2 Sheets--Sheet 1.

B. F. CHASE.

Apparatus for Working Glass.

No. 161,861. Patented April 13, 1875.

Fig. 1

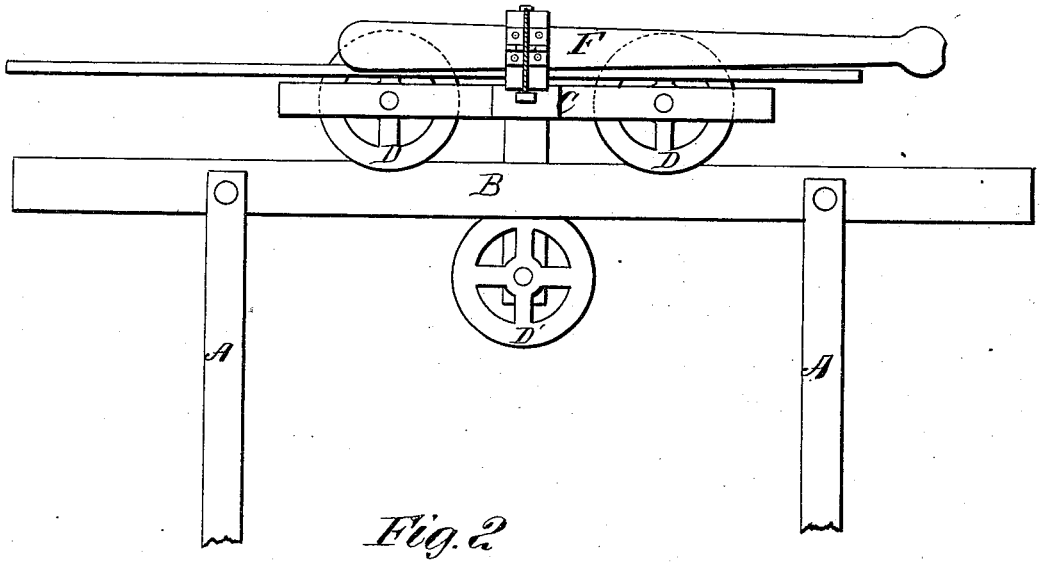

Fig. 2

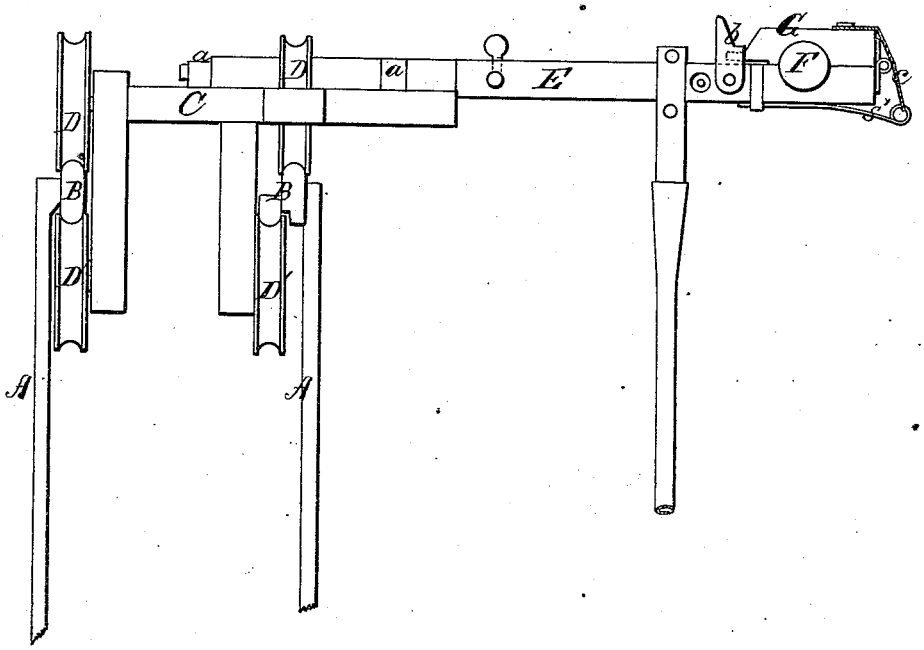

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Fig. 3

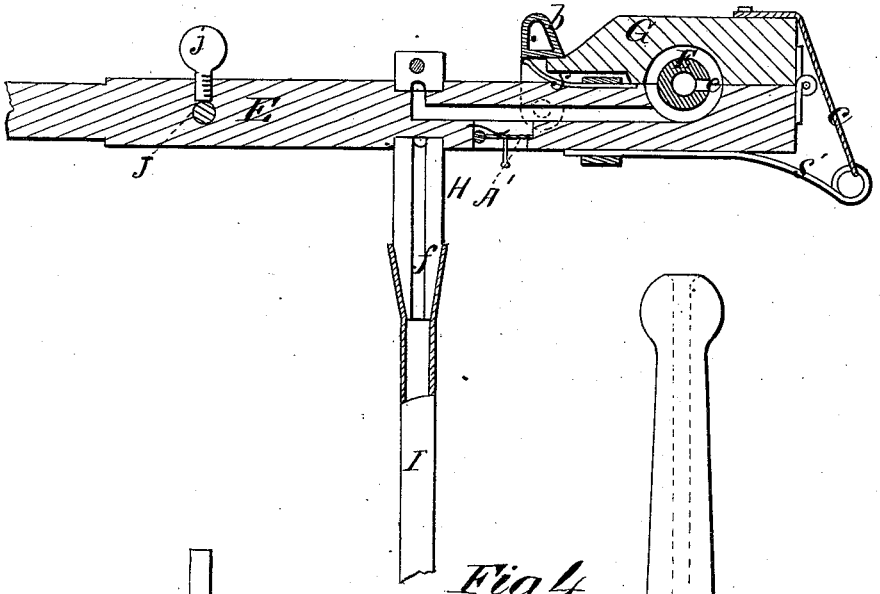
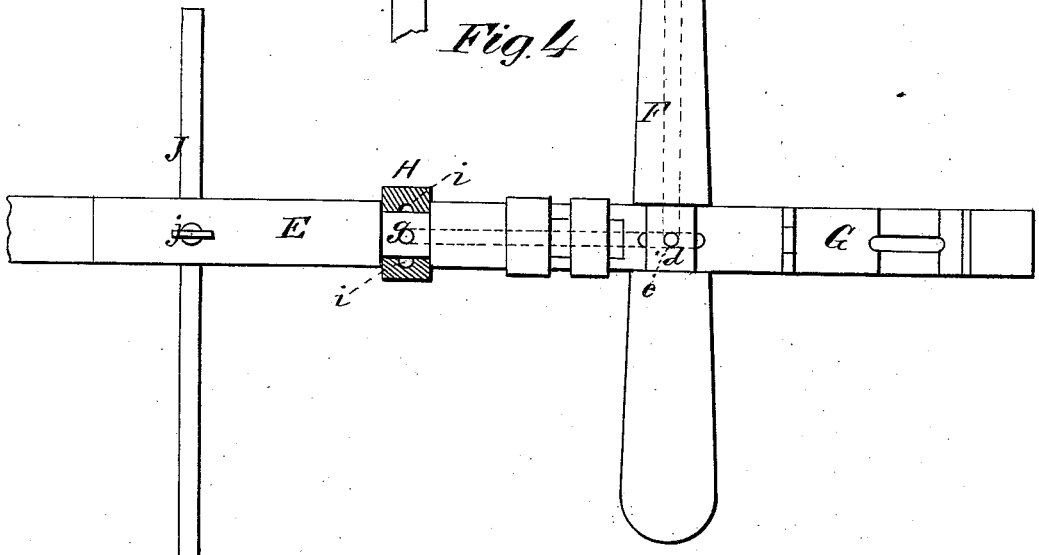


Fig. 4



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UNITED STATES PATENT OFFICE.

BENJAMIN F. CHASE, OF JACKSBOROUGH, TEXAS.

IMPROVEMENT IN APPARATUS FOR WORKING GLASS.

Specification forming part of Letters Patent No. **161,861**, dated April 13, 1875; application filed January 11, 1875.

To all whom it may concern:

Be it known that I, BENJAMIN F. CHASE, of Jacksborough, in the county of Jack and State of Texas, have invented a new and valuable Improvement in the Manufacture of Glass; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawing is a representation of a side view of my device. Fig. 2 is a front view of the same, and Fig. 3 is a sectional view. Fig. 4 is a detail view.

This invention has relation to improvements in the manufacture of glass; and has for its object to relieve the operators in glass-works of the bodily fatigue entailed by swinging heavy masses of glass on the end of the blowing-tube, and of relieving the lungs of the heavy and serious labor necessary for subjecting the glass to the various distentions required for producing any article.

To this end the nature of the invention consists in combining, with a blowing-tube arranged in and communicating with the tubular end of a horizontally arranged and rotating rod, a flexible pipe communicating with a blowing-engine, whereby the swinging movement may be given to the said blowing-tube for the purpose of elongating a ball of glass, and the power of a mechanical blower used for the purpose of distending the same, as will be hereinafter fully explained.

In the annexed drawings, A designates a number of uprights suitably fixed to the ground and sustaining on their upper ends rails B of a tramway. Upon this track is arranged a carriage, *c*, consisting of grooved wheels D D′, sustaining a suitable frame, this carriage being intended to run along rails B to and from the furnace, as may be required. E designates a horizontally arranged and rotating rod, of any suitable metal, projecting outward from carriage C in a line vertical to the track, which rod has its bearings in the upper part of the said carriage, and is held against displacement by means of journal-plates *a*, as shown in Fig. 2. The outer end of this rod is tubular, and it communicates with a blowing-tube, F, arranged in its end by means of a perforation, *e*, cut through to its tubular interior, as shown in Fig. 4, and it is detachable by means of a hinged plate, G, which is adapted to swing over and against rod E, to which it is secured by means of a latch, *b*, pivoted to the said rod, and adapted to be engaged over the free end of plate G, as shown in Fig. 3, this latch being actuated to effect an automatic engagement with the said plate by means of a spring, *s*.

When latch *b* is retracted plate G is automatically removed from rod E by the reaction of a spring, *s′*, rigidly secured, as to one of its ends to the said rod, and connected with the said plate by means of a flexible attachment, *c*. An examination of Fig. 3 will show that blowing-tube F is partly embraced in rod E and partly in plate G; consequently, when the latter is vibrated into the position shown in Fig. 4, the said tube may be replaced by another of greater length or size, in accordance with the amount of material to be manipulated, that portion *d* of the said tube embraced between the said plate and its rod being cylindrical and of reduced size, for the purpose of allowing it to rotate freely in its bearings, while preventing it from endwise displacement. H designates a tubular and sectional coupling, consisting of two parts clamped around rod E in a groove cut therein for the purpose, and communicating with the tubular interior of the said rod by means of a perforation, *g*.

This coupling, while having an air-tight connection with rod E, will allow it to vibrate freely in its bearings, the passage of air through the said coupling being at no time interrupted, owing to the fact of a groove, *i*, being cut completely around the cylindrical inner part of the same, as shown in Fig. 4. I designates a flexible tube, applied upon the end of the shank *f* of the coupling, extending thence to a blowing-engine, which may be either a separate and distinct apparatus, or that commonly used for producing a very high degree of temperature in glass or other like furnaces.

With a view to regulating the degree of strength of the blast to suit the various exigencies of the manufacture of glass, I have made use of a valve, A′, adapted to be thrust into the bore or tubular part of rod E, where-

by the degree of power of the said blast may be reduced or increased to any extent, thereby closely simulating and imitating the qualities of the lungs, and enabling the operator to easily and conveniently regulate the power of the blast or blowing engine.

Having described the mechanical parts of my improved apparatus for the manufacture of glass, I shall now proceed to describe its mode of operation.

The carriage is run up to the furnace, and the end of the blowing-tube inserted into the "glory-hole" until a sufficient quantity of material has been accumulated upon its end by successively repeated insertions. The carriage is then run back out of the way, and the blower-tube, having been connected with the blast-engine, is then caused to vibrate for the purpose of elongating the mass of metal upon its end, the process of distending the same meanwhile continuing, or alternating with vibrations, until the requisite size of cylinder has been obtained, when it is detached from the blower in the usual well-known manner, and is successively subjected to action of the heat in the "flatting-furnace," conveyed to the flatting-table, passing thence to the cutters, who divide the sheet into panes of glass of various sizes.

With a view to conveniently causing the vibratory motion to be imparted to the blowing-tube, I employ an actuating-rod, J, the same being preferably of metal, which is adjustably applied in a perforation through rod E, and is held in any position with relation thereto by means of a set-screw, *j*, as shown in Fig. 4.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a glass-blowing apparatus, the combination, with a mechanically-supported vibrating blowing-tube, F, of a pipe, I, communicating with a mechanical blower, substantially as specified.

2. The combination, with the blowing-tube F, arranged in and communicating with the tubular end of a horizontally-rotating rod, E, of the sectional coupling H of tube I, substantially as specified.

3. The combination, with the rod E, supporting blowing-tube F, of a transporting-carriage, C, substantially as specified, and for the purpose set forth.

4. The combination, with the rotating rod E, supporting blowing-tube F, of the adjustable actuating-rod J, substantially as specified.

5. The combination, with a blowing-tube, F, and a blast-pipe, I, communicating with a mechanical blower, of a regulating-valve, A′, substantially as specified.

6. The combination, with the rod E and blowing-tube F, of the hinged plate G and spring *s*′, substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

BENJAMIN F. CHASE.

Witnesses:

GEORGE E. UPHAM,

D. D. KANE.