

No. 705,877.

Patented July 29, 1902.

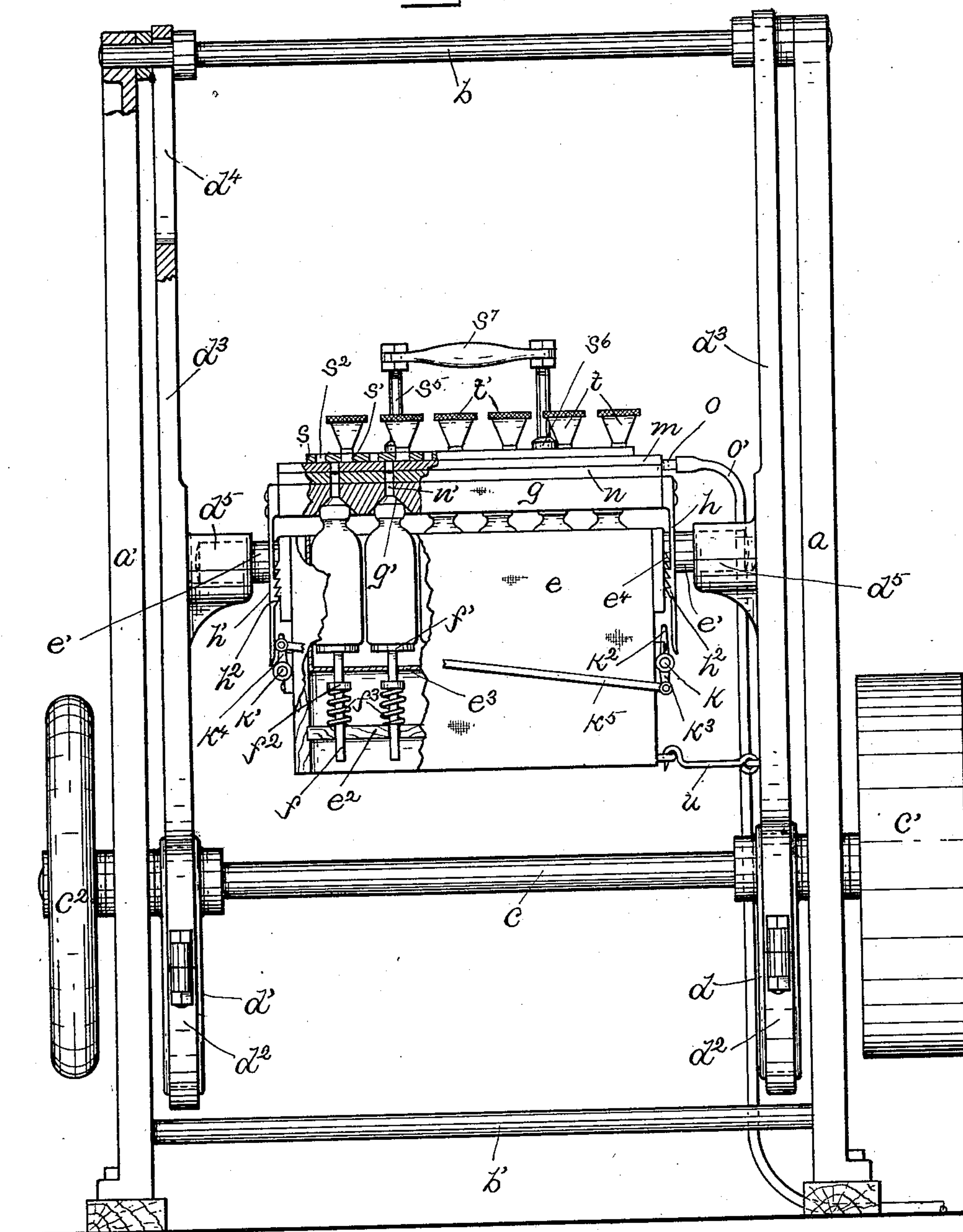
M. P. SHEA.
BOTTLE WASHING MACHINE.

(Application filed Oct. 17, 1901.)

(No Model.)

4 Sheets—Sheet 1.

Fig. 1.



WITNESSES

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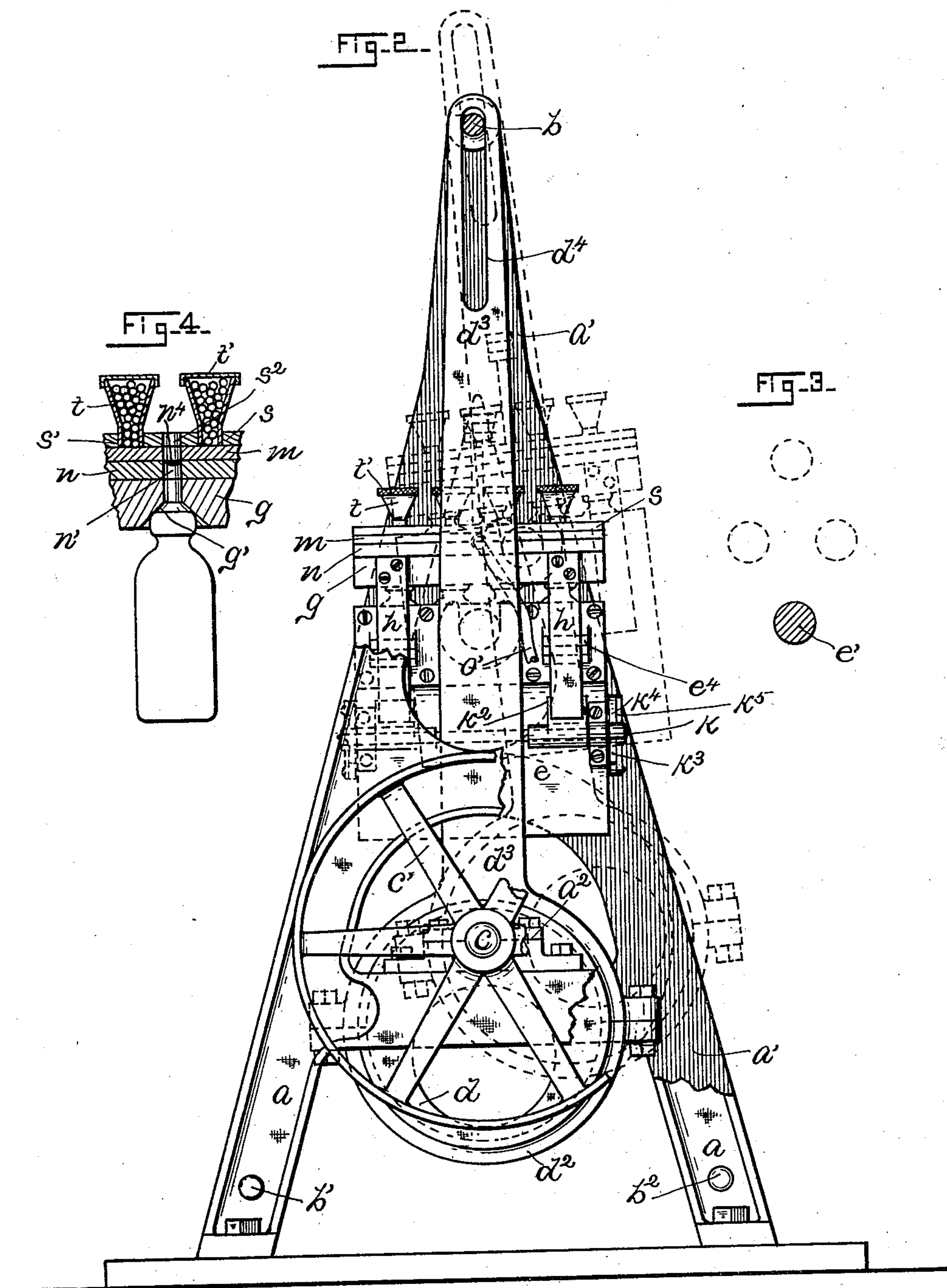
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4 Sheets—Sheet 2.



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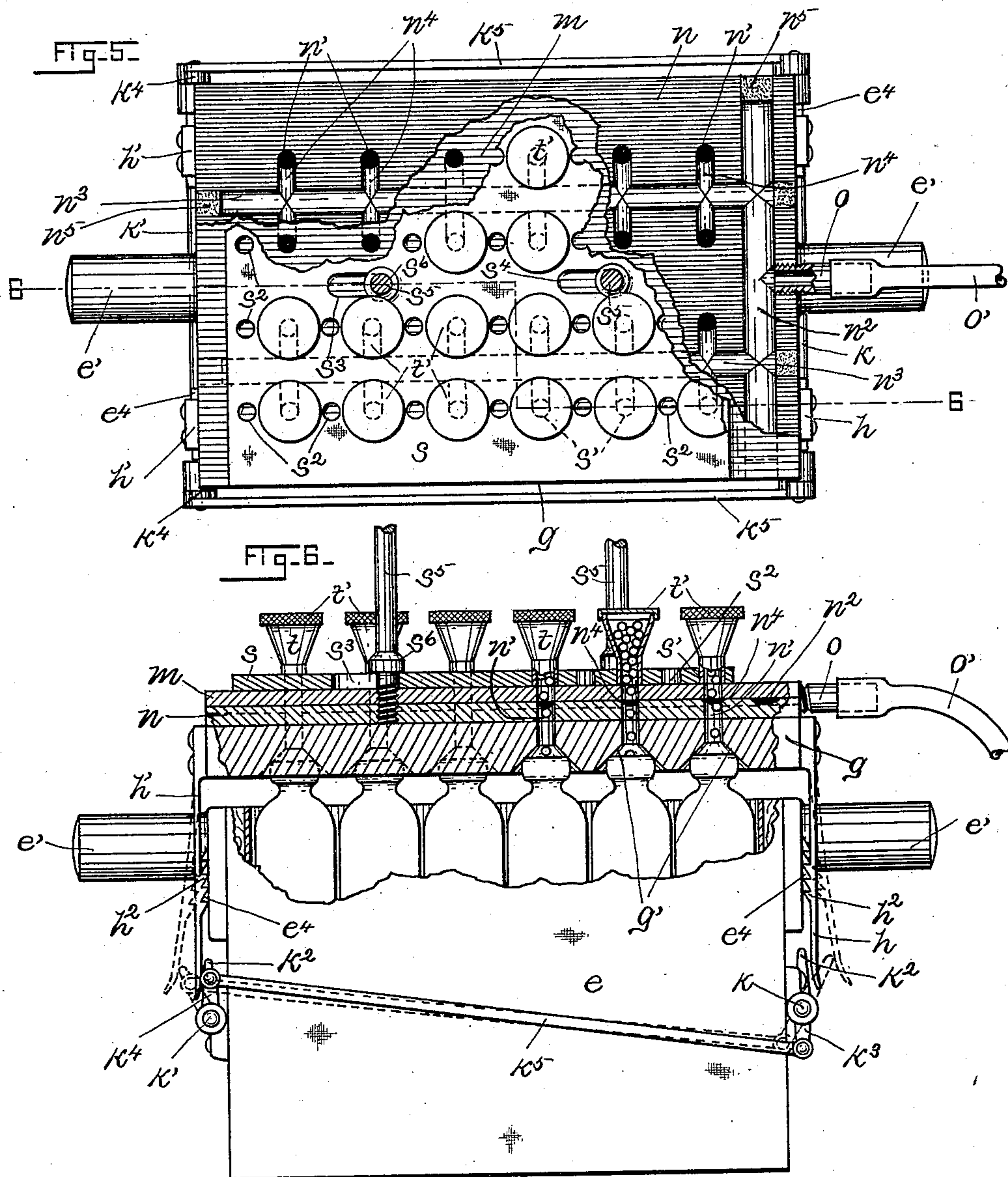
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4 Sheets—Sheet 3.



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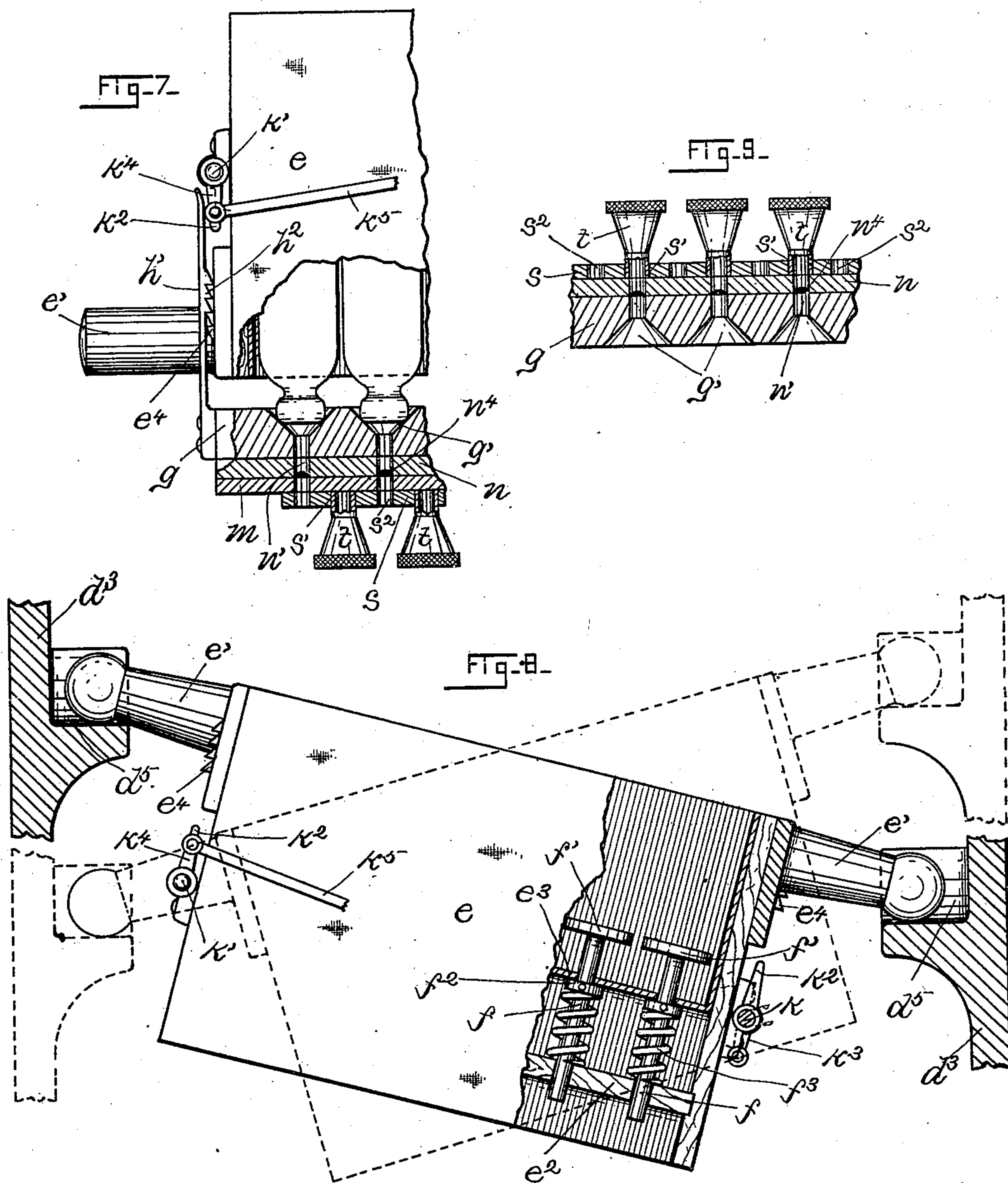
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4 Sheets—Sheet 4.



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MICHAEL P. SHEA, OF NEW LONDON, CONNECTICUT.

BOTTLE-WASHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 705,877, dated July 29, 1902.

Application filed October 17, 1901. Serial No. 78,998. (No model.)

To all whom it may concern:

Be it known that I, MICHAEL P. SHEA, a citizen of the United States, residing at New London, in the county of New London, State of Connecticut, have invented certain new and useful Improvements in Bottle-Washing Machines, of which the following is a full, clear, and exact description.

This invention has for its object the provision of a machine, largely automatic in its operations, for washing a considerable number of bottles simultaneously and more thoroughly than ordinarily accomplished by hand, the said machine doing away with much of the usual handling of the bottles and economizing time, because of the fact that a number of bottles are washed at once.

A machine embodying the qualities just mentioned is especially useful to bottlers of many kinds of beer, "soft" drinks, and the like, in which the emptied bottles are returned to the bottler for refilling; but before being refilled they must be cleansed, which cleansing operation when performed by hand is necessarily slow and often not thoroughly performed.

Briefly describing my newly-invented bottle-washing machine, a box or case is provided of suitable shape and size to readily receive and support a given number of bottles, such bottles being held in close proximity to but in no way binding upon each other. The said bottles, instead of resting upon the bottom of the box, are received, respectively, upon spring-controlled seats, which seats when the peculiarly-constructed cover of the box is placed in position serve to hold the bottles in such close contact with said cover that the displacement of the bottles is practically impossible. The placing of the cover in position also serves to center each bottle in position to receive at proper times a supply of water and shot through passages in the said cover, as hereinafter fully explained. Mechanism (also fully explained hereinafter) is embodied in the machine which serves to impart motion to the said box of such rapidity and nature that the water and shot are so agitated within the bottles that the thorough cleansing of the latter is quickly effected.

To assist in the explanation of my inven-

tion, I have provided the accompanying four sheets of drawings, which serve to illustrate the same, as follows:

Figure 1 is a front elevation of my newly-invented bottle-washing machine. Fig. 2 is an end elevation of my machine as seen from the right hand of Fig. 1, much of the nearer end frame and of the driving-pulley being broken away to better disclose the construction of the said machine. Fig. 3 is a view serving to illustrate the nature of the movement of the bottle-carrying box or case above mentioned. Fig. 4 is a sectional view of a portion of the box-cover, also above mentioned, showing the same in connection with a bottle. Fig. 5 is a plan view of the said cover broken away in part to expose the interior construction thereof. Fig. 6 is a side elevation of the said box, the same being broken away in part to expose the bottles therein and having its cover in position, the latter being in section taken on the line 6 6 of Fig. 5. Fig. 7 shows a portion of the said box and cover inverted to accomplish the draining of the bottles, as hereinafter described. Fig. 8 illustrates the manner in which a modification in the movement of the box is attained. Fig. 9 shows in section a modification in the construction of the said box-cover.

Referring to the drawings, the letters $a a'$ denote the end frames of my machine, and $b b' b^2$ tie-rods, which serve to secure the same together. The end frames $a a'$ are each provided with suitable bearings a^2 for the support of the main shaft of the machine, which latter is denoted by the letter c . The shaft c bears at one end adjacent the outer face of the frame a a driving-pulley c' , and at its opposite end adjacent the outer face of frame a' the said shaft bears a balance-wheel c^2 . The shaft c has also mounted thereon two eccentrics $d d'$, located, respectively, adjacent the inner confronting faces of the frames $a a'$. The eccentric-straps d^2 are each provided with upwardly-extending arms d^3 , whose upper ends are slotted, as at d^4 , to straddle the tie-rod b , the slots d^4 being of suitable length to permit the arms d^3 to travel upon the said rod b when actuated by the eccentrics $d d'$. Approximately midway their height the arms d^3 have formed upon their

confronting sides suitable bearings d^5 , which serve to support the bottle-carrying box, as more fully described hereinafter.

When the shaft c is in motion, the eccentrics d d' , through the arms d^3 , serve to cause the box carried by the said arms to travel with a combined vertically-reciprocating and sidewise movement, thereby agitating the water and shot within the said bottles for the purpose explained.

The box which receives the bottles is denoted as a whole by the reference-letter e and has projecting from its opposite ends near its upper portion trunnions e' , which are adapted to be received in the bearings d^5 of the arms d^3 , and thus serve to support the said box in the machine.

As already stated, the box e is of such size and shape as to receive without crowding a certain number of bottles of a given style, the box in the drawings being of the proper size to receive two dozen of such bottles. The box e may be constructed of any suitable material, either wood or metal; but in the drawings the same is illustrated as constructed of wood.

Reference has also been made to the fact that the bottles when received in the box e rest upon spring-actuated seats, which latter are provided in the following manner: The box-bottom e^2 and a plate e^3 , located somewhat above the said bottom, are drilled to provide bearings for rods f , which I term "seat-posts," the latter corresponding in number with the number of bottles the box is designed to hold and being so located as to be in alinement, respectively, with the central line of the bottles when the latter are in position to be washed. Each post f bears at its upper end a disk f' for the reception of a bottle and also bears beneath the plate e^3 a collar f^2 , between which and the box-bottom e^2 there is confined a spiral spring f^3 , the latter encircling the seat-post. The springs f^3 seek ever by expansion to force their respective seat-posts f into their upper position, which is determined by the location of the collars f^2 on the posts, the upward travel of the latter being limited by the engagement of the said collars with the under side of the plate e^3 . When, however, the bottles are forced downward, as hereinafter explained, the springs f^3 yield to allow their respective seat-posts f to travel downward correspondingly.

The cover of the box e is denoted by the reference-letter g and is preferably constructed of hard rubber or the like material, and the face of the said cover that confronts the box is provided with conical or concave recesses g' , so disposed that their centers are in direct opposition to the described disks f' . Means are provided for removably securing the cover g to the box, which means consist in locating at each end of the said cover metallic strips or spring-tongues, of which those at one end of the cover are denoted by the

letter h and those at the opposite end by the letter h' . The spring strips or tongues h h' are provided on their faces confronting the box e with teeth h^2 , similar to ratchet-teeth, which latter are adapted to engage and interlock with similar teeth e^4 , provided on the box ends or, as shown in the drawings, on a plate from which the trunnions e' project.

After the box e has been filled with the bottles to be washed the cover g is placed over the same, the mouth or open end of each bottle entering one of the cone-shaped recesses g' . The cover g is forced downward upon the bottles, their respective spring-seats yielding during such operation in order that the springs f^3 shall cause the said bottles to closely engage the recesses g' and so as to retain them in such engagement. Meanwhile the teeth of the spring-tongues h h' have locked into the teeth e^4 on the box ends, so that upon removing the pressure upon the cover g the latter is retained in close contact with the bottles by means of the locking-tongues h h' . The recesses g' being perfectly conical serve to center each bottle as the cover is forced into position, and, as already explained, the cover g , engaging the bottles with a considerable degree of frictional force, serves to clamp the bottles in proper position, and thus prevent any liability of their becoming displaced during the operation of washing.

In connection with the means for locking the cover g to the box e provision is also made whereby the said cover may be quickly released when it is desired to remove the same from the box. Describing this last-mentioned feature of my newly-invented machine, the reference-letters k k' denote rock-shafts located, respectively, at opposite ends of the box e and supported in suitable bearings secured to the said box. The shafts k k' each have secured thereto arms k^2 , adapted to lie in the rear of the free ends of the spring-tongues h h' when the latter are serving to secure the cover g in position on the box. The shafts k k' also bear, respectively, arms k^3 k^4 , that are connected by a link k^5 in such manner that the shafts k k' will be caused to rock in unison either to swing the arms k^2 away from or toward the box e , as will be readily understood by referring to Fig. 6 of the drawings. When the cover g is secured to the box e by the spring-tongues h h' and the arms k^2 are behind the latter, as above mentioned, it will be obvious that the shafts k k' can be readily rocked in unison to cause the said arms k^2 to engage the free ends of their respective spring-tongues h h' , and thus withdraw the teeth h^2 of the latter from locking engagement with the teeth e^4 in the ends of the box e .

Having now described the receptacle for the bottles and the manner in which the same are secured therein, also the mechanism for imparting motion to said receptacle, I will proceed to describe that portion of my ma-

chine by means of which water and shot are supplied to each bottle in the operation of washing the same.

Mounted on the upper face of the cover *g* are metallic plates *m* and *n*, said plates being secured together and forming practically a single structure. The plates *m* and *n*, with the cover *g*, are drilled, as at *n'*, to provide holes or passages leading from the bottom of each conical recess *g'* through the cover *g*, and through the said plates to the outer face of the plate *m*, the central line of the said holes being also that of the recesses *g'*. Screwed into the plates *m* *n* at one end is a short piece of pipe *o*, which enters a channel *n*² in that face of the plate *n* which confronts the plate *m*. The channel *n*² extends, preferably, entirely across the plate *n* and has leading therefrom similar channels *n*³, which extend to the opposite end of the said plate *n*, the channels *n*³ preferably crossing the channel *n*², and thus extending from end to end of the plate *n*. In the accompanying drawings the holes *n'* are shown as arranged in four rows; but it will be apparent that the arrangement of the holes and of the bottles would be largely dependent upon the number of the latter the box *e* is to receive. When arranged in four rows, as just mentioned and as shown in the drawings, two of the channels *n*³ are provided, each of which channels leads between two rows of the holes *n'*, and from the said channels *n*² short lateral channels *n*⁴ lead to the holes *n'*, thus forming a means of communication from the pipe *o* to each hole *n'*. The channels *n*² *n*³ are preferably extended to the outer edges of the plates *n*, as shown in the drawings, this being for convenience in manufacture and to enable the cleaning of the same when necessary; but the otherwise open ends of the channels are ordinarily closed with cork or other suitable stoppers, as indicated by the letter *n*⁵.

The plate *m* has mounted thereon a plate *s*, having a set of holes *s'* thereon corresponding to the holes *n'* already described. Each hole *s'* receives the lower open end of a cup *t*, which is adapted to contain a supply of shot or the like material, the said cups being provided with covers *t'*, as shown in the drawings. The plate *s* is also provided with a second set of holes *s*², which likewise correspond to the holes *n'* and which said holes *s*² alternate in position with the holes *s'*. The plate *s* is not fixedly secured on the plate *m*, but can be slid thereon to bring either the set of holes *s'*, carrying the shot-cups *t*, or the set of holes *s*² into coincidence with the holes *n'* of the plates *m* and *n* and the cover *g*. To secure the plate *s* to the plate *m*, the former is slotted, as at *s*³ *s*⁴, to receive bolts *s*⁵, whose lower ends are secured in the plates *m* *n*. The bolts *s*⁵ are provided with shoulders *s*⁶, which serve to hold the plate *s* in close contact with the plate *m*, and the upper ends of said bolts are

connected by a handle *s*⁷. To still better secure together the plates *s* and *m*, additional bolts *s*⁵ may be provided.

The described means for the introduction of water and shot into the bottles will be best understood by reference to Figs. 5 and 6, which show the same in plan and elevation, with the plate *s* partly broken away to expose the plate *m* and the latter partly broken away to expose the plate *n*.

When the cover *g* is in position on the box *e* and it is desired to introduce a supply of water and shot into the bottles, the plate *s* is slid either to the position shown in Fig. 1 or that shown in Fig. 6 in order to close the holes *n'*. Water is then introduced through the pipe *o* by means of a flexible pipe *o'*, connecting with a suitable supply, the said water flowing through the channels *n*² *n*³ *n*⁴ and entering the holes *n'* and thence passing into the bottles. When sufficient water has been introduced into the bottles, the flow is shut off and the plate *s* is slid to bring its holes *s'*, carrying the shot-cups, into alinement with the holes *n'*, or should the plate *m* have been in such position (that shown in Fig. 6) during the introduction of the water the said movement of the plate will be of course unnecessary. When the plate *s* is slid to the just-mentioned position, the shot from the cups *t* is free to drop into the bottles, which action of the shot may have occurred simultaneously with the introduction of the water. The plate *s* is now again slid into the position shown in Fig. 1, thus closing the holes *n'* and cutting off communication between the bottles and shot-cups *t*. The machine is now started to impart motion to the box *e*, which latter travels rapidly in substantially the path shown in Fig. 3, in which one of the trunnions *e'* is shown in section. The motion of the box *e* agitates the water and shot in the bottles, and thereby cleanses the same, as already fully described.

When the bottles are thoroughly washed, the machine is stopped and the plate *s* is again slid to bring the shot-cups *t* into alinement with the holes *n'*, after which upon the inverting the box *e* the shot at once returns by gravity to the shot-cups. While still inverted, the plate *s* is again slid to bring its holes *s*² in alinement with the holes *n'* to permit the water to drain from the bottles, as will be readily understood by reference to Fig. 7. Should it be desired to simply rinse the bottles, it will be obvious that the use of shot may be dispensed with by the proper manipulation of the plate *s*.

The shot-cups *t* are preferably constructed of glass, so that should the quantity of shot become depleted by loss in the draining of the bottles or in any other way such condition is readily noticeable. To prevent the rotation of the box *e* while the machine is in operation, the said box may be secured to one

of the eccentric arms d^3 by a hook u , or any suitable method for obtaining the end desired may be employed.

The handle s^7 provides a convenient means
5 for removing the cover g and the plates m n
s from the box e ; but the said cover and
plates being of considerable weight may, if
desired, be raised by a small tackle or like
device depending from the tie-rod b ; but as
10 such feature forms no part of this invention
it is not considered necessary to illustrate or
describe the same in detail.

In Fig. 8 I have shown the manner in which
a rocking as well as a rotary motion can be
15 imparted to the box e , the same being accom-
plished by adjusting the eccentrics differ-
ently, in which event the arms d^3 will not move
in unison and the box e will be rocked in sub-
stantially the manner shown. When the box
20 is to be rocked, as shown in Fig. 8, the trun-
nions are preferably provided with ball ends,
as shown.

In Fig. 9 I have shown a modification in
which the plate m is dispensed with, the chan-
25 nels n^2 n^3 n^4 of the plate n being formed in the
under face of the latter and confronting the
rubber cover e .

My machine as a whole is of simple con-
struction, is not expensive to produce, will
30 not readily get out of repair, and it performs
very rapidly and satisfactorily the work for
which it is designed.

Having thus described my invention, I
claim—

35 1. In combination, in a bottle-washing ma-
chine, a box, a cover having depressions g' ,
means for retaining a multiple of bottles in
engagement with said depressions, and means
for locking the said cover to the box consist-
40 ing of teeth affixed to the opposite ends of
the box, and depending spring-tongues on
the cover having teeth to intermesh with the
teeth on the box.

2. In combination, in a bottle-washing ma-
45 chine, a box, a cover having depressions g' ,

means for retaining bottles in engagement
with said depressions, and means for locking
the said cover to the box consisting of teeth
affixed to opposite ends of the box, and de-
50 pending spring-tongues having teeth to en-
gage with the teeth on the box, and means
for unlocking the same consisting of levers
 k^2 k^2 pivotally mounted on the box with their
free ends arranged to engage the free ends
55 of said spring-tongues and connecting-rod k^5
joining the levers at the opposite ends of the
box as specified.

3. In a bottle-washing machine, in combi-
nation, a plate g having depressions adapted
to receive the necks of a multiple of bottles, 60
means for holding said bottles in close en-
gagement with said plate, means for agitat-
ing and for inverting said bottles, openings
in said plate g coincident with the said de-
pressions, and a plate s slidably mounted over 65
the plate g ; said plate s being provided with
perforations s' extending through it and also
with shot-chambers t having discharge-open-
ings substantially as specified.

4. In a bottle-washing machine, in combi- 70
nation, a plate g having depressions adapted
to receive the necks of a multiple of bottles
and openings leading outward from said de-
pressions, means for holding the bottles in
engagement with said depressions, means as 75
set forth for introducing water into said bot-
tles, and a plate s slidably mounted over the
plate g ; said plate s being provided with per-
forations s^2 adapted to register with the said
depressions when plate s is moved in one di- 80
rection and also with shot-chambers having
outlets adapted to register with said depres-
sions when the plate s is moved in the oppo-
site direction.

Signed at New London, Connecticut, this 85
3d day of October, 1901.

MICHAEL P. SHEA.

Witnesses:

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