No. 677,816. Patented July 2, 1901.

W. R. SWETT.

MACHINE FOR BOXING MATCHES.

(Application filed June 19, 1900.)

(No Model.) 4 Sheets—Sheet 1.

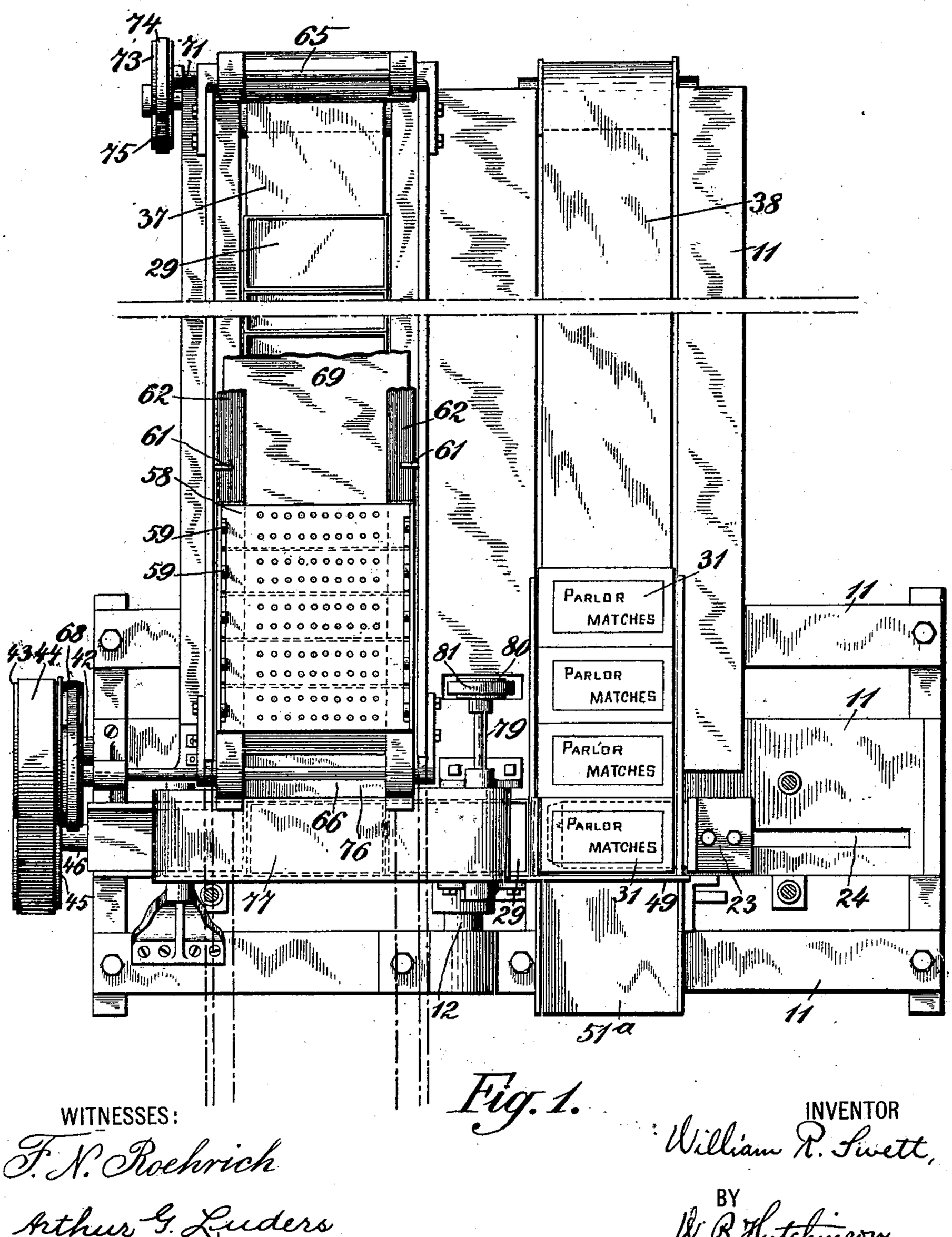

Fig. 1.

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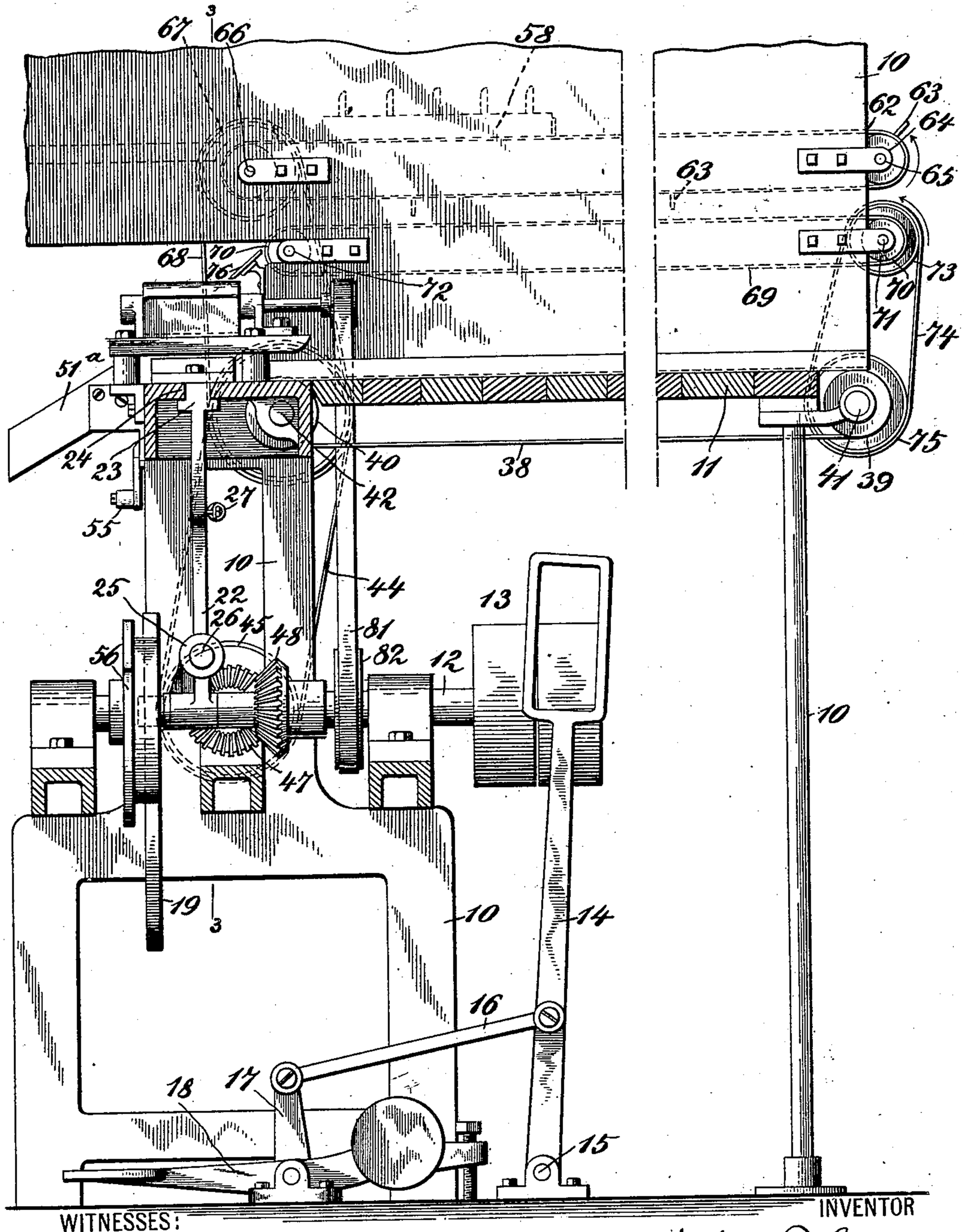

Fig. 2.

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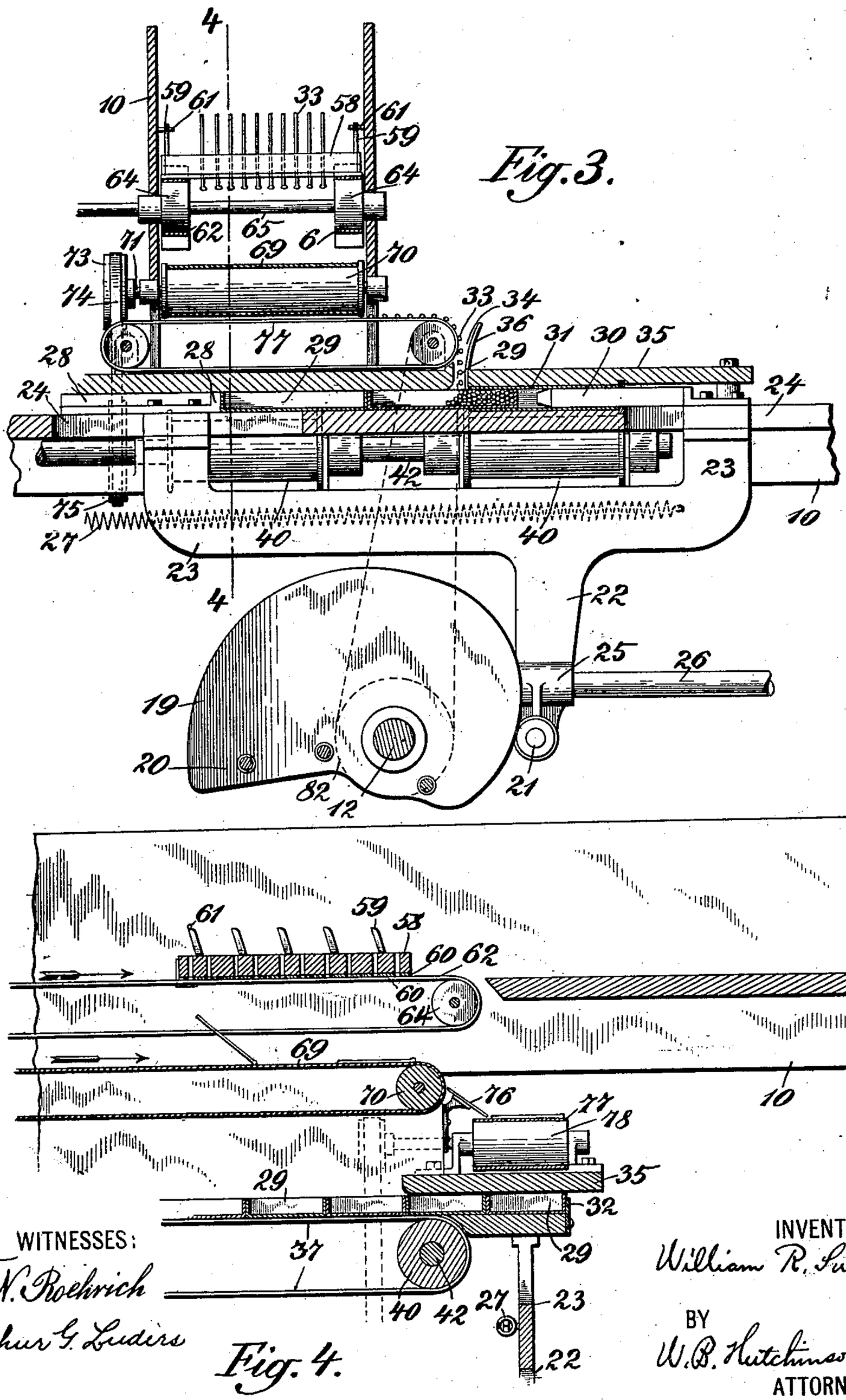

Fig. 3.

Fig. 4.

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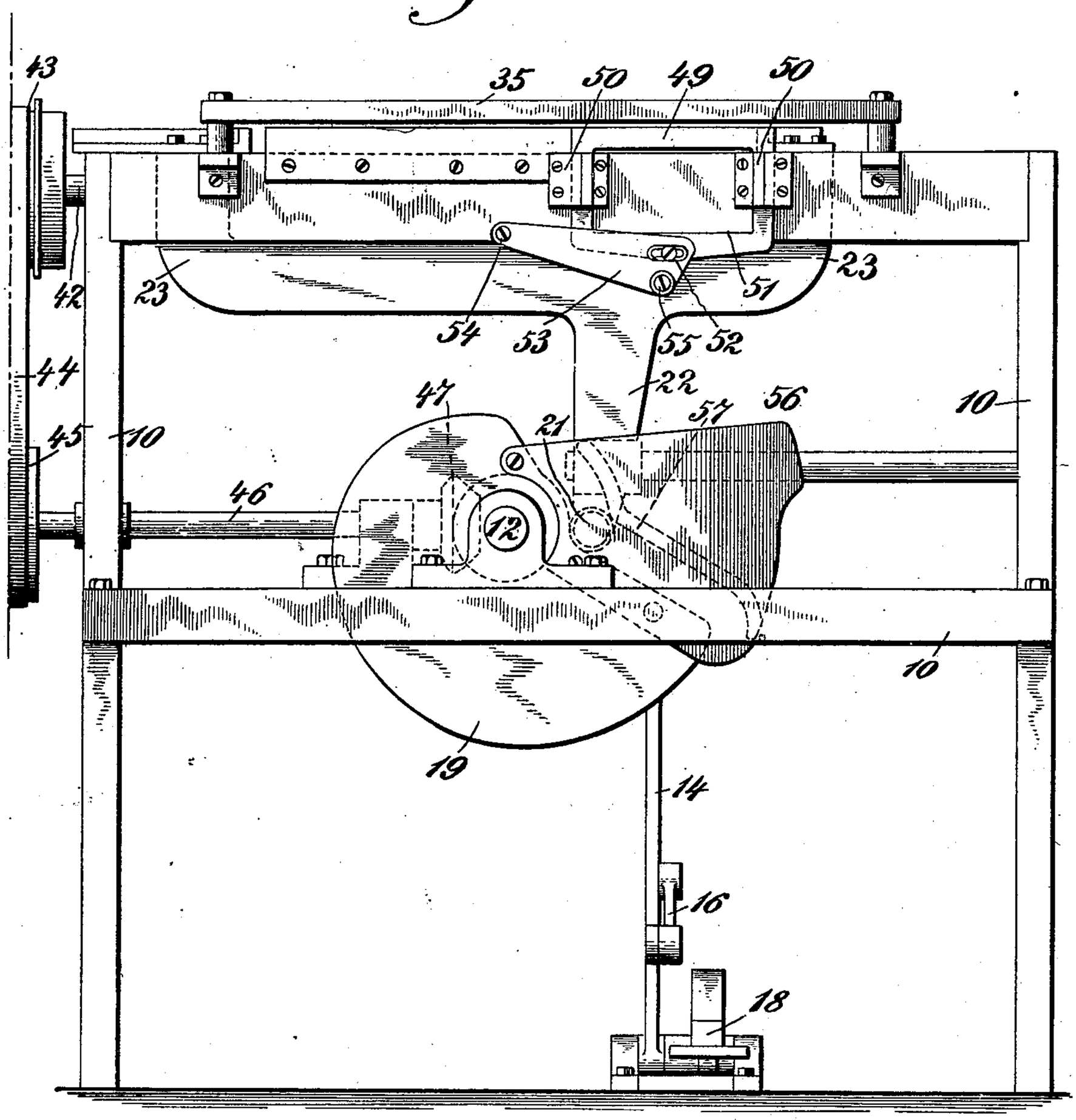
Fig. 5.



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MACHINE FOR BOXING MATCHES.

SPECIFICATION forming part of Letters Patent No. 677,816, dated July 2, 1901.

Application filed June 19, 1900. Serial No. 20,812. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM ROGERS SWETT, of Boundbrook, Somerset county, and State of New Jersey, have invented certain new and useful Improvements in Machines for Boxing Matches, of which the following is a full, clear, and exact description.

My invention relates to improvements in match-boxing machines; and one object of my invention is to produce a machine which will automatically receive a continuous quantity of match-splints, deliver them in parallel relation into a match-tray, insert the trays one by one in their appropriate shucks, and then discharge the shucks.

Another object of my invention is to produce a machine of this character which will automatically unload the splints from the holding-frames in which they have been dipped and place the splints in parallel relation and deliver them to the packing mechanism above referred to.

A further object of my invention is to get all the necessary mechanism for performing the above functions into a simple, compact, and practical form, to the end that the work may be properly and economically done without many delays and without being subject to frequent breakdowns.

To these ends my invention consists of certain features of construction and combination of parts, which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar figures of reference refer to similar parts throughout the several views.

Figure 1 is a broken plan view of the machine embodying my invention. Fig. 2 is a broken side elevation, partly in vertical section. Fig. 3 is a detail section on the line 3 3 of Fig. 2. Fig. 4 is a detail vertical section on the line 4 4 of Fig. 3, and Fig. 5 is a detail front elevation showing particularly the cam mechanism for moving the box trays and shucks and for discharging the same.

The machine is provided with a suitable frame having a sort of table-top 11 thereon; but obviously the framework is a matter of little importance and can be made of any design, the only thing essential being to provide a suitable means of support for the working parts, which are hereinafter described.

Journaled on the frame is a driving-shaft 12, which is provided, as illustrated, with tight and loose pulleys 13, the driving-belt of which may be controlled by the shipper 14, pivoted at the bottom, as shown at 15, and connected by a link 16 with the arm 17 on the treadle-lever 18. All this mechanism is common in many machines and merely illustrates a means of driving and stopping and starting the machine; but the mechanism here referred to and referred to in other parts of the specification is not claimed, and it will be understood that any suitable means of driving any of the parts can be substituted for the means shown and described.

On the driving-shaft 12 is a cam 19, having one abrupt face 20, this cam being adapted to engage the roller 21 on the lower end of the arm 22 of a yoke or ram 23, which is of a general U shape and the upper end of which slides in the slot 24 in the frame-top. To guide the lower part of the ram, the arm 22 has an eye 25, sliding on the guide-arm 26, which is supported on the machine-frame. The roller 21 is pressed against the face of the cam 19 by a spring 27, secured to the ram 23 and to an adjacent fixed support, such as a part of the frame 10; but this spring is not absolutely necessary, as other means is provided for holding the cam 19 and roller 21 in close connection, as hereinafter described.

It will be noticed that the movement of the cam will cause the ram 23 to be moved relatively slow in one direction and relatively quick in the other.

The ram 23 has at one end a plunger 28, which may be integral with the ram, but is not so illustrated, this plunger being adapted to push forward the match-trays 29, so that they may receive the matches, as presently described, and at the opposite end the ram has a tongue 30, adapted to enter the match-box shucks 31, as shown best in Fig. 3, so that the shucks being opened up will be adapted to easily receive the trays 29, and the cam 19 moves the ram in such a way that the tongue 30 is withdrawn at the same speed that the tray 29 is pushed into a shuck, and no difficulty is experienced in bringing the

two parts of the shucks together. The ram 28, tongue 30, and trays 29 slide in the raceway 32 in the front part of the machine, as shown in Figs. 1, 3, and 4.

The matches 33 are delivered into the match-trays 29 through a throat 34 in the top 35 of the raceway and are guided by a guide-plate 36, which extends downward in one side of the throat and serves to scrape off the superfluous matches as the tray advances, thus serving to level the matches into a tray and prevent the tray from being overloaded.

The trays and shucks 29 and 31 are advanced and delivered into the raceway 32 upon parallel belts 37 and 38, which are arranged with their top members substantially level with the table-top, and the operator keeps these belts supplied with the box parts, which are pushed forward into the raceway, as described, and the front trays and shucks are forced against the front side of the raceway, as in Fig. 4, and when the raceway is full the belts 37 and 38 move frictionally beneath the parts without clogging the machine or in any way interfering with its work; but as soon as a tray, for instance, is pushed by the ram 28 out of the path of the trays behind it the next tray immediately advances, being propelled by the constant motion of the belt 37. A similar effect is had on the belt 38 and the shucks 39, although the loaded shucks are discharged through the front side of the railway, as described later. The belts 37 and 38 are carried by spools 39 40, which are secured to shafts 41 and 42 near the front and rear of the machine, and the shaft 42 is provided with a pulley 43, which is driven by a belt 44, connected to a pulley 45 on a shaft 46, (see Fig. 5,) and which is journaled in the machine-frame and is driven by the gears 47 and 48, by which it connects with the driving-shaft 12.

The shucks 31 when pushed into position to receive the loaded trays 29 are prevented from being pushed forward across the raceway 32 by a vertically-movable gate 49, (best shown in Fig. 5,) which slides in guides 50 and is provided with an opening 51, through which the loaded box is discharged at the proper time. This gate 49 is connected loosely, as shown at 52, with a latch 53, which is pivoted to the frame at one end, as shown at 54, and provided with a roller 55, extending into the path of the cam-plate 56, which is secured to the cam 19, so that at the proper time the came-plate strikes the roller, lifts the latch, and permits the loaded match-box to advance by the pressure of the shucks 31 and belt 38 and discharge through the gate and into the discharge-chute 51^a. The cam-plate 56 also carries a guide 57, which corresponds in shape to that of the abrupt end of the cam 19 and which, engaging the roller 21, holds the roller and cam in close connection.

As illustrated, in this case the match-splints 33 are brought to the machine in dipping-frames 58; but this invention is not confined to the use of these peculiar frames in connection with the packing mechanism, as the matches may be discharged from any suitable frames upon the belts, to be described below, and the operation of the machine is the same. These frames 58, which are not here claimed, have slide-plates 60 thereon, which are actuated by lever-arms 59, so as to move them and by moving them to discharge the match-splints. This movement is effected by the striking of the lever-arms 59 upon a trip 61 on the superstructure of the frame 10; but other suitable discharging means can be employed. The frames 58 are placed, loaded, upon narrow belts 62, which support opposite edges of the plate, as best shown at 63, and so as not to obstruct the fall of matches. The belts 62 are mounted on spools 64, carried by shafts 65 and 66, the latter being provided with a driving-pulley 67, from which runs a driving-belt 68 to the double pulley 43, already referred to. The narrow belts 62 above referred to are provided with stops 63 to engage the frames 58 and prevent their accidental displacement.

When the matches are discharged from the frames 58, they fall upon a traveling belt 69 just below and parallel with the belts 62 and which is speeded a little higher than the said belts, so that as the matches strike they are straightened out, as illustrated in Fig. 4, and lie side by side. This belt 69 is carried by spools 70, which are mounted on shafts 71 and 72, as shown in Fig. 2, the former shaft being provided with a pulley 73, driven by a belt 74, connecting with the pulley 75 on the shaft 41, already referred to. The matches as they are discharged endwise from the belt 69 slide over the guide plane or chute 76 upon a belt 77, which travels at right angles to the belt 69 and parallel to the raceway 32, this belt 77 being mounted on spools 78, the shaft 79 of one having a pulley 80, (see Fig. 1,) driven by a belt 81, connecting with the pulleys on the driving-shaft 12.

The operation of the machine is as follows: The operator keeps the belts 37 and 38 provided with trays and shucks, which are constantly pushed forward into the raceway 32, and the belts 62 are also kept loaded with match-frames 58. The matches are released from the match-frames by the mechanism described or by other mechanism adapted for other kinds of frames, and the dropping matches strike head first on the belt 69, which straightens them out into parallel relation, and they are discharged upon the belt 77, from which they are delivered through the throat 34 into a match-tray beneath. At this moment the ram 23 is being pushed to the right by the action of the cam 19, and the matches are permitted to fill the box which is pushed forward into the shuck 31 in its path, the tongue 30 being gradually withdrawn. As the box is filled the abrupt edge of the cam releases the roller 21, the cam-plate 56 lifts the latch 53 and gate 49, the

loaded match-box is discharged through the gate, and the tongue 30 and ram 28 are returned, ready to repeat operation.

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

1. A machine of the kind described, comprising a raceway, means for delivering trays and shucks transversely into the raceway, a movable gate or abutment to limit the said transverse movement of the shucks into and across the raceway, a plunger mechanism for pushing the trays into the shucks, and mechanism for automatically moving said shuck-limiting abutment to permit the lateral discharge of the combined shucks and trays.

2. A machine of the kind described, comprising a raceway to contain shucks and trays, a sliding head or ram having its upper ends projecting into the raceway, one end of the head forming a plunger to push the trays, and the opposite end having a tongue to enter the shucks, a cam to actuate the head, a movable gate or abutment to limit the transverse movement of the shucks through the raceway, and cam-actuated mechanism for moving the said gate or abutment, substantially as described.

3. A machine of the kind described, comprising parallel belts to carry trays and shucks, a raceway traversing the paths of the belts to receive the trays and shucks, a sliding head or ram projecting into the raceway, said head carrying a plunger to engage the trays, and a tongue to open the shucks, a cam to actuate the head, a movable gate or abutment in the path of the shucks to limit their transverse movement across the raceway, and automatic means for moving the said gate or abutment, substantially as described.

4. The combination with the raceway arranged for the passage of match-trays, and a throat discharging into the raceway, of the following unloading instrumentalities, to wit: mechanism for carrying and unloading a match-frame, a belt or carrier movable below the said frame-carrying means and substantially parallel therewith, and a second belt or carrier above the raceway and at an angle to the first carrier, said second carrier discharging into the above-mentioned throat.

5. A machine of the kind described, comprising a raceway, a head or ram slidable through the raceway, one end of the said head or ram carrying a plunger to push the trays and the opposite end a tongue to enter and open the partially-collapsed and imperfectly-opened shucks, a throat discharging into the raceway, mechanism for carrying and unloading a match-frame, a belt or carrier movable below the said frame-carrying mechanism and substantially parallel therewith, and a second belt or carrier above the raceway and at an angle to the first carrier, said second carrier discharging into the above-mentioned throat.

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