

F. W. COFFIN.
TENPIN SPOTTING MACHINE.
APPLICATION FILED MAY 11, 1909.

930,353.

Patented Aug. 10, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

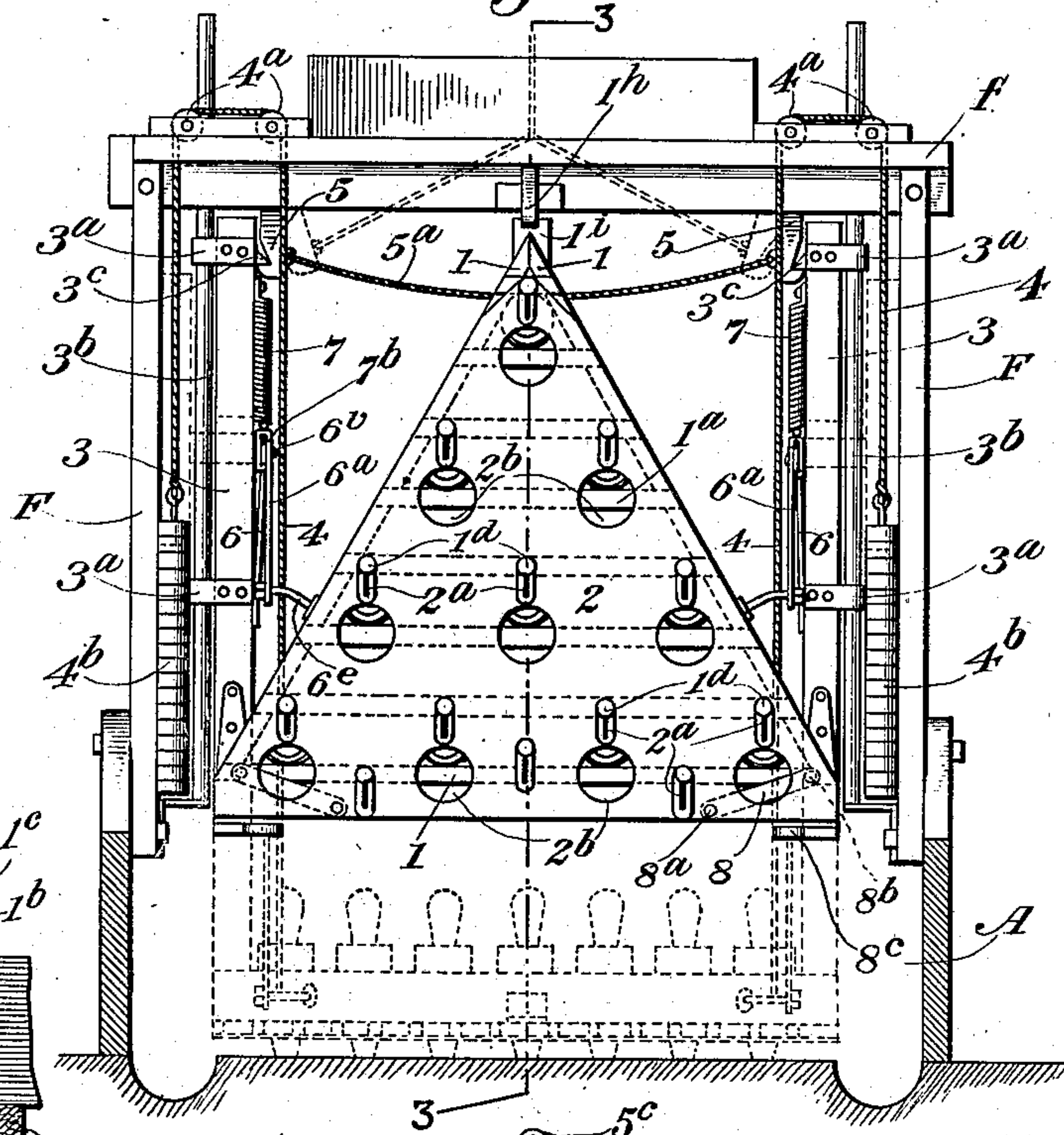


Fig. 6.

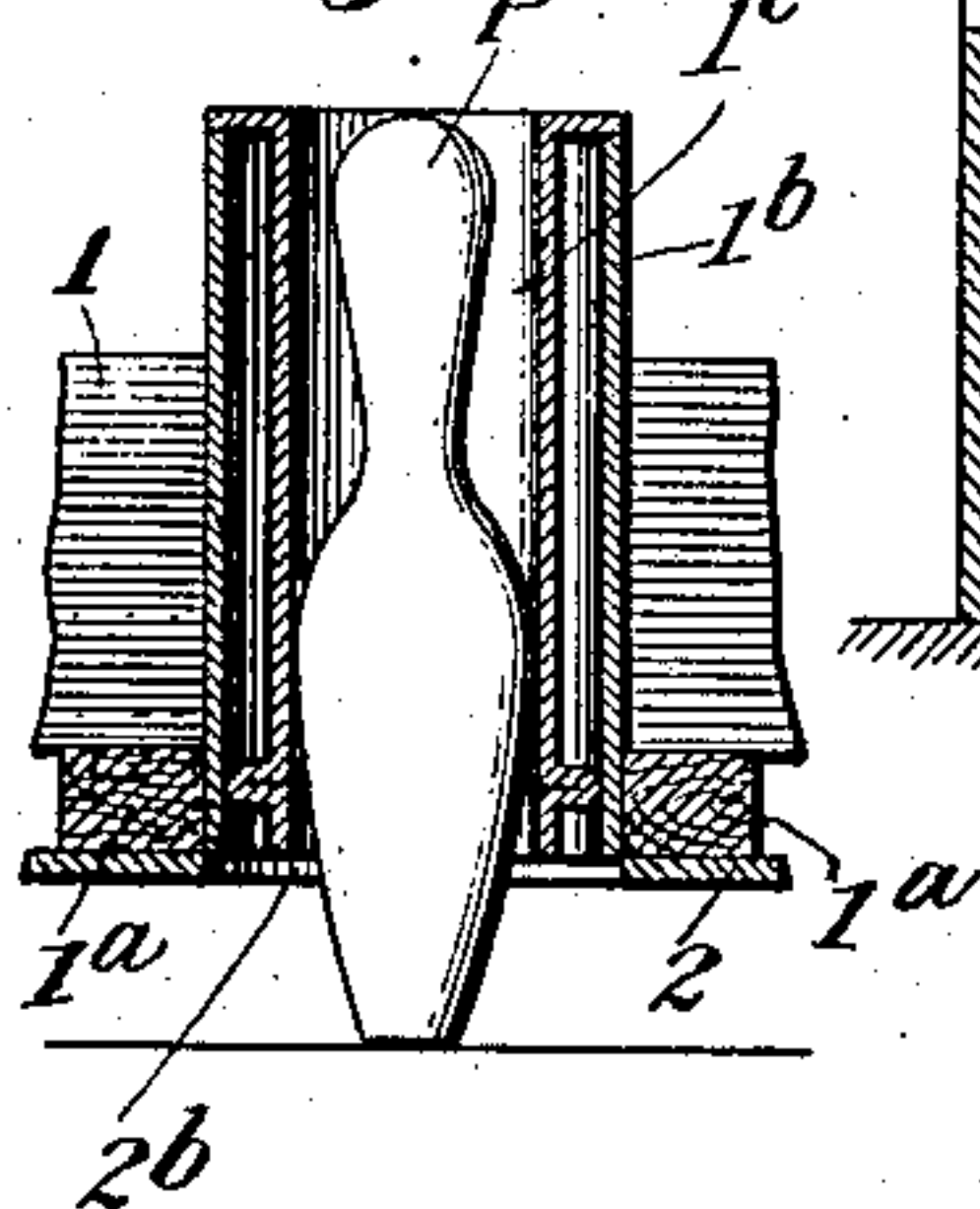
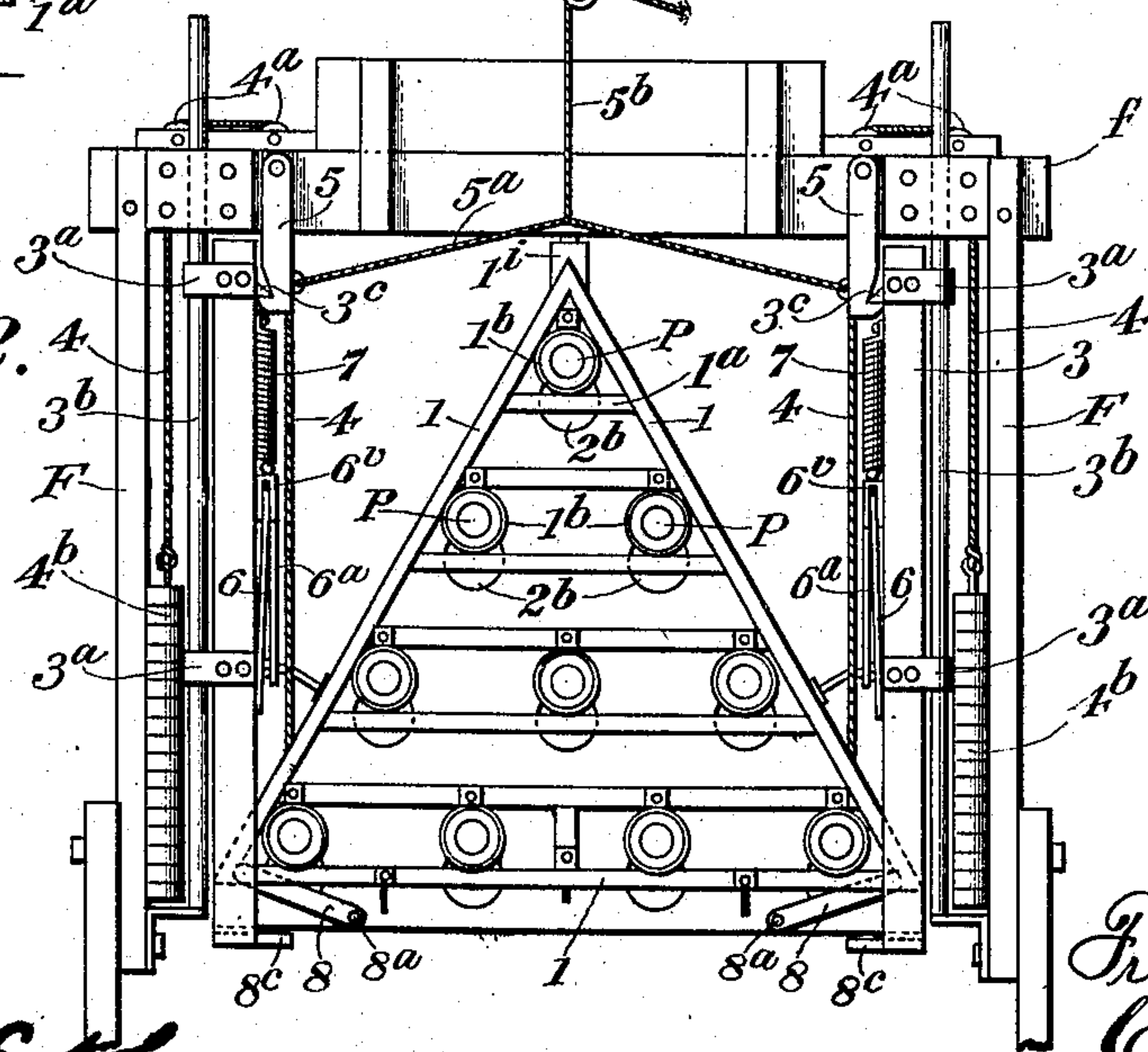


Fig. 2.



Witnesses

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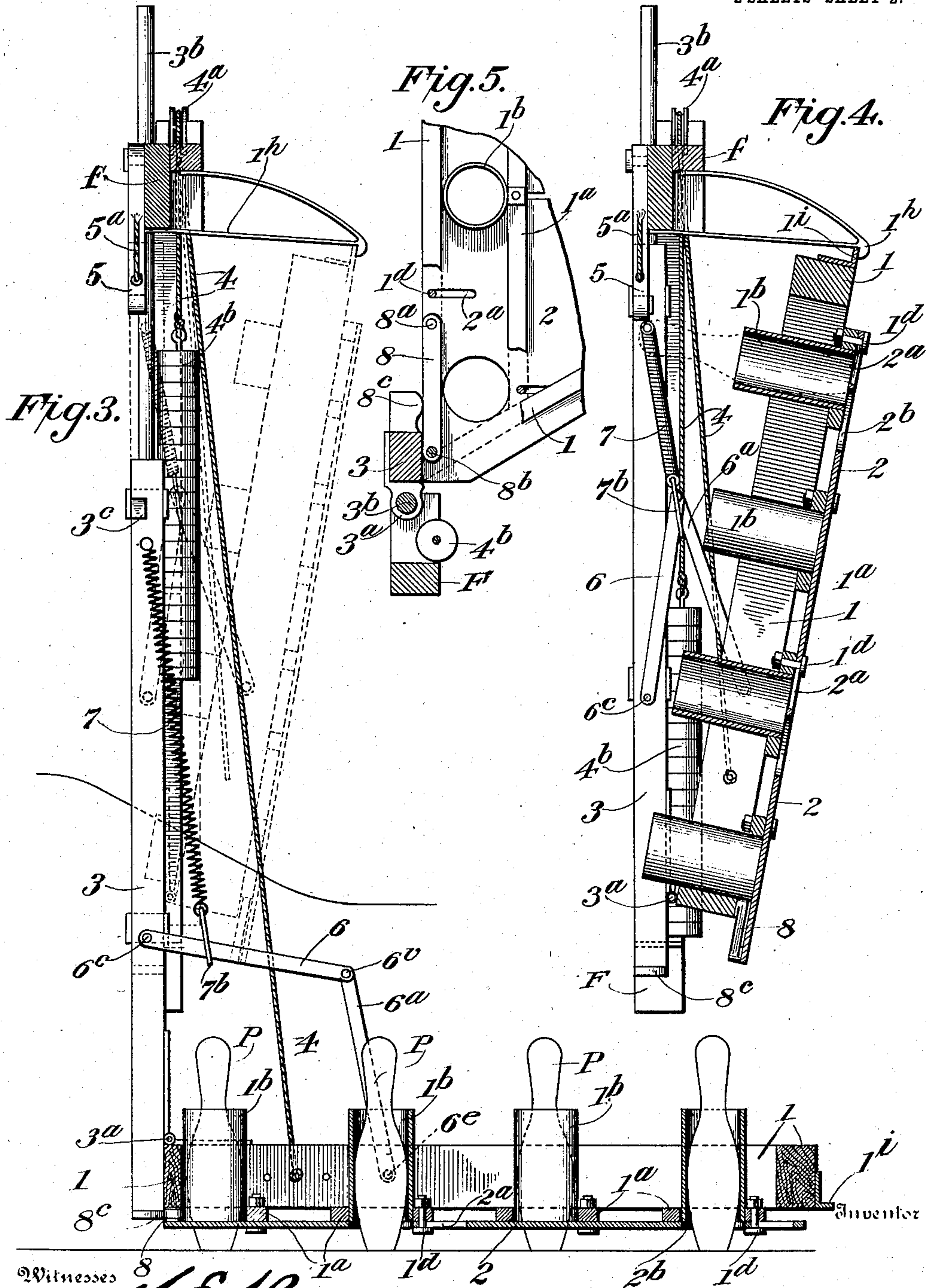
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

FRANK W. COFFIN, OF SLATINGTON, PENNSYLVANIA.

TENPIN-SPOTTING MACHINE.

No. 930,353.

Specification of Letters Patent.

Patented Aug. 10, 1909.

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To all whom it may concern:

Be it known that I, FRANK W. COFFIN, of Slatington, in the county of Lehigh and State of Pennsylvania, have invented certain new and useful Improvements in Ten-pin-Spotting Machines; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

This invention is a novel machine for setting up ten-pins, and the like, in bowling alleys, and is semi-automatic in operation, the attendant simply having to pick up the pins and put them in the machine and then release the latter, whereupon the machine places the pins in position upon the alley and moves out of the way. It can be used for setting ten-pins or any of the different games played with such pins; such as duck-pins, and candle-pins.

I will now describe the machine as illustrated in the accompanying drawings which show one practical embodiment of the invention; and will then set forth the essential features and combinations of parts for which protection is desired, in the claims.

In said drawings—Figure 1 is a front view of the machine showing it in raised or pin-receiving position in full lines, and in pin-setting position in dotted lines. Fig. 2 is a rear view of Fig. 1. Fig. 3 is an enlarged vertical section on line 3—3, Fig. 1, showing the machine in pin-setting position in full lines, and in pin-receiving position in dotted lines. Fig. 4 is a detail vertical section of the machine in raised or pin-receiving position. Fig. 5 is an enlarged detail plan view of the bottom-plate shifting devices. Fig. 6 is a detail view of one of the pin-holders, with a removable tube therein.

The machine, as shown in the drawings, comprises a triangular frame which is preferably formed of side and end bars 1 arranged vertically edgewise, and transverse bars 1^a to which are secured pin-receivers or cylinders 1^b adapted to receive the ten-pins, P. The cylinders will ordinarily be made large enough to receive the largest sized regulation ten-pins, and in order to receive smaller pins removable tubes 1^c can be arranged to be slid into the cylinders 1^b as indicated in Fig. 6 to receive the smaller sized pins, such as duck-pins or candle-pins. The frame is provided with a triangular bottom

plate 2 which is slidably connected to the bars 1^a by having slots 2^a engaged by headed pins 1^a fast to the bars 1^a. The plate 2 is provided with apertures 2^b adapted to register with the lower ends of the cylinders 1^b when the frame is in lowermost position, and when the frame is raised the plate 2 drops by gravity into the position indicated in Figs. 1 and 4 so that it blocks the lower ends of the cylinders and prevents the pins dropping therefrom or therethrough until the frame is lowered to setting position, at which time plate 2 is moved forward by devices hereinafter described, so that the holes 2^b register with cylinders 1^b and permit the pins to pass out onto the floor of the alley A.

The rear bar 1 of the frame is hinged, as shown at 3^a, to the lower ends of vertically movable bars 3, one at each side of the frame, and which bars are slidably connected by loops 3^a to vertical rods 3^b which are rigidly fastened to uprights F, one at each side of the alley; said uprights being connected at top by a cross piece f.

The frame is raised, and normally held in raised position, by means of chains or ropes 4 attached to the side bars of the frame adjacent the hinge and extending up over pulleys 4² attached to the top bar f of the frame and having weights 4^b connected to the free ends of the cords, said weights being sufficient to slightly more than counterbalance the weight of the frame 1, and the bars 3, when the pins are not in the frame. When the frame is raised by the weights, it is locked in elevated position by means of catches 5 pivoted to the top bar F of the frame and engaging beveled portions or teeth 3^c attached to the bars 3, as shown in Fig. 2; these teeth may be extensions of the upper loops 3^a. The catches 5 are connected by a cord 5^a, which is in turn connected to a pull-cord 5^b which may be carried over a pulley 5^c, suspended from the ceiling of the room, to within easy reach of the operator, so that the latter can by pulling on cord 5^b disengage catches 5 from frame 3; whereupon if the frame is loaded with pins it will descend. The frame is kept from tilting forwardly while in raised position by means of a catch 1^h attached to the top bar f of the frame and engaging a plate 1ⁱ on the apex of the frame; but the descent of the frame disengages it from the catch 1^h and allows it to tilt forwardly as it descends. To prevent the frame tilting forwardly too rapidly as

it descends I provide cushioning devices therefor consisting of jointed levers composed of members 6, 6^a, which are pivoted together at 6^v; the other end of link 6 is pivoted to the adjacent bar at 6^c, and the other end of lever 6^a is pivoted at 6^a to an arm or bracket 6^e attached to the side bars of the frame.

A contractile helical spring 7 is attached to bar 3, above each link 6, to a loop 7^b slidably engaging such link 6. When the frame is in raised position the spring 7 is contracted and the slide 7^b is at the outer end of link 6 or at the junction of links 6, 6^a, (see Fig. 4) and therefore has less power; but when the frame is released and descends, it tilts forwardly on its hinges and springs 7 are extended (see Fig. 3). The springs 7 at first offer their greatest resistance to the swinging movement of the frame, but as the frame lowers to a horizontal position the loops 7^b shift back on links 6 as indicated in Fig. 3.

When the frame is released by disengagement of catches 5—the cylinders having been previously filled with pins—the loaded frame descends and tilts forwardly on its hinges until it nearly assumes a horizontal position, at which time the plate 2 is shifted so as to cause its slots 2^a to register with the cylinders. The shifting of the plate may be accomplished in various ways but as shown in the drawings the lower or rear edge of plate 2 is connected to links 8, as at 8^a, and the other ends of links 8 are pivoted to the lower edges of bars 3 as shown at 8^b. When the frame is raised these links assume the position indicated in Figs. 1 and 2 and project below this lower or rear edge of the rearmost bar 1 of the frame. When the frame is released and descends levers 8 come in contact with stops 8^c fastened to the bars 3, see Figs. 3, 4 and 5, arresting the motion of said levers while the frame completes its swing to horizontal position, and in so doing the levers 8 force plate 2 to move forwardly and bring its slots 2^a into register with cylinders 1^b as indicated in Figs. 3 and 5 whereupon the pins drop onto and rest upon the alley A; and as the frame is thereupon relieved of the weight of the pins the weights 4^b overbalance the weight of the unloaded frame and return it to setting position. On the initial upward movement the frame rises clear of the pins and then begins to tilt upwardly, the tilting being accomplished by the combined action of the pull-ropes 4, the spring 7, and links 6. The springs 7 do not come effectively into operation until after the frame has risen sufficiently to bring 6^v above the pivots 6^c, and this enables the frame to automatically rise clear of the pins before it is tilted sufficiently to interfere with the pins.

Operation: The frame is normally held

in the position shown in Figs. 1 and 4 in full lines, that is, sufficiently above the alley to be out of the way of the pins during the bowling. After the bowling the attendant places the pins in the respective cylinders 1^b and then pulls cord 5^c thereby releasing catches 5, and the loaded frame drops vertically and at the same time tilts downwardly, and just before it reaches its lowermost position the plate 2 is shifted forwardly as described, dropping the pins in exact position on the alley; and the frame being then relieved of the weight of the pins is raised and swung back to the position shown in Figs. 1 and 4 and remains in such position out of the way until it is reloaded with the pins and released by the operator. The jointed levers 6, 6^a, are used for the purpose of cushioning and regulating the swinging motion of the frame.

Having described my invention what I claim as new and desire to secure by Letters Patent thereon is:

1. In a pin-spotting apparatus the combination of a vertically movable frame provided with pin-receiving cylinders, a device for closing the lower ends of the cylinders when the frame is raised, means for holding the frame in raised position until loaded with the pins, means for releasing the frame and causing it to descend, means for shifting the closing devices to discharge the pins in the cylinders when the frame is lowered, and means for raising the frame after the pins are released.

2. In a pin-spotter the combination of a vertically movable tiltable frame provided with pin receivers, means for normally holding the frame in upwardly inclined position, means for releasing the frame when the receivers are filled with pins, means for releasing the pins from the receivers when the frame tilts forwardly to horizontal position, and means for raising the frame after the pins are released.

3. In a pin-spotter the combination of a vertically movable tiltable frame provided with pin-receivers, means for normally holding the frame in raised and upwardly inclined position, means for locking the frame in raised position, means for releasing the frame when the receivers are filled with pins, whereupon the frame descends and tilts forwardly, means for releasing the pins from the retainers when the frame reaches a substantially horizontal position, and means for raising the frame after the pins are released.

4. In a pin-setting apparatus the combination of a frame provided with pin-receivers, slidable devices adapted to close the receivers, means for raising the frame when unloaded, means for sliding said devices to release the pins when the frame is lowered, and means for raising the unloaded frame.

5. In a pin-setting apparatus the combination of a triangular frame provided with pin-receiving cylinders, a slidable bottom plate adapted to close the lower end of the cylinders, means for raising the frame when unloaded, means for sliding said plate to release the pins when the frame is lowered to horizontal position, and means for raising the unloaded frame.

6. In a pin-setting device the combination of a frame provided with pin-receivers, a slidable bottom plate on said frame provided with openings adapted to register with the receivers, means for shifting said plate out of register with the receivers when the frame is raised, and means for shifting said plate into register with the receivers when the frame is lowered.

7. In a pin-setting device the combination of a frame provided with pin-receivers, a slidable bottom plate on said frame provided with openings adapted to register with the receivers, means for shifting said plate to move the openings out of register with the receivers when the frame is raised, and means for shifting said plate to bring the openings into register with the receivers when the frame is lowered; with means for automatically raising the frame when empty, and means for holding said frame in raised position while being loaded.

8. In combination vertically movable bars, a frame hinged to said bars, pin-receivers in said frame, means for raising the frame and bars, spring controlled levers for regulating the swinging movement of the frame on said bars, and means for releasing the pins in the receivers when the frame is lowered to horizontal position.

9. In combination vertically movable bars, a triangular frame hinged to said bars, pin-receivers in said frame, weights connected with said frame for raising it and the bars, spring controlled levers for regulating the swinging movement of the frame on said bars, and a slidable bottom plate on said frame for releasing the pins in the retainers when the frame is lowered to horizontal position.

10. In combination vertically movable bars, a frame hinged to said bars, pin-re-

ceivers in said frame, weights connected with said frame for raising it and the bars, means for regulating the swinging movement of the frame on said bars, and means for releasing the pins in the retainers when the frame is lowered to horizontal position; with catches for locking the frame when in raised position.

11. In combination vertically movable bars, a triangular frame hinged to said bars, pin-receivers in said frame, weights connected with said frame for raising it and the bars, spring controlled levers for regulating the swinging movement of the frame on said bars, a slidable bottom plate on said frame for releasing the pins in the retainers when the frame is lowered to horizontal position; and catches for locking the frame when in raised position.

12. In a pin-setting device the combination of a pin-holding frame provided with pin-receivers, a slidable bottom plate on said frame, means for sliding the plate on the frame, vertically movable bars to which said frame is hinged and levers pivoted to said plate and to said frame at opposite ends, and stops adapted to engage said levers and arrest their movement during the swinging descent of the frame whereby said plate is shifted.

13. In a pin-setting device the combination of a pin-holding frame provided with pin-receiving cylinders, a slidable bottom plate on said frame provided with openings adapted to register with the cylinders, means for sliding the plate on the frame, vertically movable bars to which said frame is hinged, levers pivoted to said plate and to said frame at opposite ends, and stops adapted to engage said levers and arrest their movement during the swinging descent of the frame, whereby said plate is shifted bringing its opening into register with the pin cylinders.

In testimony that I claim the foregoing as my own, I affix my signature in presence of two witnesses.

FRANK W. COFFIN.

Witnesses:

G. T. OPLINGER,
JAMES NEMECEK.