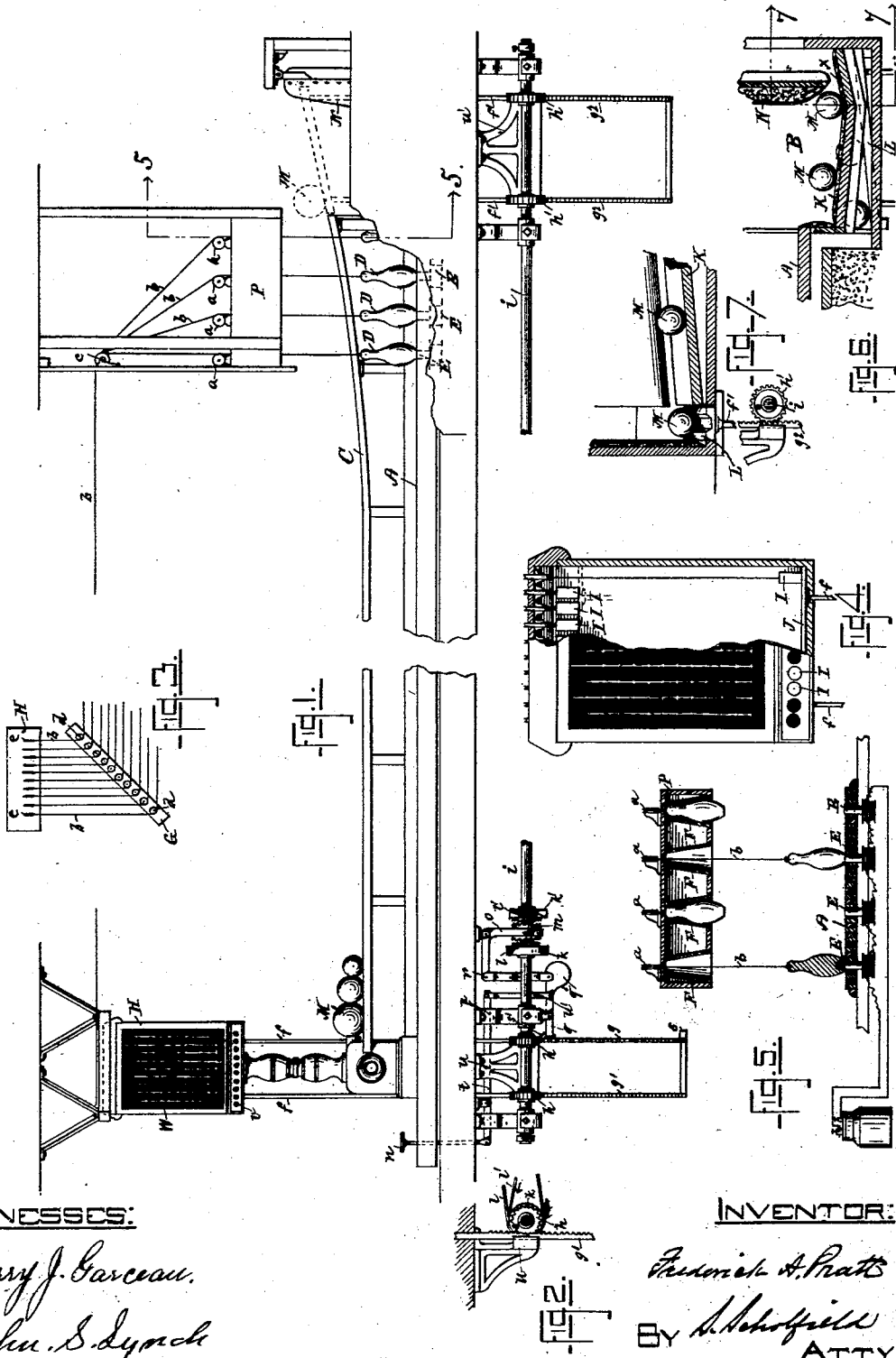


(No Model.)

F. A. PRATT.
BOWLING ALLEY.

No. 572,073.

Patented Nov. 24, 1896.



WITNESSES:

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FREDERICK A. PRATT, OF PAWTUCKET, RHODE ISLAND.

BOWLING-ALLEY.

SPECIFICATION forming part of Letters Patent No. 572,073, dated November 24, 1896.

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To all whom it may concern:

Be it known that I, FREDERICK A. PRATT, a citizen of the United States, residing at Pawtucket, in the State of Rhode Island, have invented a new and useful Improvement in Bowling-Alleys, of which the following is a specification.

My invention relates to automatic mechanism for setting up the pins and returning the balls; and it consists in the employment of magnets for holding the pins in their proper position on the bed of the alley and in means for raising the pins from the bed and for lowering the pins to the holding-magnets, as hereinafter set forth.

In the accompanying drawings, Figure 1 represents a broken side elevation of a bowling-alley provided with my improvement. Fig. 2 represents a detail view showing a side view of the rack and gear for elevating the weights which are connected with the pins. Fig. 3 represents a detail top view showing the inclined bar and the pulleys thereon for guiding the chains or cords to which the elevating-weights are attached. Fig. 4 represents a detail front elevation with a portion of the score-board broken away, showing the elevating-weights at the back of the score-board. Fig. 5 represents a detail vertical section taken in the line 5 5 of Fig. 1. Fig. 6 represents a central longitudinal section of the inclined floor of the pit. Fig. 7 represents a detail transverse section taken in the line 7 7 of Fig. 6.

In the drawings, A represents the bed of the alley; B, the pit; C, the run, and D the pins, which are placed over the poles of the electromagnets E, which extend upward to the level of the bed A, as shown in Fig. 5. Directly over the pins D and at a suitable distance therefrom are placed the conical guides F, which are held in the frame P, and over each of the said conical guides is placed a pulley *a*, over which the chain or cord *b*, attached to the upper end of the pin D, is drawn, the said conical guides serving to properly center the raised pins over their holding-magnets and prevent lateral vibration. The chains or cords *b* from the several pins, after passing over the pulleys *a*, pass over a corresponding series of pulleys *c*, and thence to a corresponding series of pulleys *d*,

arranged upon the horizontal inclined bar G, around which the chain or cords *b* are deflected to the pulleys *e* at the top of the case H, at the front of which is placed the score-board W, and to the ends of the chains or cords *b* are attached the weights I, which serve to raise the pins D from the bed A to the conical guides F whenever the said pins have been loosened from the attracting-face of the magnets E, the weights in this case passing downward from the upper portion of the case H to the table J, from which the parallel rods *f f* extend downward to the racks *g g'*, which engage with the pinions *h h* upon the shaft *i*, the said shaft being driven by means of the loose clutch-pulleys *k k'* and the sliding clutch-sleeve *m*, the pulley *k* being driven in one direction by means of an open belt *l* and the pulley *k'* by means of a crossed belt *l'*, the belts being shown in section in Fig. 1. The clutch-sleeve *m* is operatively connected with the pedal *n* by means of the bell-crank lever *o* and suitable connecting-links, so that by the downward movement of the pedal *n* the clutch-sleeve *m* may be thrown into engagement with the proper clutch-pulley for causing the elevation of the table J with the weights I, which rest thereon.

To the lower end of the hanger *p*, which supports the shaft *i*, is pivoted the weighted lever *q*, from which connection is made with the outer arm of the bell-crank lever *o* by means of the link *r*, and to the side of the rack *g* are attached the projecting pins *s s'*, which serve to ship the clutch-sleeve from engagement with one of the clutch-pulleys to the other and to throw the clutch-sleeve to a central position out of engagement. Whenever it is desired to raise the weights I to reset the pins D, then, by pressing downward upon the pedal *n*, which is connected by means of the lever *t*, pivoted to the guide-hanger *u* and connected by means of the link *u'* with the lever *q*, the clutch-sleeve *m* will be thrown into engagement with the clutch-pulley *k* to cause the raising of the table J upon which the weights I rest, and the upward movement of the table J will continue until the pin *s* strikes the end of the lever *q*, thus serving to throw the clutch-sleeve *m* out of engagement with the clutch-pulley *k*. Then the weighted end *q'* of the lever *q* will serve

to carry the clutch-sleeve *m* into engagement with the reversely-moving clutch-pulley *h'* to carry the table J down to its former position to rest upon the bottom of the case H, and
 5 when the table J has reached such downward position the pin *s'* will strike the upper side of the end of the lever *q*, to throw the clutch-sleeve *m* out of engagement to an intermediate point between the clutch-pulleys, and
 10 upon such elevation of the table J the previously-raised pins D will be brought down by their own weight to rest upon the magnets E, which serve to hold the pins in their set position against the upward pull derived
 15 from the suspended weights I.

When the pins D are set in order on the bed A of the alley and the balls M are rolled, the pins which are dislodged from the magnets are carried upward by the attached
 20 weights, which drop from their suspended position at the top of the case H to the table J, and the number of pins so dislodged will be seen through the openings *v* made in the front of the case H below the score-board W.

25 The floor K of the pit B is made to incline toward the buffer N, as shown in Fig. 6, and also incline laterally toward the inclined lifting table L, as shown in Fig. 7, the said floor K being also provided with a rising portion *x*,
 30 whereby the balls will be kept away from the buffer when rolling laterally toward the inclined lifting table L, the said lifting table being operated in its up-and-down movement

simultaneously with the table J by means of the continuous shaft *i*, the pinions *h' h'*, and
 35 the racks *g² g²*, which are connected by means of the rods *f' f'* with the table L and guided by the hanger *u'*.

The automatic mechanism for raising the weights I and the balls M may be varied from
 40 that shown and described, or the tables upon which they rest may be elevated by hand-operated means, if desired.

I claim as my invention--

1. The combination of the overbalancing-
 45 weights, with the pins, the connecting chains or cords, and the magnets, substantially as described.

2. The combination of the magnets, and the pins, with means acting to overbalance and
 50 raise the pins, and means for lowering the pins, substantially as described.

3. The combination of the overbalancing-weights, the pins, the connecting cords or chains, the magnets, and the table for raising
 55 the weights, with the laterally-inclined bed of the pit, the inclined table for raising the balls to the run, and means for causing the simultaneous elevation of the weights and
 60 balls, upon their respective tables, substantially as described.

FREDERICK A. PRATT.

Witnesses:

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 HARRY J. GARCEAU.