

No. 780,236.

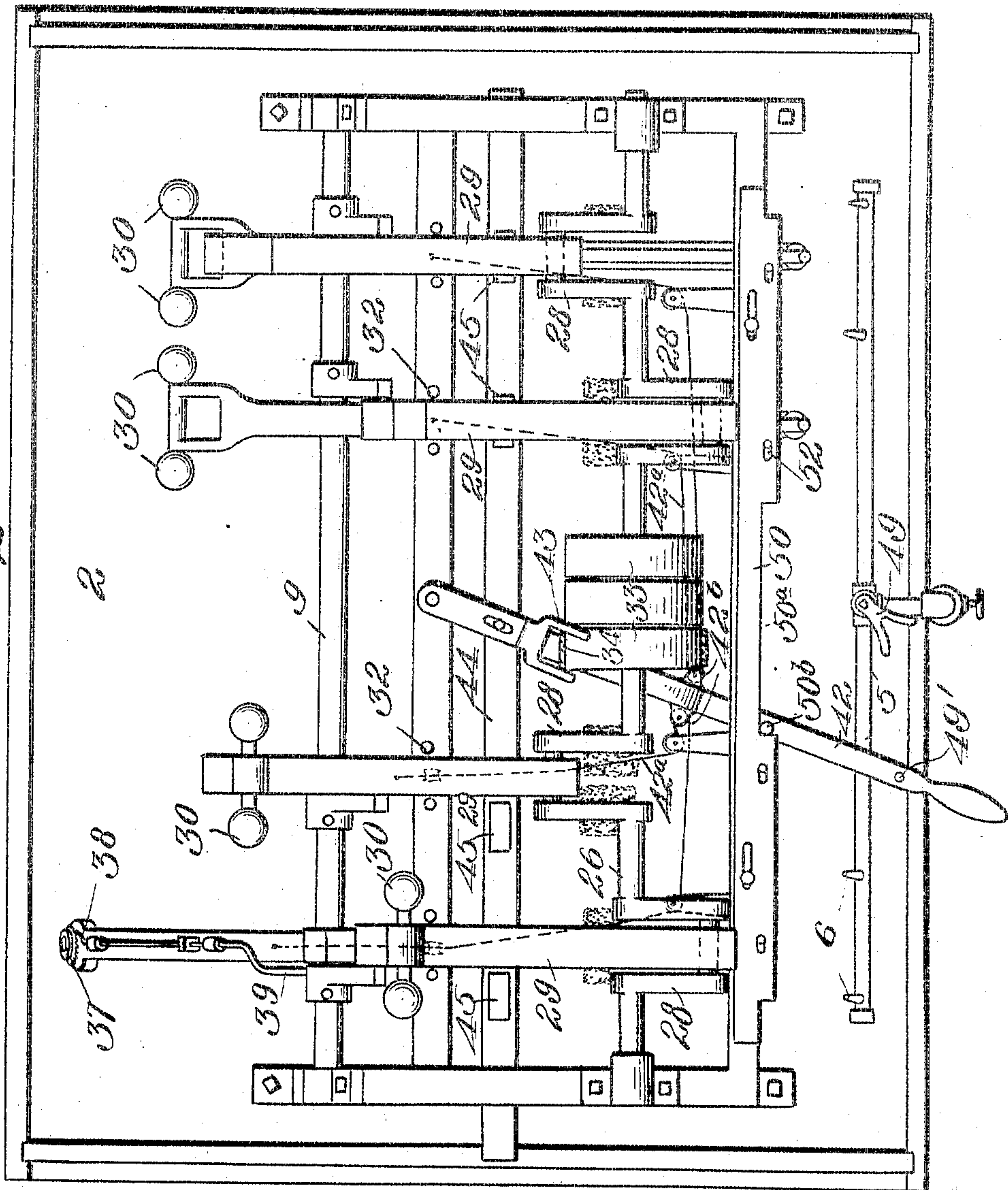
PATENTED JAN. 17, 1905.

L. C. SEARS.
BOTTLE CLEANING MACHINE.

APPLICATION FILED MAR. 12, 1904.

4 SHEETS—SHEET 1.

Fig. 1.



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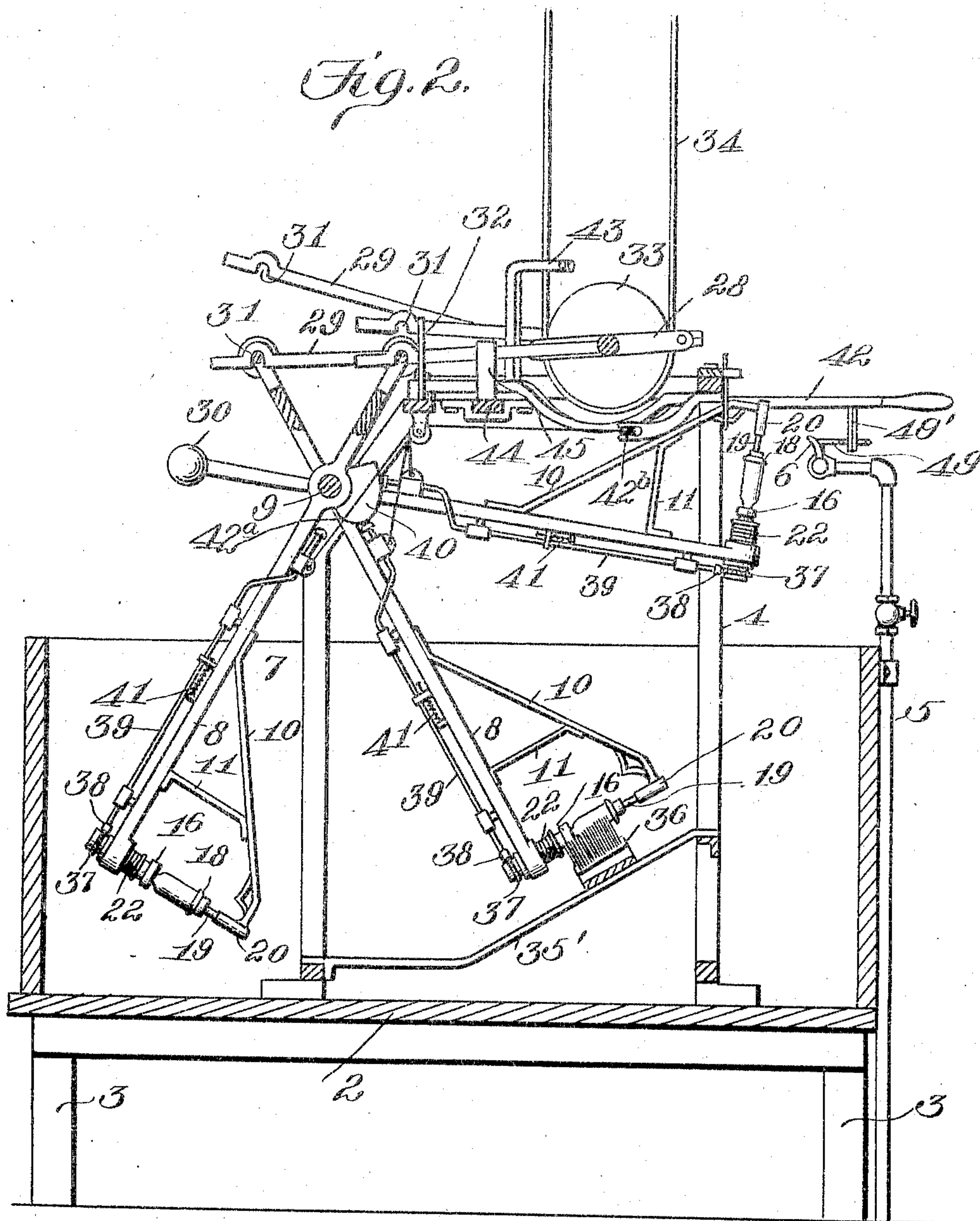
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4 SHEETS—SHEET 2.



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4 SHEETS—SHEET 3.

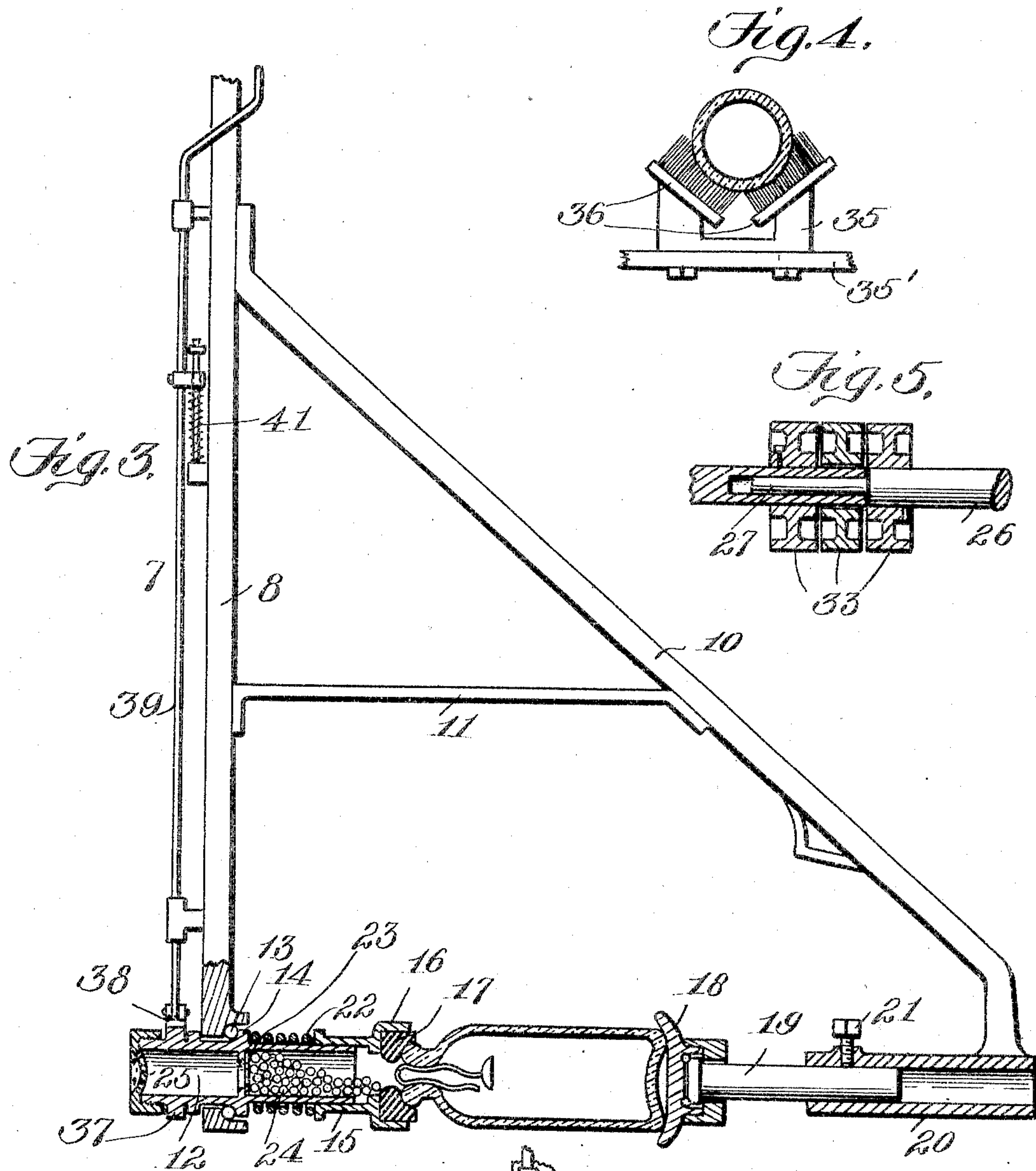


Fig. 4.

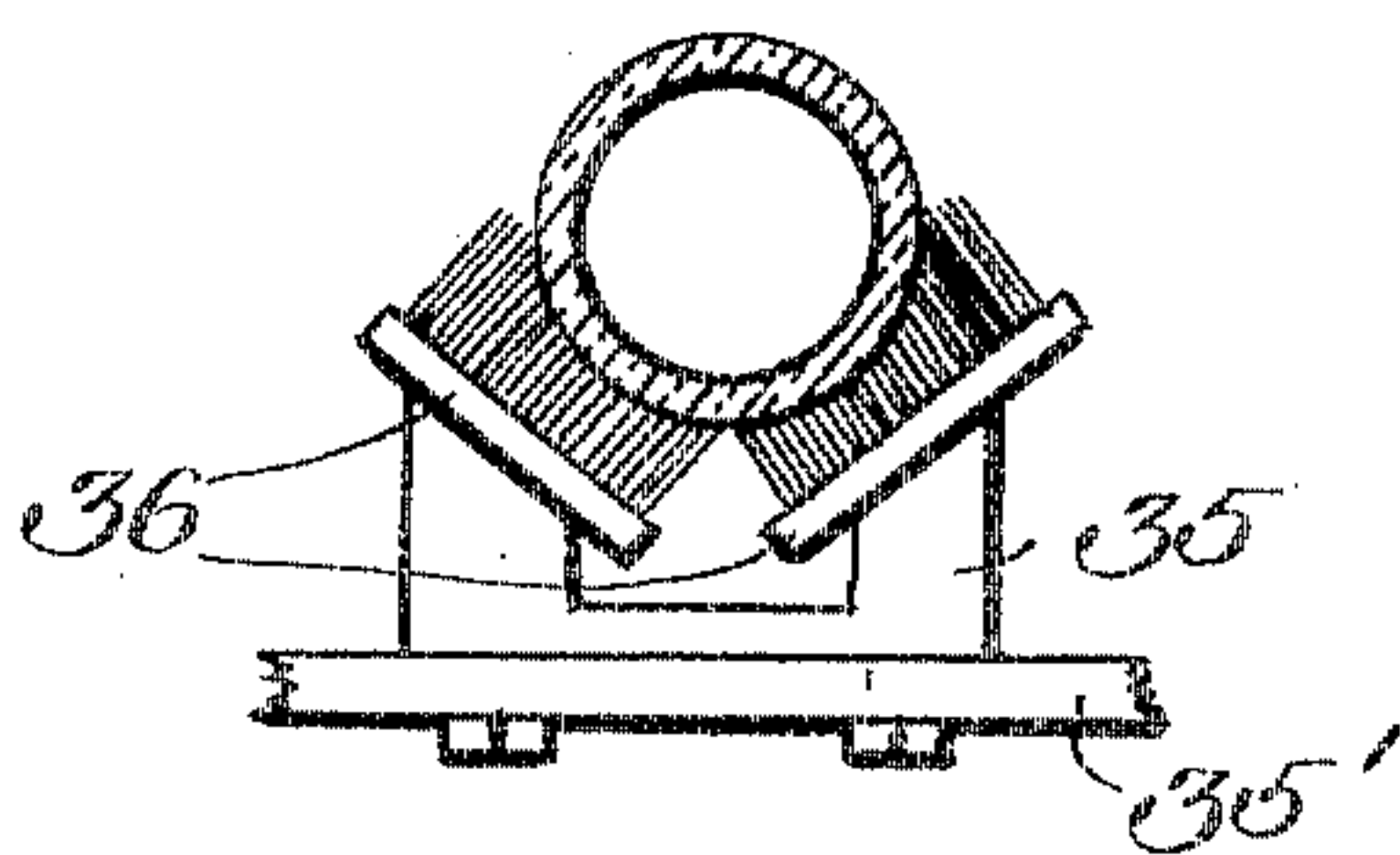


Fig. 5.

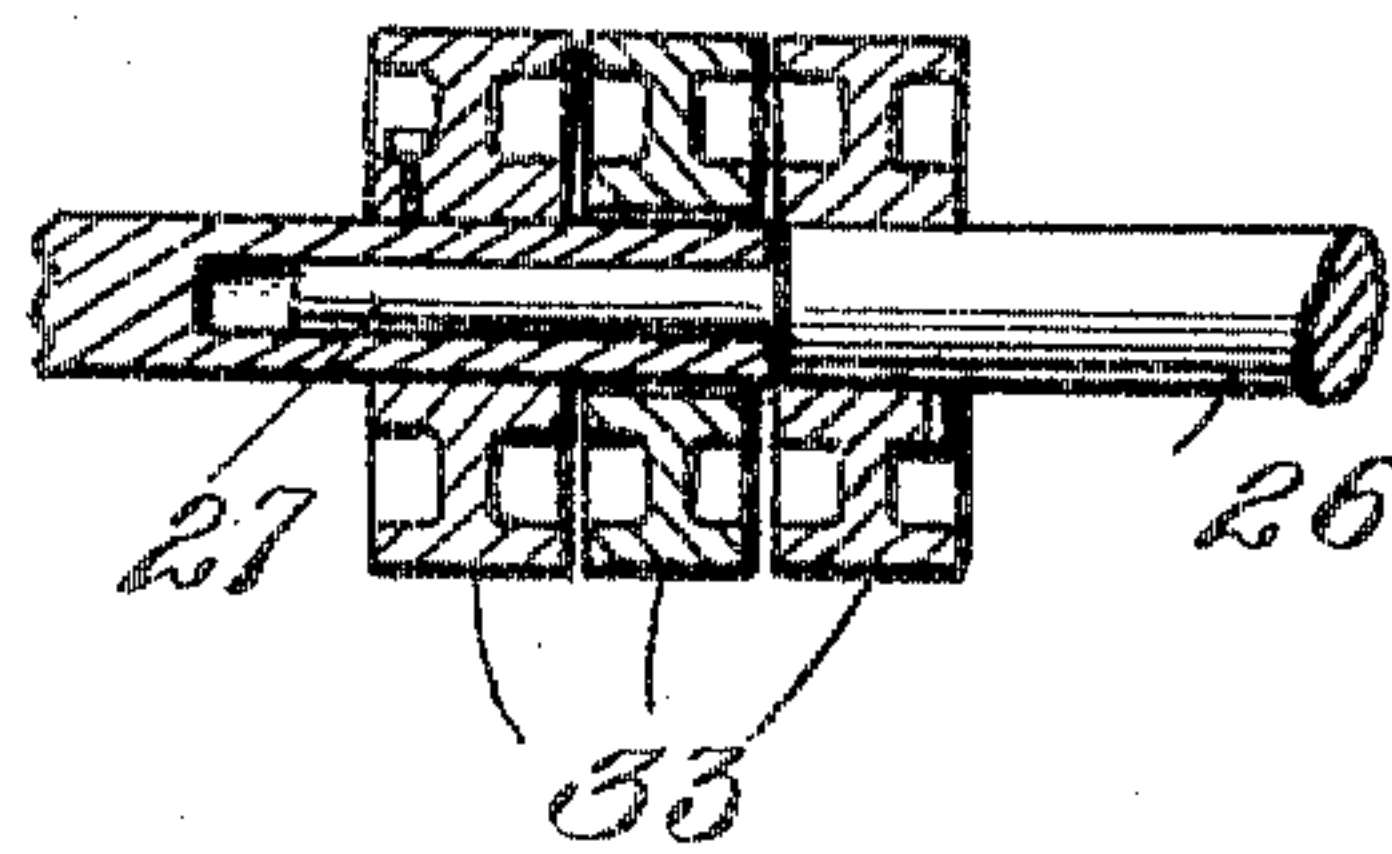
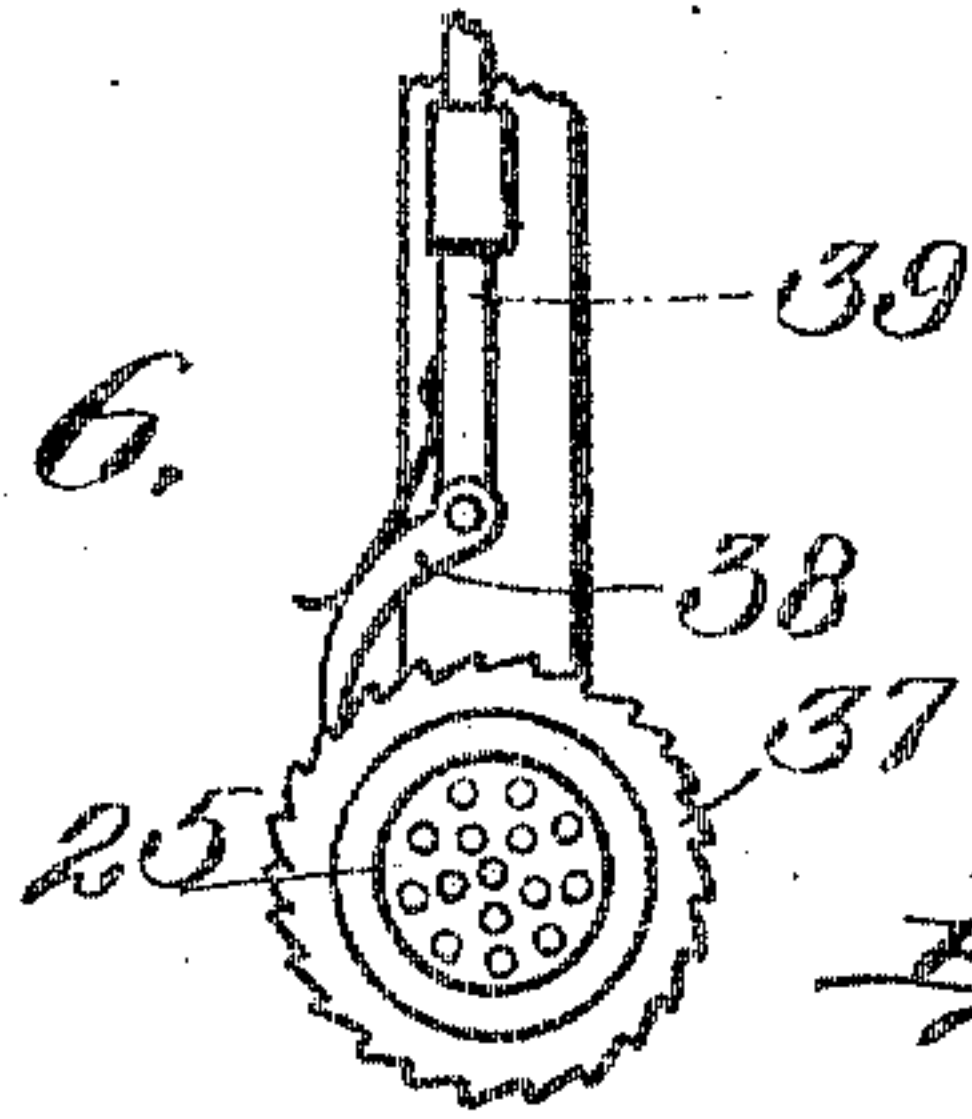


Fig. 6.



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4 SHEETS—SHEET 4.

Fig. 7.

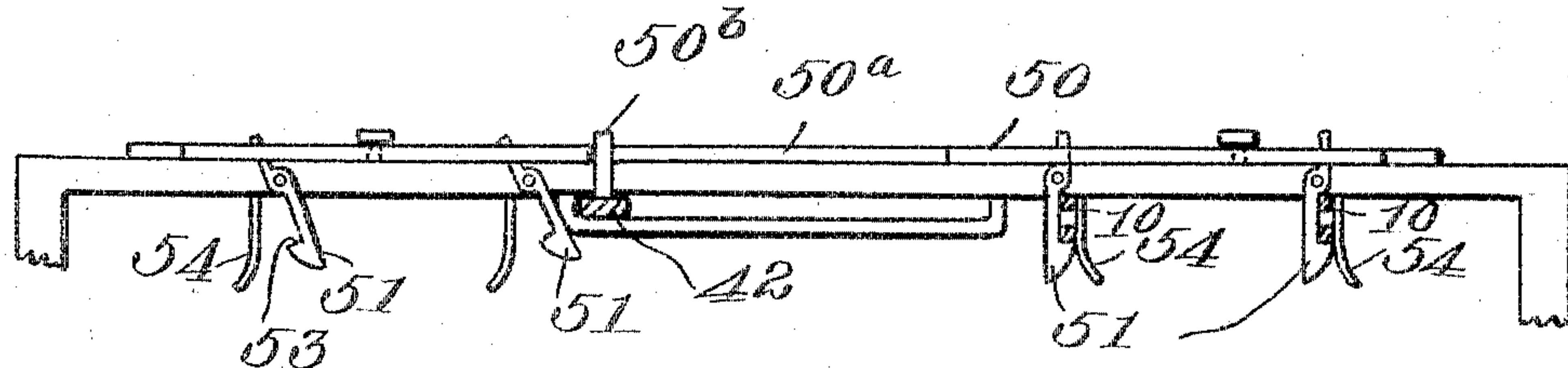


Fig. 8.

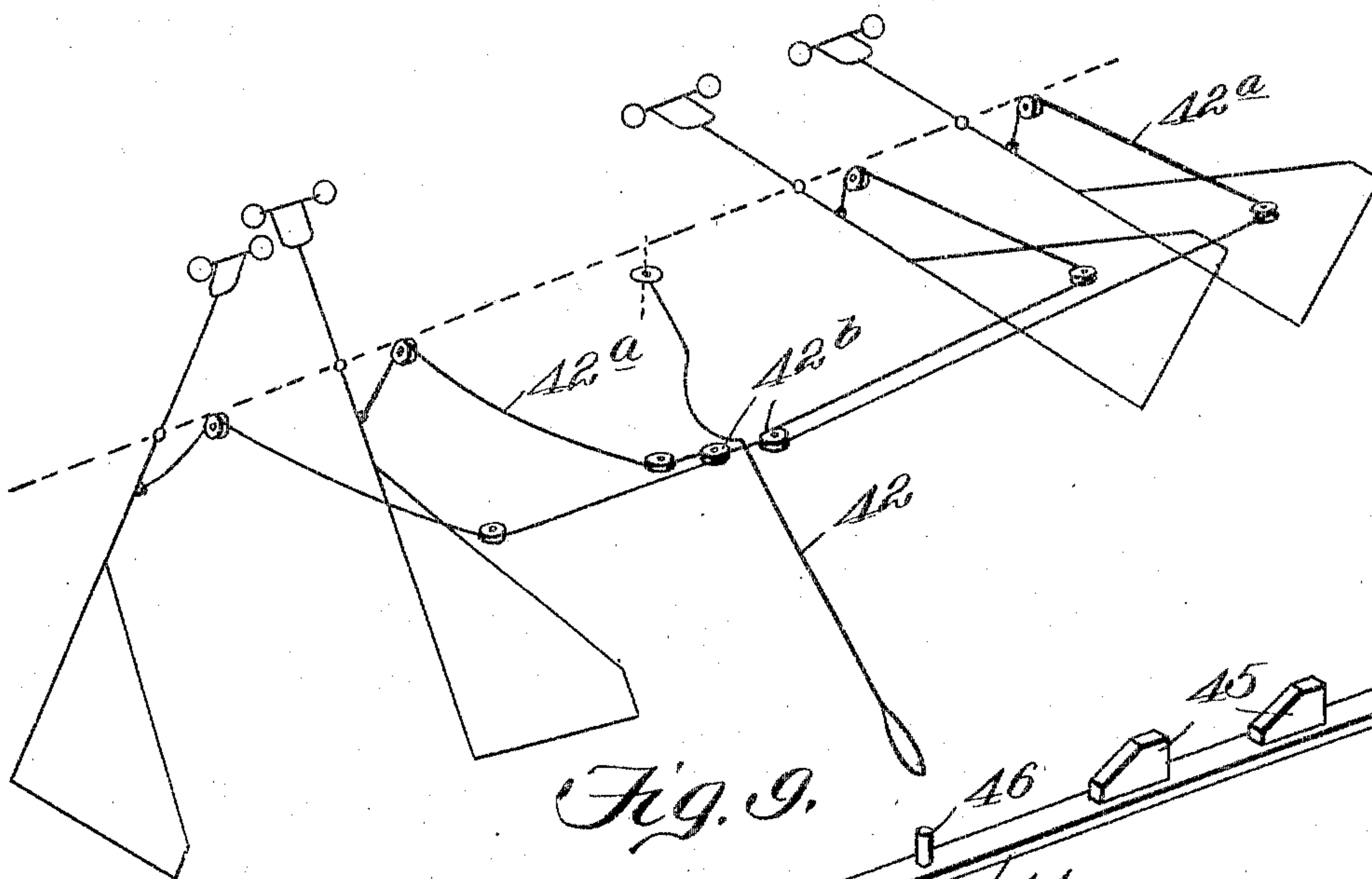


Fig. 9.

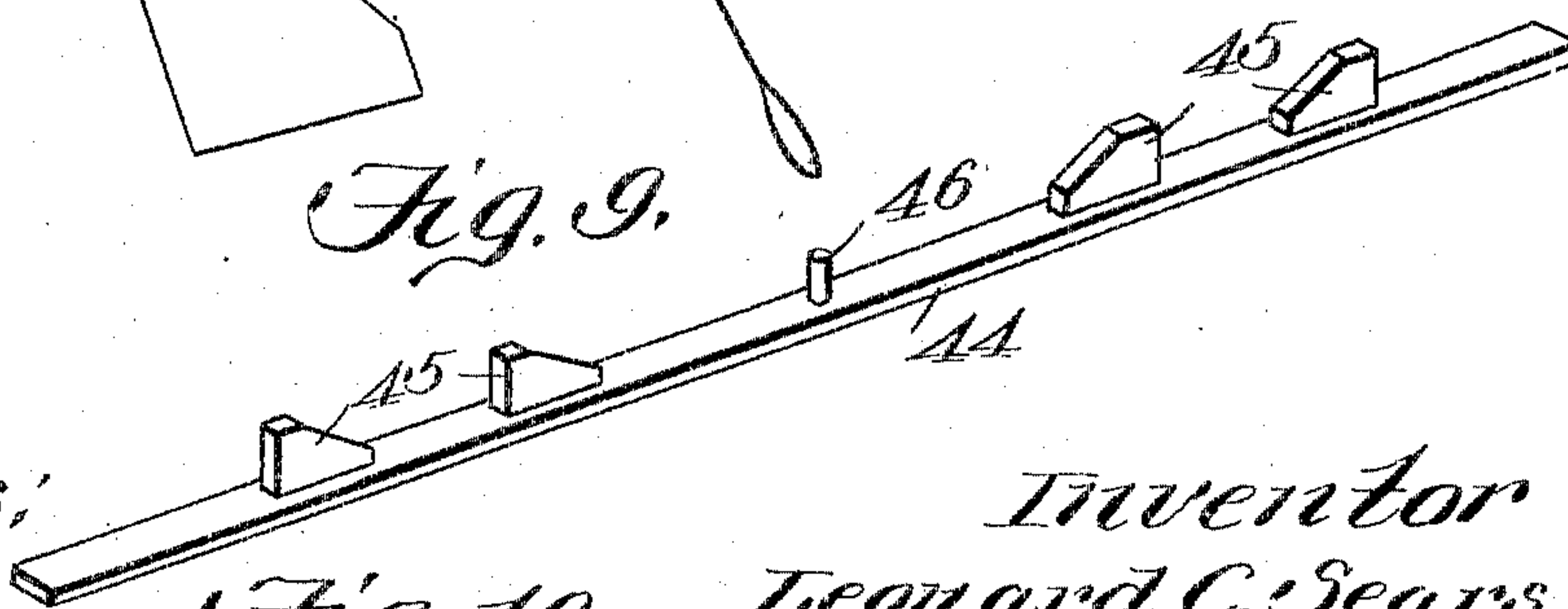
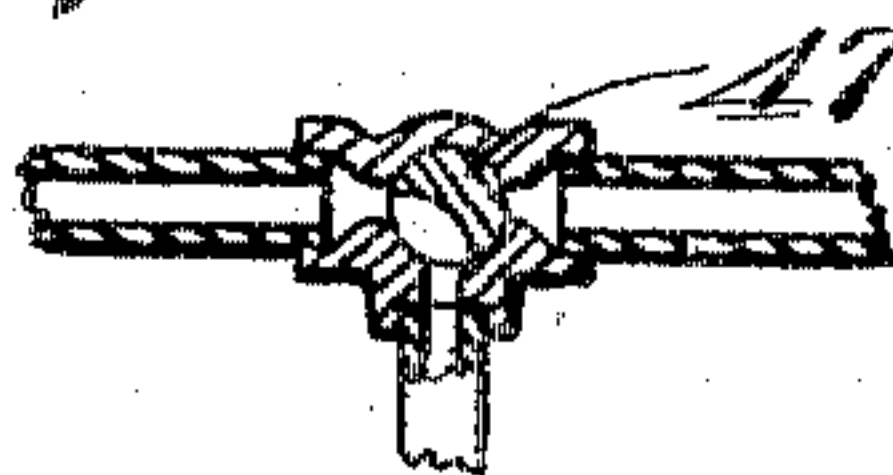


Fig. 10.



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UNITED STATES PATENT OFFICE.

LEONARD C. SEARS, OF ONAWA, IOWA.

BOTTLE-CLEANING MACHINE.

SPECIFICATION forming part of Letters Patent No. 780,236, dated January 17, 1905.

Application filed March 12, 1904. Serial No. 197,852.

To all whom it may concern:

Be it known that I, LEONARD C. SEARS, a citizen of the United States, residing at Onawa, in the county of Monona and State of Iowa, have invented new and useful Improvements in Bottle-Cleaning Machines, of which the following is a specification.

This invention relates to bottle-cleaning machines. I of course employ the term "bottle" in its broadest sense, for it will be obvious as the nature and objects of the invention are understood that the machine can be effectively utilized for cleaning other articles.

In the drawings accompanying and forming a part of this specification I have selected for illustration one simple and convenient adaptation of the invention, which will be set forth in detail in the following description; but the invention is not limited to the disclosure thus made, for many and material changes as to several features thereof may be made within the scope of my claims succeeding said description.

It is essential that for sanitary and other reasons the interiors of certain kinds of bottles—for example, those that are to contain carbonated liquors, milk, or other beverages—should be thoroughly scoured. This the machine hereinafter described does in a thorough manner, while at the same time the exteriors of the bottles are also cleaned. In the present instance I scour the bottles by causing shot, steel disks, or other suitable cleaning substances to traverse the interiors thereof, which shot, steel disks, or other cleaning substances move at a comparatively high velocity, thereby effectually removing all objectionable substances adhering to such bottles. During the scouring or shotting of the bottles I also exteriorly clean the same, which latter result can be conveniently obtained by brush mechanism. After the bottles have been thoroughly cleaned they may be brought under the action of a washer and rinser, which may be of the character disclosed by Letters Patent No. 684,112, granted to me October 8, 1901, and to which reference may be had. As previously indicated, I simultaneously scour the interiors of the bottles and scrub the exteriors thereof; but the scrubbing

and scouring means may be used separately in some cases—that is to say, I do not limit myself to their joint use in a single machine.

Referring to the accompanying drawings, Figure 1 is a plan view of a machine including my invention. Fig. 2 is a sectional end elevation of said machine. Fig. 3 is a sectional elevation of a carrier hereinafter described, the upper part thereof being removed. Fig. 4 is a detail in elevation of a brush. Fig. 5 is a sectional elevation of a portion of the driving mechanism shown in Figs. 1 and 2. Fig. 6 is a detail in elevation of the means represented in Fig. 3 for rotating the bottle. Fig. 7 is a detail in elevation of a latching mechanism and certain parts associated therewith. Fig. 8 is a diagram of the carrier and shifting means therefor. Fig. 9 is a detail in perspective of a slide, and Fig. 10 is a section of the valve portion of the rinsing means which I may employ with the machine.

Like characters refer to like parts throughout the different views.

The bottle-cleaning machine illustrated involves the use of a tank, vat, or other suitable receptacle for holding water, as 2, and which may be of any desirable shape, size, or material, said receptacle being represented as having depending legs, as 3, adapted to rest upon a suitable support. The bottom of the tank or vat 2 is illustrated as supporting the end members of a skeleton framework, (denoted in a general way by 4,) which framework sustains certain of the operative parts of the apparatus. The tank 2 is adapted to contain the water employed in conjunction with the shotting and scrubbing means hereinafter described for cleaning interiorly and exteriorly the bottles, which bottles are caused to move back and forth through the intervention of suitable mechanism in the said water.

As previously indicated, I may use with the machine a washer and rinser, and I have illustrated in the drawings such an appliance, the same being shown in Fig. 1. The cleaning-water may be supplied to the tank 2 by the overflow water from the rinser or said tank may be supplied with water in any other desirable way. I prefer, however, to use the

overflow from the rinser in case the latter is employed. I will now describe briefly the washer and rinser illustrated in said Fig. 1, which may be of the character disclosed by the Letters Patent hereinbefore mentioned.

The vertical portion of a supply-pipe (denoted in a general way by 5) extends upward along the front of the tank 2 and has a T-head overhanging the upper open side of the said tank, the branches of the T-head being provided with bottle-receiving nipples or nozzles, as 6, for supplying water to the interiors of the bottles after the same have been shotted and scrubbed. The overflow from the nipples or nozzles 6 in the present case passes into the tank 2, so as to supply the latter with the requisite amount of water, said tank having in practice an overflow-outlet at a suitable height to carry off the waste water.

I desire to state at this stage that I use the terms "tank" and "shot" in their broadest sense in order to include any equivalent devices whereby the results accomplished by the invention are obtained. It is apparent, as I have previously stated, that instead of shot, which traverse the inner surfaces of the bottles, I may employ an equivalent device for the same purpose, such as steel disks, while at the same time I can utilize means other than a tank for supplying the necessary washing-water to the interiors of the bottles.

A bottle when subjected to the shotting or scouring and scrubbing actions hereinafter described is supported by a suitable carrier, and the machine may be equipped with any desired number of the carriers. In fact, one of them may be employed, although I prefer, for obvious reasons, to employ several of said carriers. In Fig. 3 I have shown one of the carriers, and as they are all the same a detailed description of one will suffice for them all. Referring to said figure, it will be seen that the carrier (denoted in a general way by 7) includes in its makeup an elongated shank or bar, as 8. This bar 8 is sleeved between its ends for oscillatory or vibratory motion upon the fixed shaft 9, supported by the framework 4 and extending the complete length of the machine. At a point below the center of motion of the bar 8 an angular arm or bracket 10 extends, the bracket and bar being united by a suitable brace, as 11. The structure just outlined is a thoroughly strong one. The lower portions of the several carriers or hangers 7 of course traverse the water in the tank 2, and means of a suitable nature, as will be hereinafter described, are provided for mechanically oscillating the several carriers. In the present instance I simultaneously oscillate two carriers, while the other two are at rest, so that when the carriers are out of action scoured and scrubbed bottles can be removed therefrom and dirty ones inserted in their stead. When the dirty bottles are applied to the carriers, they can

be put into action, while the other carriers can be shifted into their ineffective positions to remove the cleaned bottles and carry out the procedure just outlined. Referring again to Fig. 3, it will be seen that the lower end of the bar 8 is perforated to rotatively receive the cylinder or sleeve 12, which contains, as will hereinafter appear, a shot-receptacle. To minimize the friction between the rotating cylinder 12 and the bar 8, which rotatively receives the same, I interpose between the two parts antifriction rollers or balls, as 13, the said balls fitting in an annular groove in the hub of the bar and bearing against an annular shoulder 14 upon the periphery of said cylinder or sleeve 12. The forward end of the cylinder or sleeve 12 slidably receives the tubular inward extension 15 of the collar 16, which collar receives the elastic gasket 17, which may be of rubber or the like, the said gasket abutting against an internal circular flange of the collar. The gasket 17 is shown as concaved and as perforated, the perforation opening into the concavity, so as to provide for the passage of shot and water from the cylinder or sleeve 12 into the mouth of a bottle, the top or neck of which fits in said gasket, as illustrated in Fig. 2. The butt or bottom of the bottle fits in a concaved seat in the under or rear side of the plate 18, illustrated as connected by a ball-bearing swivel-joint with the rear or lower end of the rod or stem 19, which is telescopically connected with the lower end of the arm 10, said arm terminating in a rearwardly-extending tube 20 to adjustably receive the rod or stem 19, the two parts being held in adjusted relation by the set-screw 21, so as to adapt the carrier for receiving bottles of different heights. The cylinder or sleeve 12 is surrounded by a coiled push-spring 22, one end of which bears against the annular flange 14, while the other end bears against a similar annular flange upon the tubular part 15 in order to yieldingly hold the bottle against its seat in the plate 18. The cylinder or sleeve 12 is divided interiorly into two substantially equal chambers or compartments by the perforated diaphragm or disk 23, the chamber on the right constituting a receptacle for the shot 24, which is used to scour the interior of the bottle supported by the carrier or hanger as the latter is oscillated or vibrated. The rear open end or bottom of the cylinder or sleeve 12 is provided with a perforated disk 25, suitably held in place, the perforations of which provide for the ready ingress of water to the sleeve or cylinder 12 and from thence to the bottle, and also permit the ready escape of the water from the cylinder which has dripped thereinto from the bottle when the latter is in an inverted position, as will hereinafter appear.

I have described in detail one simple and convenient form of carrier or hanger for the bottle to be cleaned in the machine. In the

organized machine two series of these hangers are illustrated, the series, as will be evident from the foregoing description, operating in alternation, although they are sustained for oscillation by the common shaft 9.

I will now describe the means illustrated for vibrating the bottle carriers or hangers.

A power-shaft is shown at 26, suitably mounted upon the framework 4, said power-shaft consisting of independently-movable sections, one section being adapted to operate one series of carriers, provided a series is present in the machine, while the other shaft-section is adapted to operate the other series of carriers. The two sections of the shaft, as shown by Fig. 5, are alined by a pin 27 on one fitting a bore in the other. The shaft 26 is shown as provided with four cranks, as 28, to which the pitmen or connecting-rods 29 are suitably jointed, said pitmen or connecting-rods extending rearward therefrom and being adapted to be detachably connected with the respective carriers, whereby the said carriers can be operated independently of their pitmen for a purpose that will hereinafter appear.

When the several rods 29 are connected with the carriers 7 and when the power-shaft or either section thereof is operated, it will be apparent that the said carriers will be oscillated, and in practice I intend to impart a comparatively rapid movement to the carriers in order to secure the best possible action. The carriers have a working stroke of about that illustrated in Fig. 2—that is to say, the two foremost carriers in said figure are represented as being at their extreme backward and forward positions, respectively, and as located at equal distances from the vertical or perpendicular. In other words, the carriers have equal movements through arcs at opposite sides of the vertical in order to assure the proper gravitation of the shot into and out of the bottles as their carriers are oscillated. When the said carriers are moved from their rearward to their forward positions on the working strokes thereof, the shot are caused to traverse with considerable velocity the interiors of the bottles, and they bear closely against the inner surfaces thereof, so as to thoroughly scour the said bottles, it being understood, of course, that the shot enters the mouth of the bottle from the shot-receptacle hereinbefore described. Water in sufficient quantity to secure proper scouring also enters the bottle by way of the sleeve or cylinder 12.

The upper ends or heads of the carriers 7 are of T form, the branches thereof having balance-weights, as 30. The rear ends of the several connecting-rods 29 are recessed or notched, as at 31, to removably receive the upper ends of said carriers. By lifting the connecting-rods the carriers can be swung forward to remove scoured and scrubbed bottles therefrom and to substitute dirty ones therefor. The connecting-rods during their

reciprocation are guided by pins or studs, as 32, rising from the top of the framework 4. I provide means, as will hereinafter appear, for simultaneously lifting two of the rods 29 and permitting the gravitation of two of them into their working positions, so that the upper ends of the cooperating carriers or hangers for the last-mentioned rods can enter the recesses or notches 31 in said rods.

It will be remembered that I have described the machine as involving two series of vibratory carriers or hangers, the same operating in alternation, and the means illustrated for obtaining such function will now be described.

It will be seen that the shaft 26 is provided with three pulleys, each denoted by 33, the intermediate pulley being an idle one, while the other two are suitably fixed to the adjacent ends of the two sections of said shaft. The outer or effective pulleys or band-wheels 33 may be operated by a belt, as 34. When the belt is on the left pulley 33, the two carriers at the left will be operated, while if the belt be shifted to the effective pulley at the right the two carriers at the right will be operated, and both series will be thrown out of action by shifting the belt to the intermediate or idle pulley 33. The belt-shifting means will be hereinafter described.

In the form of the machine represented the bottles while being internally scoured or shot-ted are at the same time externally cleaned, and brushes are illustrated for securing this result. As the brushing means is the same for each bottle, I will describe but one of them.

The numeral 35 denotes a block suitably fastened within the tank or vat 2—as, for example, by being attached to the cross-bar 35' of the framework. This block 35 is recessed on its upper side to receive the bodies of the brushes 36, two of the latter being shown and as angularly disposed to each other under the level of the water in the tank 2. These brushes are intended to scrub the outer surfaces of the bottles, and so that the complete outer surfaces of the bottles can be brought under the action of the respective brushes said bottles while they are being shot-ted or interiorly scoured are rotated, and the means shown for accomplishing such function will now be set forth.

It will be seen that the cylinder or sleeve 12 is provided peripherally and near what is shown as its rear end with a ratchet 37, with which the spring-controlled pawl 38 cooperates, the pawl being adapted to rotate the ratchet 37, and thereby the bottle supported by the carrier, through the intermediate parts step by step on the strokes of the carrier. The pawl 38 is pivotally connected to the forward end of the rod 39, supported by suitable guides for reciprocation upon the carriers 7. The shaft 9, it will be remembered, is fixed and is provided with a series of forward projections or lugs, as 40, one cooperative with

each rod 39. On the forward stroke of the carrier 7 the reciprocatory rod 39, carried thereby, will abut at its upper end against the cooperating projection or lug 40, so as to secure, through the action of the pawl 38, a movement of the ratchet 37 a distance equaling one or more teeth, whereby the bottle will be turned a corresponding distance. The bottle on its forward-and-backward strokes moves against the bristles of the brushes 36, so as to clean the outer surface thereof, the bottle being turned while against the brushes, so that its entire outer surface is brought under the action of the brush device, this being particularly advantageous with square-shouldered bottles in order to effectually clean the same. In practice I set the brushes sufficiently far forward that only the bottles pass in contact therewith. In other words, the several ratchets do not come in contact with said brushes. The pawl is advanced by the abutment of its rod 39 against a projection or lug 40 in opposition to a spring, as 41, said spring being suitably supported and being of the coiled type and arranged to exert its force against the said rod. The spring of course imparts what might be considered a retractive movement to the rod 39, and thereby permits the pawl to drop behind a tooth following that or those which it had just operated.

Suitably fulcrumed upon and guided by means on the framework 4 is a hand-lever 42, the handle of which is in convenient reach of an attendant for the machine. This hand-lever performs five offices—namely, the shifting of the belt 34, the operation of means controlling the connecting-rods 29, the operation of the carriers 7, the operation of means for effecting the movement of a valve controlling the water through the branches of the T-head of the supply-pipe 5, and the operation of carrier-latches hereinafter described. Said hand-lever 42 is provided at a suitable point in its length with a forked extension 43, between the branches of the fork of which the inner run of the belt 34 works, the said hand-lever having a movement sufficient to shift the belt from one extreme pulley 33 to the other, and vice versa. Suitably guided upon the top of the framework 4 is an elongated bar 44, having wedges, as 45, shown as four in number—that is to say, there is one wedge for each connecting-rod 29. The sliding bar 44 is provided at or near its middle on the upper side thereof with a pin 46 to enter an elongated slot in the hand-lever 42 near the pivot end thereof.

When the hand-lever 42 is swung to the right by an attendant, the bar 44 will be correspondingly moved, so as to carry the two wedges 45 at the left under the connecting-rods 29 to lift the latter out of engagement with the bottle-carriers 7, while at the same time the two wedges 45 on the right are moved from under their

connecting-rods 29, so that the latter rods can drop into their power-transferring positions. While the hand-lever 42 was being moved toward the right, the belt 34 was being shifted from the pulley 33 at the left to the pulley 33 on the right, so as to reciprocate the two connecting-rods 29 at the right and at the same time to stop the two connecting-rods on the left. The supply-pipe 5 at a suitable point is provided with a valve, as 47, of some suitable type, the stem of which is provided with a bifurcated arm 49, adapted to be operated by the pendant pin 49' of the lever 42. The valve 47 is of such construction as to permit when actuated by said hand-lever alternately the flow of water through the two branches of the said supply-pipe, which branches, as will be remembered, are provided with the nipples or nozzles 6.

When two of the carriers 7 are separated from the cooperative connecting-rods 29, the former of course are out of action and can be shifted forward directly by hand or through the primary agency of the hand-lever 42 to bring the bottles to an inverted position for permitting first the gravitation of the water from the interior of the bottles and from the cylinder 12 into the tank 2 and then the removal of the scoured and scrubbed bottles, following which latter procedure two dirty bottles will be applied to the two carriers. The hand-lever 42 serves to operate the carriers 7 into a position to permit the water to gravitate from the bottles temporarily supported by said carriers, the removal of the empty clean bottles, and the substitution therefor of dirty bottles, and I will now set forth the connection shown between said hand-lever and two of the carriers, which is a duplicate of the other connection.

The bight of a rope 42^a, having branches of substantially equal length, passes around an antifriction-roller 42^b, carried by said lever, said branches being connected at their ends to the carriers 7 below the center of motion thereof and passing in contact with suitable guide-pulleys on the framework of the machine. Let it be assumed that the lever 42 is being moved from the extreme left toward the right. Initially the slide 44 is operated by said hand-lever to effect the elevation, as hereinbefore set forth, of the two connecting-rods 29 on the left out of working relation with their companion bottle-carriers 7. Following immediately this last-mentioned action and before the lever reaches the center of its stroke it pulls the branches of the rope 42^a forward, thereby simultaneously moving the two released carriers in a corresponding direction and into position to be latched, as will hereinafter appear. On the return of the hand-lever the reverse action occurs. When two of the carriers are thrown out of action and shifted forward, as just stated, to permit

the gravitation of the water from the bottles supported thereby, they are latched in such position, as will now be set forth.

Upon the upper forward side of the framework 4 the slide 50 is mounted, said slide being operable by the hand-lever 42, four of the offices of which have been hereinbefore described—namely, the movement of the belt 34, the shifting of the slide 44, the shifting of the carriers 7, and the operation of the valve 47. The fifth office of the said hand-lever is the operation of the slide which controls the latching mechanism illustrated and now to be described.

A series of latches 51 is illustrated, four being shown, and as pivoted between their ends to the upper forward side of the framework adjacent the slide 50, the upper arms of the latches extending through longitudinal slots 52 in said slide, while the lower branches thereof are shouldered, as at 53. Coöperative with each latch is a spring guide-finger, (denoted by 54.) The several latches 51 have a preponderation of weight below their axes, so that they will automatically assume a vertical position with their shouldered portions in contact with, or substantially in contact with, the respective guide-fingers 54. When the slide 50 is at the extreme left, the inner end walls of the two left slots 52 therein will be in contact with the upper branches of the two latches 51 at the left in order to hold said latches in an inclined position with the shouldered portions thereof out of contact with the coöperating guide-fingers 54, while both end walls of the slots at the right will be out of contact with the upper branches of the two latches at the left in order that said two latter latches will be maintained in a vertical position. When the slide 50 is moved toward the right by the manipulation of the hand-lever 42, the inner end walls of the two slots at the left in the bar will be moved away from the coöperating latches, so that the latter can assume a vertical position in order to bring their shouldered portions under two carriers which had been shifted forward, as hereinbefore set forth, while the inner end walls of the two slots at the right will be moved in contact with the upper portions of the two latches at the right, thereby moving said latter two latches into angular position and carrying their shouldered portions away from the guide-fingers 54, so that should two carriers have been upheld by said two last-mentioned latches they will be thereby released.

In the forward edge of the slide 50 is an elongated aperture 50^a, the end walls of which are adapted to be alternately engaged by the depending pin 50^b of the hand-lever 42. The aperture is quite long, so as to permit of a considerable motion of said lever without actuating the slide 50. When said lever is at the extreme left, the pendent pin will be against the corresponding wall of the aperture 50^a.

As said lever moves toward the right the pin moves away from the left wall and toward the right wall of the aperture, striking the latter when said lever has practically made a full stroke, thereby on the continued movement of the lever shifting said slide toward the right to cause the latches on the right to assume their carrier-releasing positions and those on the left to assume their carrier-holding positions.

The operation of the hereinbefore-described machine is as follows: Two bottles being supported by the two carriers 7 at the left, the belt 34 being on the left effective pulley 33 and the slide 44 being at its extreme left position, the two rods 29 at the left will be coupled to said two carriers 7, so that the section of the shaft 26 at the left will be operated in order to reciprocate said rods 29 and correspondingly oscillate said carriers 7 to effect the scouring and scrubbing of the bottles supported thereby. During the time the two carriers on the left are being operated under the primary action of the belt 34 the two carriers at the right are upheld by the latches 51, so as to apply two dirty bottles to said last-mentioned carriers. When the dirty bottles are applied to the two carriers on the right, the latter are released, so as to be let down into the tank 2 by swinging the lever 42 to the right. When said lever is thus moved, it also shifts the belt 34 from the extreme left pulley 33 to the extreme right pulley 33 in order to operate the two rods 29 on the right, whereby when the upper ends of the said two right carriers enter the notches 31 in the coöperating rods said right carriers will be vibrated. It will be understood, of course, that on the initial movement of the lever 42 to the right the two wedges 45 on the right of the sliding bar 44 are moved from under the coöperating rods 29, so that said rods can drop into their operative positions. As the hand-lever moves to the right to secure the functions just set forth the slide 50 is carried in a corresponding direction through the agency of said hand-lever, thereby operating the two latches at the right so that they will release the coöperating carriers to permit the latter, with the dirty bottles supported thereby, to enter the water contained within the tank 2. During the motion of the slide-bar 44 to the right the two left wedges 45 will be carried under the coöperating rods 29 to elevate the latter, thereby disconnecting the said two rods at the left from the coacting carriers to permit the upward swinging of the same on the continued movement of the hand-lever 42 in the manner hereinbefore described. When the two last-mentioned carriers are swung upward under the action of said hand-lever, they are engaged by the latches 54, so as to hold the bottles in an inverted position for the reason hereinbefore set forth. The two scoured

and scrubbed bottles are then removed from their carriers and placed over the two nipples 6 on the left, so as to effect the washing of the interiors of said bottles. As the lever 42 swings to the right in the manner described the valve 47 is operated as hereinbefore set forth to effect the flow of water to the right branch of the T-headed supply-pipe 5. When the two bottles on the right have been scoured and scrubbed, the foregoing operation will be reversed, so that the action of the machine is a continuous one.

In the foregoing description I have used the expressions "right" and "left" simply for convenience, and in using these terms I mean those parts to the right or left of the machine, as the case may be, viewing the same from the front.

While I have hereinbefore described the machine as being operated by mechanical power, it is apparent that it can be operated by hand or foot power.

Having thus described the invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a machine of the class described, an oscillatory carrier provided with a seat for a bottle-bottom and with a sleeve, the sleeve having means to receive the mouth of said bottle and a shot-receptacle having an open forward end arranged to communicate with the bottle, means for rotating the sleeve and thereby the bottle, and brushing means supported independently of the carrier for scrubbing the outer surface of said bottle during the back-and-forth motion of the carrier.

2. In a machine of the class described, an oscillatory carrier provided with a seat for a bottle-bottom and with a sleeve, the sleeve having means to receive the mouth of said bottle and a shot-receptacle having an open forward end arranged to communicate with the bottle, means for rotating the sleeve and thereby the bottle, and two brushes disposed angularly to each other for engaging the exterior surface of the bottle during the back-and-forth motion of the carrier.

3. In a machine of the class described, an oscillatory carrier provided with an arm terminating in a tube, a stem adjustably fitted in said tube, a seat, for the bottom of a bottle, rotatively connected with said stem, a sleeve rotatively supported by the body of the carrier, having means for receiving the mouth of the bottle and a shot-receptacle having an open forward end to communicate with the interior of the bottle, means for rotating the sleeve, and brushing means supported independently of the carrier and serving to scrub the external surface of the bottle on the back-and-forth motion of the carrier.

4. In a machine of the class described, an oscillatory carrier, a sleeve supported by said carrier and provided internally with a perfo-

rated diaphragm to divide the interior of the sleeve into two chambers or compartments, the forward one being adapted for the reception of shot, a perforated disk provided at the rear portion of the sleeve, means at the forward end of the sleeve for receiving a bottle-mouth, and means connected with the carrier for receiving the bottom of the bottle.

5. In a machine of the class described, an oscillatory carrier, a rotative sleeve supported by said carrier and provided internally with a perforated diaphragm to divide the interior of the sleeve into two chambers or compartments, the forward one being adapted for the reception of shot, a perforated disk provided at the rear portion of the sleeve, means at the forward end of the sleeve for receiving a bottle-mouth, means connected with the carrier for receiving the bottom of the bottle, means for positively rotating the sleeve, and thereby the bottle associated therewith, during the oscillation of the carrier, and means for externally scrubbing the bottle during its rotation.

6. In a machine of the class described, an oscillatory carrier having a seat for receiving the bottom of a bottle, a sleeve carried by the body of the carrier and provided internally between its ends with a perforated diaphragm, the forward end of the sleeve being open and the rear end thereof being provided with a perforated disk, and a yielding-mounted collar upon the forward end of said sleeve, provided at its front with a gasket to receive the bottle-mouth.

7. In a machine of the class described, a plurality of carriers, each provided with means for holding a bottle and with a shot-receptacle arranged to permit the movement of the shot into and out of the bottle by the movement of the carrier, and mechanism for positively operating the carriers in opposition to each other.

8. In a machine of the class described, a movably-mounted carrier having bottle-holding means provided with a shot-receptacle arranged to permit the movement of the shot into and out of the bottle by the movement of the carrier, a ratchet connected with the bottle-holding means, a pawl coöperative with the ratchet, mechanism operable on the movement of the carrier to actuate the pawl, whereby the latter will turn the ratchet and thereby the bottle-holding means, and a brush device adapted to engage the outer surface of the bottle on the movement of the carrier.

9. In a machine of the class described, a shaft, a plurality of oscillatory bottle-carriers loosely supported between their ends by said shaft and having a means for carrying shot and for positively holding bottles, said shot-carrying means being arranged to permit the movement of the shot into and out of the bottle by the movement of said carriers, and power-

transmitting members detachably connected with the upper branches of the respective carriers.

10. In a machine of the class described, an oscillatory carrier for a bottle, having means for carrying shot, said shot-carrying means being arranged to permit the movement of the shot into and out of the bottles by the movement of said carrier, a power-shaft having a crank, and a rod connected with the said crank and having a notch to receive the carrier.

11. In a machine of the class described, an oscillatory carrier having a bottle-holder, means for positively operating said bottle-carrier, the latter having a shot-receptacle arranged to permit the movement of the shot into and out of the bottle by the movement of the carrier, a ratchet connected with the bottle-holding means, a reciprocatory spring-actuated rod provided with a pawl for actuating said ratchet, a fixed part adapted to engage the rod and operate same in opposition to its spring, and a brush device.

12. In a machine of the class described, an oscillatory carrier for a bottle, including a bar and an arm connected to and extending from said bar, the arm terminating in a sleeve, a spindle adjustably supported by said sleeve, a seat for the bottom of the bottle having a ball-bearing connection with said spindle, a rotative sleeve supported on the outer end of the bar by a ball-bearing, said sleeve having internally between its ends a perforated diaphragm and at its outer end a perforated disk, a collar slidable on the forward end of the sleeve, provided in its forward end with an annular gasket to receive the mouth of said bottle, a coiled spring surrounding the sleeve, the forward end thereof bearing against said collar and the sleeve having an annular shoulder to be engaged by the rear end of the spring, means for positively rotating the sleeve, and thereby the bottle associated therewith, during the motion of the carrier, and means for externally scrubbing the bottle during its rotation.

13. In a machine of the class described, an oscillatory carrier for a bottle, including a bar and an arm connected to and extending from said bar, a cylinder supported by the bar and having perforated disks, one at one end thereof and the other interiorly thereof, a spring-controlled collar having a tubular extension slidably fitted on the forward end of said cylinder, a gasket to receive the upper end of the bottle, fitted in said collar, and a seat for the lower end of the bottle telescopically connected with said arm.

14. In a machine of the class described, a plurality of independently-oscillatory bottle-carriers having means for carrying shot, said shot-carrying means being arranged to permit the movement of the shot into and out of the bottles by the movement of the carriers, a

crank-shaft in two sections, a pulley fixed to each shaft-section, a loose pulley between the other pulleys, pitmen connected with the respective cranks and detachably connected with the respective carriers, and mechanism for simultaneously moving the pitmen in opposite directions to throw them into working relation respectively with their cooperating carriers and for also shifting a belt operating in conjunction with said pulleys.

15. In a machine of the class described, a plurality of independently-oscillatory bottle-carriers having means for carrying shot, said shot-carrying means being arranged to permit the movement of the shot into and out of the bottles by the movement of the carriers, a crank-shaft in two sections, a pulley fixed to each shaft-section, a loose pulley between the other pulleys, pitmen connected with the respective cranks and detachably connected with the respective carriers, and a sliding bar having wedges to engage the pitmen, the bar, when moved in one direction, serving to move some of the pitmen out of working relation with their cooperating carriers and to permit the movement of the remaining pitmen into working relation with their carriers.

16. In a machine of the class described, a plurality of bottle-carriers having means for carrying shot, said shot-carrying means being arranged to permit the movement of the shot into and out of the bottles by the movement of the carriers, a shaft in two sections, a pulley fixed to each shaft-section, an idle pulley between the other pulleys and carried by one of the shaft-sections, and power-transferring means between the shaft-sections and the respective carriers.

17. In a machine of the class described, a plurality of independently-oscillatory bottle-carriers having means for positively holding the bottles and for carrying shot, said shot-carrying means being arranged to permit the movement of the shot into and out of the bottles by the movement of the carriers, mechanism for alternately positively operating independent series of the carriers, and means for positively holding those carriers which are at rest in an elevated position.

18. In a machine of the class described, a plurality of independently-oscillatory bottle-carriers having means for positively carrying bottles and shot, said shot-carrying means being arranged to permit the movement of the shot into and out of the bottles by the movement of the carriers, a shaft in two sections, a pulley fixed to each shaft-section, a pulley between the other pulleys and loosely carried by one of the shaft-sections, pitmen connected to the respective shaft-sections and arranged for detachable connection with the carriers, a slidable bar having wedges adapted to effect the movement of the pitmen in opposite directions, and a lever having belt-

shifting means and connected with said sliding bar.

19. In a machine of the class described, a plurality of independently-oscillatory bottle-carriers, each provided with means for positively holding a bottle and with a shot-receptacle arranged to permit the movement of the shot into and out of the bottle by the movement of said carriers, and mechanism

for positively operating the carriers in alternation. 10

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

LEONARD C. SEARS.

Witnesses:

F. J. MARSHALL,

C. G. HILDRETH.