

No. 771,963.

PATENTED OCT. 11, 1904.

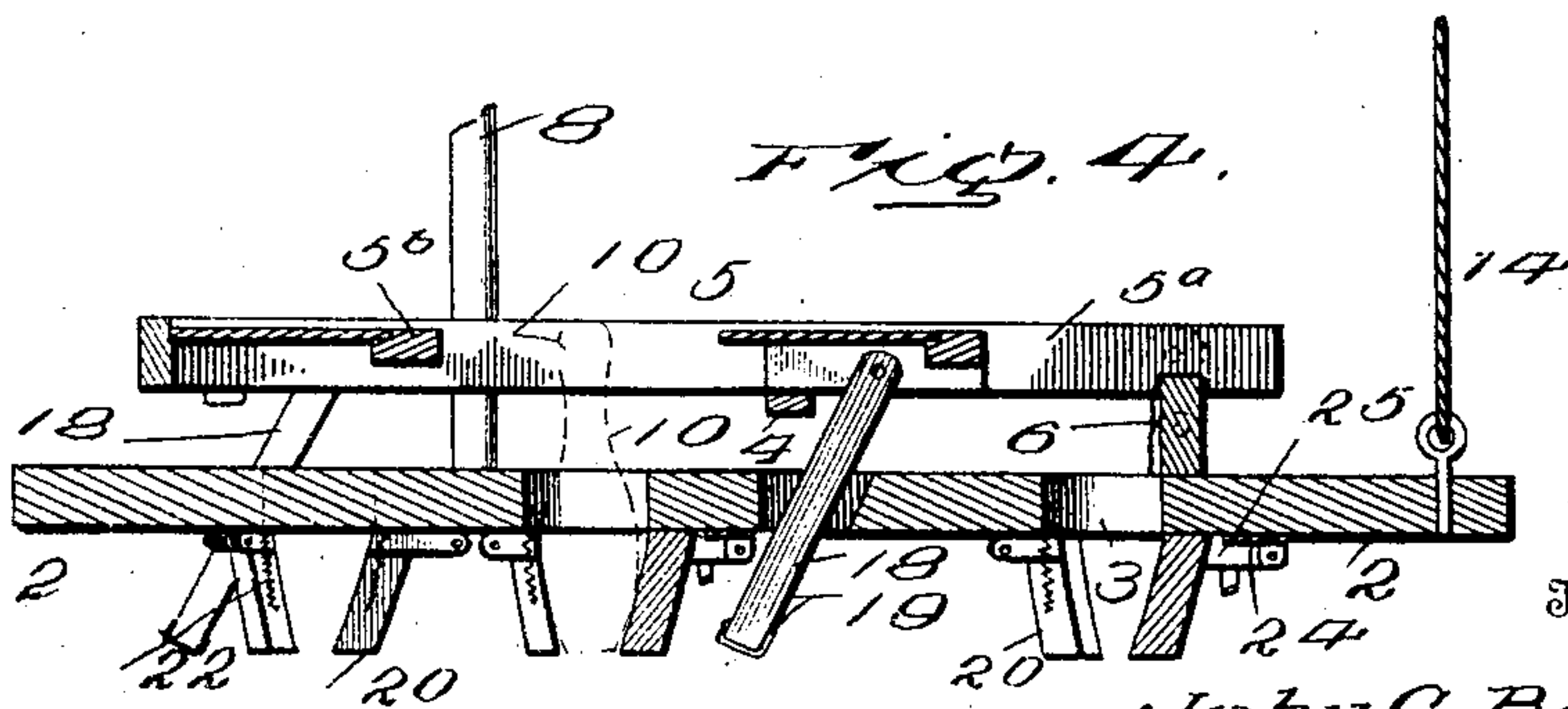
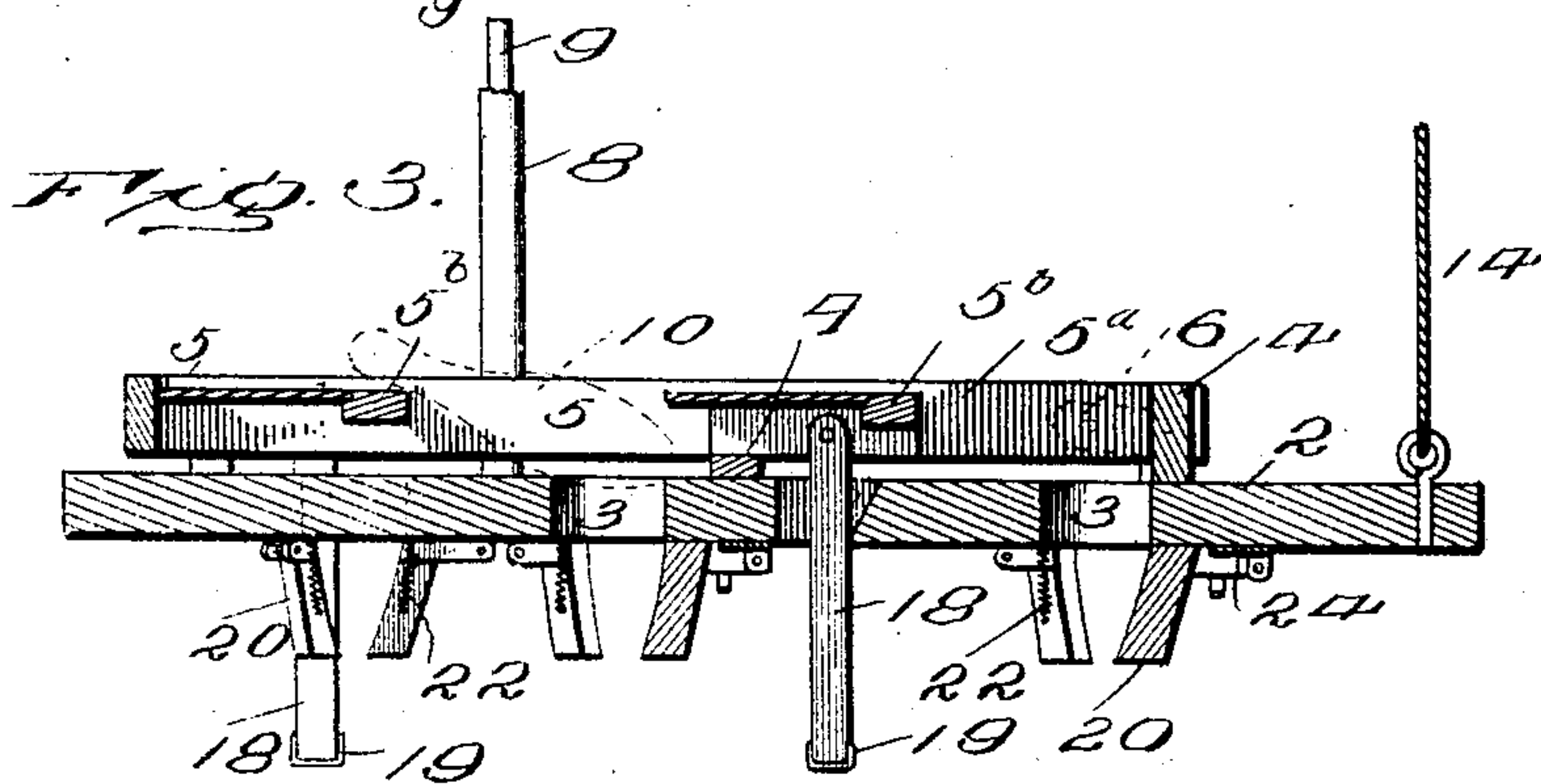
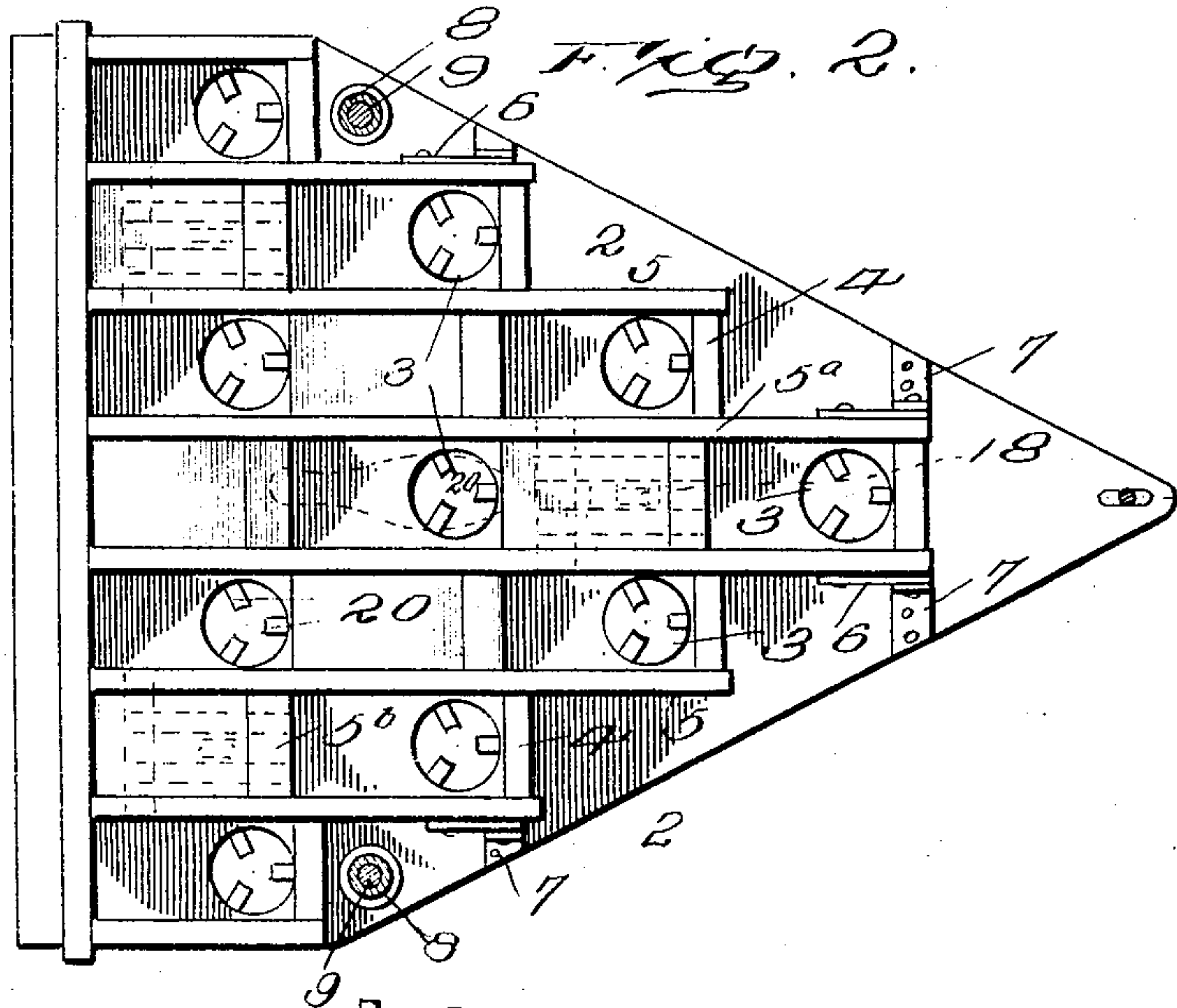
J. C. BACKUS.

APPARATUS FOR SETTING PINS OF BOWLING ALLEYS.

APPLICATION FILED OCT. 16, 1903.

NO MODEL.

3 SHEETS—SHEET 2.



Witnesses

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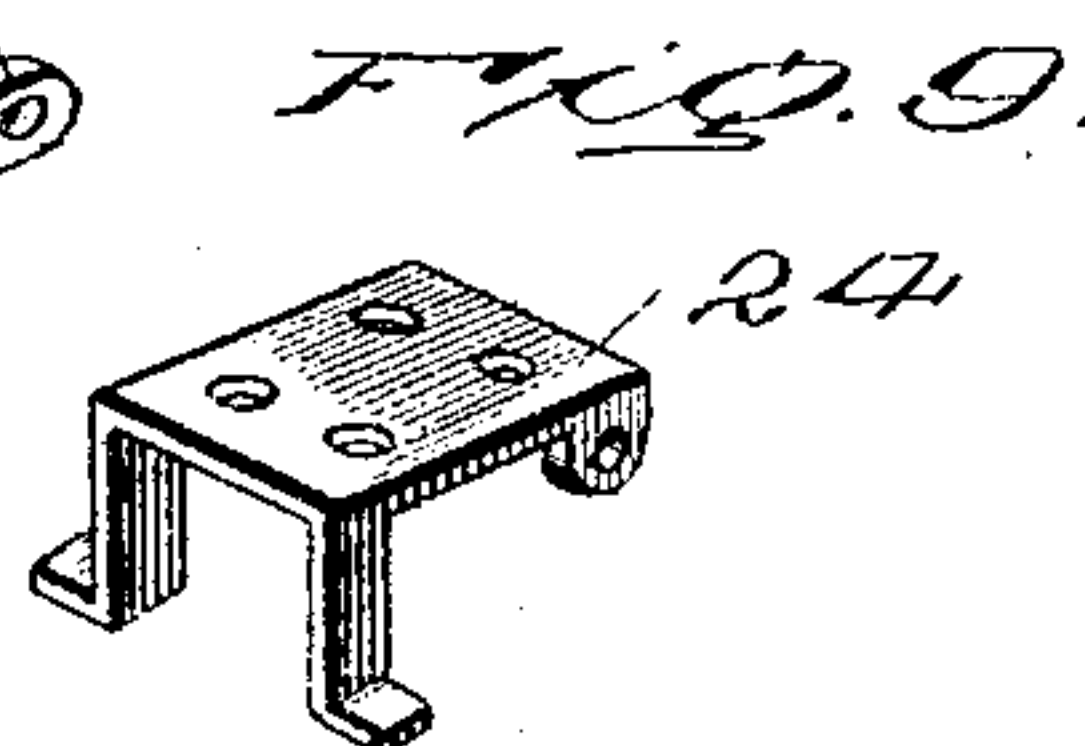
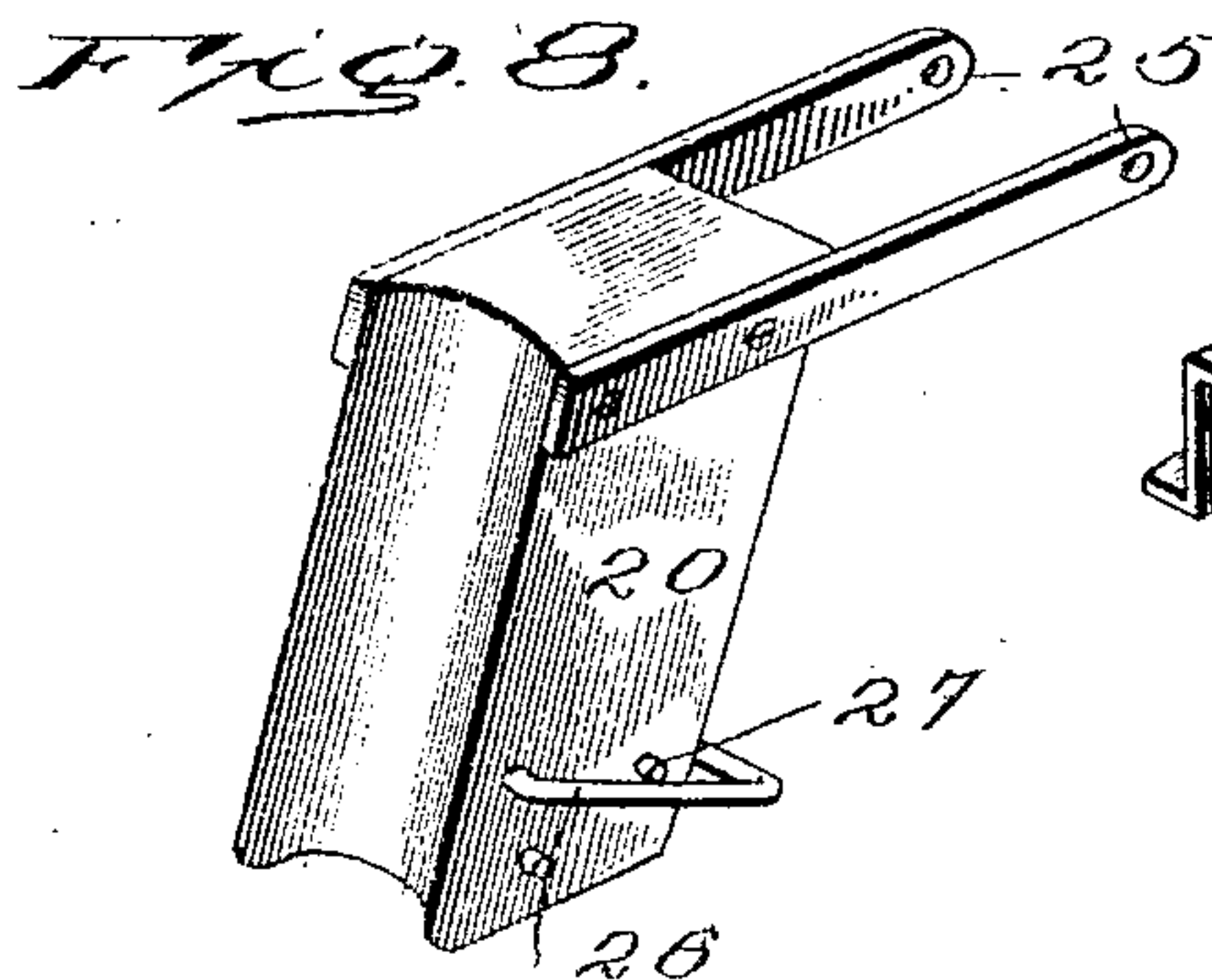
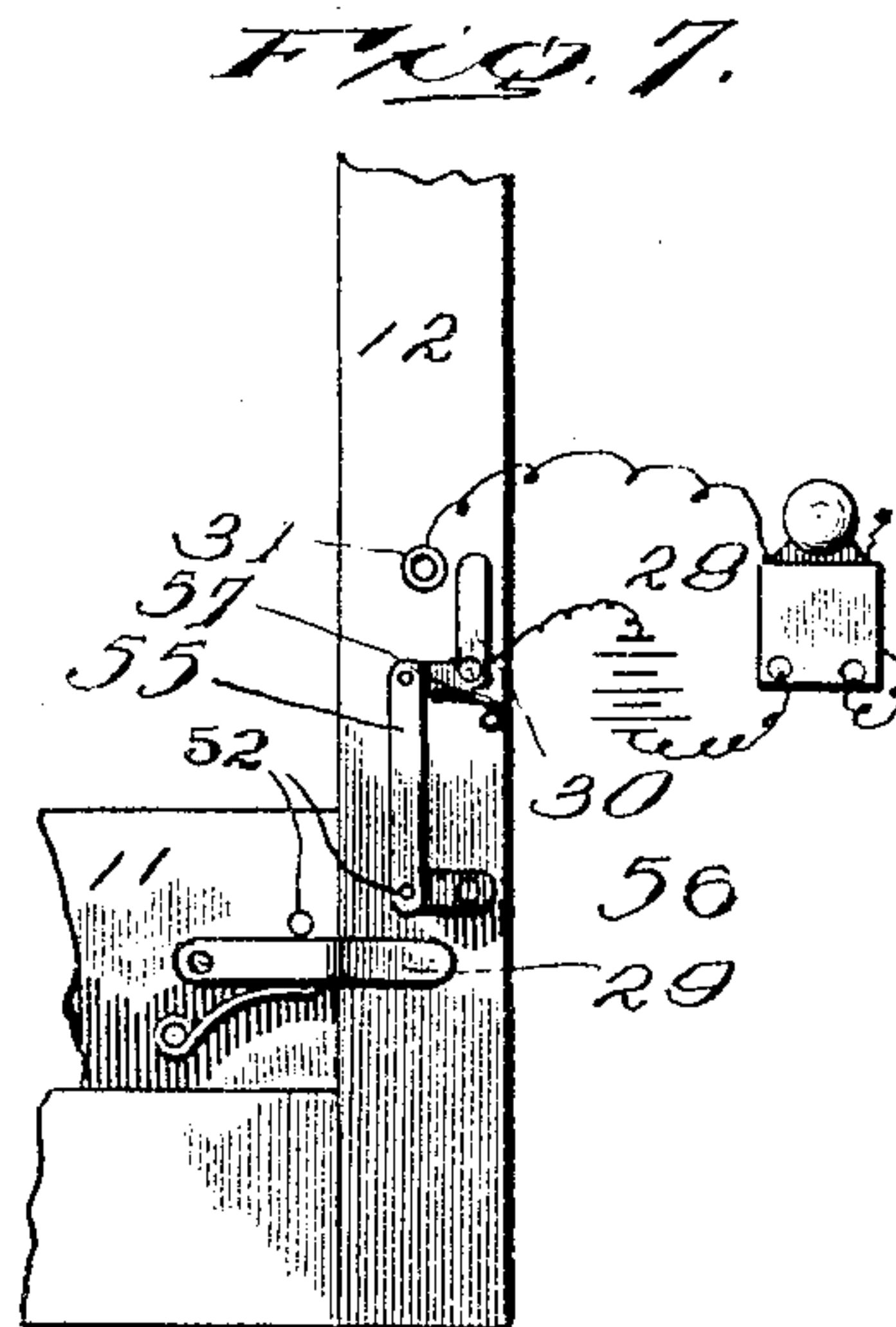
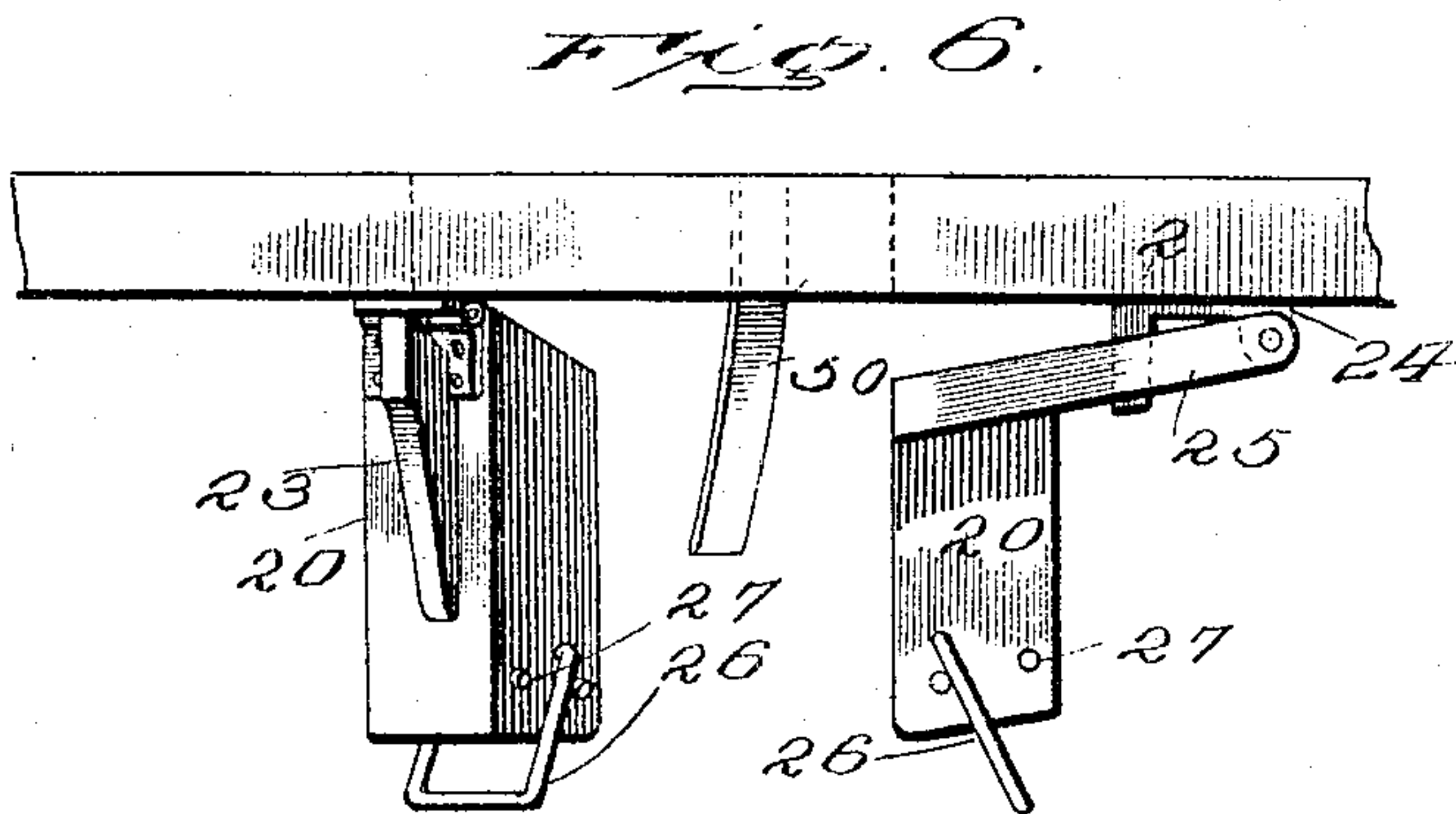
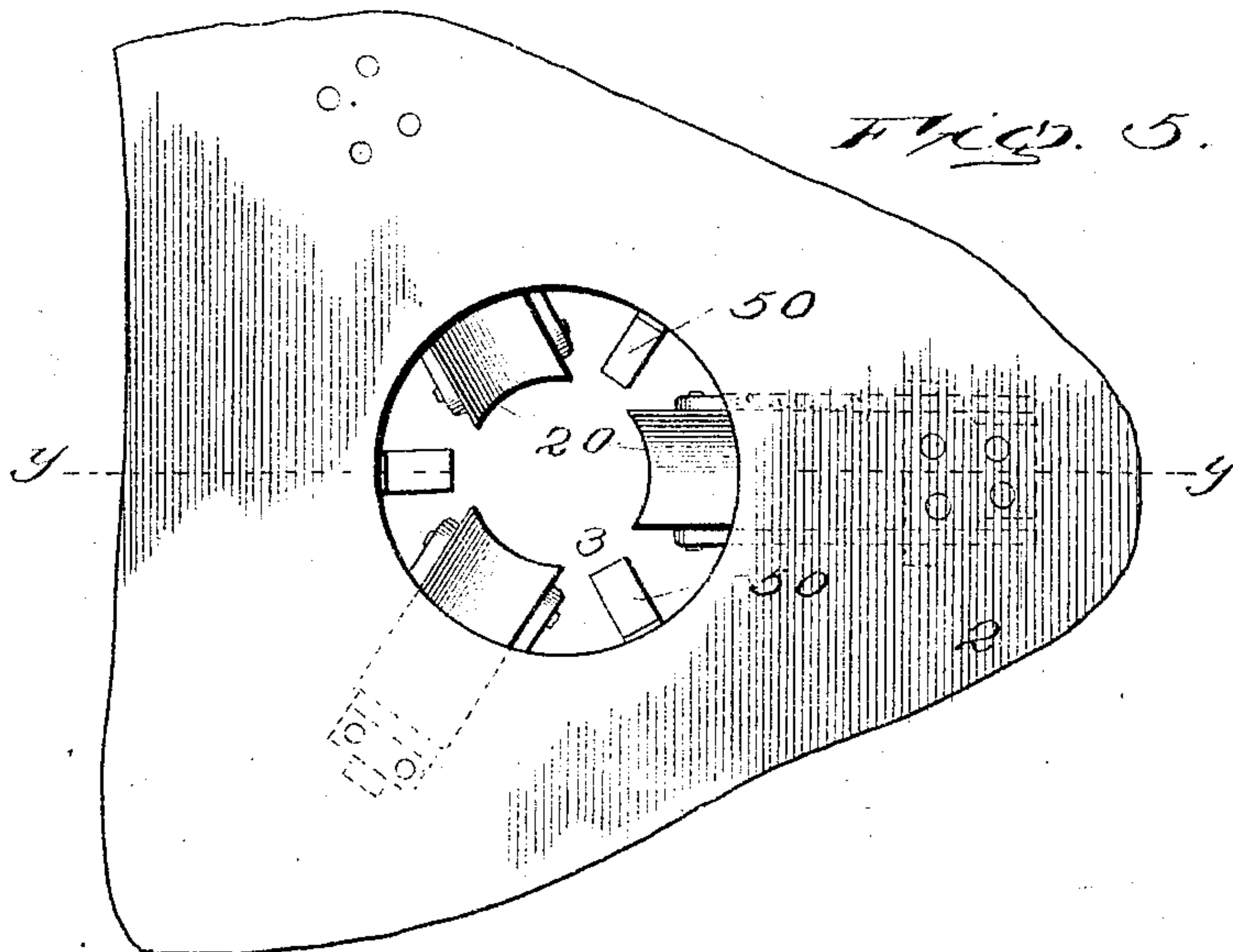
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Witnesses

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UNITED STATES PATENT OFFICE.

JOHN C. BACKUS, OF SMETHPORT, PENNSYLVANIA.

APPARATUS FOR SETTING PINS OF BOWLING-ALLEYS.

SPECIFICATION forming part of Letters Patent No. 771,963, dated October 11, 1904.

Application filed October 16, 1903. Serial No. 177,316. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. BACKUS, a citizen of the United States, residing at Smethport, in the county of McKean and State of Pennsylvania, have invented certain new and useful Improvements in Apparatus for Setting Pins of Bowling-Alleys, of which the following is a specification.

This invention provides means for supporting the pins of bowling-alleys and conveying same to the surface of the alley to place the pins in their proper relative positions upon the alley.

The apparatus consists, essentially, of a carrier disposed above the alley and adapted to support the pins and means for shifting the pins into a position preparatory to their delivery from the carrier, said means being automatically operable.

Further, the invention consists of peculiar means for guiding the carrier in its movement toward and from the surface of the alley and peculiar alarm mechanism electrically operated for notifying the bowler at the end of the alley opposite to that upon which the pins are disposed that the pins are in position ready to be bowled over.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction of the means for effecting the result reference is to be had to the following description and drawings hereto attached.

While the essential and characteristic features of the invention are susceptible of modification, still the preferred embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of the rear end of the alley, showing the apparatus in working position. Fig. 2 is a top plan view of the carrier and the shifting frame which is supported thereby. Fig. 3 is a vertical sectional view through the carrier and the shifting frame, the relative positions of these parts being that assumed by the same preparatory to the setting of the pins upon the alley. Fig. 4 is a view similar to Fig. 3, showing the position of the shifting frame when actuated to deliver

the pins from the carrier. Fig. 5 is a top plan view of a portion of the carrier, parts being broken away, showing the disposition of the guide-legs depending therefrom. Fig. 6 is a partial sectional view about on the line Y Y of Fig. 5. Fig. 7 is a detail view showing the circuit-closing means for operating the alarm mechanism. Fig. 8 is a detail view of one of the forms of guide-legs by which the pins are directed to their several positions upon the alley. Fig. 9 is a detail perspective view of the supporting-plate to which the guide-leg illustrated in Fig. 8 is secured, showing the specific form of the said plate.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The apparatus is disposed adjacent the end of the alley 1 upon which the pins are stood.

Carrier 2 of the apparatus consists of a platform of approximately triangular form, said platform being provided with a plurality of openings 3 of a number equal to the number of pins—in this instance ten. The openings 3 are arranged in the same relation as are the ten pins when disposed upon the alley. Blocks 4 are disposed adjacent each opening in the carrier and serve as stops to limit the movement of the pins when the same are being thrown into position upon the carrier preparatory to the operation of the same by which the said pins are delivered from the carrier to the alley 1. Pivoted to the upper side of the carrier is the shifting frame 5, which frame consists of longitudinal bars 5^a and connecting-bars 5^b, transversely disposed relative to the bars 5^a. The shifting frame 5 is adapted for an oscillatory movement relative to the carrier and coöperates with the carrier to support the pins in an inclined position thereon. The frame 5 is pivoted by means of links or corresponding elements 6, which are secured to the frame, and brackets 7, projected from the carrier.

The carrier 2 is provided with tubular guides 8, which are extended upwardly from the carrier and which receive guide-bars 9, secured to the ceiling upon the end of the alley, the

latter serving to retain the carrier in such a position that the pins will be disposed upon the surface of the alley 1 when the carrier is operated so as to deliver said pins, which are
 5 designated 10 in the drawings. The carrier is supported above the alley by means of a weight 11, which is movable in guides 12, disposed adjacent the alley 1, and which is connected to the tubular guide-bars 8 by means
 10 of flexible connections 13. The weight is also connected to the front end of the carrier by a connection 14, all of which connections pass over pulleys 15, suitably secured to the ceiling above the alley. The weight 11 is slightly
 15 heavier than the combined weight of the carrier, shifting frame, and the pins to be supported by the said members, so that the normal tendency of the weight is to support the carrier above the alley. The carrier in position
 20 above the alley, the pins are thrown upon the same in an inclined position, the butt-ends of the pins being disposed in contact with the stop-blocks 4, the upper ends resting upon the connecting-bars 5 of the shifting
 25 frame 5. The butt-ends of the pins in the position described above rest above the openings 3 in the carrier, so that upon proper actuation of means to be described the carrier will be permitted to lower to the surface of the
 30 alley, when automatic means will give the shifting frame an oscillatory movement, throwing the pins 10 into an upright position and causing the same to drop through the openings 3 upon the surface of the alley. To permit the
 35 movement of the carrier toward the alley, the same must be relieved of the weight of the element 11, which holds it in its normal position, and to do this an operated rope 16 is connected to the weight and provided with a
 40 handle 17, by which the operator may pull the weight upwardly to thereby allow of downward movement of the carrier. In order to automatically actuate the shifting frame as the carrier reaches the limit of its downward
 45 movement toward the alley, legs 18 depend from the shifting frame and passing through openings in the carrier-platform are adapted to strike the alley simultaneously as the carrier reaches the position before mentioned,
 50 said legs thereby actuating the shifting frame upwardly and forwardly, raising the pins and permitting the same to drop through openings 3 upon the alley 1. The lower ends of the legs 18 are suitably protected
 55 by cushion means 19, of rubber or analogous material, so as to prevent injury to the surface of the alley.

As is well known, bowlers are often balked when about to throw the ball upon noting that
 60 the pins at the ends of the alley are disaligned due to carelessness upon the part of the setter. The above causes no small amount of chagrin, and it is desired as a special feature of this invention to avoid the same by the
 65 provision of means of accurately setting the

pins in their proper positions. For this purpose guide-legs 20, pending from the under side of the carrier 2, are utilized to direct the lower ends of the pins 10 to the spots 21, which indicate the exact position which the
 70 pins 10 should assume when standing. The guide-legs 20 incline toward each other and are pivotally secured to the carrier, so as to permit movement of the same as the carrier resumes its normal position above the alley. 75

Various means of securing the legs 20 to the carrier may be used. The preferred means is to utilize springs 22, which are connected at the upper ends thereof to the carrier and at the lower ends to the respective legs with
 80 which the same are adapted to cooperate. The springs 22 normally hold the legs in the inclined position illustrated, being of a tension, however, sufficient to accomplish the above, permitting the legs to move apart under the
 85 weight of the pins 10 as the carrier is raised. In Fig. 6 a rigid stop 23 is utilized instead of the springs, and this stop limits the rearward movement of the legs as the carrier moves upwardly. Figs. 8 and 9 illustrate still another form of
 90 the means for limiting the movement of the legs 20. In this last form the leg is pivoted to a plate 24, which is provided with downwardly-extending stops integrally formed therewith which cooperate with the supporting-
 95 arms 25 of the legs to limit the downward or rearward movement thereof.

When the stop means 23 or 24 is used for limiting the movement of the legs 20, it is desirable that links 26 be pivotally secured to
 100 the lower ends of the legs to force the same into an inclined position relative to the opening 3 in the carrier as soon as the latter is moved downwardly to a position preparatory to the delivery of a pin. The links 26 are
 105 limited in their movement by means of stop-pins 27, so that the said links are always in such a position as to force the legs inwardly as soon as the said links come into contact with the surface of the alley. 110

When the carrier is disposed adjacent the alley in delivering the pins, the legs 20 rest upon the alley in the inclined position. (Shown most clearly in Fig. 4 of the drawings.) The lower portion of the pin exactly fits between
 115 the inclined portions of the legs, which inclined portions direct the butt-end of the pin with mechanical accuracy to its proper position upon the alley. As the carrier moves upwardly under the actuation of the weight
 120 to assume its normal position the pins remain in their upright position, the legs being forced apart should the spring means 22 be used or falling apart of their own gravity should the stop means 23 and 24 be used. 125
 The openings 3, as will of course be understood, are of exactly the same diameter as is the diameter of the widest portions of the butt-ends of the pins.

The alarm mechanism used in connection 130

with the invention consists of an ordinary electric bell 28, located at the front end of the alley, said bell being rung by closing the circuit in the usual manner. The ringing of the bell is actuated by the weight 11, said weight carrying the spring contact-actuator 29, which coöperates with a contact-piece 30 of approximately bell-crank form to ring the bell. As the weight moves upwardly under the actuation of the pull-cord 16 the contact 29, being movably secured to the weight, passes the contact 30 without actuation of the same other than to move it away from the binding-post 31. The upward movement of the weight permits the lowering of the carrier 2 and setting of the pins, as before set forth. Release of the weight causes the upward movement of the carrier, and as the said weight moves downwardly the contact-actuator 29 actuates the contact 30, and thereby closes the circuit and causes ringing of the alarm 28, signifying that the pins 10 are ready to be bowled over. A plurality of the contact-actuators 29 and 30 may be so arranged as to cause closing of the circuit at intervals, so as to ring the bell a more or less number of times. Thus an arrangement closing the circuit twice as the weight descends would ring the bell or alarm 28 twice, indicating that the pins upon the alley No. 2 are ready for the bowler, and this arrangement could be carried out so that three rings of the bell would signify that alley No. 3 was ready, and so on. A stop 52 limits the forward movement of the contact-actuator 29, and this stop coöperates with the contact-actuator 29 to hold same rigid as it strikes the bell-crank contact-piece 30 in the downward movement of the weight. In the upward movement of the weight the contact-actuator 29 yields because of the disposal of the spring adjacent thereto and does not operate the contact-piece upon the support 12. The vertically-disposed link 55 is connected at its upper end to one arm of the contact-piece 30, being supported at its lower end by a pivoted bar 56. The link 55 when struck by the contact-actuator 29 on the downward movement of the weight 11 causes continuous ringing of the bell as long as the said contact-actuator 29 is traveling along same. A spring 57, bearing against the horizontal arm of the contact-piece 30, restores this member to its normal position out of contact with the contact 31 as soon as the actuator 29 moves out of engagement with the link 55.

It is preferred that the weight 11 be arranged in guides immediately above the carrier and approximately between the guide means 8 thereof. However, this can only be done when the ceiling of the room in which the alley is disposed is sufficiently high to permit of the same.

Describing in detail the exact operation of the invention, it is designed that a number of

extra pins, approximately four, be used in connection with the setting apparatus. The extra pins should be thrown upon the carrier in the inclined position described hereinbefore. The first ball of the bowler having been delivered, the pins which are knocked over by the same should the bowl be a "spare" are thrown upon the carrier. As soon as the second ball has been delivered, which usually overthrows the remaining pins, the operator grasps the handle 17 and pulling thereon lifts the weight, dropping the carrier 2 to the alley. Simultaneously as the carrier reaches its limit of movement toward the alley the shifting frame 5 is actuated by contact with the legs 18, which throws the pins upon the carrier into an upright position, delivering the same from the carrier to a position upon the alley. The operator holds the carrier in its lowered position for a few seconds, so as to steady the pins 10, which are now disposed between the respective sets of legs 20, after which the handle 17 is released, permitting the weight to resume its normal position. The legs 20 spread apart as the carrier moves upwardly, and the pins 10 have been quickly and accurately set ready for another bowl. The weight resuming its normal position operates the alarm mechanism, ringing the bell, notifying the bowler that the carrier is out of the way and the pins in position. Immediately the carrier is in its uppermost position after delivery of the pins 10 the extra pins in overturned position at the rear of the alley are thrown upon the carrier. The operation of the device is carried on continuously in the above manner.

When there are extra pins, it is readily noted that certain pins may be disposed upon the carrier, so that when a few pins have been bowled over these may be placed also upon the carrier, and as the bowler throws his second ball in a spare tenpins may be upon the carrier ready to be delivered as soon as the second ball has bowled over the remainder of the pins. Though the extra pins are not necessary, they are preferably employed.

Springs 50 project downwardly from the carrier 2 adjacent the legs 18 and may be adjusted so as to take up wear upon the pins caused by continued use of same. These springs secure absolute accuracy in the spotting of the pins and also steady them immediately they are received between the guide-legs upon actuation of the shifting frame.

Having thus described the invention, what is claimed as new is—

1. In a pin-setting apparatus for bowling-alleys, the combination of a carrier adapted to receive pins thereon, means for displacing the pins from the carrier, and means other than the carrier for guiding the pins from the carrier to the alley.

2. In a pin-setting apparatus for bowling-alleys, the combination of a movable carrier,

a shifting frame supported by the carrier, and means for actuating the shifting frame to effect delivery of the pins from the carrier.

3. In a pin-setting apparatus for bowling-
5 alleys, the combination of a carrier, a shifting frame disposed upon the carrier for supporting the pins in an inclined position, and means for automatically actuating the shifting frame to cause delivery of the pins from
10 the carrier.

4. In a pin-setting apparatus for bowling-
alleys, the combination of a movable carrier for supporting the pins preparatory to delivery to the alley, and a shifting frame pivotally supported by the carrier for actuating
15 the pins to deliver same to the alley.

5. In a pin-setting apparatus for bowling-
alleys, the combination of a carrier for supporting the pins, an oscillatory shifting frame
20 supported by the carrier for actuating the pins in delivering the same to the alley.

6. In a pin-setting apparatus for bowling-
alleys, the combination of a movable carrier, means for supporting pins on said carrier,
25 and movable guide means projected from the carrier for directing the pins to their positions upon the alley as the same are delivered from the carrier to the alley.

7. In a pin-setting apparatus for bowling-
30 alleys, the combination of a movable carrier, means for supporting pins on said carrier, and movable guide-legs pendent from the carrier for directing the pins to their positions upon the alley as the same are delivered from
35 the carrier to the alley.

8. In a pin-setting apparatus for bowling-
alleys, the combination of a carrier, an oscillatory shifting frame pivoted to the upper
40 side of the carrier, means for automatically operating the said shifting frame to deliver the pins from the carrier to the alley, and movable guides depending from the carrier to direct the pins to their positions upon the
45 alley as the same are delivered from the carrier.

9. In a pin-setting apparatus for bowling-
alleys, the combination of a carrier for supporting the pins, a shifting frame supported
50 by the carrier for actuating the pins to deliver same from the carrier, and legs pendent from the shifting frame for automatic operation of the same to effect the delivery of the pins from the carrier.

10. In a pin-setting apparatus for bowling-
55 alleys, the combination of a movable carrier for supporting the pins, a shifting frame cooperating with the carrier to support the pins in an inclined position, means for automatically operating the shifting frame to actuate
60 the pins to cause delivery of the same from the carrier, and independent means for guiding the pins to their respective positions upon the alley after the carrier has reached an ascertained point in its movement.

11. In a pin-setting apparatus for bowling- 65
alleys, the combination of a carrier, a shifting frame supported by the carrier and automatically-operating guide means for directing the pins to their respective positions upon the alley in the delivery of the same from the 70
carrier.

12. In a pin-setting apparatus for bowling-
alleys, in combination, a carrier for supporting pins, a shifting frame, and means for
75 changing the relative positions of the carrier and frame, whereby the pins are delivered from the carrier to the alley.

13. In a pin-setting apparatus for bowling-
alleys, the combination of a carrier for supporting pins, a frame, and means to be tripped
80 upon the descent of the carrier to the alley to effect relative shifting movement of the frame and carrier.

14. In a pin-setting apparatus for bowling-
alleys, the combination of a carrier movable
85 toward and from the alley, a shifting frame pivoted to the carrier and adapted to cooperate therewith to support pins in an inclined position, weight means for holding the carrier in an ascertained position above the alley, 90
means for lowering the carrier, guide means for directing the movement of the carrier relative to its position above the alley, and independent guide means pendent from the carrier for directing the pins to their respec- 95
tive positions upon the alley.

15. In a pin-setting apparatus for bowling-
alleys, the combination of a carrier, an oscillatory shifting frame pivoted to the carrier
100 and comprising supporting-bars, actuating-legs extending from the frame for effecting a delivery of the pins from the carrier, tubular guides extended upwardly from the carrier for guiding the same in its movement toward
105 and from the alley, the carrier being provided with a plurality of delivery-openings, guide-legs movably secured to the carrier beneath the said openings for directing the pins to their respective positions upon the alley, and
110 weight means for supporting the carrier above the alley in an ascertained position.

16. In a pin-setting apparatus for bowling-
alleys, the combination of a carrier provided
115 with a plurality of delivery-openings, an oscillatory shifting frame pivoted to the upper side of the carrier adjacent the said openings and adapted to support the pins above the openings in an inclined position, automatic means
120 for operation of the said frame, automatically-operable guide-legs extending from the carrier adjacent the openings therein, tubular guides extended upwardly from the carrier for directing its movement relative to the alley, and weight means for supporting the carrier
125 in an ascertained position above the alley preparatory to delivery of the pins.

17. In a pin-setting apparatus for bowling-
alleys, the combination of a movable pin-sup-

porting carrier, and spring-actuated guide members for directing the pins from the carrier to proper positions on the alley.

18. In a pin-setting apparatus for bowling-
5 alleys, the combination of a movable pin-supporting carrier, guide members for directing the pins from the carrier to proper positions on the alley, and spring means connecting the carrier and members aforesaid to normally

hold the said members in an ascertained position.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN C. BACKUS. [L. s.]

Witnesses:

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OCTAVIA RAYMER.