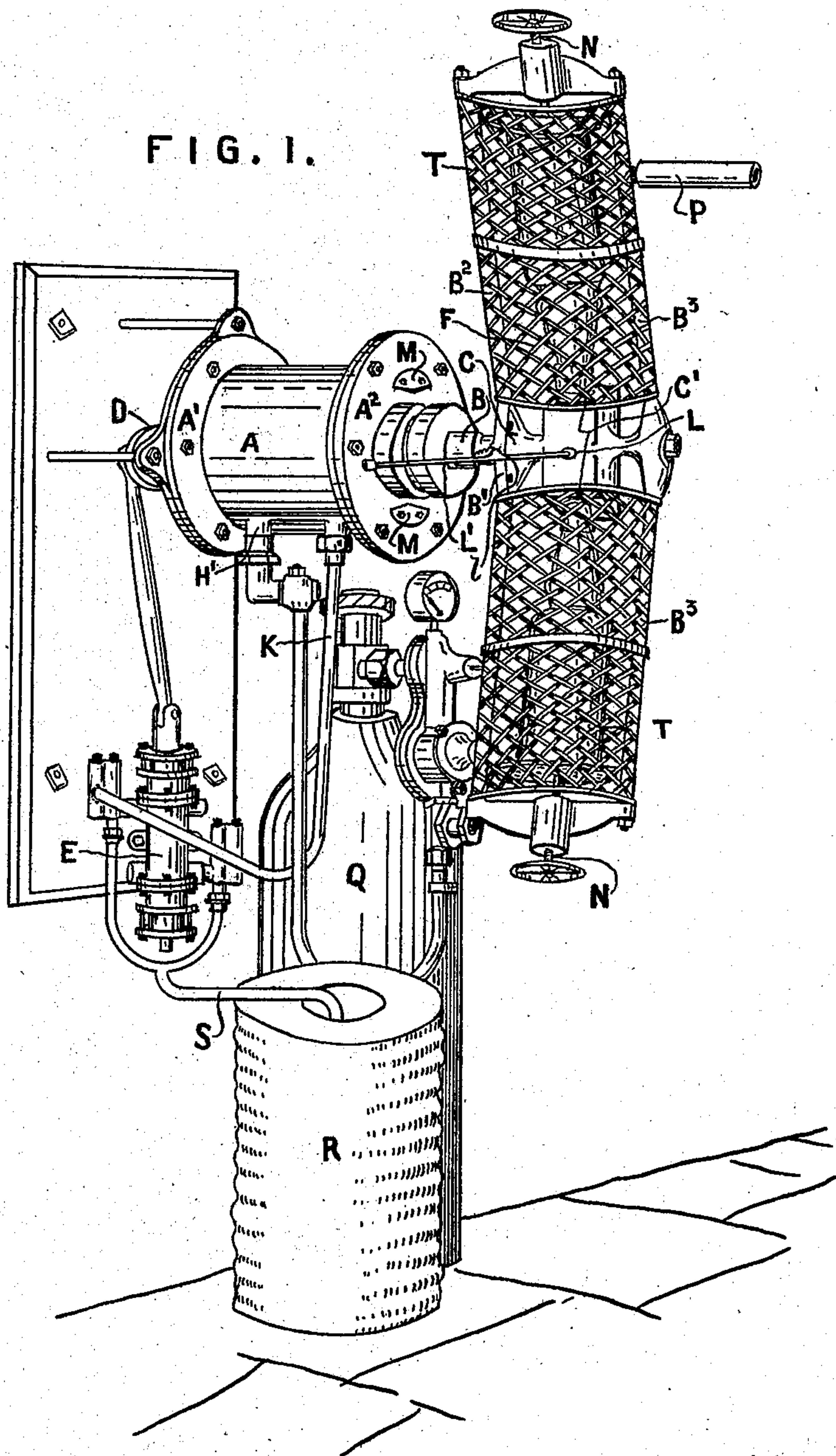


899,782.

FIG. 1.



W. P. Burke

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B. Richardson

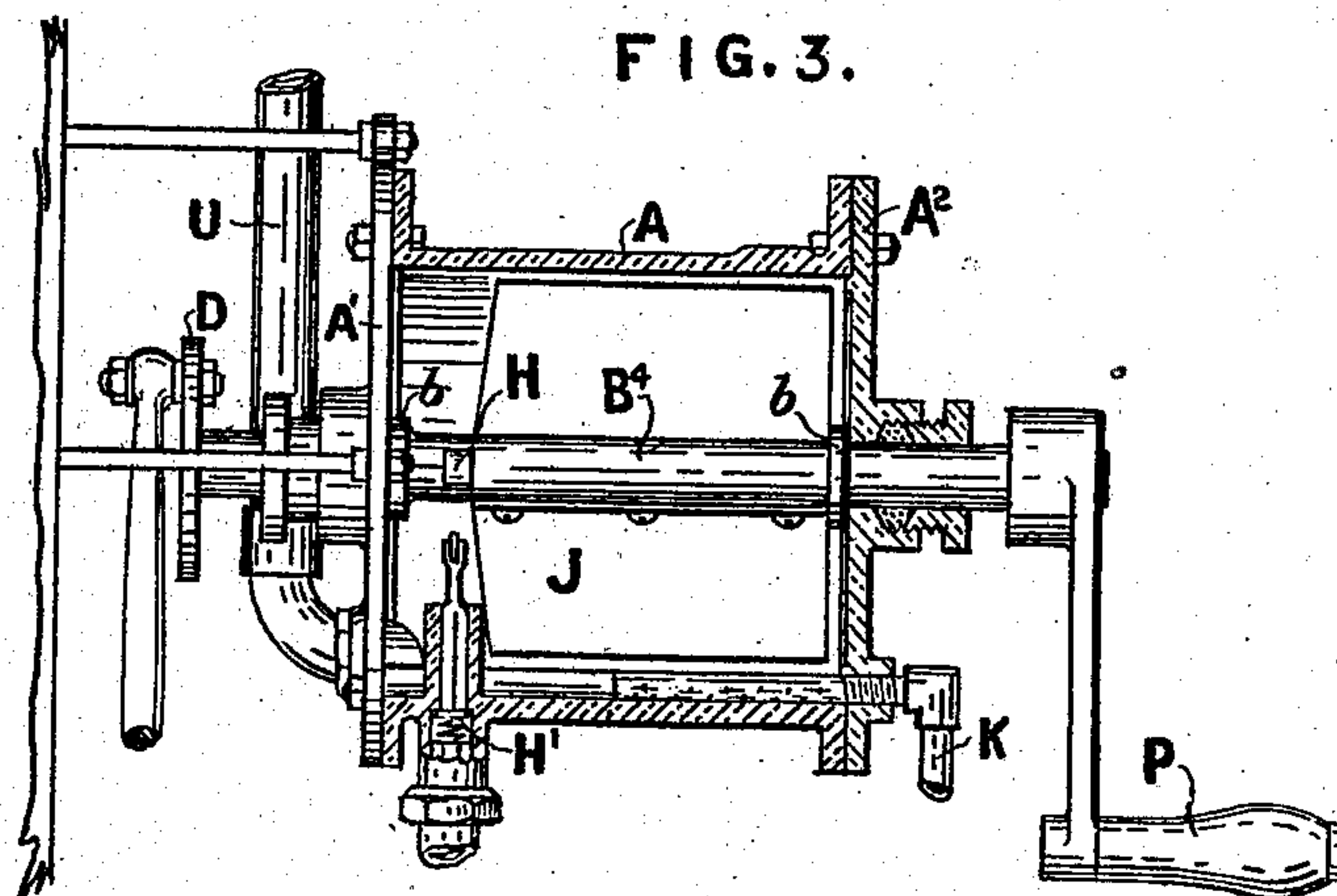
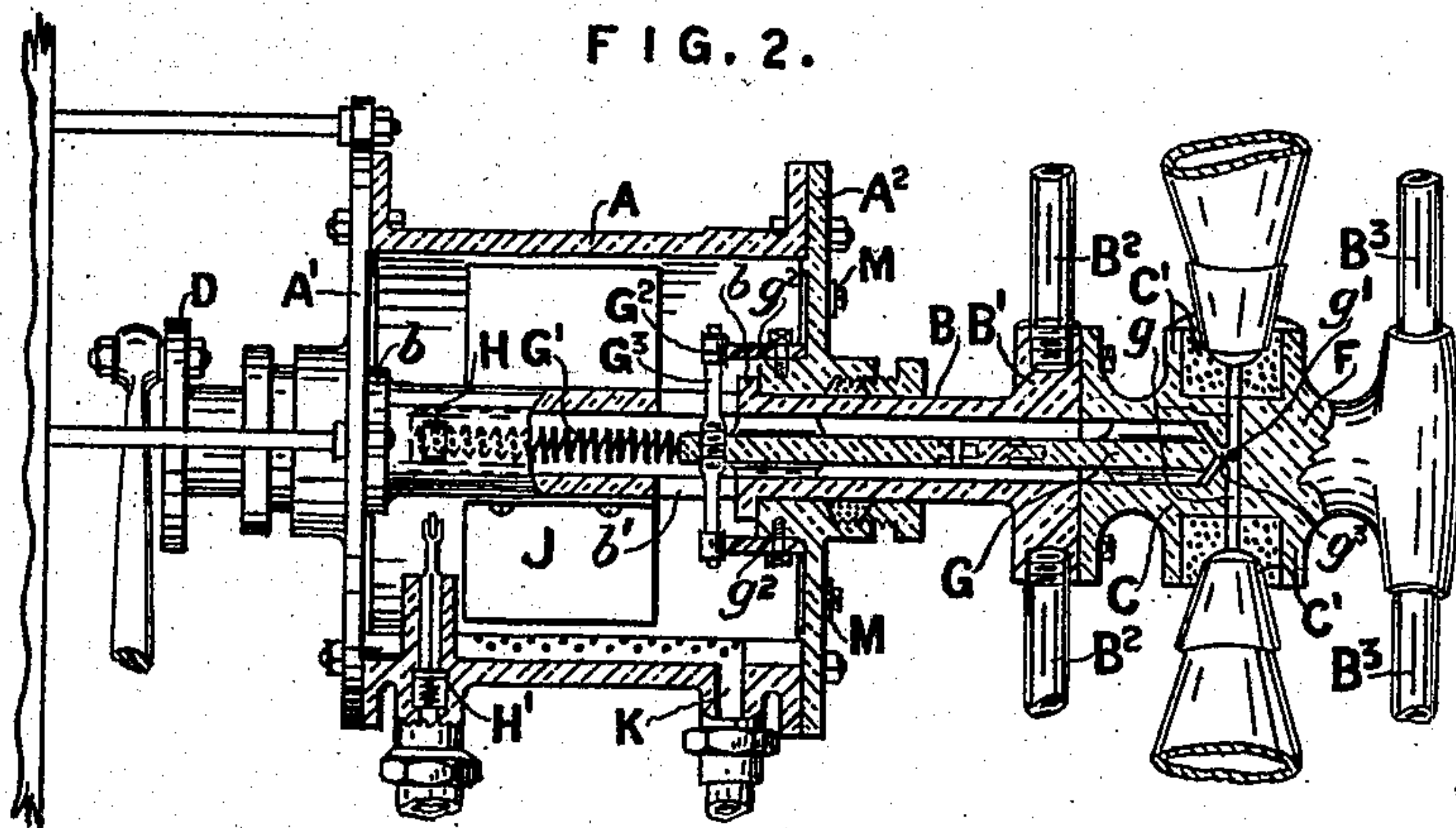
ATTYS.

A. J. BILLOWS.  
 APPARATUS FOR CARBONATING AND BOTTLING LIQUIDS.  
 APPLICATION FILED NOV. 14, 1906.

899,782.

Patented Sept. 29, 1908.

2 SHEETS—SHEET 2.



WITNESSES

*W. P. Burk*  
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By *Richardson*

ATT'YS.



# UNITED STATES PATENT OFFICE.

ARTHUR JAMES BILLOWS, OF BRISBANE, QUEENSLAND, AUSTRALIA.

## APPARATUS FOR CARBONATING AND BOTTLING LIQUIDS.

No. 899,782.

Specification of Letters Patent.

Patented Sept. 29, 1908.

Application filed November 14, 1906. Serial No. 343,442.

*To all whom it may concern:*

Be it known that I, ARTHUR JAMES BILLOWS, citizen of Australia, residing at 643 Ann street, Fortitude Valley, Brisbane, in the State of Queensland, Commonwealth of Australia, manufacturing chemist, have invented new and useful Improvements in Apparatus for Carbonating and Bottling Liquids, of which the following is a specification.

This invention relates to apparatus for aerating liquids and filling bottles therewith, of the character in which the bottle holding device is mounted on a hollow spindle through which the liquid is introduced into the bottle, having been previously aerated in a stationary chamber into which the gas and liquid constituents are introduced by suitable means.

It has been usual to introduce the liquid intermittently by means of a pump actuated by the rotation of the bottle holder, while the gas is admitted continuously from a source under pressure through a suitable reducing valve.

According to the present invention, both the liquid and the gas are automatically admitted in small proportionate quantities so that the apparatus may be applied to producing one or more small bottles of freshly aerated liquid, only the quantities of gas and liquid required to fill the bottles being admitted to the mixing chamber during one or more revolutions of the bottle holder, according to the capacity of the bottle or bottles to be filled.

The apparatus hereinafter described, for example, is designed to produce in a few seconds two bottles of aerated liquid from freshly introduced materials.

In carrying out my invention I provide a cylindrical mixing chamber having a cover at each end provided with a gland and stuffing box in which revolves a hollow shaft or trunnion closed at the back end and having a disk and crank pin for operating a small double acting pump for forcing the liquid into the bottles. At the other end is fitted a two bottle rack provided with sockets for the mouth of each bottle and a screw at the back to keep each bottle in place. There is a passage from the socket to the trunnion and inside the chamber the trunnion is slot-

ted for the admission of liquid and gas and the operation of a valve in the trunnion for regulating the admission of liquid into each bottle in turn.

A water and gas valve are provided on the chamber and a snifting valve on the rack.

A safety valve may be provided on the mixing chamber if desired.

As a modification, I dispense with the bottle rack and attendant parts, and provide a crank by which the shaft is rotated, and means, such as a siphon and tap for drawing off the gased liquid from the mixing chamber.

In order however that my invention may be clearly understood I will now describe it, reference being made to the accompanying drawings in which

Figure 1 shows a perspective view of a complete machine. Fig. 2 is a sectional view showing the interior arrangements. Fig. 3 illustrates a modification of my invention.

A is the mixer with covers A' A<sup>2</sup> the latter having two short cam tracks fastened to it.

B is the hollow shaft having two collars b on it to keep it in place while rotating. At the rear end is the disk D having a number of holes in it so that the stroke of the pump E may be varied. If desired, other means may be provided for varying the stroke of the pump. This pump E is of ordinary construction, with valves having long guides as used in soda-water machinery.

At the front end of the hollow shaft B I provide a head C which carries the bottle frame or rack F. This head may be made solid with the hollow shaft B, but I prefer, in order that the valve G and seat may be more easily got at, that it should be made separate and bolted to the flange B' on the end of the shaft B with a pressure, tight joint. The flange B' and the head C are each provided with two bosses to receive the rods B<sup>2</sup>, B<sup>3</sup> which form the frame F. The head C is also provided with two sockets C' for the bottles. The valve G, which is a valve of ordinary construction, closes (by the action of the spring G') the passage g<sup>3</sup> leading to the passage g which in turn lead to each of the bottle sockets C', but it is opened from time to time by the rollers G<sup>2</sup>, on the cross head G<sup>3</sup> rising upon the cams g<sup>2</sup>. g' indicates the position of the snifting passage which leads from the passages g to the air.



Formed on or attached to the hollow shaft B are two cam wipers H which open, for an instant the gas inlet valve H'.

J are two or more vanes to keep the mixture agitated.

K is the water inlet from the pump and may have a non-return valve on it if desired.

The snifting valve L which is a valve of ordinary construction capable of closing the snifting passage  $g'$  is operated by the lever L' fulcrumed at  $l$  and operated by striking against the cams M.

N are the screws for holding the bottles in place, while T are the guards to prevent accidents if a bottle bursts.

P is the handle for rotating the machine.

Q is an ordinary gas cylinder with reducing valve and pressure gage.

R is the vessel to contain the liquid to be bottled. S the suction pipes.

The bottle frame is made so that the bottles are at an angle of about 150 degrees to each other in order to facilitate the operation of stoppering.

The machine although shown bolted to a board and fastened to a wall can of course be made to stand on legs, or bolted to a stand of its own.

The *modus operandi* is as follows:—The vessel R having been filled with the liquid it is desired to bottle and the suction pipe inserted, the bottle-frame should then be rotated several times until the mixer is charged; the gas should then be turned on and set for a given pressure. The bottles should then be put in place, in the rack, the guards T shut and the frame F rotated, when the following action takes place:—Starting with the machine as shown in Fig. 2 the mixture of gas and the liquid in the mixer A is forced through the slots  $b'$  along the hollow shaft past the valve G, (which is, at this stage, held off its seat by the cam tracks  $g^2$ ) along the passage  $g$  into the bottles; then as the rack is rotated the rollers  $G^2$  drop off the cams  $g^2$  closing the valve G by the spring  $G'$ ; the pump E all the while forcing fresh liquid into the chamber and presently the cam wiper H opposite to that shown, just touches the valve rod of the valve H' admitting a puff of gas, and passes on. And at a time when nothing is passing from the mixer to the bottles the snifting valve lever L' touches against the cam M and opens the snifting valve L for a small fraction of a minute, so as to let out the compressed air from the bottle; and so on. Thus the bottles are rotated so a small quantity of well gased liquid is forced into the two bottles and further mixed in

them. The number of rotations required to fill the two bottles varies in accordance with the relation of the pump capacity to the bottles.

With this machine bottles known as four way bottles do not give satisfactory results as they have to be inverted to get the ball to fall into place.

I preferably use a bottle specially designed or those that hold the ball in a recess formed in or near the heel.

A modification of my machine consists in dispensing with the trunnion B and bottle rack F (a solid shaft B<sup>4</sup> and crank handle P being provided in lieu thereof) and drawing off the gased liquid from the mixing chamber A by a siphon pipe U or other means.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

1. A machine for carbonating and bottling liquids comprising a stationary mixing chamber, a hollow shaft rotating within the chamber and having one end projecting there-through, a bottle rack secured to the end of said shaft, means for delivering liquid to the stationary chamber, a gas inlet in said chamber, a valve controlling the same, a valve in the hollow shaft controlling the communication to the bottle rack, means on the shaft for opening the gas valve inlet once during each revolution of the shaft, and means for opening the valve in the hollow shaft during each revolution of said shaft.

2. A machine for carbonating and bottling liquids, comprising a stationary mixing chamber, a rotating hollow shaft in said chamber and projecting therefrom, a bottle rack mounted on said shaft, vanes on said shaft within the chamber, cams on the shaft, a gas admission valve adapted to be operated by said cams, a valve for controlling the admission of the liquid to the bottles, a cross head connected to said valve, rollers on said cross head, a cam track in the mixing chamber on which the rollers travel, a snifting valve for controlling the exhaust from the bottles, a cam for controlling the same, and a double acting pump operated by the hollow shaft, substantially as described.

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

ARTHUR JAMES BILLOWS.

Witnesses:

ALEXANDER ANDERSON,  
ARTHUR BISHOP.