

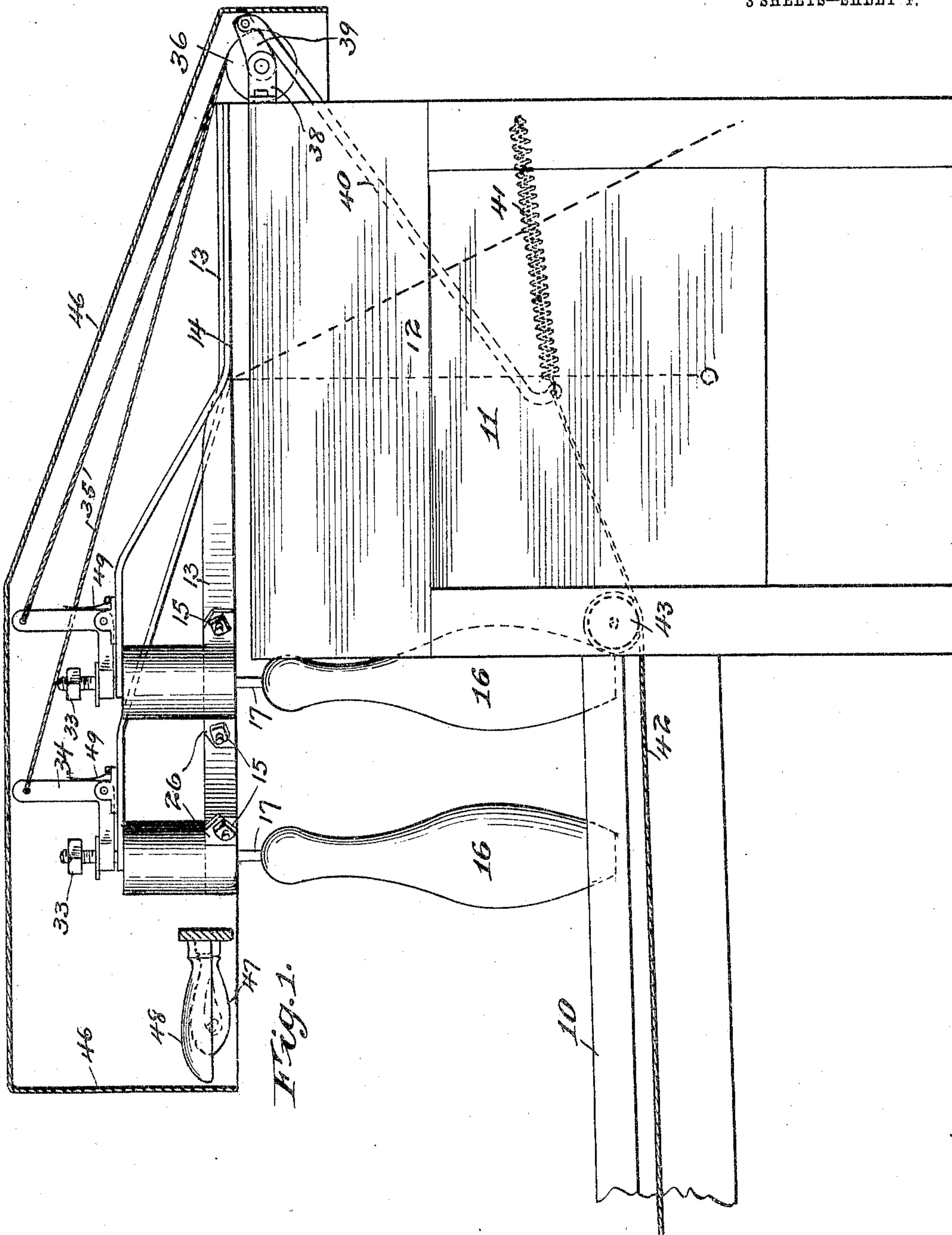
No. 789,394.

PATENTED MAY 9, 1905.

R. A. THOMPSON & C. J. OLSON.
MECHANICAL PIN SETTER FOR BOWLING ALLEYS.

APPLICATION FILED MAY 12, 1904.

3 SHEETS—SHEET 1.



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S. N. Pond

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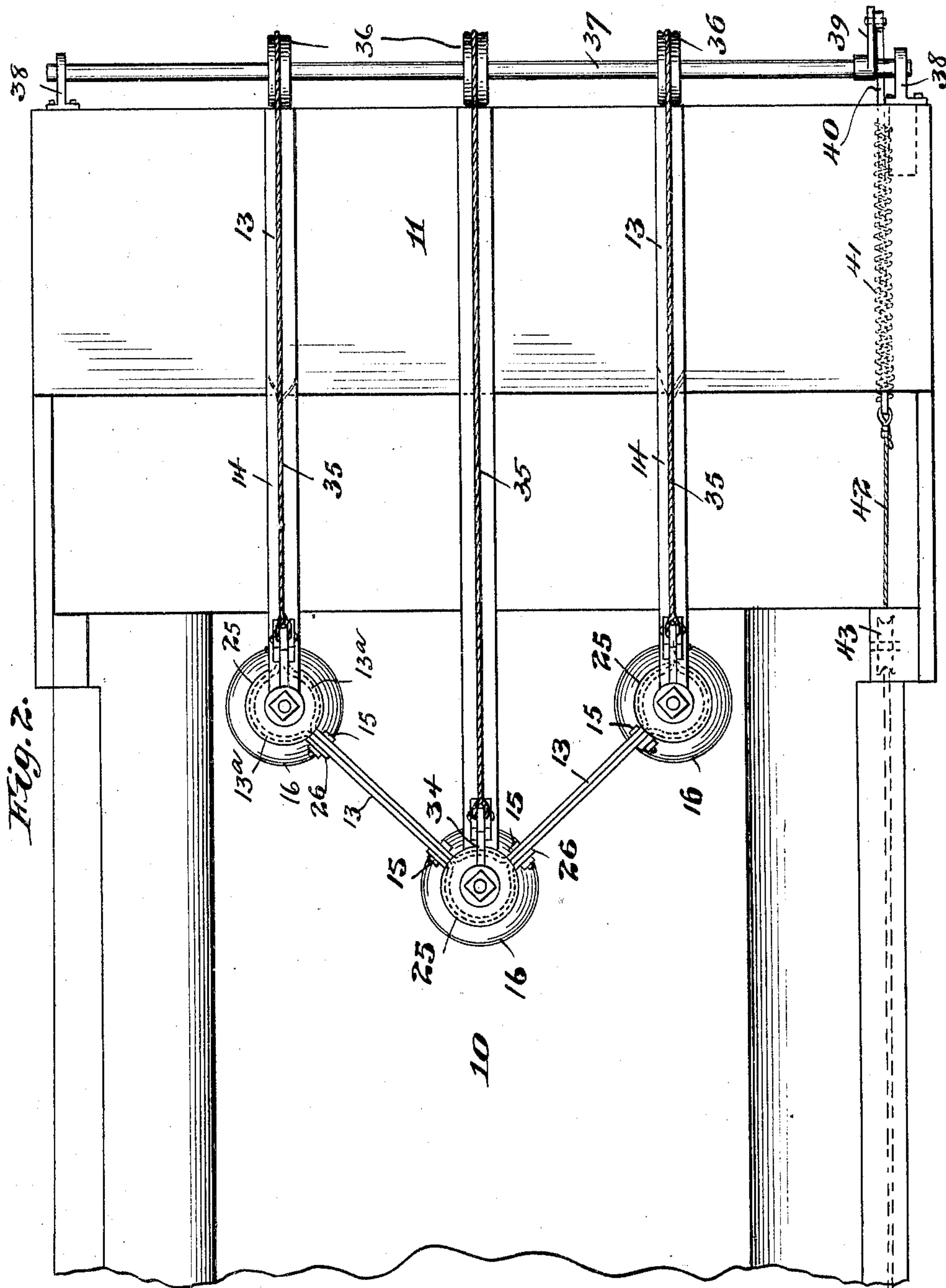
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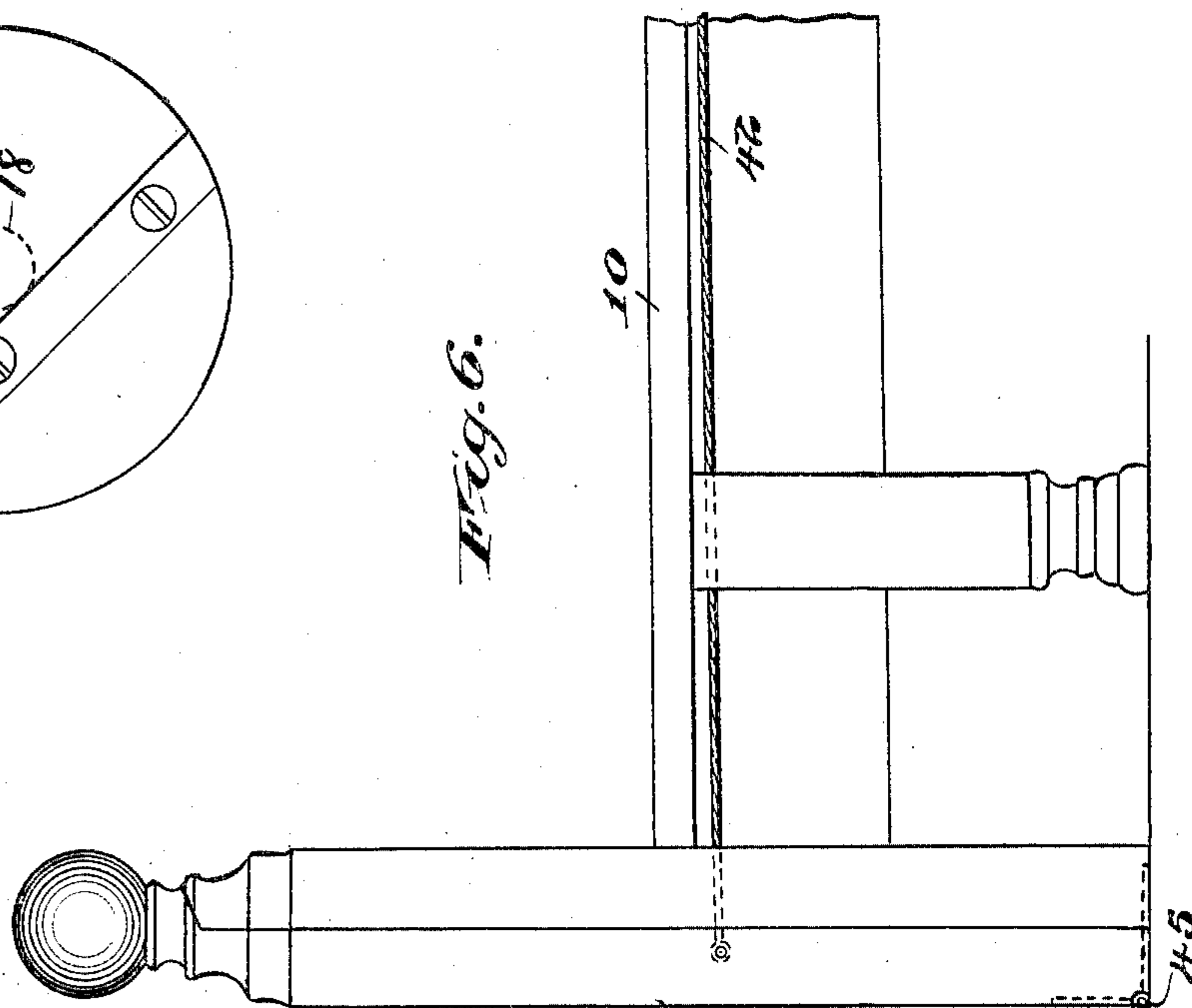
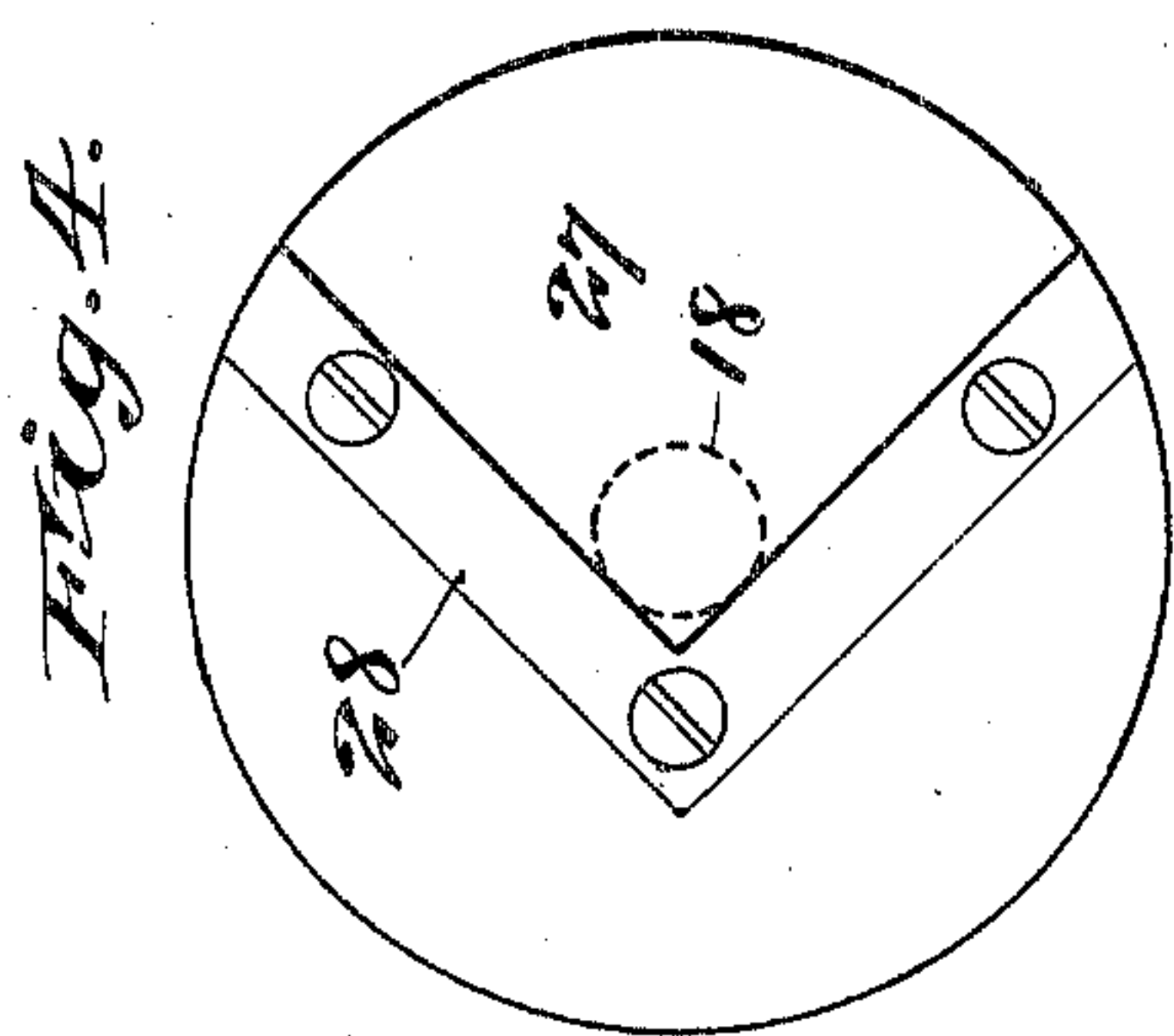
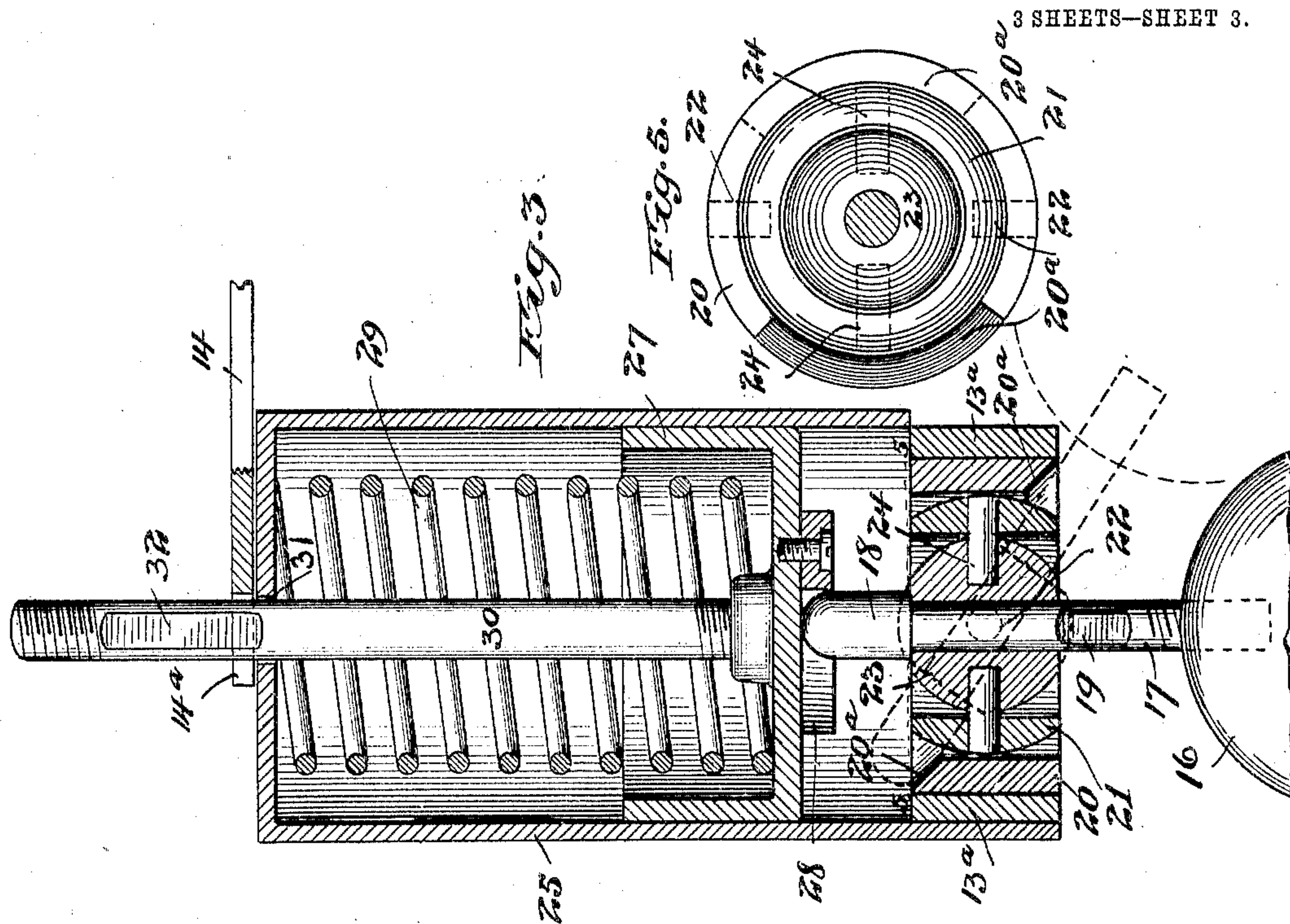
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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MECHANICAL PIN-SETTER FOR BOWLING-ALLEYS.

SPECIFICATION forming part of Letters Patent No. 789,394, dated May 9, 1905.

Application filed May 12, 1904. Serial No. 207,680.

To all whom it may concern:

Be it known that we, ROBERT A. THOMPSON and CHARLES J. OLSON, citizens of the United States, and residents of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Mechanical Pin-Setters for Bowling-Alleys, of which the following is a specification.

Our invention relates to an appliance in the nature of a mechanical pin-setter for use upon bowling-alleys.

The primary object of the invention is to dispense with the necessity of an attendant to reset the pins in such games as tenpins, cocked hat, and all bowling games in general, whereby time, labor, and expense as compared with the present mode of practicing these games may be saved; and to this end the invention consists in a novel mechanical device for resetting the pins to playing position controllable from the players' end of the alley, substantially as hereinafter described, and more particularly defined in the claims.

Referring to the drawings, Figure 1 is a side elevational view of the rear end of a bowling-alley equipped with our improved pin-setting mechanism. Fig. 2 is a top plan view of the same. Fig. 3 is an enlarged vertical sectional view through the pin-controlling mechanism. Fig. 4 is a bottom plan view of the plunger-head that actuates the stem of the pin equipped with a guiding or confining member for the latter. Fig. 5 is a top plan view of the universal-joint support for the stem of the pin; and Fig. 6 is a side elevational view of the players' end of the alley, illustrating the mechanism for actuating the pin-resetting devices.

Our invention is herein illustrated as applied to an alley adapted for playing the game of cocked hat; but it will be understood that the invention is equally applicable to alleys designed for playing any other bowling games.

10 designates the bed of the alley in the usual form, and 11 the back-stop frame or housing, in which may be suspended a canvas or other yieldable sheet or cushion to arrest

the balls, (indicated by the dotted line 12.) Mounted upon the top of the frame or housing 11 and projecting inwardly of the adjacent end of the alley are a series of supporting members unitedly constituting a carrying-frame for the pin-controlling devices hereinafter described. These supporting members, as herein shown, comprise a series of horizontally-disposed bars 13, suitably secured to the top of the frame 11 and warped to bring their forwardly-projecting portions in a vertical plane, and a corresponding series of bars 14, also secured to the frame 11 and upwardly inclined at their intermediate portions and thence extended forwardly over the projecting ends of the bars 13. The lower bars 13 are disposed in parallel pairs and at three points above the rear end of the alley and directly above the positions of the pins are separated and curved outwardly to form clamping-collars for gimbal ring devices which support the pins, these collars being indicated at 13^a, clamping-bolts 15 being provided to draw together the sections of each collar.

16 designates the pins, in the upper end of which are inserted, preferably by the screw-threaded connection shown, stems 17, having diametrically-enlarged heads 18 and provided with a squared or flattened portion 19 for the application of a wrench. This stem and a pin depending therefrom are supported in the collar 13^a by a universal joint, herein shown as taking the form of a gimbal joint, having an outer ring 20, rigidly clamped by the collar 13^a, an inner ring 21, having a convex outer surface and pivotally mounted in the ring 20 on horizontal pivots 22, and a vertically-apertured sphere 23, flattened at its upper and lower poles and mounted in the ring 21 on pivots 24, disposed at right angles to the line of the pivots 22.

25 designates a cylinder mounted on and above each collar 13^a and conveniently secured in position by cutting and bending outwardly part of the lower portion of the cylinder to form laterally-extending wings 26, which are united to the frame members 13

by the clamping-bolts 15, which tighten up the collars 13^a. Within the cylinder 25 is a piston 27, preferably of the cup shape shown, which piston is provided on its under surface with a V-shaped guide 28, Fig. 4. The lower face of the piston comprised within the guide 28 engages the enlarged head 18 of the stem of the pin, the latter lying at the apex of the guide, as shown in Fig. 3 and by dotted lines in Fig. 4, when the pin is vertical. Between the upper face of the piston and the head of the cylinder is interposed a strong compression-spring 29, the piston having a stem 30 disposed axially of the spring and extending through and above an aperture 31 in the head of the cylinder. The piston-stem 30 near its upper end is provided with a flattened or squared portion 32, and above said flattened portion the stem is screw-threaded, as shown, for the application of a nut 33. The upwardly-extending members 14 of the supporting-frame overlie the heads of the cylinders 25, each of them being slotted or apertured, as shown at 14^a, for the reception of the piston-stem therein, the slot or aperture engaging the flattened or squared portion 32 of the piston-stem to prevent rotation of the latter.

Pivotaly mounted at its bend on the upper surface of each bar 14, inwardly of the free end of the latter, is a bell-crank lever 34, the horizontal arm of which is apertured to receive the stem of the piston, while its vertical arm receives an actuating connection, herein shown as a cable 35, secured to the upper end of the arm at one end, and at its opposite ends secured to the periphery of a disk 36, fast on a shaft 37, rotatably mounted in bearings 38 on the back wall of the frame 11. Fast on the shaft 37 near one end is an arm 39, to which is pivotaly connected an inwardly-extending link 40, the inner end of said link being connected to the frame by a tension-spring 41, whereby the arm, through the link, is normally thrown upwardly. To the inner end of the link 40 is secured a cable 42, which is trained beneath a guide-pulley 43 and extends alongside the alley and beneath the gutter thereof to an actuating-lever 44, which, as herein shown, may consist of a pivoted longitudinal section of the usual post at the players' end, said lever being hinged to the floor at 45 and capable of being drawn rearwardly to actuate the series of bell-cranks 34 through the described connections when the pins 16 are to be reset to normal playing position.

The pin-actuating mechanism as thus described is preferably inclosed and housed by a hood 46, suitably secured to the frame 11 and entirely concealing from view the mechanism above the tops of the pins, and in front of the foremost cylinder 25 may be secured by a suitable bracket an electric or other lamp 47, provided with a light-deflecting hood

48, so disposed as to throw a strong light upon the inner end of the alley.

The drawings show the pins in playing position, at which time the springs 29 are under compression and exert a strong downward pressure upon the stems of the several pins in a direction coincident with their longitudinal axes and directly resisted by the pivotal supports of the pins. When now the pins are struck and laterally displaced by the impact of the ball or by contact with each other, the stems are displaced from their vertical positions, as shown, and consequently the pressure of the springs is no longer directly resisted by the pivotal supports of the stem, with the result that the pistons descend and maintain the stems and the pins attached thereto in the inclined or offset positions to which they have been displaced by the impacts which they have received in play, such positions indicating or standing for the usual knockdown position of the pins resulting from a successful play with the ball. The lateral angle in and through which the pins may swing when thus struck is determined and limited by the guide 28 engaging the head 18 of each stem, while the angle of upward swing is limited only by the clamping-ring 13^a, for which purpose the diagonally opposite upper and lower edges of the outer gimbal ring 20, lying in the field of movement of the stem 17, are preferably concaved and beveled, as shown at 20^a. The swing of the pins to the inclined or offset position, and the consequent downward movement of the plungers, retaining and holding them in such position obviously brings the nuts 33 on the upper ends of the stems of said plungers down into substantial engagement with the horizontal arms of the several bell-crank levers 34, and when the pins are to be restored to playing position an outward swing on the lever-post 44, acting through the described connections, tilts the bell-crank levers backwardly, thereby raising the plungers against the compressive action of their actuating-springs and permits the pins under their own gravity to swing back into the vertical position shown, in which the stems of the pins again assume positions in longitudinal alinement with the resultant forces of the springs, the guides 28 also serving to center the pins, while the spring 41 restores the lever 44 to upright position and maintains the connections taut. The bell-crank levers 34 may be restored to normal position by springs 49, or the latter may be omitted and the action of the main compressions spring-29 be depended upon to restore said levers to operative position when the pins are struck and deflected.

We claim—

1. A mechanical pin-setting mechanism for bowling-alleys and the like comprising in combination a suitable supporting-frame located above the bed of the alley, a plurality of uni-

versal joints carried by said frame, a series of upright stems mounted in said universal joints and serving to suspend the pins in playing position, a series of spring-actuated pistons frictionally engaging the upper ends of said stems and exerting a constant downward pressure thereupon, and means operable from the players' end of the alley for raising said pistons and permitting the pins when deflected to swing back to normal playing position, substantially as described.

2. A mechanical pin-setting mechanism for bowling-alleys and the like comprising in combination a suitable supporting-frame located above the bed of the alley, a plurality of gimbal joints carried by said frame, a series of upright stems mounted in said gimbal joints and serving to suspend the pins in playing position, a series of cylinders mounted above said gimbal joints, spring-actuated pistons in said cylinders frictionally engaging the upper ends of said stems and exerting a constant downward pressure thereupon, and means operable from the players' end of the alley for raising said pistons against the spring-pressure and permitting the pins when deflected to swing

back to normal position, substantially as described.

3. A mechanical pin-setting mechanism for bowling-alleys and the like comprising, in combination, a suitable supporting-frame located above the bed of the alley, a plurality of universal joints carried by said frame, a series of upright stems having rounded heads mounted in said universal joints and serving to suspend the pins in playing position, a series of cylinders mounted above said universal joints, spring-actuated pistons in said cylinders frictionally engaging the heads of said stems and exerting a constant downward pressure thereupon, centering-guides on the stem-engaging faces of said pistons, and means operable from the players' end of the alley for raising said pistons against the spring-pressure and permitting the pins when deflected to swing back to normal position, substantially as described.

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