

J. J. DOIDGE.

TACK LOADER.

APPLICATION FILED JUNE 1, 1909.

975,840.

Patented Nov. 15, 1910.

2 SHEETS—SHEET 1.

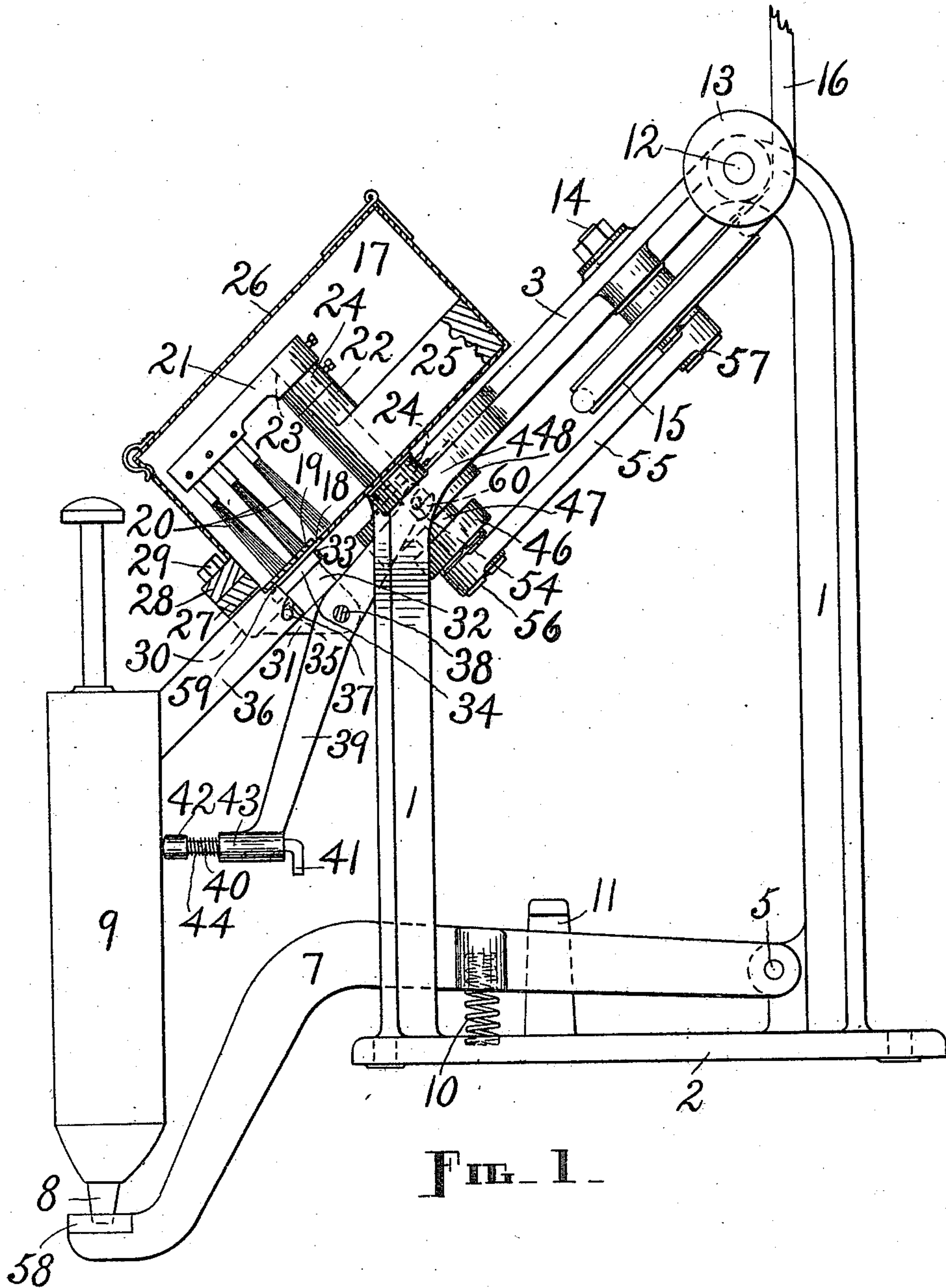


FIG. 1.

WITNESSES:

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J. M. Sterns

INVENTOR.

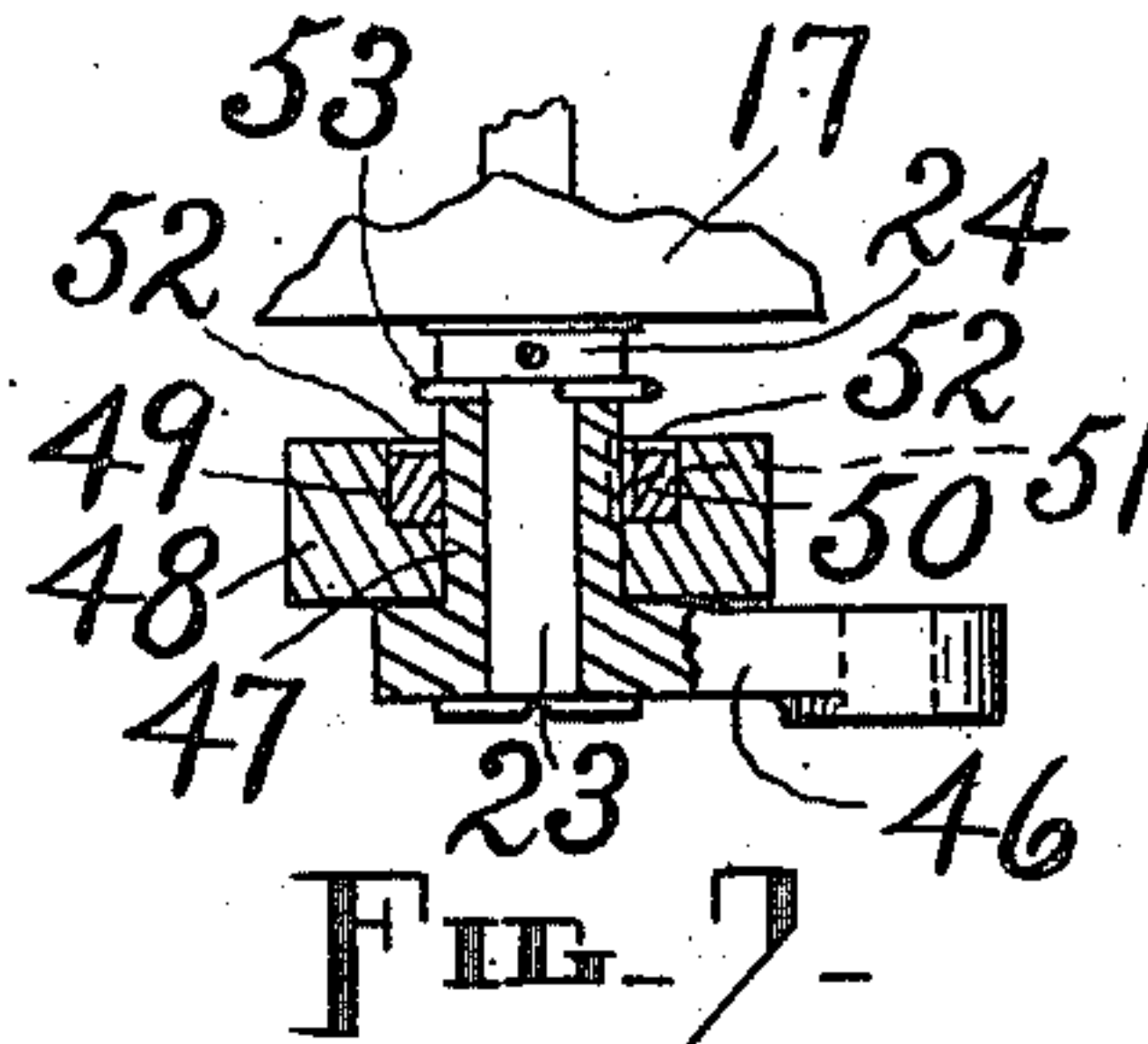
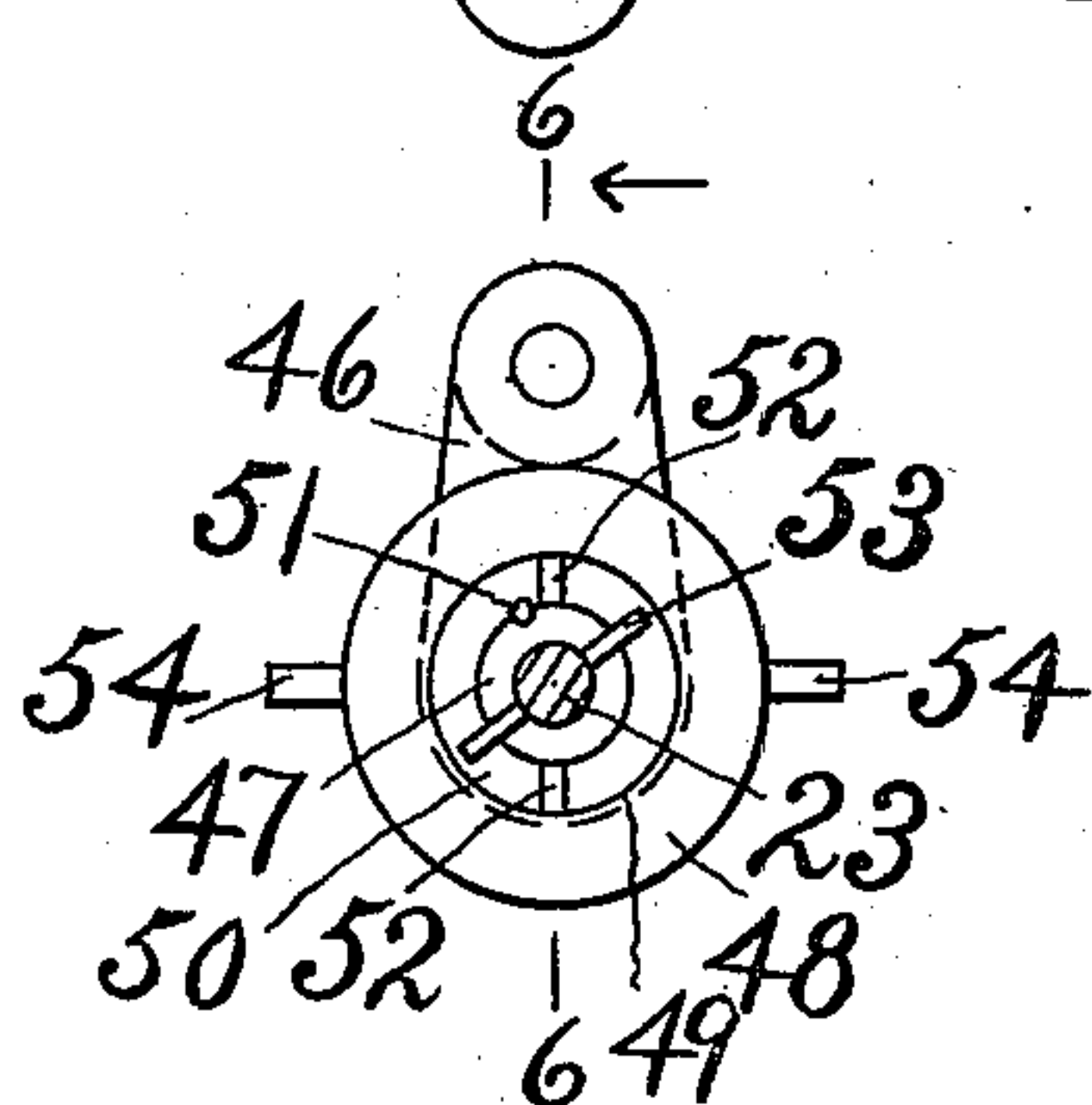
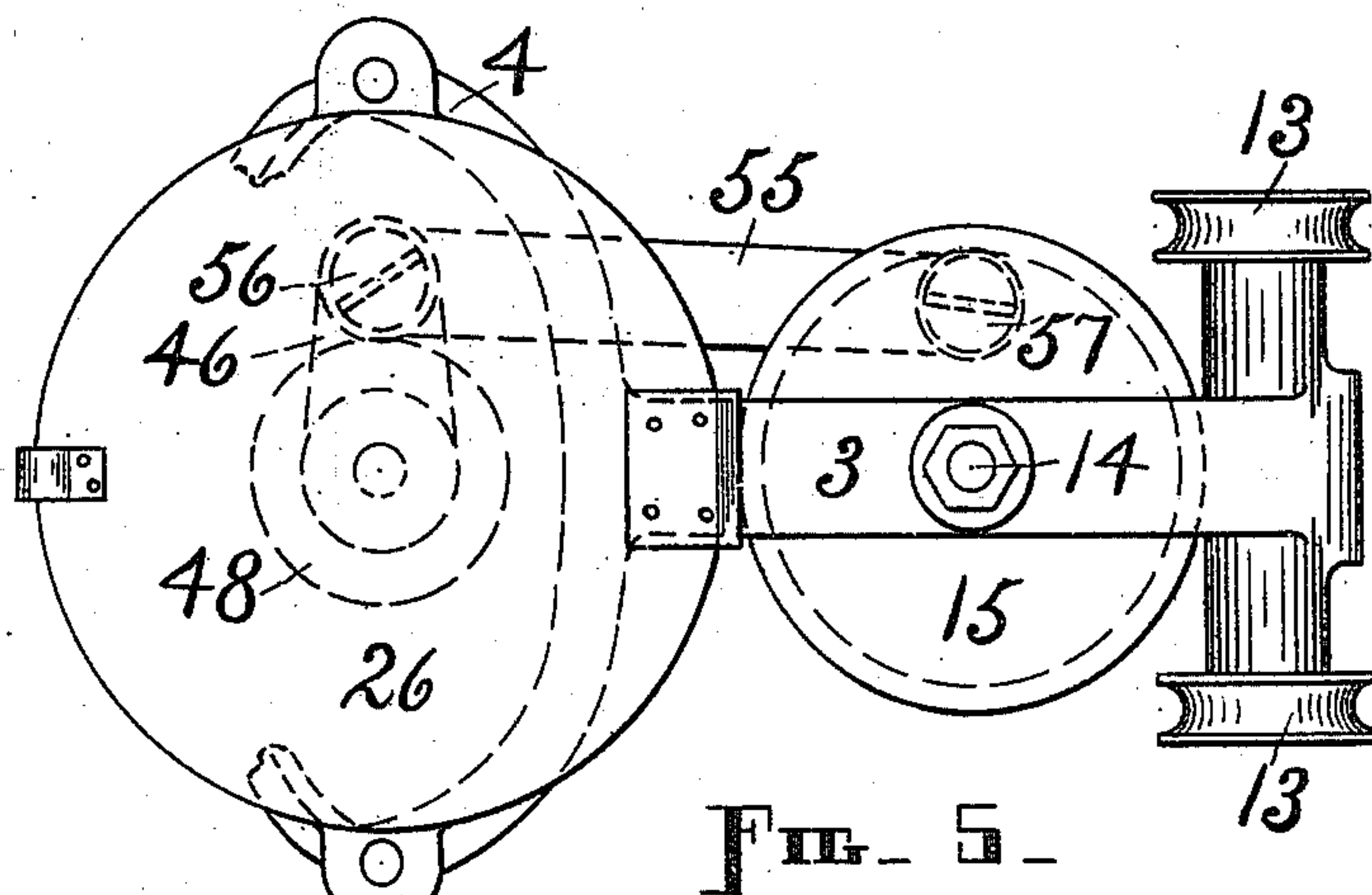
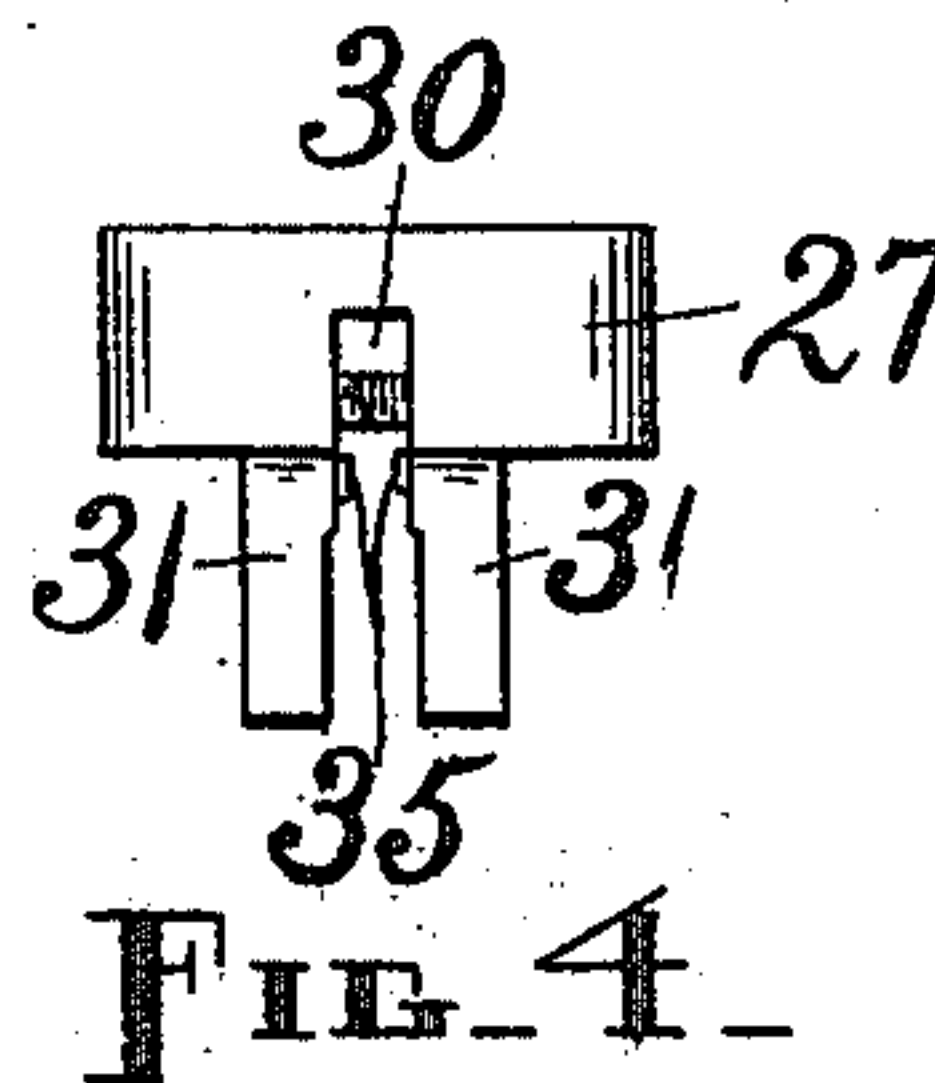
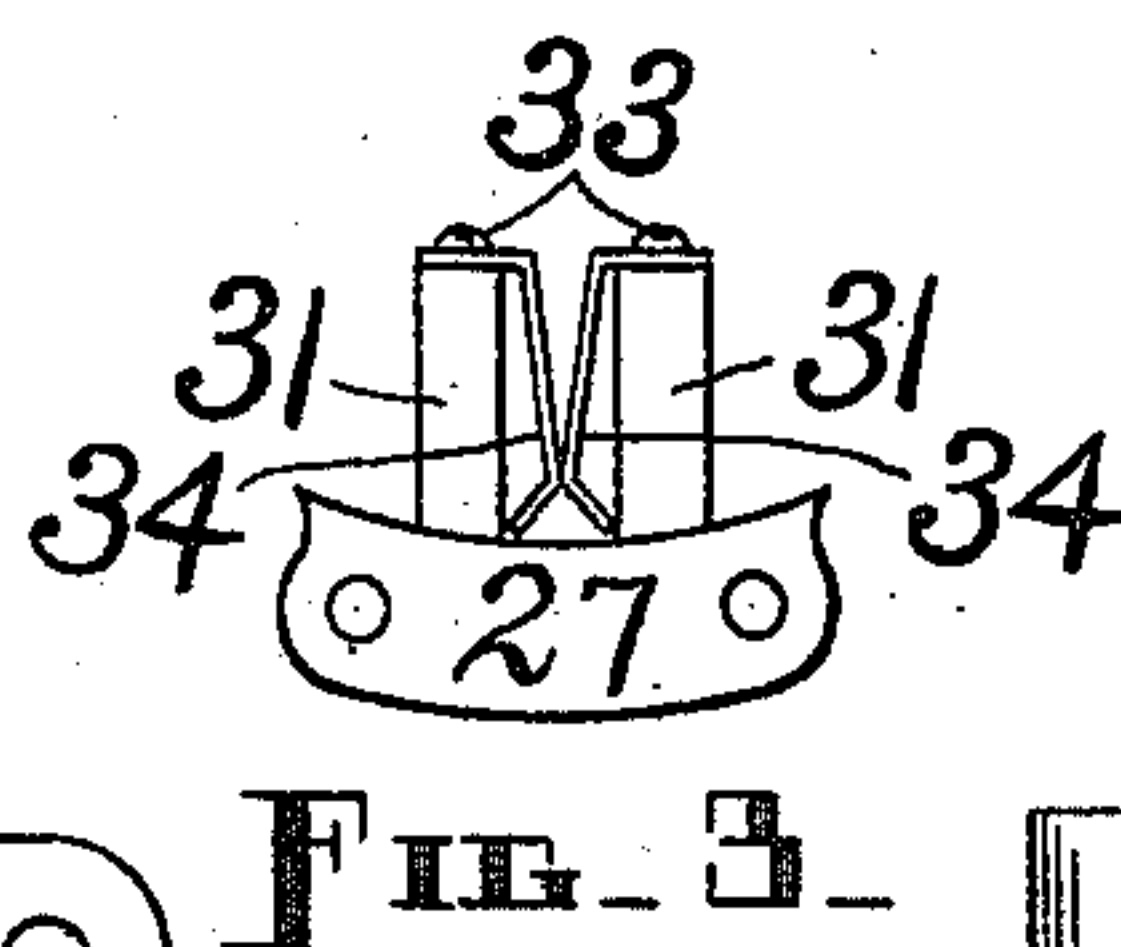
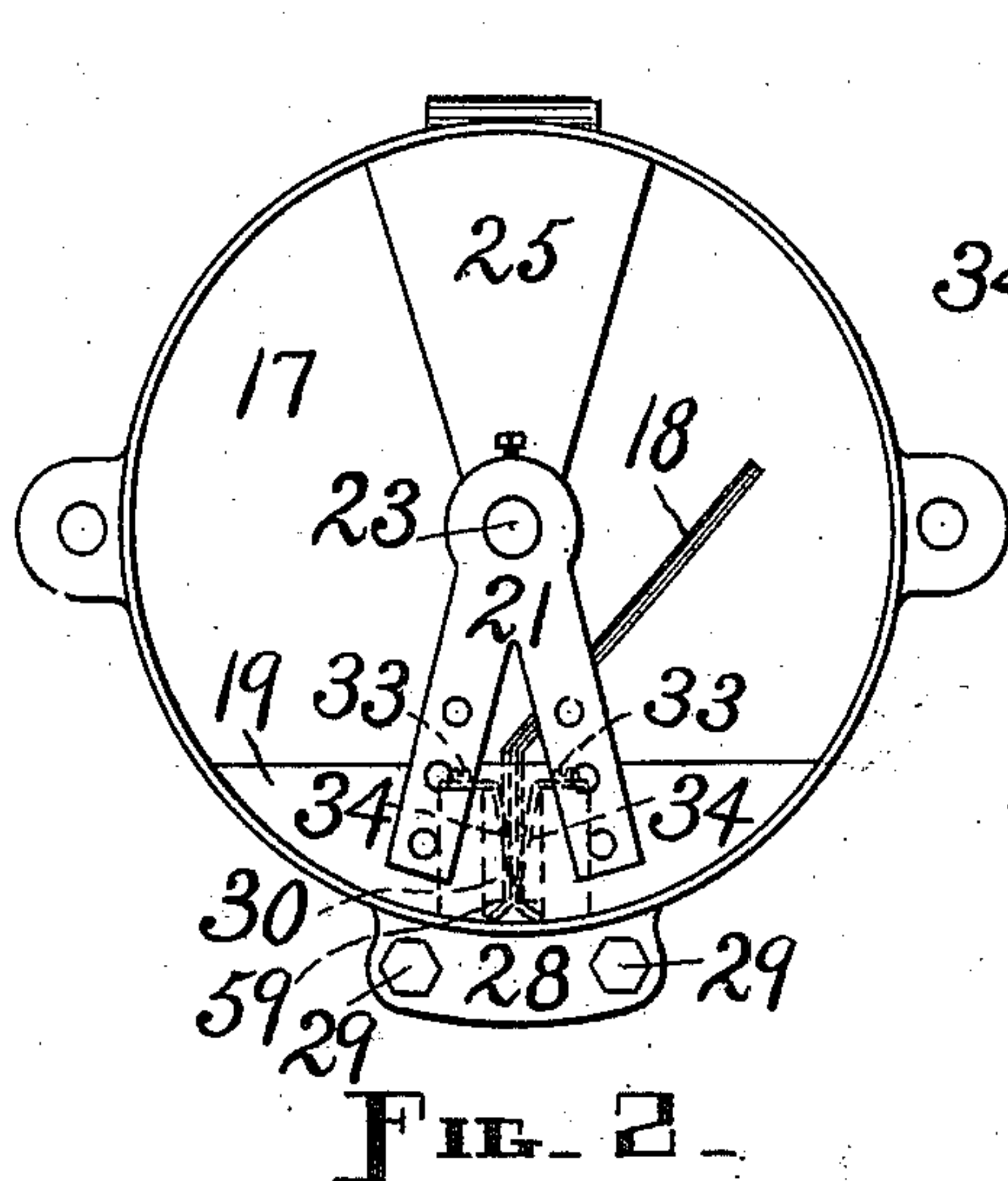
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2 SHEETS-SHEET 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

JOHN J. DOIDGE, OF SOUTH FRAMINGHAM, MASSACHUSETTS.

TACK-LOADER.

975,840.

Specification of Letters Patent.

Patented Nov. 15, 1910.

Application filed June 1, 1909. Serial No. 499,271.

To all whom it may concern:

Be it known that I, JOHN J. DOIDGE, a subject of the King of Great Britain, residing at South Framingham, in the county of Middlesex and State of Massachusetts, have invented a new and useful Tack-Loader, of which the following is a specification.

My invention relates to improvements in devices or machines for feeding tacks, nails, or other fasteners having heads, into hand tack drivers, such drivers being more especially used for driving tacks in the process of lasting boots and shoes, and said invention comprises generally certain peculiar holding means for the driver while being loaded, tack-controlling means, and mechanism operated by the driver for throwing the agitator into and maintaining it in action and for throwing the same out of action, together with such other parts and members as may be necessary to make the loader effectual, all as hereinafter set forth.

The object of my invention is to produce a comparatively simple and inexpensive but practicable and efficient machine for expeditiously loading or filling hand drivers, such machine being automatic in its action, that is to say, the act of attaching a driver to the loader is all that is required to open the raceway and cause the feeding operation to take place, and the withdrawal of such driver from the loader results in cutting off the supply of tacks and in a cessation of the feeding operation.

A further object of my invention is to provide a loader so constructed that very little change is needed to adapt drivers of ordinary construction thereto.

Other objects will appear in the course of the following description.

I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation in partial section of a machine which embodies a practical form of my invention, a driver being shown, also in elevation, operatively connected with such machine; Fig. 2, a top plan of the hopper without the lid or cover; Fig. 3, a top plan of the gate for the hopper; Fig. 4, a front elevation of said gate; Fig. 5, a top plan of the hopper and part of the supporting frame, showing in connection therewith the driving mechanism for the brush; Fig. 6, a top plan of a portion of such

driving mechanism, showing the clutch, and Fig. 7, a section on lines 7—7, looking in the direction of the arrow, in Fig. 6. The detail views are all detached and assumed to lie horizontally or to stand vertically as the case may be.

Similar figures refer to similar parts throughout the several views.

Referring to the drawings, it will be observed that I provide a suitable frame or support 1 which rises from a bed or base 2 and has a downwardly and forwardly inclined top 3 which consists in part of a yoke 4, the latter constituting the lower, forward portion of said top.

Having its rear end pivoted at 5 to the frame 1 and extending forward over the front edge of the base 2 is an arm 7, which arm forms a yielding support or stirrup for the cone-shaped foot 8 of a hand driver 9, since said arm is tensioned upwardly by means of a spring 10 interposed between it and said base. A stop 11 rises from the base 2 and has a lip which projects over the arm 7 to limit the upward movement of the same and prevent it from flying up too far under the influence of the spring 10 when the driver 9 is removed therefrom. Journaled in the upper end of the frame 1 at the rear is a horizontal shaft 12, and upon opposite ends of this shaft are tightly mounted two pulleys 13. Secured in the inclined top 3 of the frame 1 is a stud 14 inclined at right-angles to the inclination of said top. Loose on the stud 14 is a pulley 15 driven by a belt 16 which passes around said pulley and up behind the pulleys 13 to a pulley (not shown) on a main or counter-shaft.

A hopper 17 for tacks is securely fastened on the yoke 4, so that it inclines just as the yoke does, and this hopper has a raceway 18 in its floor, such raceway starting at or adjacent to the lowest point in such floor and extending directly toward the center of said hopper for some little distance, when it turns to one side, as clearly shown in Fig. 2. This raceway is made by cutting a slot in the floor of the hopper, for the bodies of the tacks to slide in, and channeling said floor both sides of said slot, for the heads of said tacks to slide in. The lower branch or what may be termed the radial branch of the raceway 18 is covered by a guard plate 19 which lies on the floor of the hopper 17 over such branch. The plate 19

prevents the tacks from piling up in and about and crowding the outlet of the raceway 18, but does not interfere with the passage of the tacks when properly located with their points down and projecting through and their heads up in said raceway. The plate 19 also prevents the tacks in the lower or radial branch of the raceway from becoming upwardly displaced, and protects them from the agitator member for the tacks, such member in this case consisting of a brush 20 having a V-shaped head 21.

In the center of the hopper is a hub 22 within which a shaft 23 is journaled, such shaft being parallel with the stud 14. The inner, closed end of the brush head 21 is tightly mounted on the inner or upper terminal of the shaft 23 with a collar 24 between such head and the top of the hub 22. Below the bottom of the hopper is another collar 24 on the shaft 23. The two collars 24 are tight on the shaft and hold the latter against endwise movement. The shaft 23 is operated from the pulley 15 by the means and in the manner presently to be described. Extending from the hub 22 upward and backward to the rear wall of the hopper 17 is a V-shaped abutment 25 which prevents the tacks from getting behind or above said hub as they are swept about or agitated by the brush 20. By providing a barrier having sides which incline from above or behind downwardly or forwardly and inwardly, such as the abutment 25, in the upper central part of the hopper, I enhance the facility with which the brush 20 is able to present the tacks to the raceway 18, since all tacks swept against the sides of said abutment must immediately drop or roll down into the path of said brush again. The operation and action of the brush will be subsequently clearly set forth in this specification.

26 is a suitable cover hinged to the hopper 17.

What is herein termed a gate 27 is fastened against the underside of a lug 28 on the front of the hopper 17, by means of two bolts 29. The gate 27 has a central slot 30 in the underside, and is provided with two ears 31 which are spaced apart and have portions of their inner faces inset, as best shown in Fig. 4. The ears 31 extend above and behind that part of the gate 27 that is bolted to the lug 28, and the slot 30 opens above and behind into the space 32 between said ears at this point, which space is directly below and opens into the lower or delivery branch of the raceway 18, see Fig. 1. Fastened at their upper and rear ends, each by a screw 33, to the corresponding edges of the ears 31, are two springs 34. These springs flare outward at their free terminals and normally contact with each other adjacent to such flaring parts; they

are located immediately below the delivery branch of the raceway 18, and when closed, that is, when their free terminals are in contact, such springs hold back any tacks that may be in said branch of the raceway. Projecting inwardly from the inner faces of the ears 31 are two pins 35.

The driver 9 has a raceway 36 which is adapted to enter the slot 30 in the gate 27 and between the ears 31, where it encounters the springs 34, separates their closed terminals, and so opens the way into said raceway from the raceway 18 for the tacks to pass into said driver. The lower end of the raceway 18 is enlarged, or rather said raceway runs into a recess 59 in the floor of the hopper under the lowermost portion of the plate 19 and the adjacent part of the lower wall of said hopper, and the upper edge of the nose of the raceway 36 fits into this recess, so that the connection between the two raceways is complete and perfect. Curved slots 37, in the free end or nose of the raceway 36, receive the pins 35, and the driver is held in place at its upper end by the engagement of said raceway with the gate 27, including the ears 31 and said pins, while said driver is supported on the arm 7.

Pivoted between the ears 31 at 38 is an operating lever 39 for the clutch mechanism through the medium of which the shaft 23 is actuated. In the lower end of the lever 39, which lower end is sleeved to receive it, is a plunger 40. The plunger 40 has a bent part 41 at the rear end and a head 42 at the front end. A spring 44 encircles the plunger 40 between its head 42 and the adjacent end of the lever sleeve 43. The bent part 41 and the back end of the sleeve 43 limit the forward movement of the plunger under the influence of the spring 44. When the driver 9 is in place the body thereof bears against the head 42 of the plunger 40 and rocks the lever 39 to throw in the clutch, as explained below, the spring 44 being of sufficient strength for this purpose, but at the same time affording the necessary flexibility and compensation in the mechanism, as will presently appear.

The clutch hereinbefore mentioned comprises an arm 46 having a sleeve 47 at one end which is loose on the lower terminal of the shaft 23, a collar 48 loose or free on said sleeve and having an annular recess 49 therein, a ring 50 keyed at 51 to the sleeve but capable of endwise movement relative thereto and loose in said recess, said ring having cross grooves 52 in its exposed face or end, and a cross rod 53 in and projecting from said shaft above the grooved end of said ring. The grooved portions of the ring 50 are adapted to be brought into registry and actual engagement with the rod 53. Projections or trunnions 54—54 on oppo-

site sides of the collar 48 are received into the slotted ends of the arms of the upper, bifurcated or forked terminal of the lever 39, said collar being partially located between said arms, and these and adjacent portions of the operating mechanism of the machine being within the yoke 4. One of the slotted arms of the lever 39 for the trunnions 54 appears at 60, in Fig. 1. A connecting-rod 55 has one end pivotally attached at 56 to the arm 46 opposite the sleeve 47, and the other end pivotally attached at 57 to the pulley 15, the pivotal points of attachment 56 and 57 being on the undersides of said arm and pulley.

The rotary motion of the pulley 15 oscillates the arm 46 with its sleeve 47, through the medium of the connecting rod 55, and the ring 50 is partially rotated in opposite directions by said sleeve, owing to the fact that it is keyed thereto, but the shaft 23 remains stationary until the collar 48 is actuated to bring said ring into contact with the cross rod 53 with said rod in the grooves 52. As soon as this last engagement takes place, however, the motion of the sleeve 47 is imparted to the shaft 23, through the medium of the ring 50 and the rod 53, and continues to be so imparted until the collar 48 is moved so as to disengage said ring from said rod. The collar 48 can only be moved axially, while the ring 50 not only can be moved in a similar manner, but also oscillates with the sleeve 47, as already stated.

The endwise movement of the collar 48 is brought about by the connecting of the driver 9 with the machine, on the one hand, and by the disconnecting of said driver from said machine, on the other hand, the arm 39 being rocked on its pivot 38 to raise said collar and throw in the clutch when the driver is placed in the machine, and to lower said collar and throw out said clutch when the driver is removed from the machine. In the event that, when the collar 48 is elevated and so lifts the constantly-oscillating ring 50 into contact with the normally-stationary rod 53, the grooves 52 are not in registry with said rod, the spring 44 on the plunger 40 under full compression as it would then be between the sleeve 43 and the plunger head 42, the plunger having been thrust backward by the driver 9 when placed in the loader, expands to the necessary extent and acts on the lever 39 to rock the same still more and bring about the interlocking engagement between said ring and rod as soon as said grooves come into registry with the rod, by elevating the axially movable members more than was done in the first instance or when the driver was placed in position.

The movement imparted to the shaft 23, when the clutch is thrown in, oscillates the brush 20 from side to side in the hopper 17,

and said brush sweeps the tacks in said hopper over the raceway 18, and some of said tacks enter said raceway with their heads up and their points down in such position that they slide down the raceway into the driver. At such times as the machine is not engaged in feeding a driver it is not necessary or desirable to keep the brush in motion and the tacks in motion, and it is for this reason that I provide the clutch. The operation of the brush will eventually sweep every tack in the hopper into the raceway.

The operation of the movable parts of the machine having already been explained in detail, it will be necessary to describe only briefly the operation of the machine as a whole, and this I will next proceed to do, it being assumed that the rotary and oscillating members normally driven by the belt 16 are in motion, and that there is a supply of tacks in the hopper 17. The foot 8 of the empty driver 9 is first placed on the step 58, which may be indented to receive it, of the arm 7 and the latter is pressed downward against the resiliency of the spring 10, next the raceway 36 is inserted in the gate in the manner previously described, and then said driver is released and said spring permitted to react on said arm and so to assist in retaining the driver in place. While thus being placed in position, the driver 9 engages the plunger 40, rocks the lever 39, and thereby causes the clutch to be thrown in and the brush 20 to be set in motion; also the nose of the raceway 36 opens the gate springs 34. Now, the tacks swept into the raceway 18 by the brush, slide down said raceway beneath the plate 19 and between the now open springs 34, and enter the driver by way of the raceway 36. The stream of tacks continues to flow in this manner from the hopper to the driver until enough have been supplied to the driver, when the operator forces down the driver and the arm 7, disengages the raceway 36 from the gate, and removes the driver entirely from the loader. Instantly upon the withdrawal of the nose of the raceway 36 from the gate the springs 34 close the exit from the raceway 18, and the released lever 39 permits the clutch to be thrown out by the downward movement of the collar 48 and the ring 50 with the result that the brush ceases to operate or to be operated. When free the arm 7 rises under the influence of its spring 10 into contact with the lip of the stop 11. Gravity is sufficient to bring about the disconnection of the interlocking members of the clutch, upon the release of the long arm of the lever 39.

In addition to the advantages noted above, it will be seen that the machine consists of few parts, readily assembled, generally accessible, and easily separated or taken apart should occasion require.

Although the machine illustrated and described embodies my invention in a practical form, it is conceivable that many changes may occur to one skilled in the art, and all such changes to which I am entitled, whether they be in the shape, size, or construction of some or all of the parts of said invention, are sought and intended to be covered by my claims.

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

1. The combination, in a tack loader, with a suitable hopper provided with a raceway, of a gate forming part of the mouth of said raceway and having the raceway continued therethrough and provided with normally-contacting but separable springs located between the walls of the raceway in said gate and having outwardly-flaring free terminals, such gate being adapted to have connected therewith and disconnected therefrom the raceway of a tack driver, and such springs being adapted to be separated or to have their normally-contacting parts opened by the driver raceway when thrust between them and to be closed upon the withdrawal of said driver raceway.

2. An inclined hopper, for a tack loader, having a raceway in the floor thereof, and provided in the upper portion with an abutment which bars the tacks from such upper portion and means in said hopper adapted to play in the space unoccupied by said abutment to actuate the tacks into said raceway.

3. The combination, in a tack loader, with a suitable tack receptacle provided with a raceway, and a gate forming part of the mouth of said raceway, such gate having ears spaced apart and provided with inwardly-directed pins to receive and hold the nose of the raceway of a tack driver, of a pivotally-mounted upwardly-tensioned arm

adapted to support said driver and retain it with the nose of its raceway in engagement with said gate.

4. The combination, in a tack loader, of a suitable frame, a tack receptacle supported by such frame and provided with engaging means for the nose of the raceway of a tack driver, a pivotally-mounted upwardly-tensioned arm adapted to support said driver and retain it with the nose of its raceway in engagement with said engaging means, an agitator for tacks in such receptacle, driving mechanism including clutch members for such agitator, and a pivotally-mounted lever having one terminal in engagement with one of such clutch members and the other terminal in operative relation to said driver when supported on said arm.

5. The combination, in a tack loader, with an agitator for tacks, and driving mechanism including clutch members for such agitator, of a pivotally-mounted operating lever for such clutch members, and a yielding member carried by and slidingly mounted in relation to said lever and located in operative relation to the body of a tack driver when connected with the loader.

6. The combination, in a tack loader, with a suitably journaled shaft, an agitator member for tacks tight on such shaft, an arm loose on such shaft, and a clutch, of means to impart continuous motion to said arm, and means to operate said clutch and lock said arm to said shaft and to unlock said parts, said last-mentioned means being capable of being operated by a tack driver which the loader is designed to load.

JOHN J. DOIDGE.

Witnesses:

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A. C. FAIRBANKS.