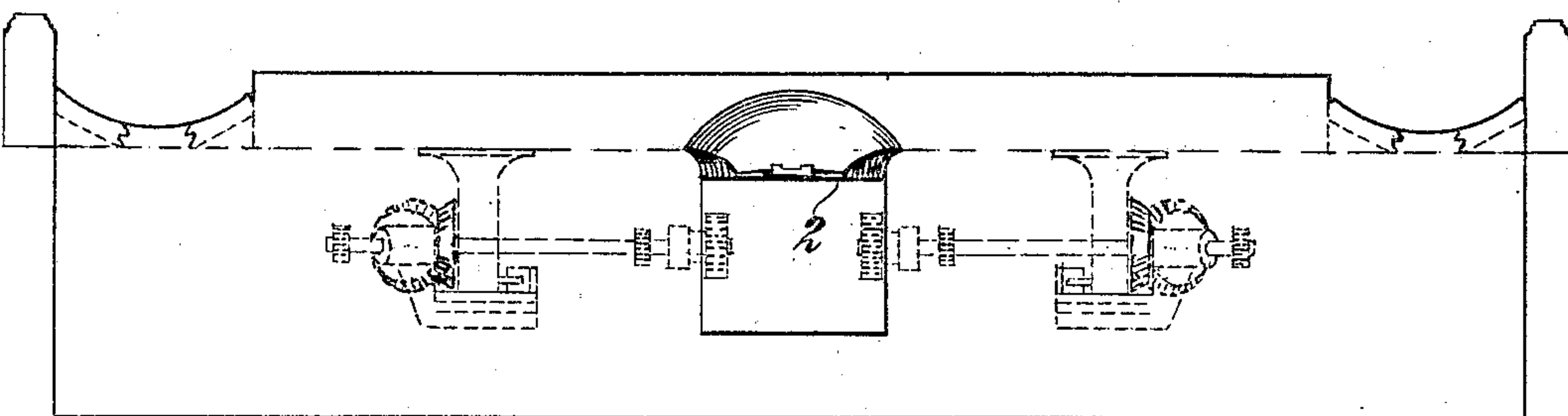
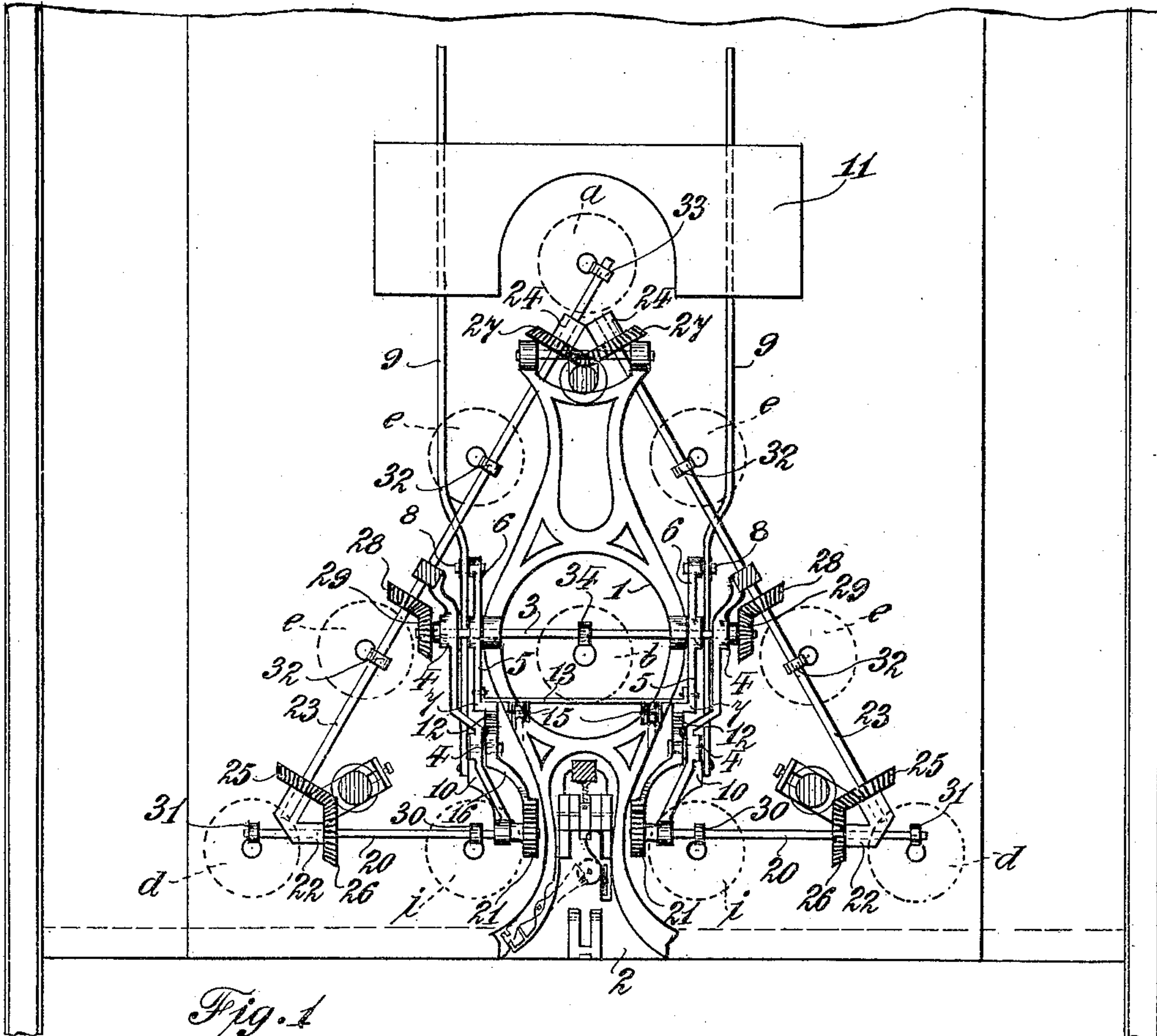


G. H. POETSCH.
PIN SETTING AND SPOTTING DEVICE.
APPLICATION FILED DEC. 8, 1908.

946,784.

Patented Jan. 18, 1910.

4 SHEETS—SHEET 1.



WITNESSES

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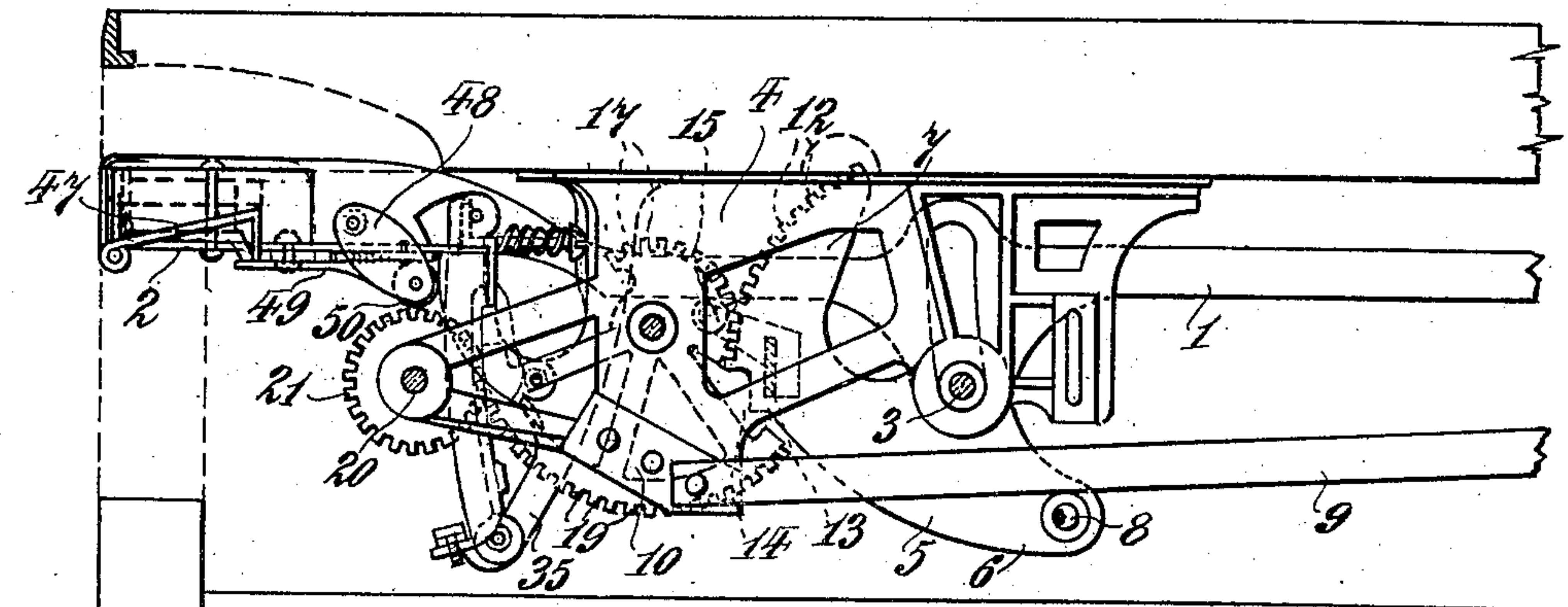


Fig. 3

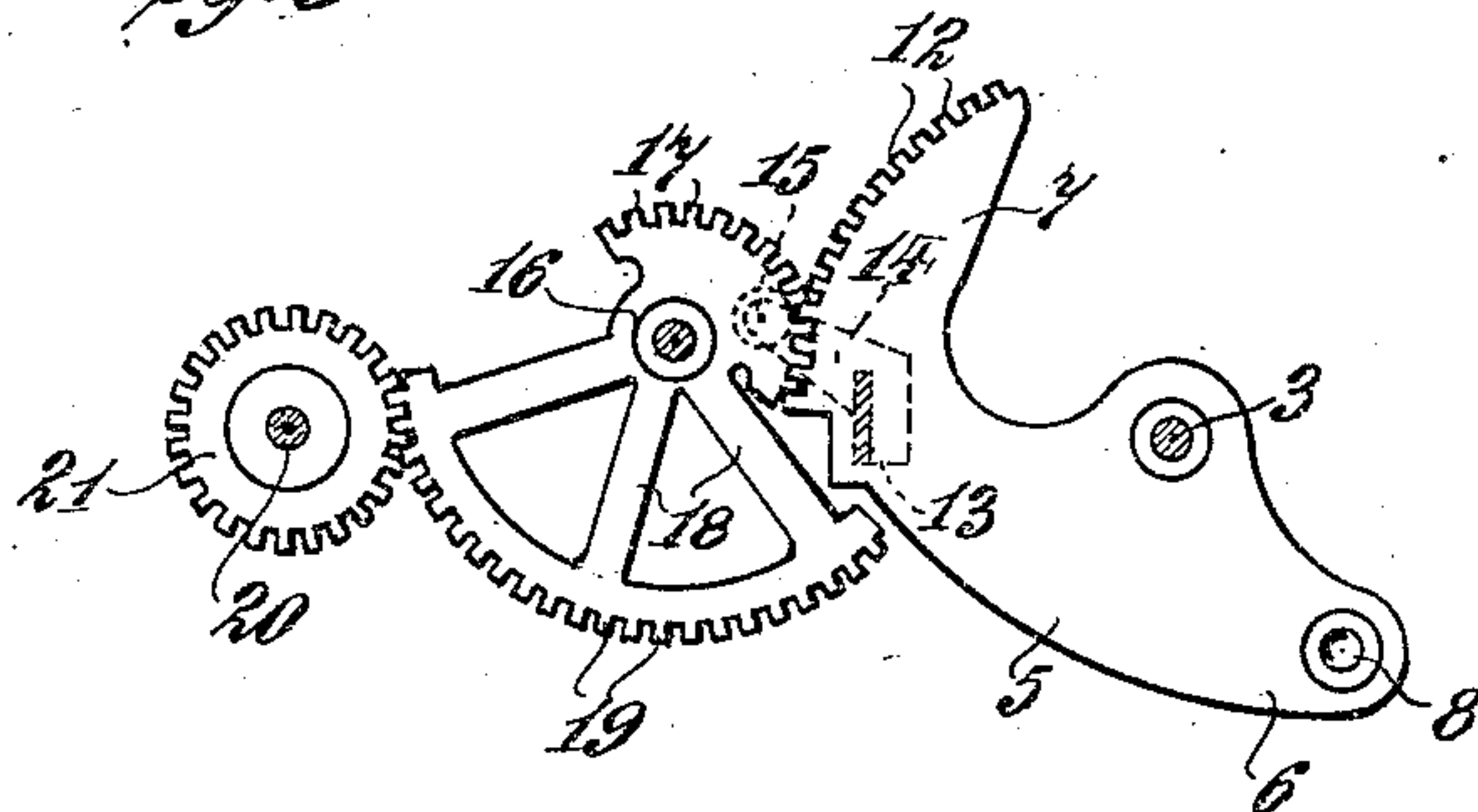


Fig. 4

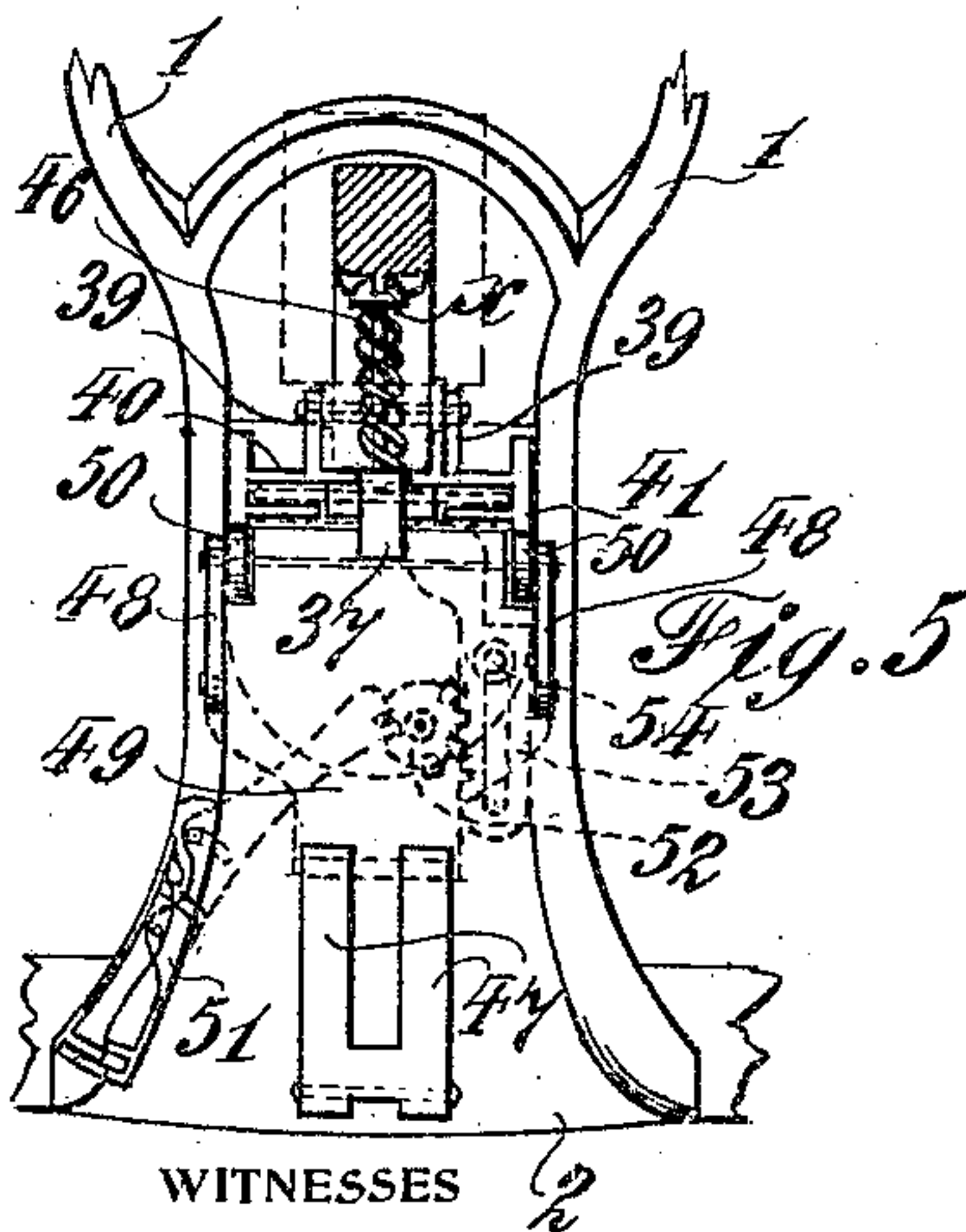


Fig. 5

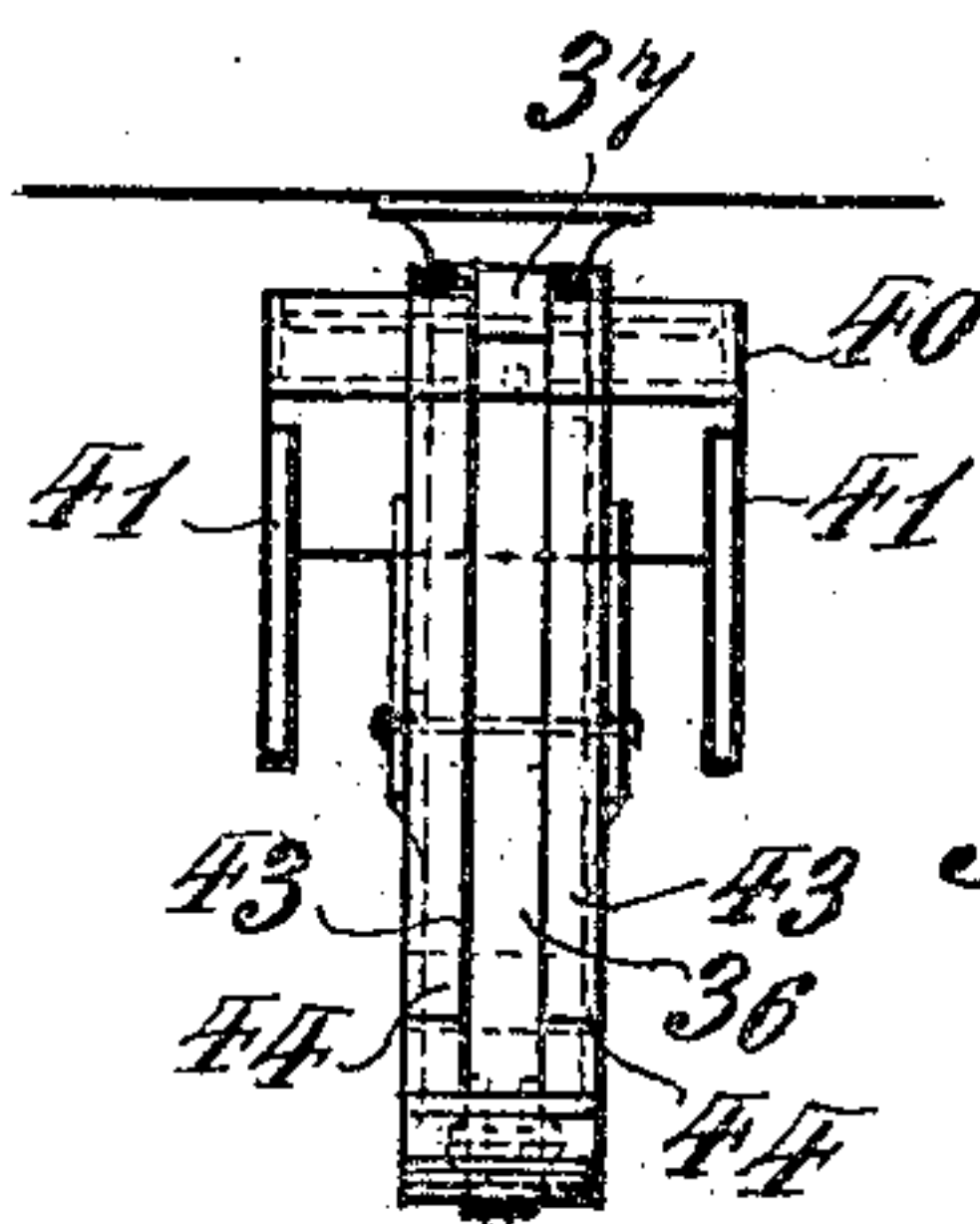


Fig. 6

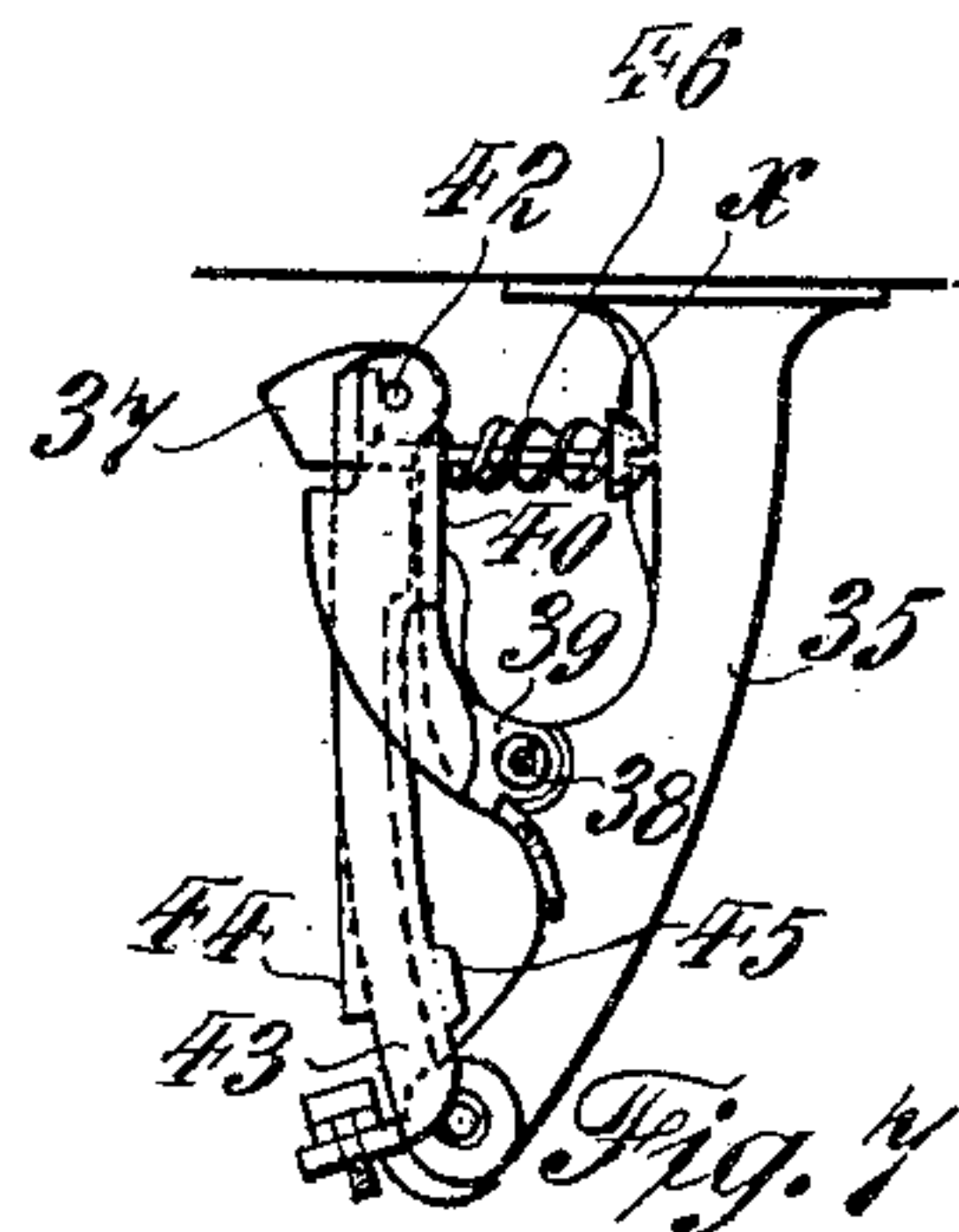


Fig. 7

WITNESSES

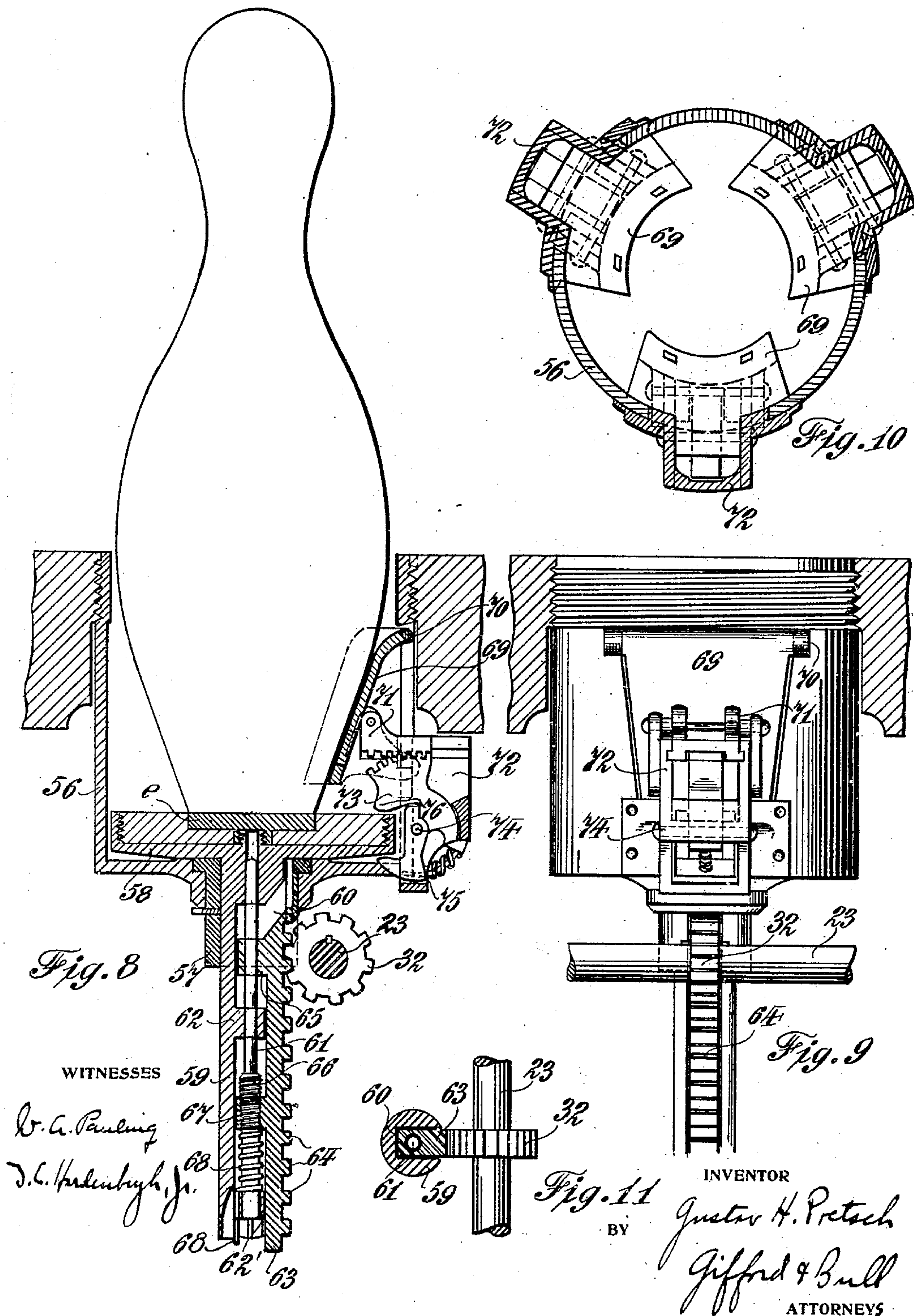
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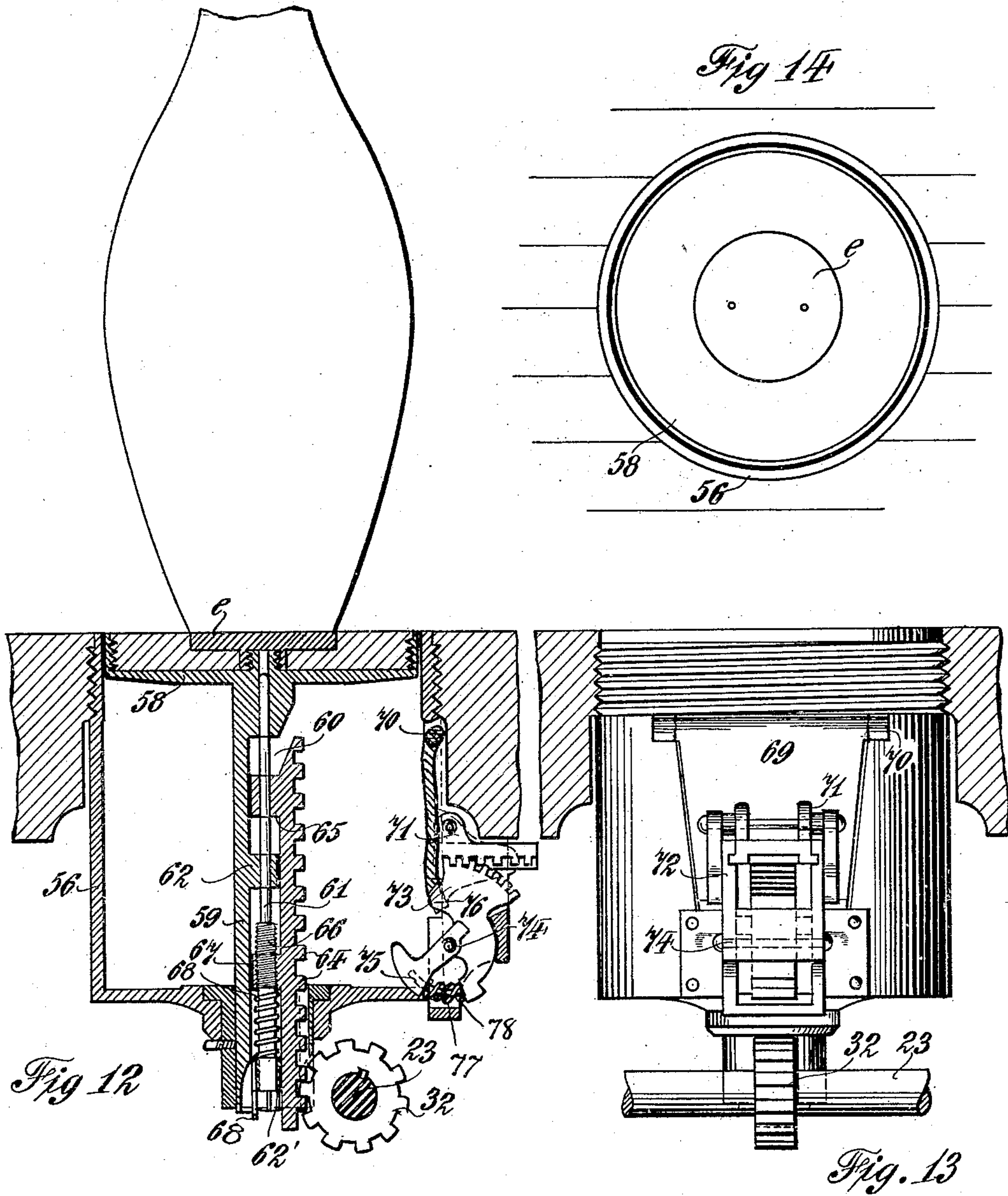
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UNITED STATES PATENT OFFICE.

GUSTAV H. POETSCH, OF NEW YORK, N. Y.

PIN SETTING AND SPOTTING DEVICE.

946,784.

Specification of Letters Patent. Patented Jan. 18, 1910.

Application filed December 8, 1908. Serial No. 466,458.

To all whom it may concern:

Be it known that I, GUSTAV H. POETSCH, a citizen of the United States, and a resident of the city of New York, borough of Manhattan, county and State of New York, have invented a certain new and useful Form of Pin Setting and Spotting Device, of which the following is a specification.

In the game of bowling it has been heretofore and is now the general custom to replace by hand the pins knocked from position by a ball delivered by the player. The pins are customarily placed in a group and in order that the pins may always occupy the same relative positions when set, accurately spaced spots are marked on the surface of the alley upon each of which a pin is to be placed. In order that every player may be on an equal footing the pins must be placed exactly on the spots, a misplacing of one or more pins resulting favorably or unfavorably, as the case may be, to the player delivering a ball after the pins have been set up and spotted in a faulty manner. Uniform and accurate setting and spotting of pins by hand, while possible, is in many instances not obtainable by reason of the inexperience, haste, etc. of the pin setter. Among devices with which I am familiar, it has heretofore been proposed to spot the pins by a machine suspended above the alley and lowered when the pins are to be spotted; which machine, while rendering accurate spotting possible, has the certain disadvantages of being bulky and of many parts, is comparatively slow in operation, and obstructs the alley when lowered so as to prevent the pin boy or pin setter from entering on the alley, should it be necessary for any reason. It has also been proposed to spot the pins by means of dowels protruding from the surface of the alley and entering holes in the bottom of the pins, this system having certain disadvantages such as the wearing out or enlargement of the holes in the pins through constant use, and the obvious fault that the pins are not solid throughout as required by the rules of the game.

It is the purpose of my invention to provide mechanism which shall be set in position beneath and in the alley floor at the pin pit end thereof, leaving the surface of the alley unobstructed at all times, whereby the pin supporting numbers are lowered in pockets in the alley at a desired time and

the pins may be readily set and automatically spotted by even the most inexperienced operator; the mechanism being simple in design and operation, and capable of being operated in a minimum space of time with a great saving of labor.

My new device may readily be placed in position in any alley now in use, the space occupied thereby being only the thickness of the alley bed itself and a portion of the space ordinarily occupied by the blocking and foundation of the alley at one end thereof.

In the drawings herewith I have shown and in the specification hereafter will describe, for the purpose of fully explaining my invention, a particular form of my device and mechanism for operating the same, but I do not desire to limit myself to such particular form since the form of my device and operating mechanism may be modified as desired, or other forms of operating mechanism used, without departing from the spirit of my invention which consists in the arrangement, combination and operation of parts as set forth in and falling within the scope of the claims hereto appended.

In the drawings herewith like characters of reference denote like parts in all the figures.

Figure 1 represents a plan view of the operating mechanism of my device, the alley floor being removed; Fig. 2 represents a view in vertical elevation of the pin pit end of the alley, certain parts of the operating mechanism being shown in broken lines; Fig. 3 represents a detail view in side elevation of a portion of the operating mechanism; Fig. 4 represents a detail view of the train of gears by which the power for the operating mechanism is transmitted; Fig. 5 represents a detail plan view of the foot tread and catch or stop mechanism; Fig. 6 represents a detail view in front elevation of the catches or stops; Fig. 7 represents a detail view in side elevation of the catches or stops as shown in Fig. 6; Fig. 8 represents a sectional view in vertical elevation of a pin pocket and mechanism; Fig. 9 represents a view in side elevation of a pin pocket, the cup and pin spot being in a lowered position; Fig. 10 represents a sectional plan view of a pin pocket with cup and pin spot lowered; Fig. 11 represents a detail top view in section of the adjustable support which carries the cup and pin spot; Fig. 12 represents a sectional view

in vertical elevation of a pin pocket, the cup and pin spot being elevated; Fig. 13 represents a view in vertical elevation of a pocket as shown in Fig. 12; Fig. 14 represents a detail plan view of the alley floor with a pocket and spin spot.

Turning to a detail description of my invention in connection with Figs. 1-4, that part of the mechanism which is located beneath the floor of the alley will be first considered. Two lever arms 1 are pivoted centrally of the alley, preferably at a point to the rear of the head pin spot *a*, extending to the rear toward the pin pit and being united at the rear end of the alley by the foot tread 2; the arms 1 are curved at their center portions to permit of the dropping of the center pin spot *b*. Extending transversely of the alley below the center pin spot is a shaft 3 extending at each end through bearings in supporting brackets 4 secured to the under side of the alley floor. Pivoted on the shaft 3 outside of and adjacent the arms 1, which are slotted at this point to permit of movement upward and downward without interference with shaft 3, are plates 5 formed with a curved portion 6 extending downward and forward and a second curved portion 7 extending up to the rear. Each portion 6 of plates 5 is provided with an outwardly projecting roller 8 upon which rests a lever arm 9 pivoted at its rear end on a plate 10 carried by brackets 4 which lever arms are joined by and support, at their forward ends, a suitable weight 11. The upper curved edge of portion 7 of plate 5 is provided with teeth 12. The upwardly extending portions 7 of plates 5 are connected by a bar 13 upon which are mounted arms 14 bearing rollers 15; upon each of the rollers 15 rests one of the lever arms 1, a downward motion of the lever arms thus resulting in a movement of plates 5 on their pivots to elevate portions 6 and depress portions 7. Adjacent the upwardly extending portion 7 of plates 5 on the inside of brackets 4 are pivoted members 16 formed at the top with an arc portion provided with teeth 17 adapted to intermesh with teeth 12 of plates 5, and having downwardly extending arms 18 united by a larger arc portion formed with teeth 19. At the rear end of each bracket 4 is provided a bearing through which extends a shaft 20 bearing at its end a gear 21 intermeshing with the teeth 19. Hence upon a downward movement of portions 7 of plates 5 the members 16 will be turned on their pivots, the arc portions bearing teeth 19 being rotated upward and revolving shafts 20 through engagement of teeth 19 with gears 21. Shafts 20 extend toward the side of the alley through bearings in supports 22, which supports form bearings for the rear ends of two shafts 23 which extend forward and incline inward at an angle passing through bearings

in brackets 4 and their forward ends resting in bearings in supports 24 to the rear of and adjacent the head pin spot *a*; shafts 23 are driven from shafts 20 by gears 25 meshing with gears 26 on shafts 20, shafts 23 being also preferably provided with intermeshing gears 27 adjacent their forward ends; the transverse shaft 3 is driven by gears 28 on shafts 23 engaging with gears 29 at the ends of shaft 3. Shafts 20 are each provided with a pinion 30 below the rear pin spots *c* and with pinions 31 below the corner pin spots *d*; shafts 23 are provided with pinions 32 below the side pin spots *e*, one of said shafts extending through its bearing in support 24 and being provided with a pinion 33 below head pin spot *a*; shaft 3 is provided with a pinion 34 below the center pin spot *b*. It will thus be seen that by a downward movement of the lever arms 1 the shafts 20, 23 and 33 will be rotated and upon an upward movement of arms 1 caused by the action of weight 11 said shafts will be rotated to a like degree in a reverse direction.

Turning to a detail description of the catch or stop mechanism for foot tread 2 and considering more particularly Figs. 5-7, a curved supporting member 35 extends downward from the alley floor adjacent the inner end of the tread. Extending upward from support 35 centrally thereof is an arm 36 provided with a shoulder 37 at its upper end, which shoulder projects over the tread 2 and limits its upward movement. Pivoted on the middle portion of support 35 at 38 on either side thereof are arms 39 joined at their upper ends by a plate 40 which extends outward and at each side is provided with a shoulder 41 projecting under the tread 2 and preventing its downward movement while shoulders 41 are in position. A pin 42 mounted at the top of plate 40 forms a pivot for downwardly extending arms 43 bearing shoulders 44, and connected back of central arm 36 by a cross member 45. A pin *x* with slotted head engaging with ribs adjacent the top of support 35, rests in an aperture or perforation passing through the plate 40 and central stop arm 36; a spring 46 around pin *x* and bearing on the head of the pin and the plate 40, tends to normally press plate 40 outward, and since the central stop arm 36 is in front of and secured to plate 40, the side stops 41 integral with plate 40, and the bottom stop arms 43 pivoted on top of and extending down in front of plate 40, all the stop members are thereby normally pressed outward.

The stops or catches are operated as follows: Pivoted at the outer end of tread 2 are upwardly inclined arms 47 provided at their free ends with vertical portions extending down through the tread 2; at each side of the tread is pivoted a member 48 provided with a curved arm 49 under the tread 2,

upon the joined ends of which arms rest the vertical portions of arms 47; at the free end of each member 48 underneath and at the side of the tread 2 is mounted a roller 50 resting against one of the shoulders 41. Upon the operator placing his foot upon the tread 2 the arms 47 will be depressed turning members 48 on their pivots, forcing the rollers 50 against the shoulders 41 and pressing these shoulders back against the action of spring 46 to permit of the downward movement of the tread 2. The tread 2 being maintained in its depressed position by shoulders 44 is released from said shoulders as follows: A lever 51 is pivoted on the under side of tread 2 one end extending up at the side of and being curved out over the tread, and the opposite end extending diagonally across the tread underneath the same; a pinion 52 mounted on the under side of tread 2 is provided with a pin resting in a slot in the end of the lever 51, which is underneath the tread; upon the end of lever 51, which is above the tread, being moved outward toward the side, the opposite end of the lever will be moved to rotate pinion 52, the latter engaging with a toothed rack 53, mounted on a pin 54 extending through a slot in the rack, and moving the rack in order that its end portion 55 may press in the shoulders 44 to permit of the automatic upward movement of the tread 2.

Turning to a description of the mechanism for setting and spotting the pins as shown in Figs. 8-14; in the floor of the alley around each of the pin spots is set a metal pocket 56 secured in the floor by means of screw threads around its upper edge; the pocket being of a size sufficient to permit of the insertion therein of a bowling pin of standard or of any desired size. An opening is provided in the bottom of each pocket at its center in which opening is inserted a metal collar 57; movement of the collar upward in the opening in the pocket being prevented by a pin or pins secured in the collar and resting against the lower edge of the opening. By means of this construction, should the alley be planed and thus reduced in thickness in order to remove inequalities in the surface caused by wear, the pockets may be screwed down in order that their edges may be flush with the surface of the alley, without altering the position of the collar 57 or any operative parts passing through said collar. Fitting in the pocket 56 is a shallow cup 58 into which is screwed a section of the alley floor open at the center to receive a pin spot *e* (for example), preferably of metal. The cup 58 is carried at the top of a shaft 59 extending downward through the collar 57. The shaft 59 is formed at one side with an open rectangular slot 60 extending from the bottom of the shaft to a point adjacent the top thereof,

the side of the collar 57 being cut away to conform to the slot. Its upper end resting in a central bore in the top of the shaft 59, a rod 61 extends downward through a bearing in an upper lug 62 projecting from the shaft in the slot 60; a rectangular bar 63 provided on one side with teeth 64 is inserted in slot 60, the rod 61 passing through a bearing in a lug 65 on said bar 63 and having its lower end enlarged to form a portion 66 threaded on the outside and screwed in a second lug 67 on bar 63; the rod may be turned by means of a head or nut on its lower end and the vertical position of the bar 63 on rod 61 may thus be adjusted. A second lug 62' is provided adjacent the bottom of shaft 59 in the slot 60, the rod 61 passing through this lower lug, its head or nut being beneath the same; the movement of shaft 59 with rod 61 is secured by means of a spring 68 coiled around the portion 66 between lug 67 and lower lug 62', the upper edge of the head or nut of rod 61 thus being held up against the lower edge of lower lug 62'. Bar 63 having been adjusted to a desired position on rod 61, said rod is locked against turning by the lower end of spring 68 resting in one of a series of grooves cut in the head or nut of the rod. The interior of the lower end of shaft 59 is cut away at one side to permit of the disengagement of the end of the spring from the nut or head when it is desired to turn the latter. By means of the adjustment of bar 63 on rod 61 the position of the pin spot at the top of the rod and of the cup 58 may be adjusted in such a manner that the spot and the portion of alley floor contained in cup 58 will always assume a proper position flush with the floor of the alley when elevated in accordance with the vertical adjustment of pocket 56. The teeth 64 on bar 63 engage with one of the pinions 30, 31, 32, 33 or 34 heretofore described, and upon the rotation of this pinion the bar 63 and shaft 59 bearing cup 58 and pin spot *e* will be lowered to the bottom or raised to the top of pocket 56 in accordance with the direction of rotation of the pinion. In lowering the shaft 59 and its pin bearing cup should the movement of the pinion fail to cease when the cup 58 is resting against the bottom of pocket 56, further downward movement of rod 61 and bar 63 is permitted by spring 68 without further movement of shaft 59. Mounted at the bottom of the pocket 56 in cut-away portions of the wall thereof are curved lips or fingers 69, preferably three in number, equally spaced apart pivoted at their tops on pins 70, mounted at each end in the wall of the pocket, and adapted when in a vertical position to lie flush with the wall of the pocket 56. The lips or fingers 69 are pivoted adjacent the center on a support 71 sliding in bearings in

a support 72 secured to the outside of pocket 56; the under edge of support 71 is toothed and engages with the teeth of a broadened arm 73 pivoted at 74 on support 72. Upon the arm 73 being rocked on its pivot the support 71 will be moved outward inclining the lip or finger 69 outward around its pivot 70. The arm 73 is rocked to move support 71 outward by means of the contact of cup 58, when descending, with a hook arm 75, extending from the pivot of arm 73 underneath the cup; and the arm 73 is rocked to move support 71 inward and return the lip or finger 69 to a vertical position through contact of cup 58, while moving upward, with a shoulder 76 of arm 73, which projects over the cup 58 when the latter has assumed its position at the bottom of the pocket 56.

After the pins have been in use for any considerable length of time the edges at the bottom of the pins are liable to become chipped or broken and it is thereupon customary to cut off the bottoms of the pins in order that the same may be flat and with unbroken edges. Were the fingers 69 immovable when in their projected positions, the pins thus shortened, would be caught and held before coming to rest on the pin spots at the bottom of the pockets; the following mechanism has, therefore, been provided. Projecting from the lower end of arm 73 is a small curved rod 78 the free end of which rests in a socket in the back of hook arm 75 and is free to move in and out in this socket; a spring 77 coiled around rod 78 bears at opposite ends against arm 73 and hook-arm 75, the power of the spring being such that it will not normally be compressed when hook-arm 75 is moved downward by cup 58 and the movement of arm 73 to project the lip 69 will thus be effected; when, however, the lip 69 is in a projected position and tends to hold a pin before the same has come to rest on the pin spot, the weight of the pin will force back the lip 69 against the action of spring 77, the rod 78 moving in the socket in hook-arm 75.

The operation of my device in brief is as follows: A player having taken his turn and having knocked all or any of the pins from the spots, the pin boy steps upon the foot tread, releasing the catch which holds it in an elevated position, and depresses the tread, thereby lowering the pin spots in the pockets in the alley, the tread being held in a depressed position by the catch provided for such purpose. The boy thereupon places the pins in the pockets, which may be done hastily and with a great saving of labor, since the pin having entered the pocket will assume a vertical position as it drops to the bottom and will be accurately spotted by means of the lips or fingers within the cup. Pins which have not been knocked from the

spots will be lowered when the pin spots are lowered in the pockets and will be accurately spotted if their position has been in any degree disturbed. All the pins being in place, the catch which maintained the tread in a depressed position is disengaged by a side thrust of the operator's foot on the lever controlling said catch, and the pins and their supports are elevated to close the pockets by means of the weight which acts automatically to elevate the tread and to reverse the operation of the mechanism which has formed the pockets. The weight is so balanced with respect to the weight of the pins to be elevated and the power required to operate the mechanism that the pins will be elevated without jar or sudden movement and will come to rest in an accurately spotted position, the surface of the alley being flush.

I have shown and described my invention as adapted for use in the usual game of bowling in which ten-pins are used but the number and arrangement of the pins may be as desired and the necessary arrangement of shafts and pinions readily provided.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:—

1. The combination with an alley of a device of the class described, comprising a plurality of pockets adjustably secured in the floor of the alley, a pin supporting member within each pocket, a section of the alley floor and a pin spot carried by each supporting member, and means for lowering the said members.

2. The combination with an alley of a device of the class described, comprising a plurality of pockets secured in and projecting below the floor of the alley, a pin supporting member within each pocket, a section of the alley floor and a pin spot carried by each supporting member, means for lowering the pin supporting members within the pockets and adjustable means for regulating the distance which the pin supporting members are to be lowered.

3. The combination with an alley of a device of the class described, comprising a plurality of pockets secured in and projecting below the floor of the alley, a pin supporting member within each pocket, a section of the alley floor and a pin spot carried by each supporting member, means for lowering the pin supporting members within the pockets, and adjustable means for regulating the distance to which one of the pin supporting members is to be lowered irrespective of the distance to which the other pin supporting members are lowered.

4. The combination with an alley of a device of the class described, comprising a plurality of pockets secured in and projecting below the floor of the alley, a pin-sup-

porting member within each pocket carrying a pin spot and a section of the alley floor, and means for lowering and for raising the pin-supporting member.

5 5. The combination with an alley of a device of the class described, comprising a plurality of pockets secured in the floor of the alley, a pin-supporting member within each pocket, a section of the alley floor and
10 a pin spot carried by each of said pin-supporting members, and means for lowering said pin-supporting members.

6. The combination with an alley of a device of the class described, comprising a
15 pocket secured in and projecting below the floor of the alley, a pin-supporting member in the pocket, a section of the alley floor and a pin spot carried by the pin-supporting member, and means for lowering the pin-supporting member to a position below the
20 floor of the alley.

7. The combination with an alley of a device of the class described, comprising a pocket secured in and projecting below the
25 floor of the alley, a pin-supporting member within the pocket, a pin spot carried by the pin-supporting member, means for lowering the pin-supporting member, and means for automatically spotting a pin inserted in the
30 pocket when the pin-supporting member is in a lowered position.

8. The combination with an alley of a device of the class described, comprising a pocket secured in and projecting below the
35 floor of the alley, a pin-supporting member in the pocket, a pin spot carried by the pin-supporting member, means for lowering the pin supporting member below the floor of the alley, and means for automatically spotting a pin inserted in the pocket when the
40 supporting member is in a lowered position, said spotting means comprising a lip or finger within said pocket.

9. The combination with an alley of a device of the class described, comprising a pocket secured in and projecting below the
45 floor of the alley, a pin supporting member in the pocket, a pin spot carried by the pin supporting member, means for lowering the pin supporting member below the floor of the alley, and means for spotting a pin inserted in the pocket when the supporting
50 member is in a lowered position, said spotting means comprising a lip or finger within said pocket adapted to automatically project into the pocket.

10. The combination with an alley of a device of the class described, comprising a pocket secured in the floor of the alley, a
60 pin-supporting member carrying a pin spot in the pocket, means for lowering the pin-supporting member, a lip or finger within the pocket adapted to lie in the wall thereof when the pin-supporting member is in an
65 elevated position, and means for projecting

the lip or finger into the pocket when the pin-supporting member is lowered.

11. The combination with an alley of a device of the class described, comprising a pocket secured in the floor of the alley, a
70 pin-supporting member carrying a pin spot within the pocket, means for lowering and for raising said pin supporting member, a lip or finger within the pocket adapted to project into the pocket when the member
75 is lowered, and means for withdrawing the lip or finger when the supporting member is raised.

12. The combination with an alley of a device of the class described, comprising a
80 pocket secured in the floor of the alley, a pin-supporting member carrying a pin spot within the pocket, means for lowering the supporting member, a lip or finger within the pocket adapted to lie in the wall thereof
85 when the supporting member is in an elevated position, and means for automatically projecting the lip or finger into the pocket when the supporting member is lowered.

13. The combination with an alley of a device of the class described, comprising a
90 pocket secured in the floor of the alley, a pin-supporting member carrying a pin spot within the pocket, means for lowering and for raising the supporting member, a lip
95 or finger within the pocket adapted to lie in the wall thereof when the supporting member is in an elevated position, means for automatically projecting the lip or finger into the pocket when the supporting mem-
100 ber is lowered, and means for automatically withdrawing the lip or finger when the supporting member is elevated.

14. The combination with an alley of a device of the class described, comprising a
105 pocket secured in the floor of the alley, a pin supporting member carrying a pin spot within the pocket, means for lowering and for raising the supporting member, a lip or finger within the pocket adapted to lie
110 in the wall thereof when the supporting member is in an elevated position, means for automatically projecting the lip or finger into the pocket when the supporting member is lowered, means for automatically
115 withdrawing the lip or finger when the supporting member is elevated, and means for automatically elevating the supporting member.

15. The combination with an alley of a device of the class described, comprising a
120 pocket secured in the floor of the alley, a pin-supporting member in the pocket, means for lowering the pin-supporting member, a lip or finger within the pocket, and means
125 for projecting the lip or finger into the pocket, said last-mentioned means comprising a pivoted arm adapted to contact with the pin-supporting member when the latter
130 is lowered.

16. The combination with an alley of a device of the class described, comprising a pocket secured in the floor of the alley, a pin-supporting member in the pocket, means
5 for lowering and for raising the pin-supporting member, a lip or finger within the pocket adapted to project therein when the pin-supporting member is lowered, and means for withdrawing the lip or finger,
10 said last-mentioned means comprising a pivoted member adapted to contact with the pin-supporting member when the latter is elevated.

17. The combination with an alley of a device of the class described, comprising a pocket secured in the floor of the alley, a pin-supporting member in the pocket, means
15 for lowering and for raising the pin-supporting member, a lip or finger within the pocket, means for projecting the lip or finger into the pocket comprising a pivoted arm adapted to contact with the pin-supporting member when lowered, and means
20 for withdrawing the lip or finger comprising a pivoted member adapted to contact with the pin-supporting member when elevated.

18. The combination with an alley, of a device of the class described, comprising a pocket secured in the floor of the alley, a pin-supporting member in the pocket, means
30 for lowering the pin-supporting member, and a pivoted lip or finger adapted to be projected into the pocket when the pin-supporting member is lowered, said lip or finger
35 being adapted to be movable on its pivot under the weight of a pin inserted in said pocket.

19. The combination with an alley of a device of the class described, comprising a pocket secured in the floor of the alley, a pin-supporting member within the pocket,
40 means for lowering the pin-supporting member, means for retaining said member in a lowered position, means for freeing the

said retaining means, and means for automatically raising the pin-supporting member after said retaining means have been freed.

20. The combination with an alley of a device of the class described, comprising a plurality of pockets secured in the floor of the alley, a pin-supporting member in each pocket provided with a vertical shaft extending below the floor of the alley and provided with teeth on one side thereof, means
55 for raising and for lowering the supporting members comprising a plurality of horizontal shafts extending beneath the floor of the alley, and a plurality of pinions carried
60 by the horizontal shafts, each of said pinions engaging with the teeth of one of said vertical shafts, said pin-supporting members being adapted to be operated upon the rotation of said horizontal shafts, and
65 means for rotating said horizontal shafts.

21. The combination with an alley of a device of the class described, comprising a plurality of pockets inserted in the floor of the alley, a pin supporting member within
70 each pocket, means for lowering the pin supporting members, and adjustable means for regulating the distance which the pin supporting members are to be lowered, said adjustable means comprising a rod extending
75 downward from each supporting member and provided with a threaded portion, a bar member below each pocket, a lug on each bar provided with a threaded aperture, the threaded portion of each of said rods being
80 adapted to pass through and to be adjustable vertically in one of said lugs.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GUSTAV H. POETSCH.

Witnesses:

T. E. HARDENBERGH, Jr.

W. A. PAULING.