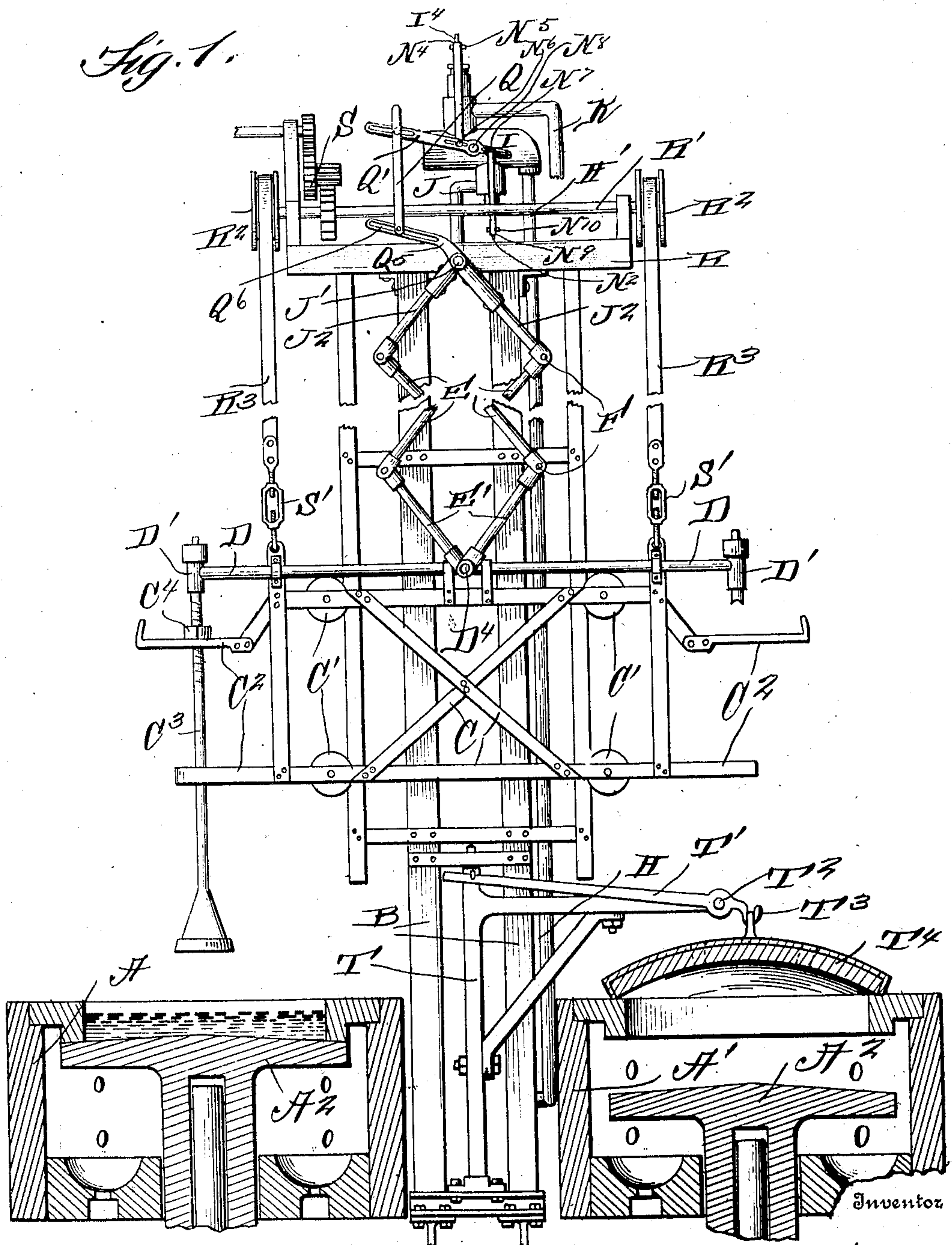


913,190.

Fig. 1.



Witnesses

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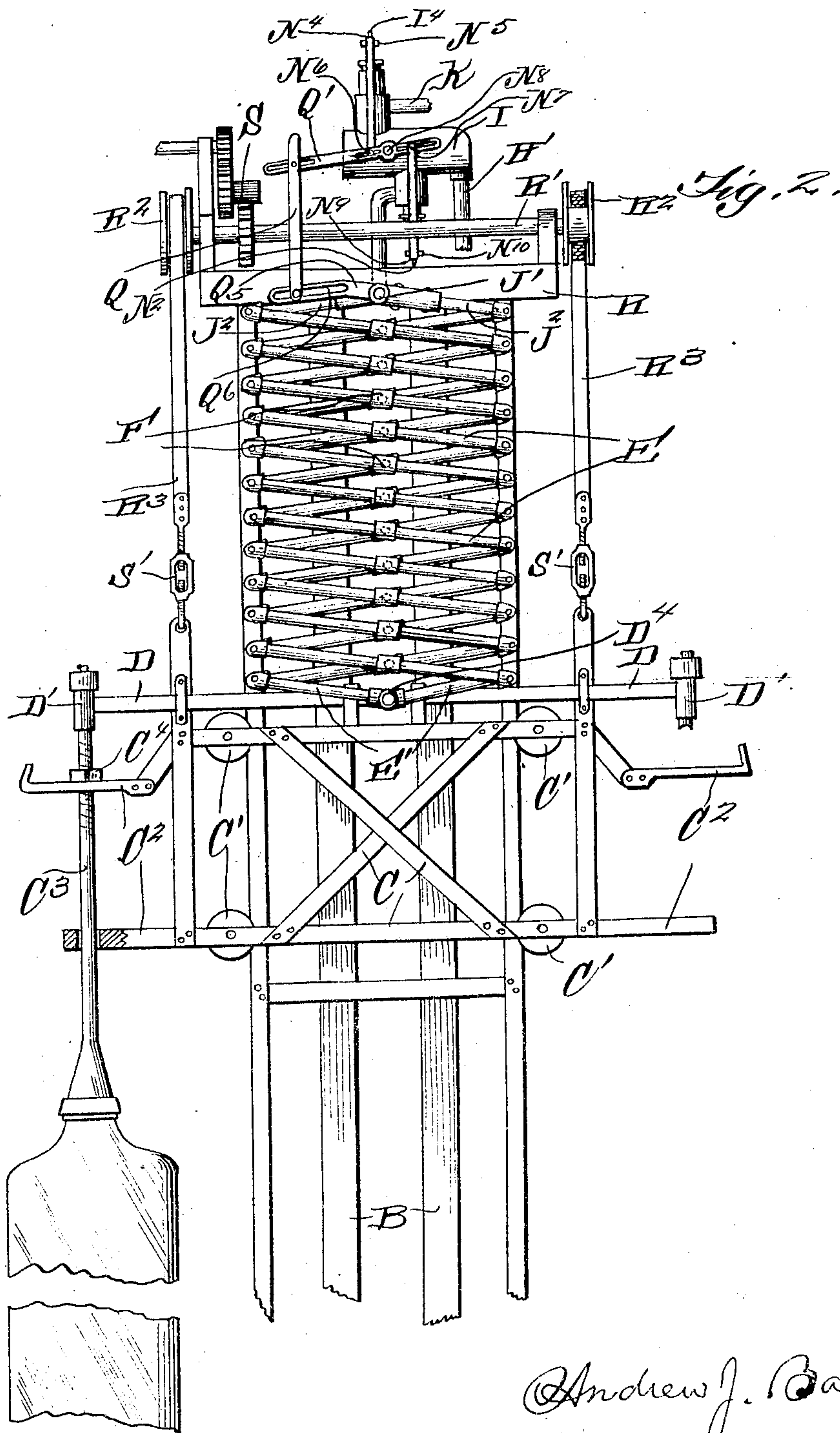
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 APPARATUS FOR BLOWING GLASS.
 APPLICATION FILED MAR. 14, 1908.

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Patented Feb. 23, 1909.
 3 SHEETS—SHEET 2.



Witnesses

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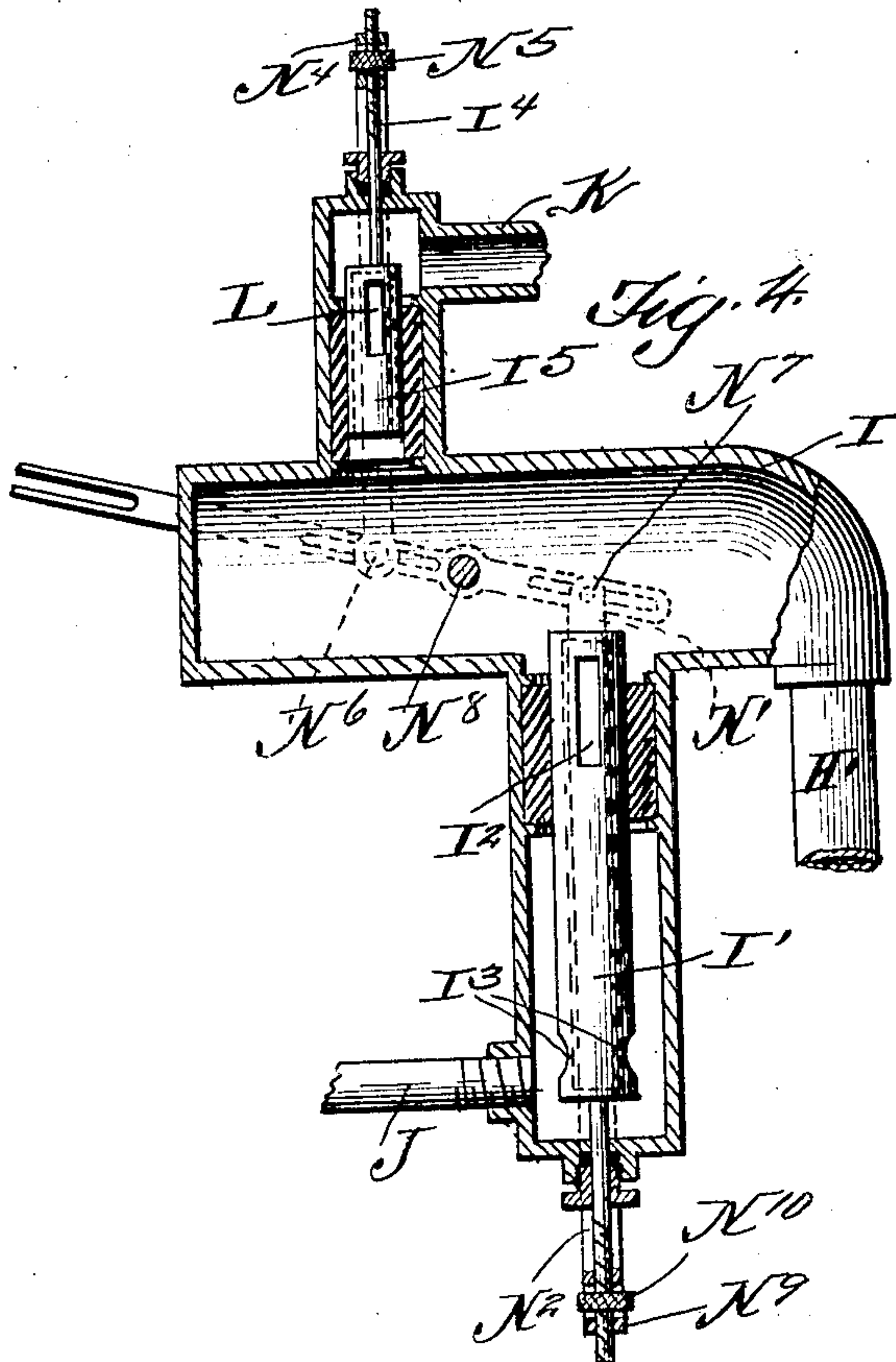


Fig. 5.

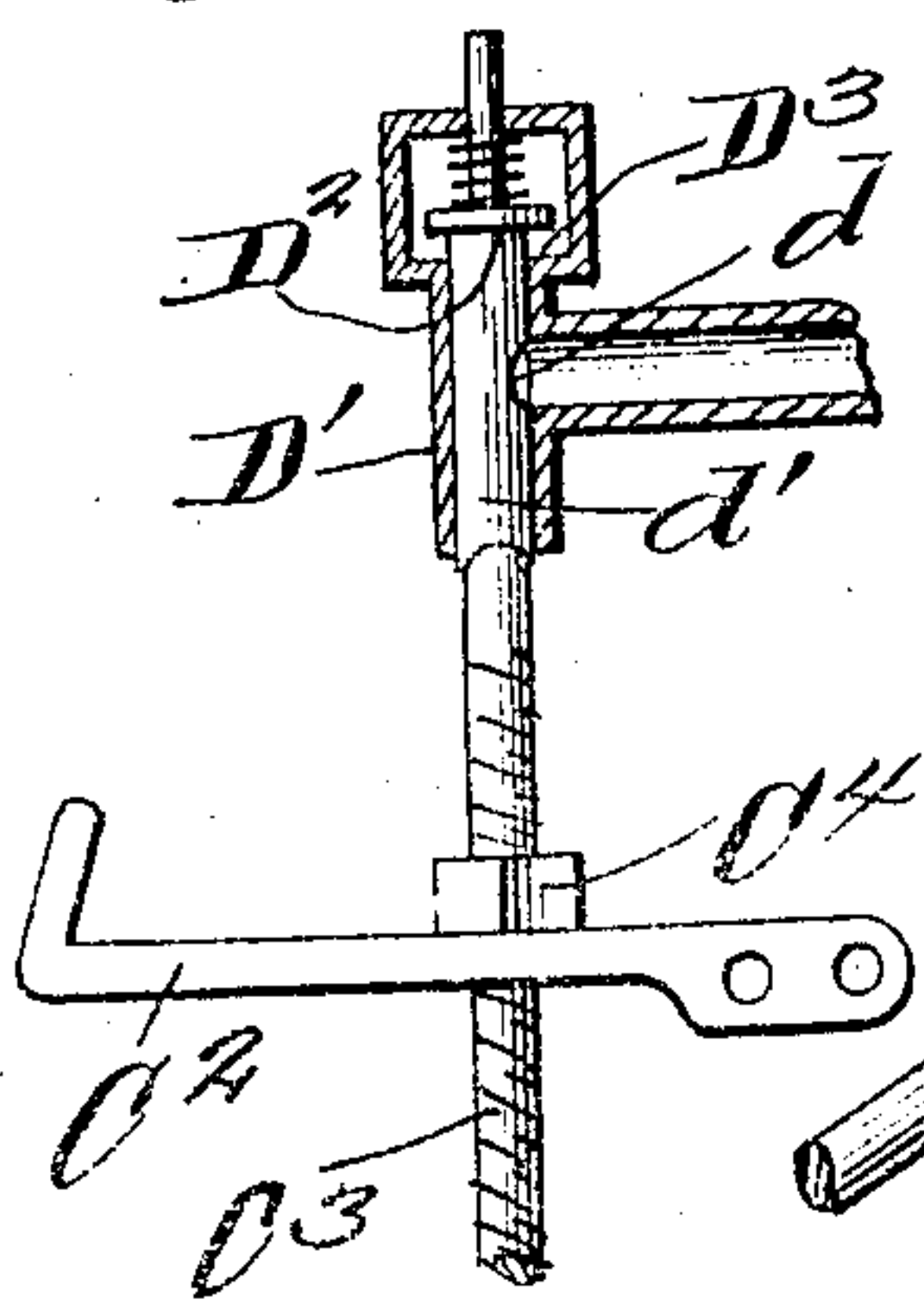
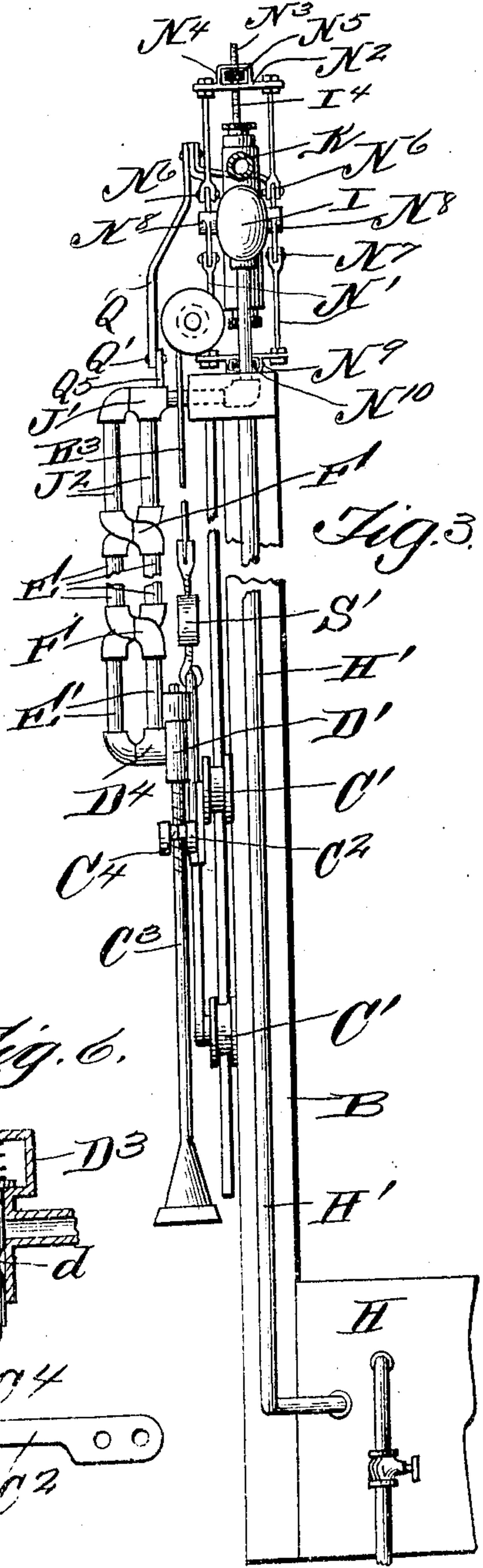
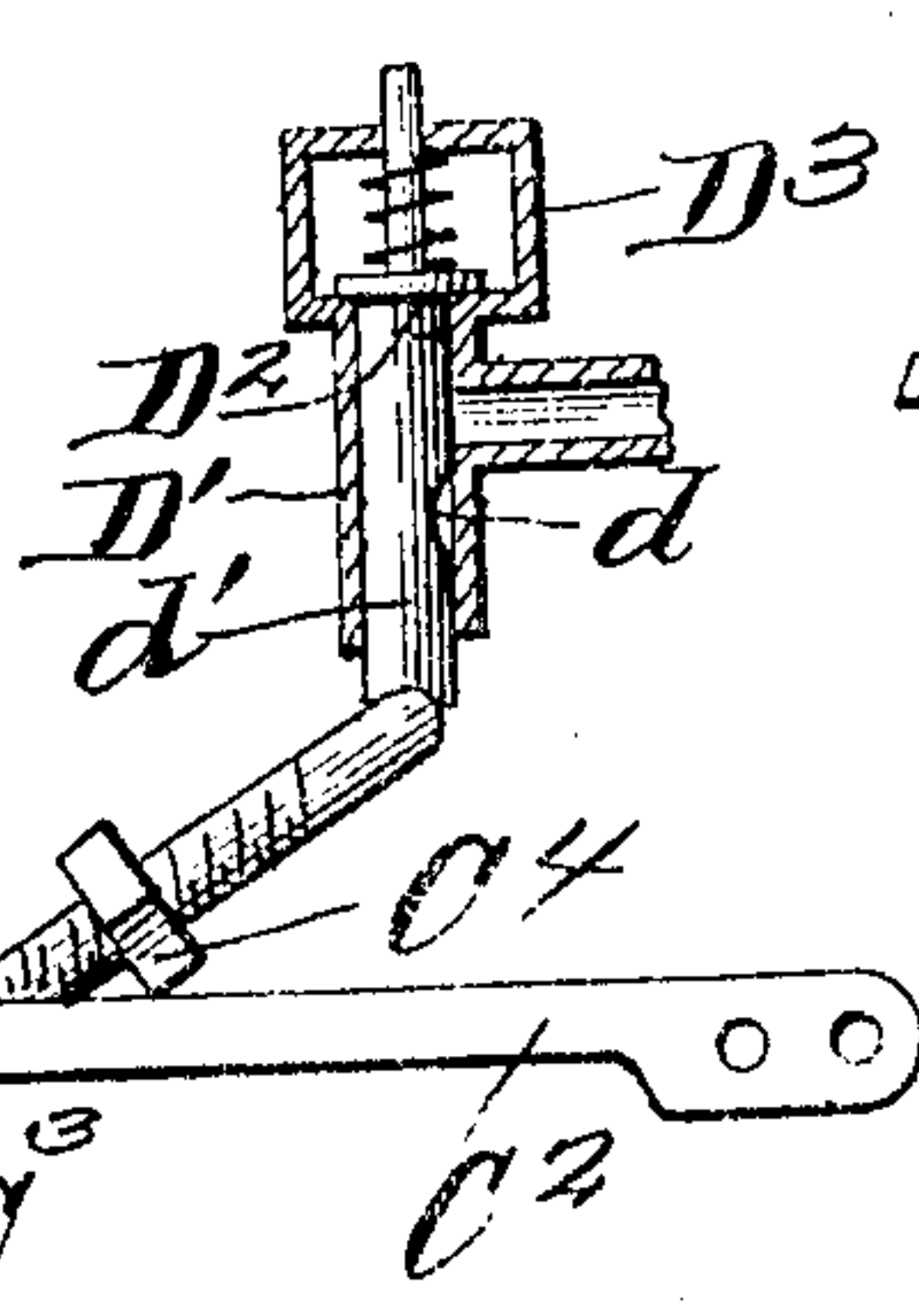


Fig. 6.



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UNITED STATES PATENT OFFICE.

ANDREW J. BATES, OF SANDUSKY, OHIO.

APPARATUS FOR BLOWING GLASS.

No. 913,190.

Specification of Letters Patent.

Patented Feb. 23, 1909.

Application filed March 14, 1908. Serial No. 421,067.

To all whom it may concern:

Be it known that I, ANDREW J. BATES, a citizen of the United States, residing at Sandusky, in the county of Erie and State of Ohio, have invented certain new and useful Improvements in Apparatus for Blowing Glass; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in apparatus for drawing glass articles, either hollow cylinders or other shapes, from a bath of molten glass, and comprises various details of construction, combinations and arrangements of parts which will be hereinafter fully described and then specifically defined in the appended claims.

My invention is illustrated in the accompanying drawings, in which:—

Figure 1 is a front elevation of the apparatus, portions being shown in vertical section. Fig. 2 is a similar view showing the apparatus in a raised position, showing the manner in which the parts would be positioned when the cylinder is completed. Fig. 3 is an edge view showing the parts in the positions illustrated in Fig. 1. Fig. 4 is an enlarged detail view of a valve apparatus for controlling the supply of air to the blowers. Fig. 5 is an enlarged detail view showing means for closing the air-supply pipe when a blow pipe is removed, and Fig. 6 is a detailed view of the valve mechanism shown in Fig. 5 closed as the blow pipe is removed.

Reference now being had to the details of the drawings by letter, A and A' designate two pots or receptacles for holding molten glass, having the removable bottoms A² so arranged that any glass remaining upon the upper surface thereof may be melted as the bottom is lowered in the manner shown in pot designated by letter A'. Rising between said pots or receptacles is a standard B upon which a vertically movable cross head C is mounted, which latter is provided with grooved wheels C' journaled in portions of the cross head which extend laterally beyond said standard B and adapted to bear frictionally against the outer edges thereof. Mounted upon the arms C² of the cross head are the blow pipes C³, and C⁴ designates an

adjustable collar which is movably held upon the blow pipe and rests upon one of the cross-pieces C², providing means whereby the blow pipe may be adjusted vertically.

D designates an air pipe which is horizontally disposed and connected at each end with a valve casing D', each of which has a spring-pressed valve D² therein having a tubular extension d', enlarged details of which are shown in Figs. 5 and 6. Said valve casing has a shouldered portion D³ against which the valve is adapted to seat. Said tubular extension d' has an opening d in the circumference thereof. The lower end of the tube d' is adapted to be engaged by the upper end of the blow pipe to hold said valve in the position shown in Fig. 5 when it is desired to allow air to pass through the blow pipe, in which position the opening d will register with the opening in the pipe D. When the blow pipe is removed from the tubing d', the latter will assume the position shown in Fig. 6, the supply of air being automatically cut off.

E—E designate series of sections of pipe pivoted together at F, and the outer ends of the sections E are also provided with airtight connections; the joints being so arranged as to allow the sections to fold in the manner shown in Fig. 2 of the drawings in the form of lazy tongs. The lower ends of the sections E are connected to the pipes E' which are pivotally connected to a union D⁴ which communicates with the pipe D. An air tank H is provided which has a pipe H' leading therefrom and through which air is supplied to a graduated valve casing I, a detail view of which is shown in Fig. 4 of the drawings, which, with its valves, controls the exhaust air and also the air necessary for blowing the cylinder. Mounted within said valve casing are two slotted plungers I' and I². The incoming air entering the valve chamber through the pipe H' enters the hollow plunger I' through the slot I² and thence passes through the openings I³ from whence it passes through the pipe J and communicates through a swivel union J' with the pipes J² which in turn are pivotally connected to and communicate with the uppermost of the pipes E, as shown clearly in Fig. 1 of the drawings. In order to maintain a uniform pressure of air in the cylinder H during the drawing process, an exit K for the surplus air leads from the upper portion of the valve casing I and the air, in order to pass through said exit

pipe K, passes through the slot L in the plunger I⁵ and thence into the upper portion of the casing from which it passes to the pipe K. In order to properly adjust said plunger, I provide the rods N' and N', the former of which are fastened at their upper ends to a cross-piece N², through which the threaded end of the plunger stem N³, which is fastened to the plunger I⁴, passes, as shown clearly in Figs. 3 and 4 of the drawings. Said cross-piece N² has a strap N⁴ surrounding an adjusting nut N⁵ which is mounted upon the threaded stem N³. The rods N are pivotally connected at N⁶ to the yoke N⁷, which latter is pivotally mounted upon the pins N⁸. Said rods N' are pivotally connected at their upper ends to the yoke N⁷ and their lower ends are pivotally connected to a cross-piece N¹ which is similar in construction to the cross-piece N² above described. Said cross-piece N⁹ is provided with a strap N¹⁰ having registering apertures therein for the reception of the threaded stem N¹¹ which is fastened to the plunger I'. Said yoke N⁷ is pivotally connected to a bar Q which in turn is pivotally connected at Q' to one end of the lever Q⁵, the pivot connecting said bar Q with the bar Q⁵ having an elongated slot Q⁶ to allow for the adjustment of the bar Q. The lever Q⁵ is connected to one of the pipes J² and is adapted, as the various pipe sections are raised and lowered, to assume the different positions shown in Figs. 1 and 2 of the drawings, to actuate the plungers in said valve casing to regulate the supply of air, thus making the actions of the plungers automatic in the operation of the apparatus. In order to regulate the supply of air through the pipes K and H', suitable valves may be positioned at any locations for convenience of the operator and to assist in increasing or decreasing the supply of air passing through said pipes.

Mounted in suitable bearings upon the cross-piece R of the standard is a shaft R' having grooved reels R² fixed thereto and to which the flat straps R³, preferably of metal, are adapted to wind as the shaft R' is rotated in any suitable manner, such as by the intermeshing gear wheels S driven from any suitable source of power. The lower ends of the straps R³ are connected to the cross head through the medium of the turn buckles S'.

T designates a crane which is pivotally mounted upon said standard and has a lever T' pivotally connected at T² upon the crane, said lever T' having a hook T³ at one end for engagement with the cover T⁴ for the molten glass pots or receptacles, said crane being adapted to swing so as to bring the cover either over one pot or the other accordingly as may be desired.

The operation of my apparatus will be readily understood and is as follows:—When it is desired to draw a cylinder from one pot

or the other of molten glass, a rotary motion is imparted to the shaft R' which will cause the cross head to rise and with it the blow pipes. The air is automatically fed through the pipes described leading to the blow pipes and, as the size of the reels R² increase in diameter incident to the reeling up of the straps R³, the upward motion of the cross head and the blow pipes is accelerated. After the cylinder has been blown, a reverse movement imparted to the shaft R' will allow the cross head to move downward upon the standard, after which the blow pipe upon the other side of the apparatus may be utilized for drawing another cylinder from the other pot of molten glass. While one pot is not in use, the bottom thereof may be lowered as shown in Fig. 1 of the drawings and the cover placed over the pot in order to allow any glass which might remain upon said bottom to be melted and run over the inclined top of said bottom of the receptacle.

By the foregoing, it will be noted that the two pots may be alternately utilized for blowing the cylinders, one being prepared for the molten glass while the other is in operation for the blowing process.

What I claim to be new is:—

1. An apparatus for blowing glass cylinders, comprising a vertically movable cross-head, blow pipes mounted therein, a series of air-supply pipes communicating with each other through joints and adapted to fold as the cross-head is raised, a valve casing communicating with said pipes, plungers mounted within said valve casing and adapted to regulate the supply of air passing through said casing, adjustable connections between said plungers and folding pipes, an air reservoir, pipes connecting the same with said casing, as set forth.

2. An apparatus for blowing glass cylinders, comprising a vertically movable cross-head, blow pipes mounted therein, a series of air-supply pipes communicating with each other through joints and adapted to fold as the cross-head is raised, a valve casing communicating with said pipes, plungers mounted within said valve casing and adapted to regulate the supply of air passing through said casing, a stem connected to each of said plungers, means upon the stems for adjusting the plungers, adjustable connections between the plungers and said folding pipes, an air reservoir, and pipe connections between the same and said casing, as set forth.

3. An apparatus for blowing glass cylinders, comprising a vertically movable cross-head, blow pipes mounted therein, a series of air-supply pipes communicating with each other through joints and adapted to fold as the cross-head is raised, a valve casing communicating with said pipes, plungers mounted within said valve casing and adapted to regulate the supply of air passing through

said casing, a stem projecting from each plunger, a yoke pivotally mounted upon the casing, connections between the yoke and said stem, adjustable connections between said yoke and folding pipes, an air reservoir, and pipe connections between the same and said casing, as set forth.

4. An apparatus for blowing glass cylinders, comprising a vertically movable cross-head, blow pipes mounted therein, a series of air-supply pipes communicating with each other through joints and adapted to fold as the cross-head is raised, a valve casing communicating with said pipes, plungers mounted within said valve casing and adapted to regulate the supply of air passing through said casing, a stem projecting from the outer end of each plunger, a yoke pivotally mounted upon the casing, a cross-piece upon each stem through which the latter pass, pivotal rod connections between said cross-pieces and yoke, and adjustable connections between the latter and said folding pipes, as set forth.

5. An apparatus for blowing glass cylinders, comprising a vertically movable cross-head, blow pipes mounted therein, a series of air-supply pipes communicating with each other through joints and adapted to fold as the cross-head is raised, a valve casing communicating with said pipes, plungers mount-

ed within said valve casing and adapted to regulate the supply of air passing through said casing, each of said plungers having an elongated slot therein and one of the plungers provided with openings in the circumference thereof, threaded stems projecting from the outer ends of the plungers, adjusting nuts mounted upon the threaded portions of the stem, a pivotal yoke mounted upon said casing, connections between said yoke and threaded stem, adjustable connections between said yoke and folding pipes, an air-supply reservoir, and pipe connections between the same and said casing, as set forth.

6. An apparatus for blowing glass cylinders, comprising a vertically movable cross-head, blow pipes mounted therein, a series of air-supply pipes having swivel union connections and arranged in the form of lazy tongs, means for supplying and regulating air fed to said pipes, a rotatable shaft, reels mounted thereon, and straps winding about said reels and connected to the cross-head, as set forth.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

ANDREW J. BATES.

Witnesses:

JAS. H. THATCHER,
J. R. SMALLEY.