

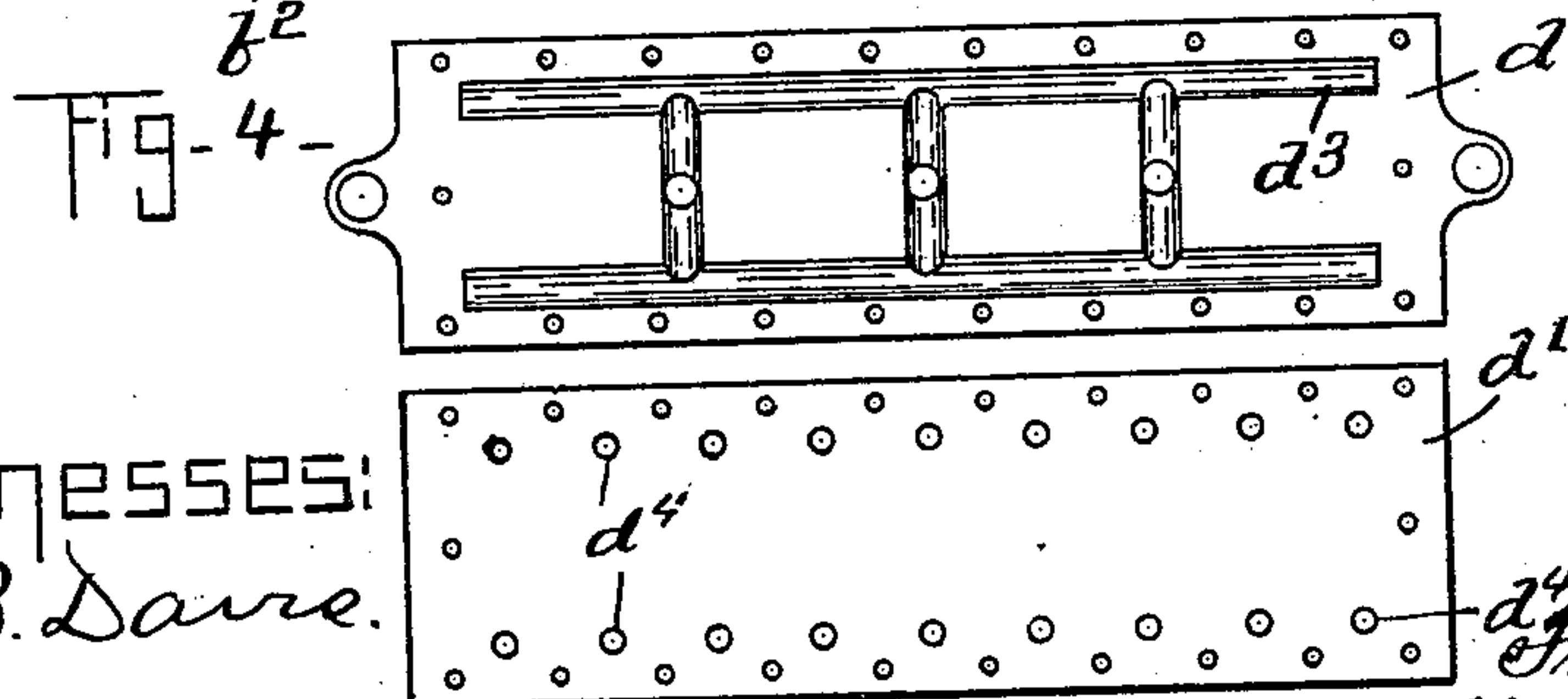
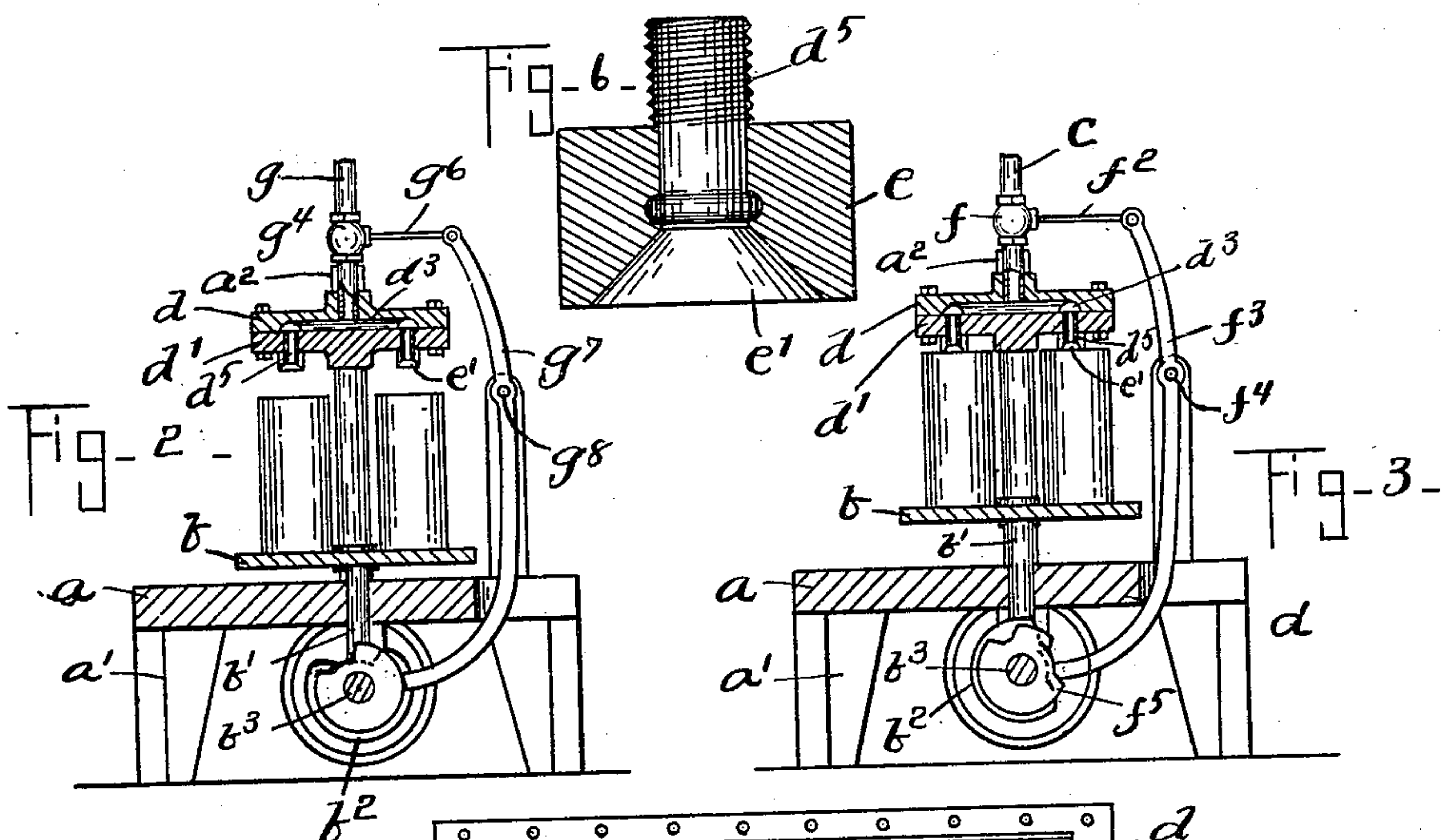
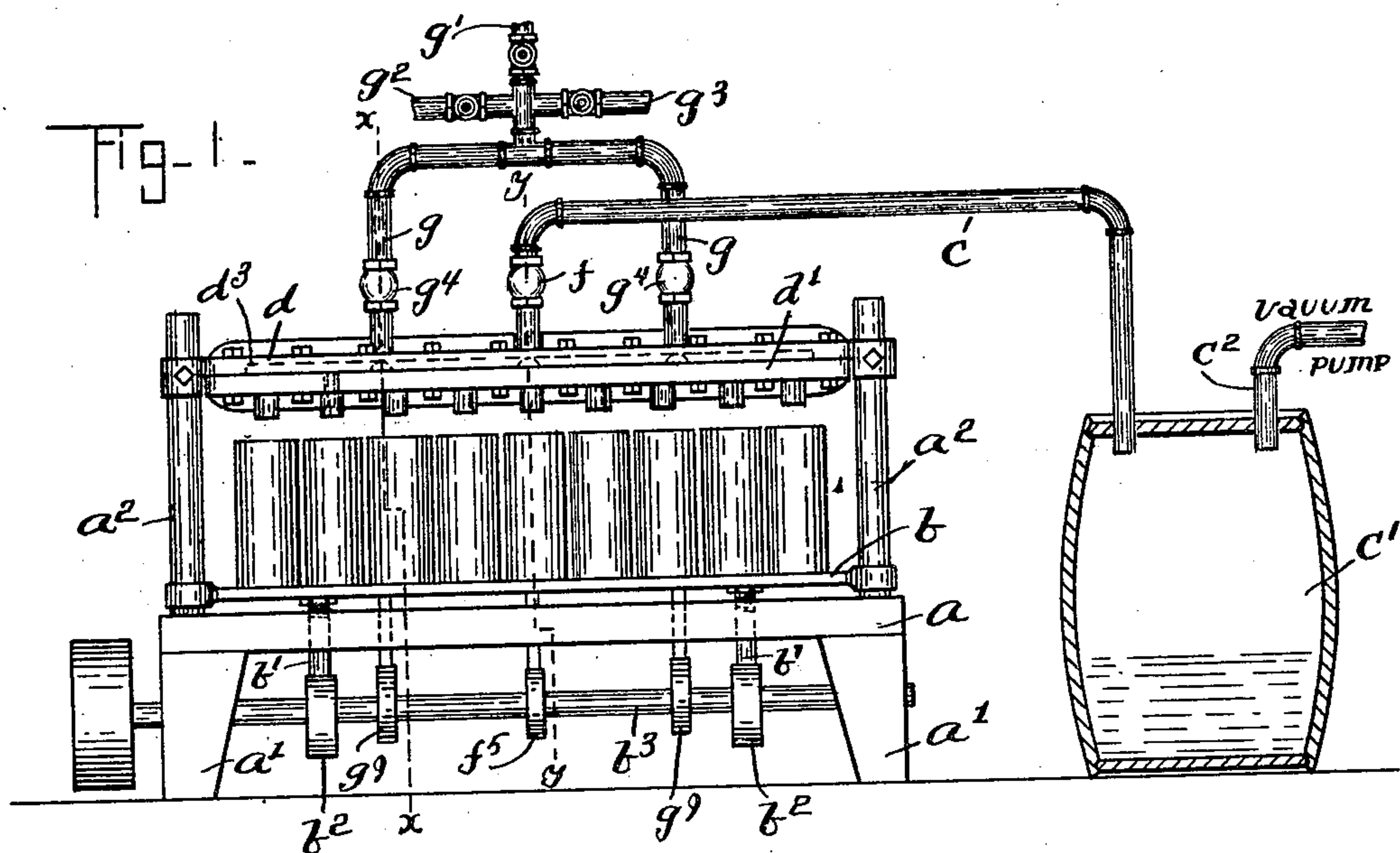
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Patented July 23, 1901.

F. D. CLEVELAND.
CAN FILLING MACHINE.

(Application filed Oct. 31, 1900.)

(No Model.)



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UNITED STATES PATENT OFFICE.

FRANCIS D. CLEVELAND, OF WINCHESTER, MASSACHUSETTS.

CAN-FILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 678,862, dated July 23, 1901.

Application filed October 31, 1900. Serial No. 34,981. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS D. CLEVELAND, of Winchester, county of Middlesex, State of Massachusetts, have invented an Improvement in Can-Filling Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates to can-filling machines, and is especially adapted for use in introducing a non-solid filling into cans previously packed with fish or other solids.

The invention has for its object to construct a machine designed to carry out a novel method of filling cans, the machine operating to exhaust the air from the cans, then to introduce the filling, which will be drawn into the cans by suction, assisted by pressure, if desired—a step which usually results in filling the cans too full—and then to remove a quantity of material from the cans.

The invention also has for its object to construct a machine whereby a number of cans will be filled at a time and provision made for adapting the machine to cans of different sizes and also to cans of different heights; that the cans may be filled through a single small hole in each, a hole which can be closed by a drop of solder; that excessive care need not be taken in disposing the cans on their support; that the machine may be easily and quickly cleaned; that a change may be quickly made from one to another kind of filling.

In carrying out this invention a chamber is provided having a number of exits into engagement with which the cans will be moved; and a delivery-pipe and an exhaust-pipe will be connected to said chamber, each having a valve and automatic means provided for operating said valves, whereby the air is exhausted from all of the cans, the filling supplied by the delivery-pipe, and then a quantity of the material withdrawn from the cans. The chamber may comprise a top plate and a bottom plate secured together, said top plate having recesses in its underside and said bottom plate having a number of exits, which are disposed opposite said recesses to provide passageways. The bottom plate is detachably connected to the top plate, and a number of bottom plates will be provided having

differently-disposed exits, thereby providing for filling cans of different sizes. The top plate is adjustably mounted on suitable supports, provision being thereby made for cans of different heights. The exhaust-pipe and the delivery-pipe will be connected to said top plate. The delivery-pipe, which is connected to the top plate, may have connected to it a number of pipes leading to different sources of supply, which may be different kinds of sauces, and one of which may be water, each pipe having a valve controlling the delivery to the common delivery-pipe, which is connected to the chamber. The exhaust-pipe has a receptacle to receive any material which is drawn into the exhaust-pipe from the chamber, and the material thus drawn into said receptacle is in condition to be used over again.

Figure 1 shows in front elevation a can-filling machine embodying this invention. Fig. 2 is a vertical section of the machine shown in Fig. 1, taken on the dotted line xx . Fig. 3 is a vertical section of the machine shown in Fig. 1, taken on the dotted line yy . Fig. 4 is an under side view of the top plate of the chamber, to which the exhaust and delivery pipes are connected. Fig. 5 is a plan view of the bottom plate of said chamber; and Fig. 6 is a sectional view of one of the yielding air-tight connectors applied to one of the exits of the chamber.

a represents the base or bed of the machine, which is supported by legs a' , and two vertical posts a^2 are erected upon said base or bed, one at or near each end thereof, which are made of any suitable length and adapted to serve as guides and supports for some of the operating parts.

A platform or table b of any suitable shape and size is provided, on which the cans to be filled are placed, and said platform or table is disposed above said bed a , and as herein shown has formed at each end a hole adapted to receive one of the upright posts a^2 . The can-support is moved up and down or toward and from the bed a and during such vertical movement is guided by said posts a^2 . The means for moving said can-support b up and down may be of any suitable construction; but for simplicity two pins b' b' may be secured to the under side of said table, which

depend therefrom and pass down through holes in the bed *a* and project below said bed for a short distance and rest upon cams $b^2 b^2$, which are secured to a rod or shaft b^3 , which
 5 is suitably supported and which will be rotated by any suitable means, and said cams $b^2 b^2$ will be so shaped as to lift the can-support *b* to a predetermined elevation and hold it in such elevated position for a predetermined
 10 length of time and then return it to its lowermost position during each complete revolution of the shaft b^3 .

The cans to be filled are placed upon the can-support *b* side by side and each can will
 15 have a single small hole in it of a size that can be afterward closed by a drop of solder, and it is the purpose and intent of this invention to first exhaust the air from the cans, producing therein a vacuum, and afterward
 20 draw the filling into the cans by the suction produced by said vacuum, assisted more or less by pressure on the filling, if required, and afterward remove a portion of the material from the cans to reduce the quantity of fill-
 25 ing to the required amount. The air will be withdrawn and the filling introduced through the same hole. To produce a vacuum in the can, any ordinary vacuum-pump may be employed, which it is not deemed necessary to
 30 herein illustrate, but which is connected to an exhaust-pipe. The exhaust-pipe is herein represented at *c*, one end of which is connected to the top plate of a chamber, to be described, and the other end to the top of a receptacle *c'*, and another pipe c^2 leads from the
 35 top of said receptacle *c'* to the vacuum-pump. The exhaust-pipes $c c^2$ therefore contain the receptacle really as a part of it, and said receptacle is used as a depository for any material which may be drawn into the exhaust-
 40 pipe. The chamber consists, essentially, of a top plate *d* and a bottom plate *d'*, placed one upon the other and secured together by bolts or otherwise. The top plate *d* is formed
 45 or provided on its under side with a number of grooves or recesses d^3 , and the bottom plate is formed or provided with a number of exits d^4 , disposed opposite said grooves or recesses. The chamber *d d'* is supported in
 50 horizontal position upon the guide-posts $a^2 a^2$ substantially in parallelism with the can-support *b*, and when thus supported the bottom plate *d'* may be easily detached and another bottom plate substituted having a different
 55 number of exits or a number of exits differently disposed.

It will be understood that by providing a number of different bottom plates provision is made for cans of different sizes. As exits
 60 for the bottom plate *d'* said plate will have a number of holes through it, into which are screwed nipples d^5 , (see Fig. 6,) which project a short distance below the plate, and onto
 65 said projecting ends of the nipples air-tight connectors are secured, whereby an air-tight connection with the can is insured when applied over the hole in the can. The air-tight

connector herein shown, and which in practice is efficient, consists of a block *e* of rubber adapted to be secured to the end of the
 70 nipple. Such an air-tight connector may be made by forming in a block of rubber a straight or parallel-sided hole of suitable size to receive and snugly embrace the end of the
 75 nipple and a conical or flaring hole *e'*, communicating with the straight hole, which diminishes the thickness of the block toward its lower end. The air-tight connector *e* is
 80 made large enough for its lower end, against which the cam is pressed, to cover quite an area, so that in case the hole in the can should not be made exactly at a predetermined
 85 point or the cans should not be correctly placed on the table said air-tight connector will still cover the hole and subserve its purpose. The cans which are
 90 placed on the platform *b* will be bodily lifted by the rising platform or table and will be pressed against said air-tight connectors and will be held in such position while a vacuum
 95 is being formed in each can and also while each can is being filled.

The top plate *d* of the chamber *d d'* is adjustably secured to the guide-posts a^2 , whereby it may be supported at any suitable elevation, provision being thereby made for
 95 adapting the machines to cans of different heights.

A valve *f* is placed in the pipe *c* at a suitable point, which is adapted to be opened and
 100 closed at regular times, as will be hereinafter described, and when said valve *f* is opened and the vacuum-pump operated a vacuum will be produced in the can. As the machine is herein constructed the valve *f* serves as
 105 and constitutes a controlling device for the means for producing a vacuum in the can; but in lieu of this form of controlling device my invention includes within its scope any
 110 other form or construction of controlling device by which the vacuum may be controlled. As soon as the vacuum is produced in the can and while said vacuum is held the filling will be supplied.

g represents a common delivery-pipe for
 115 the filling, and said pipe is connected to the top plate *d* of the chamber in the same manner as the exhaust-pipe *c* is connected, and said common delivery-pipe has leading to it
 120 one or more pipes which will be connected with a corresponding number of supply-tanks.

Several different supply-tanks for different kinds of filling may be employed, and
 125 also a supply-tank for water to be used for cleaning the machine, and the pipes from all of said tanks will be connected with said common delivery-pipe, and each pipe leading to said common delivery-pipe will have
 130 a valve by which communication with said common delivery-pipe is established. Thus provision is made for different kinds of filling or for a supply of water, and the change from one to another may be quickly made.

As herein shown, three such pipes $g' g^2 g^3$ are employed.

The common delivery-pipe g is herein shown as made in two branches, yet any other number of branches may be provided, and each branch will be supplied with a valve g^4 , adapted to be opened at predetermined times to establish communication with the chamber $d d'$. As the machine is herein constructed the valves g^4 serve as and constitute controlling devices for the passage leading from the supply to the chamber, by which the filling or water is introduced; but in lieu of this form of controlling device my invention includes any other form or construction of controlling device by which the passage of the filling or water may be controlled.

In operating the machine it is first designed to produce a vacuum in the can, then close the communication with the exhaust-pipe and hold the vacuum, and then establish communication with the common delivery-pipe, in order that the can may be filled by suction, assisted by pressure, if desired, then close the communication with said common delivery-pipe, and then again open communication with the exhaust-pipe, in order that a small quantity of the material may be withdrawn from the can; and, furthermore, it is designed that the controlling devices by which these several results are successively accomplished shall be operated automatically and at proper relative times. In carrying out this part of my invention the can-support or table b is raised and lowered by the cams $b^2 b^2$ on the cam-carrying shaft b^3 and all of the cans raised against the yielding exits of the chamber $d d'$, to thereby establish an air-tight connection with the chamber, and by means of said cams $b^2 b^2$ the cans will be held in this position until filled. The valve f in the exhaust-pipe, which may be an ordinary gate-valve, has its stem f^2 connected to the upper end of a lever f^3 , pivoted at f^4 to a bracket on the frame, the lower end of said lever engaging a cam f^5 , which is also secured to said shaft b^3 . While the cans are held in air-tight connection with the chamber by the cams $b^2 b^2$, the cam f^5 will open the valve f , to thereby exhaust the air from the cans, and then close said valve. The valves $g^4 g^4$ in the common delivery-pipe, likewise made as ordinary gate-valves, have their stems g^6 connected to the upper ends of the levers $g^7 g^7$, pivoted at g^8 to brackets on the frame, the lower ends of said levers $g^7 g^7$ engaging like cams $g^9 g^9$, also secured to said shaft b^3 . Also while the cans are held in air-tight connection with the chamber and after the air has been exhausted from the cans the valves $g^4 g^4$ will be opened by the cams $g^9 g^9$ and the filling supplied. The filling rushes into the cans and usually fills them too full and causes their side walls to bulge outwardly more or less, particularly if the cans are what are usually called "square" cans. To reduce said bulging side walls to

normal, the cam f^5 again opens the valve f for a short interval of time to withdraw a portion of the material from the cans, and thereby reduce the quantity contained in the can to the required amount, producing what is ordinarily called a "commercially-filled" can. Thus the cam f^5 opens and closes the valve f twice during each rotation of the shaft b^3 .

In the operation of the machine it will be understood that when the valve f is opened the chamber $d d'$ may contain more or less filling, which will be drawn into the exhaust-pipe, together with the surplus which is withdrawn from the can, if any; but such filling will be deposited in the reservoir c' and stored up little by little, and such filling may be used over again when desired.

As before stated, any suitable pressure may be applied to the supply-tanks containing the filling from which the several pipes lead; but it is not deemed necessary to illustrate said tanks and the means for applying pressure thereto. Thus it will be understood that by the machine herein shown the cans are or may be filled too full, so that the side walls bulge outwardly, after which a portion of the material is withdrawn from the cans, as contrasted to filling the cans or attempting to fill them just full enough, and, furthermore, by the machine herein shown the hole in each can may be made small enough to be closed by a drop of solder, which is very important.

I claim—

1. In a machine for filling cans, the combination of a chamber having a number of exits, means for supporting a number of cans and for moving them toward and from the exits of said chamber, an exhaust-pipe connected with said chamber containing a valve, a delivery-pipe also connected with said chamber containing a valve, cams for operating said valves, constructed and arranged to first operate the valve in the exhaust-pipe and then operate the valve in the delivery-pipe, substantially as described.

2. In a machine for filling cans, the combination of a chamber having a number of exits, means for supporting a number of cans and for moving them toward and from the exits of said chamber, an exhaust-pipe connected with said chamber containing a valve, a delivery-pipe connected with said chamber containing a valve, and cams for operating said valves, constructed and arranged to first operate the valve in the exhaust-pipe, then operate the valve in the delivery-pipe, and then again operate the valve in the exhaust-pipe, substantially as described.

3. In a machine for filling cans, the combination of a chamber having a number of exits, means for supporting a number of cans and for moving them toward and from the exits of said chamber, an exhaust-pipe connected with said chamber containing a valve, a delivery-pipe also connected with said chamber containing a valve, and automatic means for

successively operating said valves, whereby air will be exhausted from the cans, the filling supplied, and then a quantity of material withdrawn, substantially as described.

5 4. In a machine for filling cans, the combination of a chamber having a number of exits, means for supporting a number of cans and for moving them toward and from said exits, an exhaust-pipe connected with said chamber
10 containing a receptacle and also a valve, for clearing the chamber and for exhausting air from all the cans, a delivery-pipe also connected with said chamber containing a valve, for supplying all the cans with filling, and
15 automatic means for successively operating said valves, substantially as described.

5. In a machine for filling cans, a chamber having a number of exits, a delivery-pipe connected to said chamber, pipes leading from
20 said delivery-pipe to several sources of supply, each pipe containing a valve, a valve in said delivery-pipe and automatic means for

operating it, a can-support located beneath said chamber and means for moving it, substantially as described.

25 6. In a machine for filling cans, a chamber having a number of exits, an exhaust-pipe connected to said chamber, a delivery-pipe also connected to said chamber, pipes leading from said delivery-pipe to several different sources of supply, each pipe containing a
30 valve, a valve in said delivery-pipe, a valve in said exhaust-pipe, and automatic means for successively operating said valves, a can-support located beneath said chamber and
35 means for moving it, substantially as described.

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

FRANCIS D. CLEVELAND.

Witnesses:

B. J. NOYES,

H. B. DAVIS.