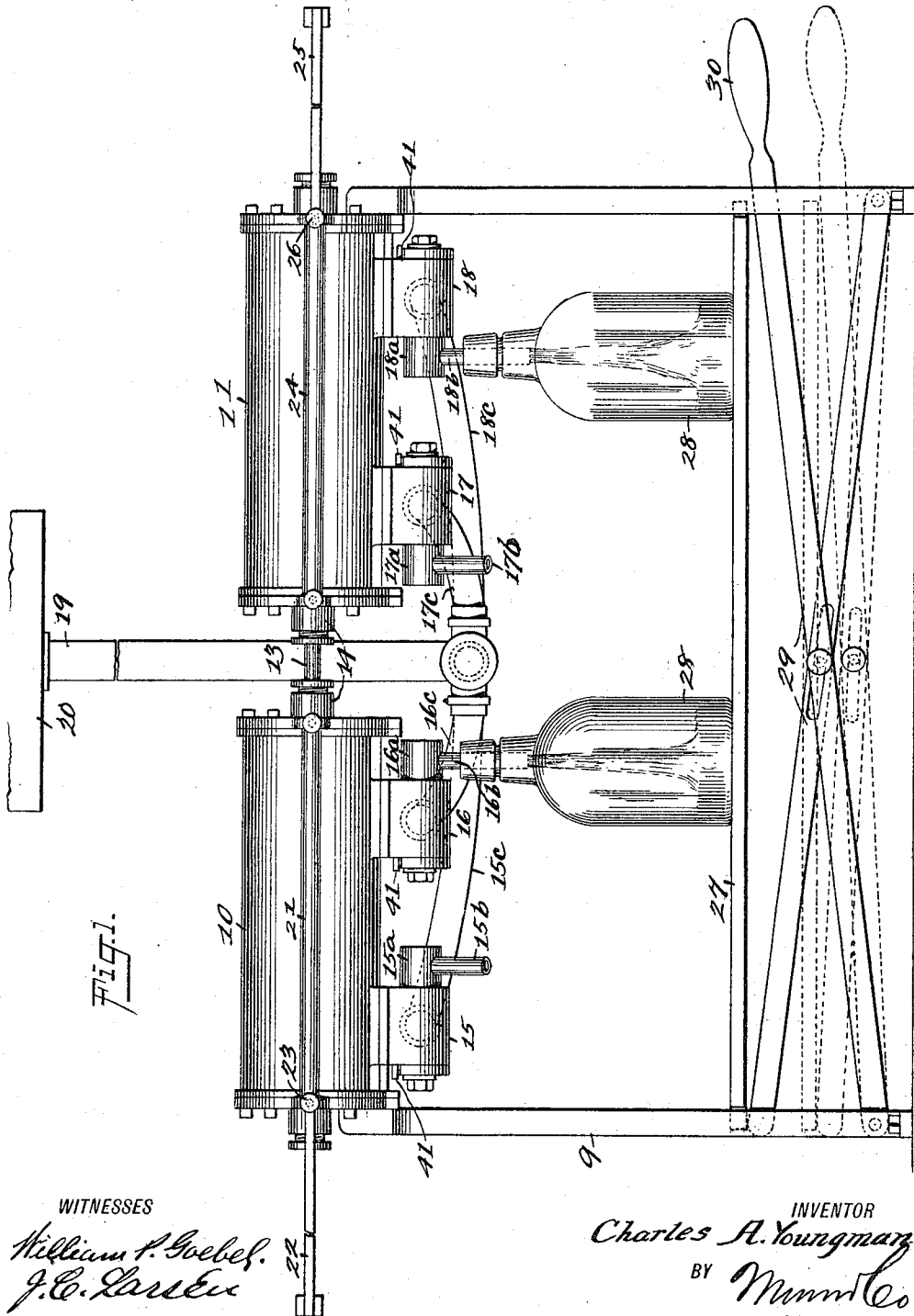


1,211,027.

C. A. YOUNGMAN.
BOTTLE FILLING MACHINE.
APPLICATION FILED APR. 19, 1915.

Patented Jan. 2, 1917.
4 SHEETS—SHEET 1.



WITNESSES

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Fig. 3.

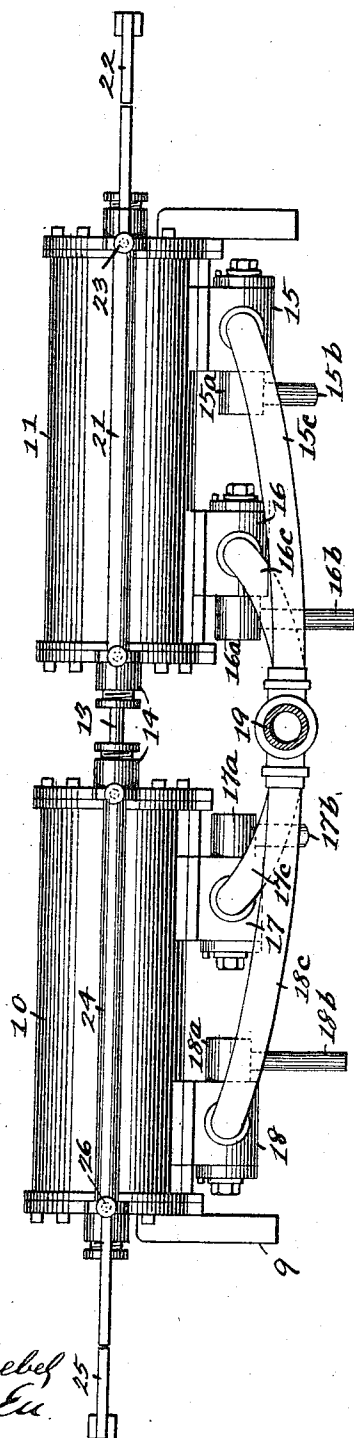
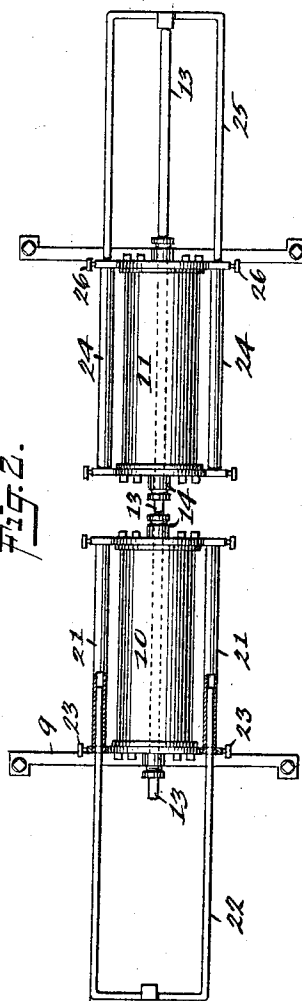


Fig. 2.



WITNESSES

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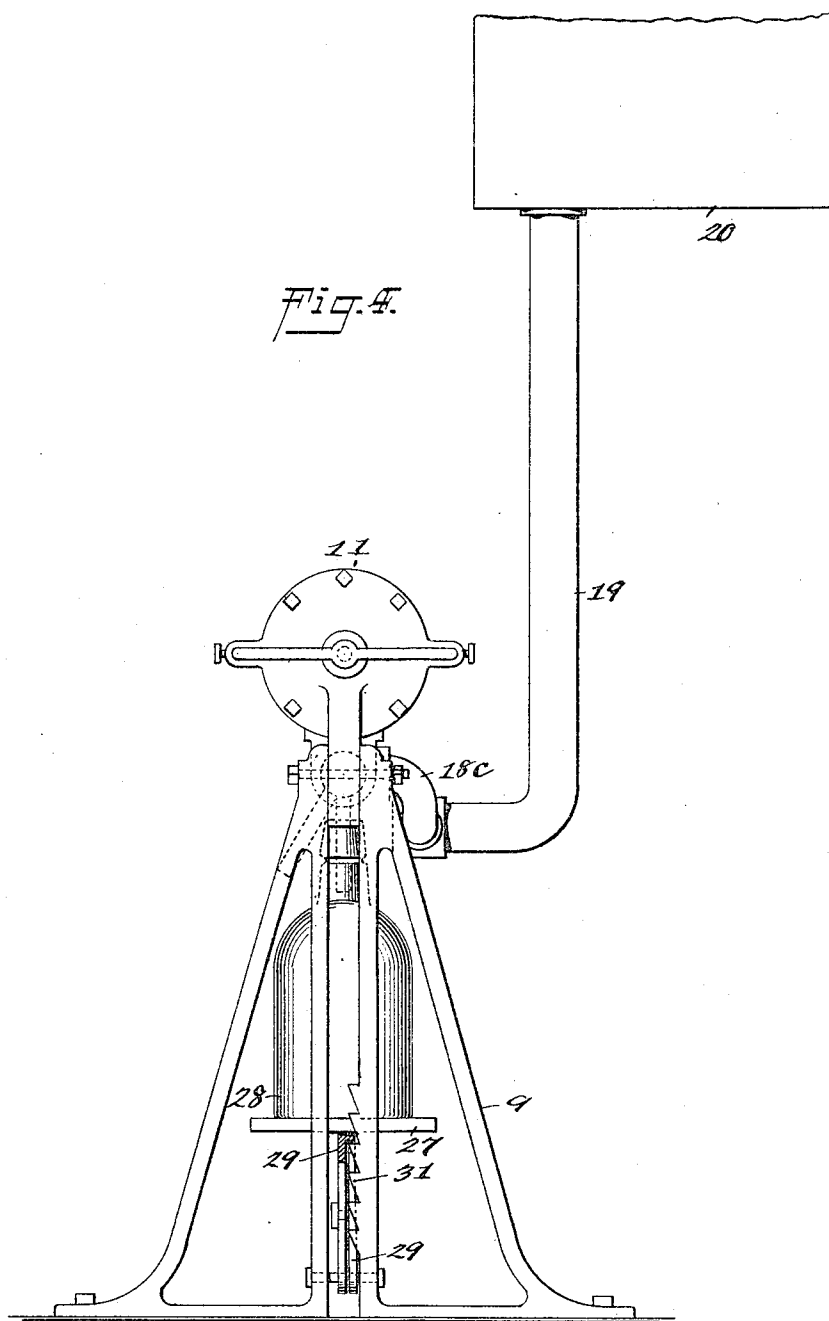
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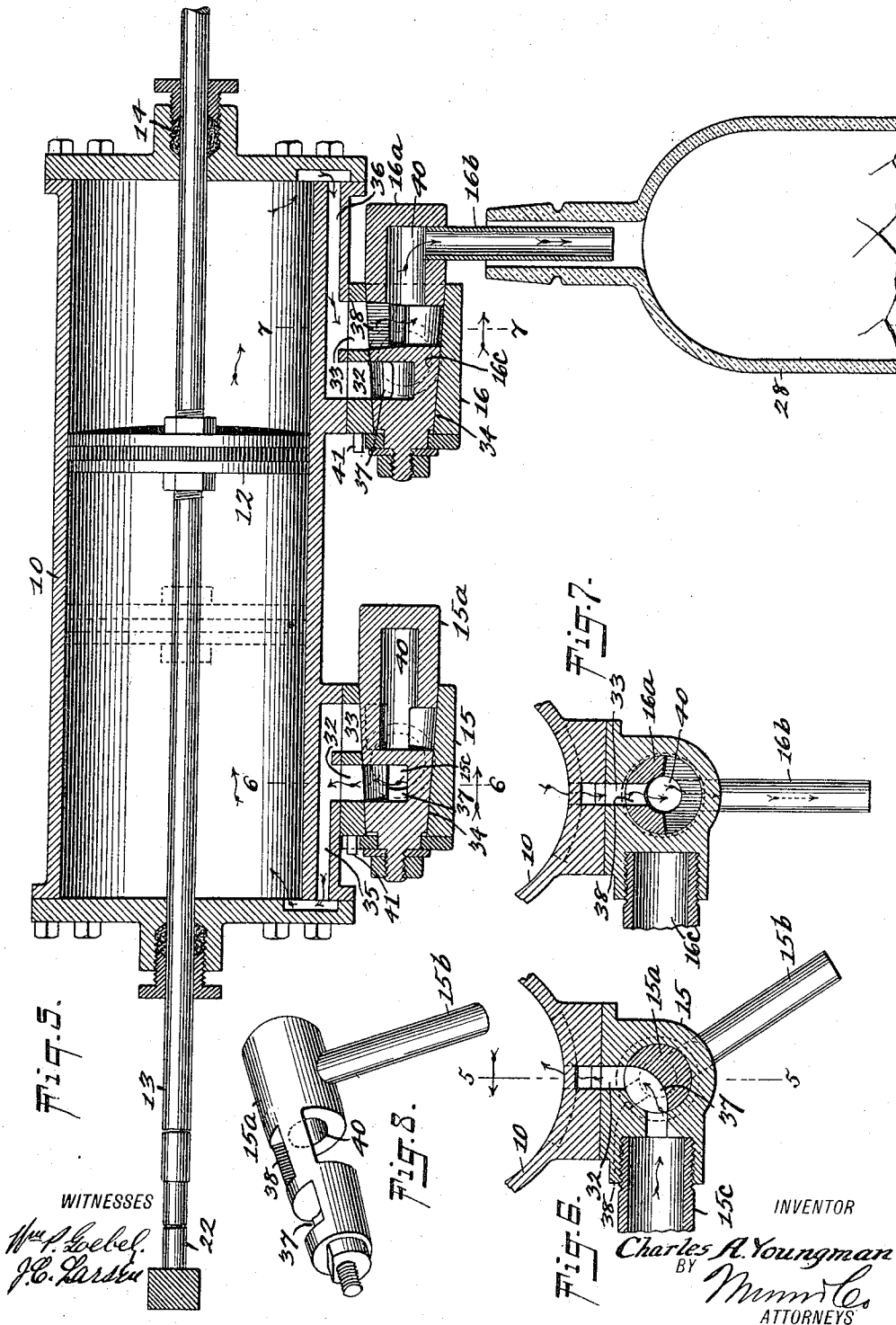
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UNITED STATES PATENT OFFICE.

CHARLES A. YOUNGMAN, OF LOUISVILLE, KENTUCKY.

BOTTLE-FILLING MACHINE.

1,211,027.

Specification of Letters Patent.

Patented Jan. 2, 1917.

Application filed April 19, 1915. Serial No. 22,318.

To all whom it may concern:

Be it known that I, CHARLES A. YOUNGMAN, a citizen of the United States, and a resident of Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Bottle-Filling Machines, of which the following is a specification.

My invention relates to the bottling of liquids, and one of the main objects thereof is to provide a machine for such purpose which will control the quantity of liquid admitted to each bottle or other receptacle.

A further object is to provide means whereby this result will be accomplished by gravity of the liquid to be bottled; and other objects are to provide such machines which are simple in construction, positive in operation, composed of but few parts not likely to get out of order to require repair, and comparatively inexpensive.

My invention is fully described in the following specification, of which the accompanying drawings form a part, in which the separate parts are designated by the same reference characters in each of the views, and in which:—

Figure 1 is a front elevation of a machine constructed in accordance with my invention; Fig. 2 is a partial plan view thereof, on a reduced scale; Fig. 3 is a fragmentary view of the rear thereof; Fig. 4 is an end elevation thereof; Fig. 5 is an enlarged, longitudinal, vertical, central, section through one of two cylinders which I employ, and its connected bottle filling nipples and valves; Fig. 6 is a section taken on the line 6—6 of Fig. 5; Fig. 7 is a section taken on the line 7—7 of Fig. 5; and Fig. 8 is a detached, perspective, view of one valve.

In the drawings forming a part of this application I have shown one form of embodiment of my invention, comprising a frame or support 9 having two cylinders 10 and 11 mounted thereon and in the same axial planes, each of said cylinders having a piston 12 slidable therein, only one of which is shown, and which pistons are connected by means of a common piston rod 13 slidable in suitable stuffing-boxes 14. Each of said piston cylinders has two valve casings at the lower side thereof, 15 and 16 for the cylinder 10 and 17 and 18 for the cylinder 11, corresponding valves 15^a, 16^a, 17^a, 18^a, and nipples 15^b, 16^b, 17^b, 18^b, being contained in the respective casings, and each of said

casings is in communication with a liquid feed pipe 19 from an elevated reservoir 20 by means of branching tubes 15^c, 16^c, 17^c, and 18^c, whereby the supply of liquid is constant to each casing.

Longitudinally adjustable in tubes 21 secured to the cylinder 10, Fig. 2, is a yoke-shaped frame 22 adapted to be locked in desired relationship with said cylinder by means of set-screws 23, the cylinder 11 being likewise provided with similar tubes 24, yoke-shaped frame 25, and set-screws 26, and the cross-heads of said frames 22 and 25 are in the direct line of the corresponding ends of the piston rod 13 and serve to limit the movement of the same in either direction, it being observed that the outer ends of said piston rod project through their respective cylinder heads.

Vertically movable in the support 9 is a platform 27 for the bottles 28 or other receptacles to be filled with the liquid from the reservoir 20, a toggle-lever arrangement 29 being provided thereunder for moving both ends of said platform simultaneously upwardly or downwardly, a handle 30 being provided on one of the levers for such platform movement, and I also provide a ratchet 31 whereby the platform 27 may be adjustably held at any desired height.

In view of the fact that all of the valve casings and contained valves are exactly alike, a description of those on the cylinder 10 will suffice; each casing is provided with two distinct ports 32 and 33 communicating the valve bore 34 with a passage for the casing 15 and 36 for the casing 16 in the wall of the cylinder 10 and which passages communicate with corresponding ends of said cylinder, one on each side of the piston 12.

Each of the valves is provided with a passage 37 adapted to communicate the port 32 with the corresponding branch tube 15^c or 16^c, whereby the liquid from the reservoir will flow into the cylinder 10, but one of said valves is turned to close this communication while the other is open thereto, for a reason to be explained; each of said valves has, also, a port 38 adapted to be placed in communication with the respective port 33 in one position and being in constant communication with the corresponding nipple 15^c or 16^c through a bore 40, and it will thus be seen that each nipple may be placed in communication with the

corresponding cylinder passage 35 or 36, the communication between said cylinder passages and the respective branch tubes being closed when the nipples are so open to their respective cylinder passages, and, when said branch tubes are open to said cylinder passages, said nipples are out of communication with said cylinder passages; in the arrangement illustrated, the nipples are in communication with the cylinder passages when vertically arranged, whereas they are out of such communication when inclined, as in Fig. 7, and the branch tubes are then in communication with the corresponding cylinder passages.

Assuming the parts to be in the positions shown in Fig. 5 with the exception of the piston which is assumed to be in the position indicated by dotted lines; if, now, the liquid from the reservoir be allowed to pass therefrom, a suitable cock being provided therefor although not shown, said liquid passes to the branch tubes, through the passage 37 of the valve 15^a, port 32, and cylinder passage 35, to the cylinder 10, on the left of the piston, but no liquid passes through the valve 16^a for the reason that the passage 37 thereof is turned to close off communication between the corresponding branch pipe and the cylinder passage 36; the latter passage, however, is in communication with the nipple 16^b, and the liquid in the cylinder, if any, to the right of the piston is free to escape from the cylinder. This, however, creates a partial vacuum in this portion of the cylinder which tends to prevent such liquid escape until the liquid entering the cylinder on the other side of the piston moves said piston into the position shown in full lines, thus forcing the liquid through the nipple 16^b, and into the bottle thereunder, this movement of the piston being limited by the set positions of the yokes 22 and 25, and the amount of liquid so forced out of the cylinder being thus gaged. When this quantity of liquid has been forced into the bottle, said bottle is removed, such removal tending to throw the nipple 16^b from vertical to inclined position, thus reversing the valve 16^a and closing nipple communication but opening the branch tube communication; an empty bottle is then placed beneath the valve casing 15 with the nipple therein, this moving said nipple from inclined to vertical position, and opening nipple communication with the cylinder and closing reservoir communication, and the liquid being admitted to the cylinder on the right of the piston moves said piston back to the position indicated by dotted lines in Fig. 5, thereby forcing the liquid from the cylinder at the left of the piston into the new bottle, and this substitution of bottles beneath the valve casings 15 and 16 alternately continues.

Inasmuch as one cylinder and connections would only occupy one hand of the operator, I provide two such cylinders and connections, and, to insure complementary piston operation in the two cylinders, and thus simultaneous bottle removal and substitution for both cylinders, I anchor the two pistons upon the same piston rod.

In view of the retarding effect of the partial vacuum created alternately upon each side of the respective cylinder pistons, it will be obvious that there must be piston movement, and, if I provide means for limiting the piston movement, it will be apparent that I also control the quantity of liquid forced out of each cylinder into the corresponding bottles; this piston movement, as has been described, is due to the flow of liquid into the cylinders, upon opposite sides of the pistons alternately, and I therefore have my liquid reservoir at a considerable height above the bottle filling machine, the higher the better to correspondingly increase the head of the liquid.

In order to prevent the operator from moving the nipple too far in each operation, I provide a stop 41 for each of the valves, but this is of old and well known construction and any suitable form thereof may be employed. Two bottles are thus being filled at one time, two bottles are removed at one time, and two bottles are substituted at one time, this substitution being with the valves of each cylinder alternately, the removal of bottles closing off the flow of liquid from the cylinders, but opening the flow of liquid thereto, whereas the substitution of bottles opens the valves to permit liquid to flow thereto, and closes off the liquid supply to said cylinders through the valves actuated.

It will be seen that my invention includes the creation of partial vacuums, and also involves the law of gravitation, and I reserve the right to any mechanism whatever which produces the desired results by the inclusion of these two features.

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

1. A bottle filling machine, comprising a pair of cylinders, a piston in each cylinder, a rod connecting said pistons and having ends projecting outwardly of said cylinders, adjustable means for engagement with the piston rod ends to limit piston movement in each direction, a valve at each end of each cylinder, means for leading a fluid to all of said valves, and a nipple on each valve, said valves connecting said fluid leading means with the respective cylinder end in one position thereof and connecting the cylinder ends with the respective nipples in the other position thereof.

2. A bottle filling machine, comprising a

pair of cylinders, a piston in each cylinder, a rod connecting said pistons and having ends projected outwardly of said cylinders, longitudinally arranged tubes on each cylinder, a frame slidably arranged in the tubes of each cylinder in the path of movement of said piston rod, means for locking said frames in desired positions to limit piston movement, a valve at each end of each cylinder, means for leading a fluid to all of said valves, and a nipple on each valve, said valves connecting said fluid leading means

with the respective cylinders in one position thereof and connecting the cylinder ends with the respective nipples in the other position thereof. 15

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

CHARLES A. YOUNGMAN.

Witnesses:

LEWIS W. COHN,
S. B. BERNHEIM.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents Washington, D. C."