No. 862,728. PATENTED AUG. 6, 1907.

R. P. FRIST.

GLASS BLOWING MACHINE.

APPLICATION FILED DEC. 8, 1904.

3 SHEETS—SHEET 1.

FIG. 1.

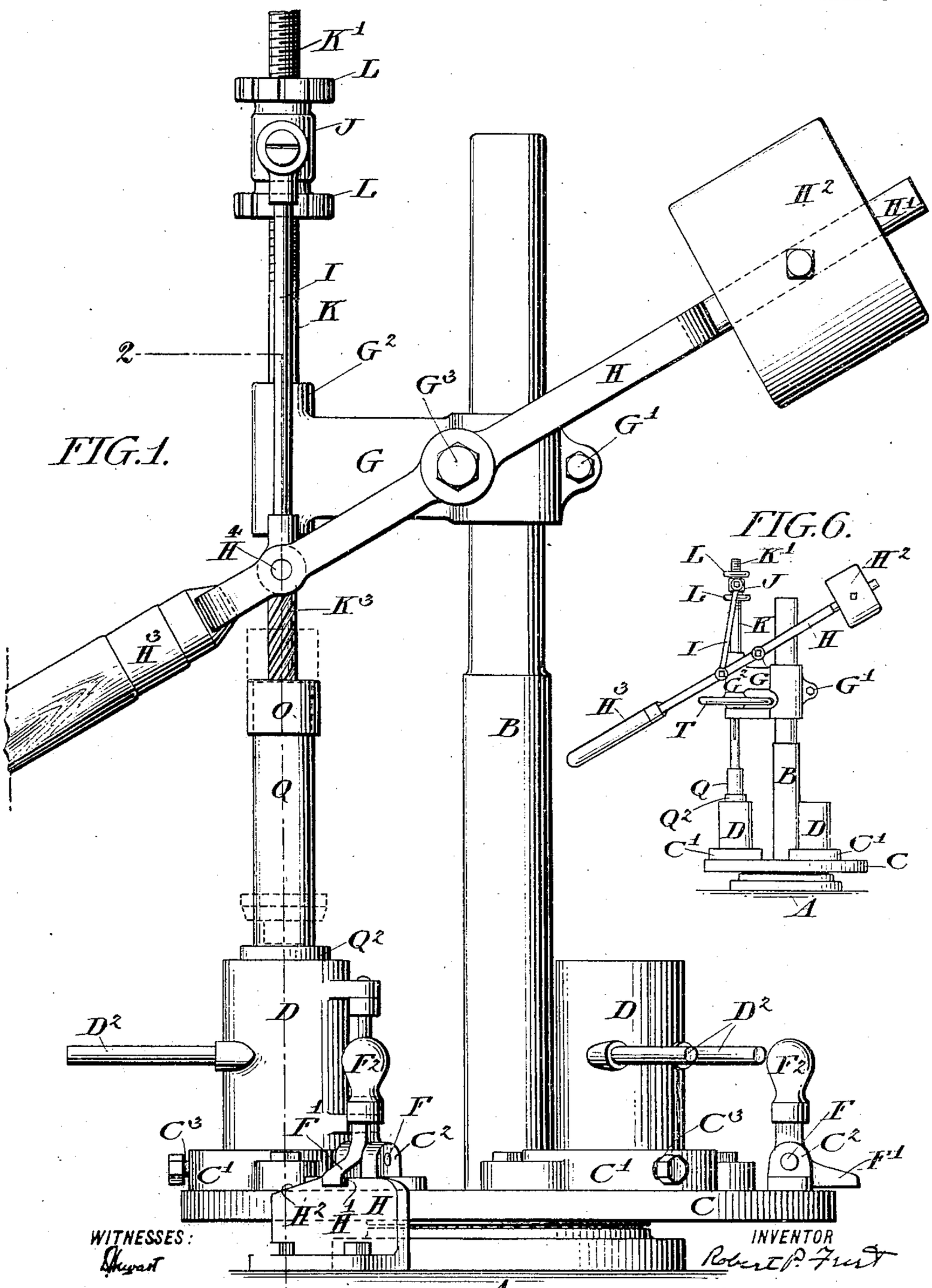

FIG. 6.

WITNESSES:

Stewart

D. S. Williams

INVENTOR

Robert P. Frist

BY

Francis D. Thurber

his ATTORNEY.

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3 SHEETS—SHEET 2.

FIG. 2.

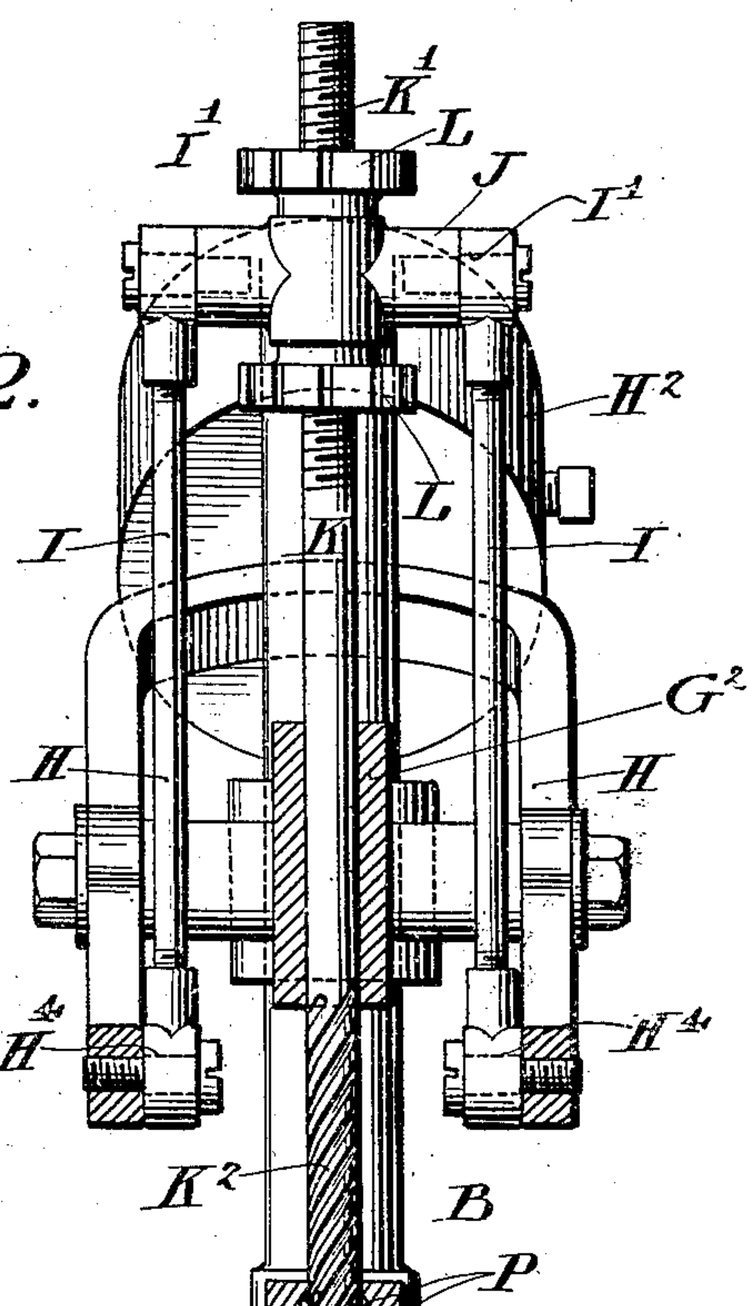

FIG. 3.

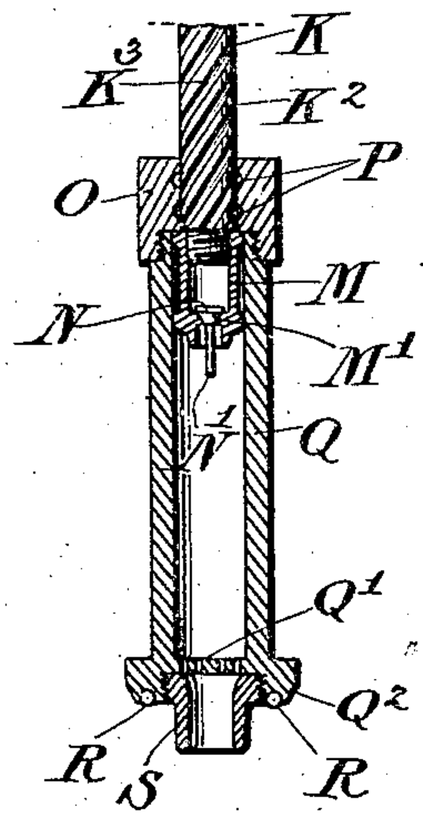

FIG. 4.

WITNESSES:

H. Hunt

R. S. Williamson

INVENTOR

Robert P. Frist

BY

Francis D. Chambers

his ATTORNEY.

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R. P. FRIST.

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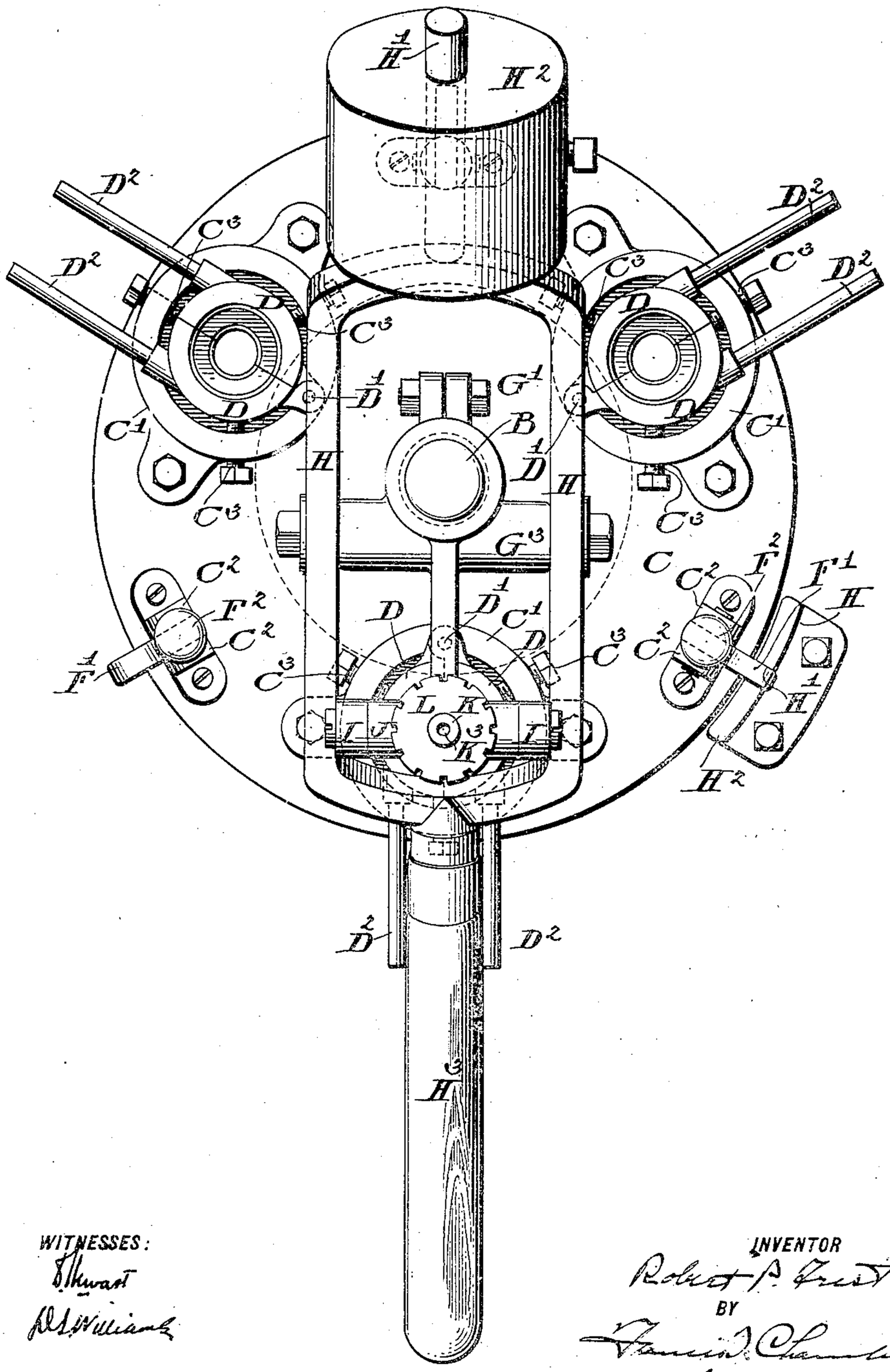
3 SHEETS—SHEET 3.

FIG. 5.



WITNESSES:

S. Stuart

H. S. Williams

INVENTOR

Robert P. Frist

BY

Francis D. Chambers

His ATTORNEY.

UNITED STATES PATENT OFFICE.

ROBERT P. FRIST, OF BRIDGETON, NEW JERSEY.

GLASS-BLOWING MACHINE.

No. 862,728. Specification of Letters Patent. Patented Aug. 6, 1907.

Application filed December 904. Serial No. 235,959.

To all whom it may concern:

Be it known that I, ROBERT P. FRIST, a citizen of the United States of America, residing in Bridgeton, in the county of Cumberland, in the State of New Jersey, have invented a certain new and useful Improvement in Glass-Blowing Machines, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

My invention relates to machinery for blowing glass and particularly to that part of the mechanism through which the blast is introduced into the glass blank to be blown.

The object of my invention is to provide for a better and more perfect formation of the neck of a bottle or similar object being formed in the machine.

Primarily my invention consists in the use of a die like blast nozzle which is forced into the neck of the blank which of course is held in a suitable mold and retained therein during the blowing of the glass. Preferably, and this is an important feature of my invention, the die nozzle is given a movement of rotation in the neck of the blank or bottle and the mechanism for effecting such rotative movement, as well as the introduction and withdrawal of the die nozzle is also a part of my invention.

Reference being now had to the drawings which illustrate a glass blowing machine provided with my improvements, Figure 1, is a side elevation of such a machine, Fig. 2, a front elevation, partly in section on the line 2—2 of Fig. 1. Fig. 3, is a view showing the bottom of the actuating spindle, its valve, the die nozzle and parts connected therewith, showing the parts in the position they occupy when the spindle is raised out of operative position. Fig. 4, is a perspective view of a bottle such as is formed in the mold illustrated. Fig. 5, is a plan view of the machine, and Fig. 6, a side elevation of a modified form of machine also embodying the leading features of my invention.

A, indicates the stationary table or base of the machine; B, a standard supported on said table; C, a rotatable table moving on the standard B, or about the same. This table, as shown, is provided with three mold receiving pockets C′, C′, C′, provided with adjusting and clamping bolts, as indicated at C^3, and the table also has secured on its upper face and symmetrically disposed with reference to the mold pockets, the lugs C^2, C^2, etc.

D, D, D, are molds which, as shown, are longitudinally divided into sections hinged together at D′, and provided with handles as shown at D^2, D^2. These molds, as shown in Fig. 2, are formed with cavities corresponding in form to the bottle or other object to be formed therein, the neck portion being adapted to form the neck of the bottle and also provided with a seat, as indicated at D^3.

The bottle is shown in Figs 2 and 4, at E, the usual neck and rim being indicated at E^2.

Between each pair of lugs C^2, is secured a pivot pin F, on which is hinged a latch lever F′, having an upwardly extending handle, as indicated at F^2. The latch levers are arranged to engage successively in the latch detent H′, of the stationary rim H, having an inclined surface H^2, over which the latch levers ride to enter the cavities H′. This latching device in combination with a mold carrying table forms in part the subject matter of my application for Letters Patent filed December 8th, 1904 Serial Number 235,960.

G, is a bracket which is secured to the standard B, preferably by a clamp as indicated at G′, so that the bracket can be shifted in position on the standard. The bracket carries a guideway G^2, and also supports a pivot pin G^3, to which is secured the yoke lever H, to the outer end H′, of which is secured a counterweight H^2, while the inner end is provided with a handle as indicated at H^3. The yoke lever supports pivot pins, as indicated at H^4, H^4, and to these pins are connected the connecting rods I, I, the upper ends of which are connected to pivot pins I′, I′, on the crosshead J, which crosshead is secured to the upper threaded end K′, of a spindle K, by means of clamping nuts L, L. The spindle K, passes through and is guided in the guideway G^2, and the lower end of this spindle is formed or provided with screw threads K^2, of steep pitch. The spindle is longitudinally perforated as indicated at K^5, Fig. 3, for the purpose of providing a channel for the admission of air and to its lower end is secured the valve box M, provided with a seat M′, at its bottom against which normally rests a valve N, with a depending spindle N′.

O, is a collar or head of a casing Q, the said collar being provided with balls or other devices for engaging with the threads K^2, of the spindle K, and the casing Q, having a perforated bottom Q′, and an annular shoulder Q^2, extending below this bottom and preferably provided with ball bearings, as indicated at R, R. To the inside of the collar Q^2, is secured the die blast nozzle indicated at S.

In operation, the table C, is rotated until one of the molds, which has already been provided with a blank, the preferable form of which is indicated in dotted lines at E′, Fig. 2, is brought into position immediately below the spindle K, in which position the table is arrested by the engagement of a latch lever F′, with a latch detent H′; the spindle is in elevated position, and the casing Q, and valve M, occupy the relative positions indicated in Fig. 3, the operator then presses down the handle lever H^3, which through the connecting rods I, I, draws the spindle K, downward, forcing the blast nozzle S, into the mouth of the blank and bringing the collar Q^2, down upon the bearing D^3, of the

mold, as these parts are shown in Fig. 2. The further continued downward movement of the spindle K, through its screw connection with the casing Q, then rotates the said casing and the nozzle S, and while this rotation is going on the valve box M, and the valve N, are moved downward in the casing Q, until near the end of the downward movement the valve spindle N′, comes in contact with the perforated bottom Q′, of the casing, opening the valve and admitting the air to and through the nozzle S, and into the blank which is then forced to take the conformation of the mold. The bottle being blown the operator then lifts or permits the lifting of the spindle K, which first of all imparts a rotative movement to the casing Q, and nozzle S, in the reverse direction to that in which these parts were moved by the descending spindle and finally lifts the casing and nozzle so as to disengage them from the bottle and mold, the valve N, of course closing at the very beginning of the elevation of the spindle. The operator, then taking hold of the handle F^2, of the engaged latch lever lifts the lever out of engagement and rotates the table until the next succeeding mold comes into operation beneath the spindle.

I have already mentioned that the latching mechanism shown is in part the subject matter of my above mentioned co-pending application and this is also true of the movable bracket G, as applied to any molding apparatus. I would also mention here that while I believe the mechanism illustrated and above described is that best adapted for the embodiment and utilization of my invention, it is capable of modification and change with regard to the special arrangement of the valve for admitting air and the mechanism for rotating the blast nozzle, and I wish to be clearly understood as asserting that my inventions are in no wise dependent on the illustrated mechanism, except where this mechanism is specifically referred to and called for in the claims.

In Fig. 6 I have illustrated one practicable modification of my invention, the machine being substantially the same as that already described except that instead of using a threaded spindle K, the spindle in this case, which of course supports the die nozzle is rotated and through it the nozzle rotated by means of a hand-wheel T, secured to the spindle, as shown.

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

1. In a glass blowing machine of the class described, the combination with a mold adapted to receive the blank to be blown, of a longitudinally and rotatably movable die blowing nozzle adapted to enter the neck of the blank and also to seat itself on the top of the mold above the blank and means for rotating said die nozzle when so seated and in operative position.

2. In a glass blowing machine of the class described, the combination with a mold adapted to receive the blank to be blown, of a die blowing nozzle adapted to enter the neck of the blank and also to seat itself on the top of the mold above the blank, and means for depressing and elevating the air nozzle to engage and disengage the mold and the glass therein, said means being connected with the nozzle so as to rotate it when its vertical motion is arrested.

3. In a glass blowing machine, the combination with a mold adapted to receive the blank to be blown of a longitudinally movable spindle having a steep screw thread or threads formed on its exterior, a casing engaged at its upper end with the screw threads on the spindle, a die blast nozzle secured to the end of the said casing and formed to enter the neck of a blank held in the mold and set against the top of the mold, means for moving the threaded spindle longitudinally and through it moving the nozzle both rotatively and longitudinally as described and means for admitting an air blast to the nozzle.

4. In a glass blowing machine, the combination with a mold adapted to receive the blank to be blown of a longitudinally movable spindle having a steep screw thread or threads formed on its exterior, a casing engaged at its upper end with the screw threads on the spindle, a die blast nozzle secured to the end of the said casing and formed to enter the neck of a blank held in the mold and rest against the top of the mold, means for moving the threaded spindle longitudinally and through it moving the nozzle both rotatively and longitudinally as described, means for admitting an air blast to the nozzle, and a valve for controlling the admission of air to the nozzle actuated by the approach and recession of the end of the spindle to and from the nozzle.

5. In a glass blowing machine, the combination with a mold adapted to receive the blank to be blown of a longitudinally movable spindle having a steep screw thread or threads formed on its exterior, said spindle being perforated to form an air conduit, a casing engaged at its upper end with the screw threads on the spindle, a die blast nozzle secured to the end of the said casing and formed to enter the neck of a blank held in the mold and rest against the top of the mold, means for moving the threaded spindle longitudinally and through it moving the nozzle both rotatively and longitudinally as described, and valve mechanism whereby the air is admitted to the nozzle when the spindle approaches it and cut off when the spindle recedes.

6. In a glass blowing machine, the combination with a mold adapted to receive the blank to be blown of a longitudinally movable spindle having a steep screw thread or threads formed on its exterior, said spindle being perforated to form an air conduit, a valve secured on the end of the spindle and normally closed by the pressure of air therein, a casing engaged at its upper end with the screw threads on the spindle, said casing having a perforated bottom, a die blast nozzle secured to the end of the said casing and formed to enter the neck of a blank held in the mold and rest against the top of the mold and means for moving the threaded spindle longitudinally and through it moving the nozzle both rotatively and longitudinally as described.

ROBERT P. FRIST.

Witnesses:
ARNOLD KATZ,
D. STEWART.