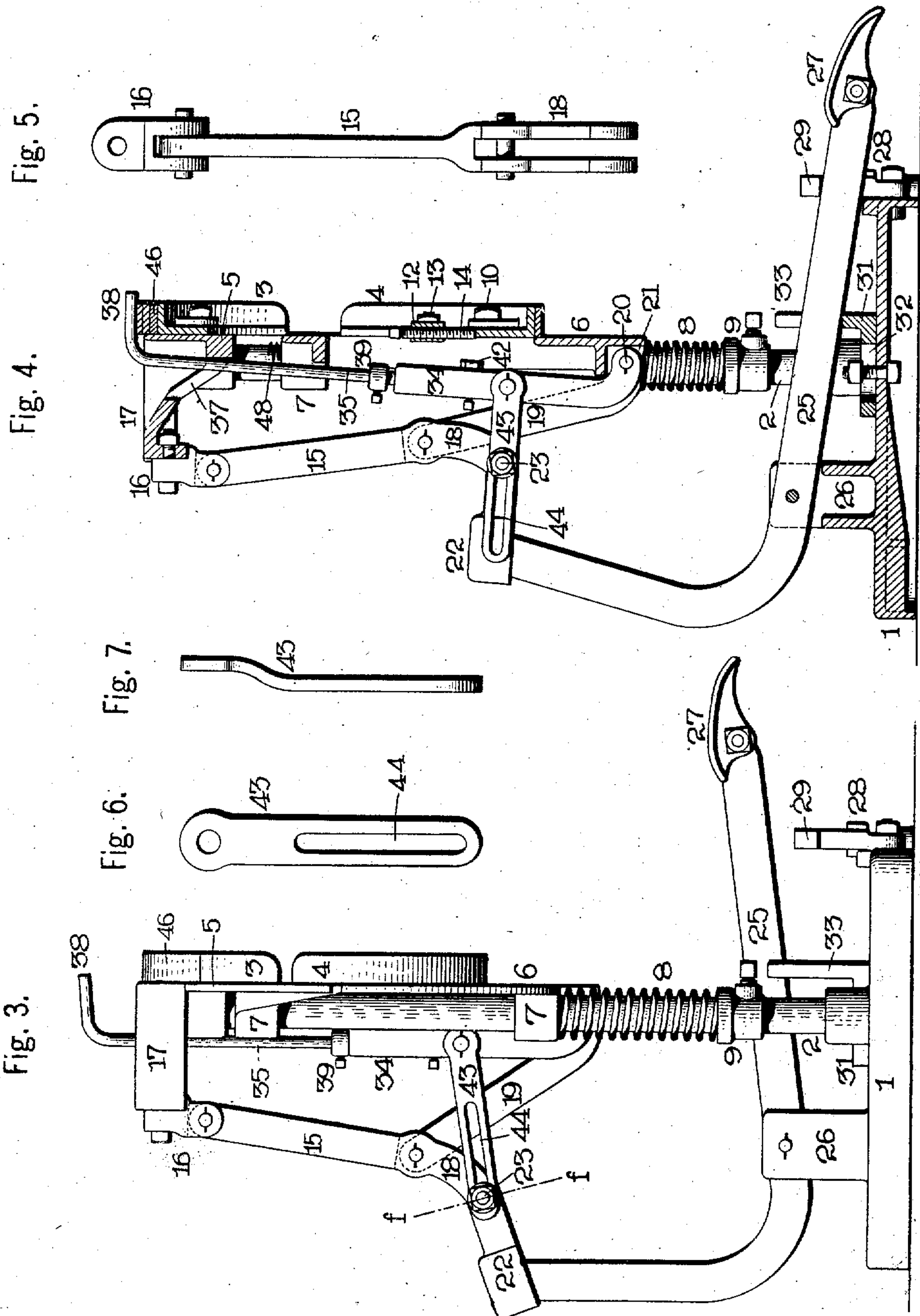
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3 SHEETS—SHEET 2.



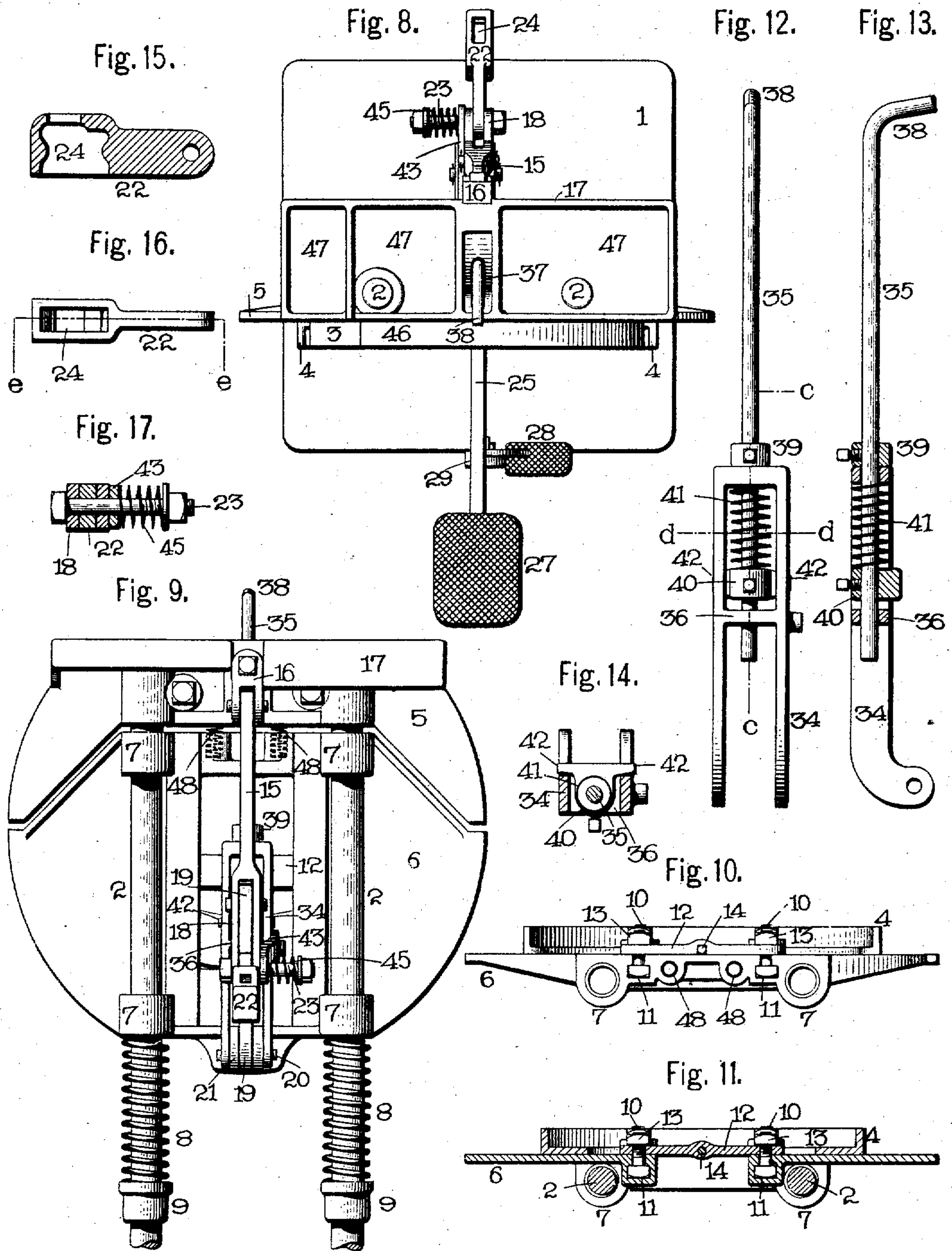
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APPLICATION FILED MAY 25, 1905.

3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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BARREL-HOOP-NAILING MACHINE.

No. 857,515.

Specification of Letters Patent.

Patented June 18, 1907.

Application filed May 25, 1905. Serial No. 262,187.

To all whom it may concern:

Be it known that I, EDWIN F. BEUGLER, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Barrel-Hoop-Nailing Machines, of which the following is a specification.

This invention relates to an improved barrel hoop nailing machine.

One of the features consists of a novel toggle joint system of levers for stretching the hoop whereby the hoop is formed into the desired shape and stretched in an efficient, quick and convenient manner by comparatively light pressure of the foot of the operator.

Another feature has reference to an extra vertical adjusting device for the hoop former for the purpose of rapidly obtaining a very fine adjustment.

Another feature has reference to an adjustable forked stop plate for limiting the downward movement of the foot lever and also supporting said lever in its depressed position.

The purposes of the invention are principally to provide an easily and quickly operated machine in which the number of parts are lessened, an extra fine adjustment is obtained and the foot lever is locked and held rigidly in its depressed position during the nailing of the hoop parts.

The invention also relates to certain details of construction, all of which will be fully and clearly hereinafter described and claimed, reference being had to the accompanying drawings, in which,—

Figure 1 is a front elevation of the improved hoop nailing machine. Fig. 2 is a similar view of the machine showing the movable plate depressed and a hoop in position to be nailed. Fig. 3 is an end elevation of the machine. Fig. 4 is a section on line *a*, Fig. 2. Fig. 5 is an enlarged detached rear view of the forked link and the block to which it is pivoted. Figs. 6 and 7 are enlarged detached views of the slotted link. Fig. 8 is a top plan view of the machine. Fig. 9 is a rear elevation of the upper portion of the machine, the base and foot lever being omitted. Fig. 10 is a detached top plan view of the sliding plate or member. Fig. 11 is a transverse section on line *b b*, Fig. 1.

Fig. 12 is an enlarged detached rear elevation of the pivotal frame and the rod for holding the hoop. Fig. 13 is a vertical section on line *c c*, Fig. 12. Fig. 14 is a transverse section on line *d d*, Fig. 12. Fig. 15 is a longitudinal section on line *e e*, Fig. 16. Fig. 16 is an enlarged detached bottom view of the recessed link for connecting the foot lever to the forked link. Fig. 17 is an enlarged transverse section on line *f f*, Fig. 3.

In referring to the drawings for the details of construction, like numerals designate like parts.

The frame of the machine consists of a base 1, and two upright bars 2, which have their lower ends rigidly secured to the base. The segmental plates 3 and 4, for forming the hoops, are secured to a plate which is formed of two sections or members; the upper or stationary member 5, being rigidly secured to the upper ends of the bars 2, and the lower or movable member 6, being slidably mounted upon the bars 2, below the member 5. The movable member 6, is provided with lugs 7, which project from the rear surface of the plate and through which the bars 2, pass loosely to permit a vertical movement of the said member. The movable member 6, is supported by spiral springs 8, which encircle the bars 2, below the lower set of lugs 7, and which are supported by collars 9, secured to the bars 2, by set screws. The springs 8, are tensioned by adjusting the collars 9, vertically upon the bars, see Figs. 1, 2, 3 and 4. The hoop forming segmental plates 3 and 4, are secured by bolts to the members 5 and 6, as shown in Figs. 1 and 2; the lower hoop forming plate 4, being secured by bolts 10, so that it may be adjusted vertically upon the member 6. The member 6, is provided with two vertically extending T slots or grooves 11, in which the heads of the bolts 10, are seated so as to have a vertical movement in said grooves 11. The ends of the bolts 10, are passed through openings in the hoop forming plate 4, and said plate is firmly fastened in place by nuts which are screwed upon the outer ends of the bolts.

In order to secure a very fine adjustment of the hoop forming plate 4, a cross bar 12, is adjustably secured at approximately the center of the member 6, by bolts 13, which are seated in the grooves 11, in the same manner as the bolts 10 and a set screw 14, is screwed

vertically through the center of the cross bar 12, and bears with its lower end against the hoop forming plate 4, see Figs. 1, 2, 4 and 11. By this means a very accurate adjustment of the plate 4, is secured, the nuts on the bolts 10, being loosened and the plate being first set in approximately the correct position and then accurately adjusted by rotating the set screw 14, so that when the member 6, is depressed, the peripheries of the plates 3 and 4, will form a true circle. The member 6, is depressed by a set of toggle levers which are operated by a foot lever as shown in Figs. 1, 2, 3, 4, 8 and 9.

A bar or lever 15, has its upper end pivoted by a pin to the forked lower end of a block 16, which is secured by a bolt to the horizontally extending portion 17, of the stationary member 5, of the divided plate, see Figs. 3, 4 and 9. The lower end 18, of the lever 15, is forked and curves slightly outwardly and a connecting link 19, has its upper end pivoted by a pin to the upper portion of the fork 18, and its lower end pivoted by a pin 20, between two lugs 21, which extend rearwardly from the lower extreme of the movable member 6, see Figs. 4 and 9.

A link 22, is pivoted at one end to the lower end of the fork 18, by a bolt 23, and has its other end enlarged and provided with a recess 24, in which the rear end of an angular foot lever 25, is adapted to seat. The foot lever 25, is formed as shown in Figs. 3 and 4, and is pivoted by a pin to the forked upper end of an extension 26, which is formed integral with the base 1. The foot lever extends forward from the forked extension 26, and a foot treadle 27, is secured by a bolt to the forward end of the foot lever by means of which the said lever may be depressed. The foot lever 25, is held in its depressed position by a latch 28, which is pivoted by a bolt to the base, and which has a lateral lug 29, adapted to engage with the top edge of the foot lever. The latch is automatically operated by a spring 30, which is seated in a lug extending from the base 1, and which bears against the bottom surface of a portion of the latch. When it is desired to release the foot lever the portion of the latch above the spring is depressed by the foot of the operator which disengages the lug 29, from the foot lever, see Figs. 1, 2, 3, 4 and 8. When depressed, the foot lever is securely held against any further downward movement by an angular plate 31, which is adjustably secured to the base 1, by a bolt which passes through a slot 32, in the plate.

The upright portion 33, of the angular plate has its upper end forked so that it straddles the foot lever, see Figs. 1, 2 and 4. When the foot lever is depressed its bottom edge comes into contact with the lower end of the fork in the upright portion 32, and as the latch 28, prevents any upward movement

of the foot lever it is held in a perfectly rigid manner. The hoop is held around the hoop forming plates by means of a rod which has its upper end bent so as to catch over the ends of the hoops and which is then drawn down with a spring tension so as to firmly hold the ends of the hoop. This mechanism is illustrated in Figs. 1, 2, 3, 4, 9, 11, 12, 13 and 14.

A pivotal frame 34, formed substantially as shown in Figs. 12 and 13, is pivoted by a pin 20, to the lugs 21, on the movable member 6, and extends vertically upward. A rod 35, has its lower end passed loosely through openings in the top of the frame and is an intermediate cross piece 36, of the frame and extends vertically upward through a slot 37, in the portion 17, of the stationary member 5, and has its upper end 38, bent forward at substantially right angles. A collar 39, is fastened by a set screw to the rod 35, immediately above the top of the frame 34, and another collar 40, is fastened to the rod by a set screw immediately above the cross piece 36. A spiral spring 41, encircles the rod 35, between the collar 40, and the top of the frame 34, and serves to hold the upper end 38, of the rod 35, against the ends of the hoop with a spring tension. The collar 40, is provided with lateral lugs 42, which strike against the edges of the frame 34, and prevent any rotation of the rod 35. The frame 34, is swung forward on its pivoting pin 20, to bring the end 38, of the rod 35, over the ends of the hoop, by a slotted link 43, which has one end pivoted by a pin to one side of the frame 34, and its other end provided with a slot 44, through which the end of the bolt 23, passes, see Figs. 3, 4, 8 and 17. The end of the link 43, is held against the lower forked end 18, of the lever 15, by a spiral spring 45, which encircles the bolt 23, the spring being held in place by a washer and a nut screwed upon the end of the bolt. The upper hoop forming segmental plate 3, has a plate 46, of hardened metal, such as steel, secured to its upper portion so that when the nails are driven through the hoop they strike the plate of hardened metal and are turned over so as not to leave any projections on the inside of the hoop. The plate is preferably secured in place by welding, but may be fastened by rivets or bolts or in any well known way. The horizontal portion 17, of the stationary member 5, has its top recessed so as to form nail holding compartments 47, in which the nails to be used in nailing the hoops may be placed. The horizontal top edge of the movable member 6, is provided with recesses in which the spiral springs 48, are placed which strike against the bottom surface of the stationary member 5, and so lessen the jar when the foot lever 25, is released to raise the movable member 6. Different sizes of hoops may be formed on this machine by simply

removing the nuts on the bolts which fasten the hoop forming plates 3 and 4, in place, removing the hoop forming plates and substituting therefor other plates having a periphery the radius of which is equal to the radius of the hoop it is desired to nail.

The operation of the machine is as follows,—
The mechanism of the machine being in the position shown in Figs. 1 and 3, a hoop is placed around the hoop forming segments 3 and 4, so that its ends overlap on the segment 3, as shown in Fig. 2, where a hoop is shown in position ready to be nailed. The foot lever 25, is now depressed by the operator pressing against the treadle 27, which downward movement of the foot lever tends to extend or spread the members 15 and 19, of the toggle and as the member 19, is pivoted to the movable member 6, of the divided plate; said movable member 6, is given a downward movement on the bars 2. At the beginning of the spreading movement of the toggle, the pivotal frame 34, is swung forward on its pivoting pin by the slotted link 43, until the upper portion of the rod 35, strikes the end of the slot 37, in the portion 17, and the upper end 38, of the rod is directly above the overlapped ends of the hoop. When the rod 35, has reached its position the resistance of the spring 45, is overcome and the bolt 23, slides forward in the slot 44, of the link 43. The downward movement of the member 6, carries with it the pivotal frame 34, and the rod 35, until the bent upper end 38, of the rod comes into contact with the overlapping ends of the hoop. The rod 35, is now held stationary and the pivotal frame 34, moves downwardly against the tension of the spring 41, until the member 6, reaches the limit of its downward movement. The mechanism of the machine is now in the position shown in Figs. 2 and 4, and the hoop is stretched tightly around the hoop forming plates. Nails are now driven through the overlapping ends of the hoop and when this is completed the operator releases the foot lever 25, by pressing upon the latch 28, as above described, and the movable member 6, and the various levers and connecting links are returned to their normal positions (as shown in Figs. 1 and 3) by the spiral springs 8.

In machines of this kind where the movable member 6, is directly connected to the foot lever, the power necessary to move the movable member downward against the tension of the springs 8, and to stretch the hoop tightly around the hoop forming plates is supplied directly by the operator's foot without the aid of leverage to reduce the pressure required.

In this improved machine, the pressure required upon the foot lever is greatly reduced owing to the leverage obtained through the employment of toggle levers for the bulk of

the power required to overcome the tension of the springs 8, and to stretch the hoop is supplied by extending the toggle levers. The foot lever, when depressed, is held rigidly between the angular forked plate 33, and the latch 28, so as to prevent the rattling of and sometimes involuntary releasing of the foot lever incident to the jarring of the machine while the nails are being driven, such as was the case when only the latch was used to hold the lever in place when depressed.

We claim as our invention.

1. In a machine of the class described, a machine frame, a hoop forming device comprising a stationary segmental member and a movable segmental member, an upper toggle lever pivoted to the stationary segmental member, a lower toggle lever pivoted to the upper toggle lever and the movable segmental member and a foot lever operatively connecting to the toggle levers, substantially as set forth.

2. In a machine of the class described, a machine frame, a hoop forming device comprising a stationary segmental member and a movable segmental member, an upper toggle lever pivoted to the stationary segmental member and having a curved portion, a lower toggle lever pivoted to the upper toggle lever and the movable segmental member and an angular foot-lever having its upper extremity pivoted to the toggle levers, substantially as set forth.

3. In a machine of the class described, a machine frame, having a plurality of projecting bars, a hoop forming device having hoop forming segments mounted on the bars, one of said segments being slidable on said bars, means for holding the hoop firmly bent around the hoop forming plates and toggle mechanism for moving the slidable plate to spread the plates sufficiently to stretch the hoop blank into circular form, substantially as set forth.

4. In a machine of the class described, a machine frame, composed of a base and bars projecting from the base, a hoop forming device having hoop forming segments, one of which is fixed to the bars and another of which is slidably mounted on the bars, means for holding the hoop firmly bent around the hoop forming plates consisting of a rod having its upper end bent to catch over the hoop ends and toggle mechanism for moving the slidable plate from the fixed plate to stretch the hoop blank into circular form, substantially as set forth.

5. In a machine of the class described, a machine frame having a base and two upright bars extending from the base, a hoop forming device having an upper member rigidly secured to the bars and a lower member slidably mounted on the bars, toggle mechanism operatively connected to the

lower member of the hoop forming device and a foot lever operatively connected to the toggle mechanism, substantially as set forth.

6. In a machine of the class described, a machine frame, having a base and two upright bars extending from the base, a hoop forming device having an upper member rigidly secured to the bars and a lower member slidably mounted on the bars, toggle mechanism operatively connected to the lower member of the hoop forming device, a foot lever operatively connected to the toggle mechanism, and mechanism for securing a very fine adjustment of the members of the hoop forming device, whereby the hoop blank will be supported in perfect circular shape, substantially as set forth.

7. In a machine of the class described, a frame having projecting bars, an upper stationary member rigidly secured to the upper ends of the bars, a lower movable member slidably mounted on the bars below the stationary member, segmental hoop forming plates attached to the said members and one of said plates being adjustable on the members to which it is attached, and manually operative means for moving the slidable member, substantially as set forth.

8. In a machine of the class described, a frame having projecting bars, an upper stationary member rigidly secured to the upper ends of the bars, a lower movable member slidably mounted on the bars below the stationary member, segmental hoop forming plates attached to the said members and one of said plates having a hardened portion against which nails driven through the hoop ends strike and are turned over, and manually operative means for moving the slidable member, substantially as set forth.

9. In a machine of the class described, a frame having projecting bars, an upper stationary member rigidly secured to the upper end of the bars, a lower movable member slidably mounted on the bars below the stationary member, segmental hoop forming plates attached to the said members, means for securing a very fine adjustment including a cross bar adjustably secured to one member and a set screw supported by the cross bar and bearing against the plate attached to said member, and manually operative means for moving the slidable member, substantially as set forth.

10. A machine of the class described having a hoop forming device consisting of a plurality of members and segmental hoop forming plates attached to said members, one of said plates being adjustable, a cross bar adjustably secured to the member having the adjustable plate, and a set screw threaded through the cross bar and bearing against the adjustable plate for the purpose of securing a very fine adjustment.

11. In a machine of the class described, a machine frame consisting of a base and a plurality of upright bars, a hoop forming device comprising a stationary member rigidly secured to the upper ends of the bars and a movable member mounted upon the bars, springs for maintaining said movable member in its elevated position, a foot lever pivoted to the base and a set of toggle levers connected to the stationary member and the movable member and the foot lever.

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Witnesses:

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