

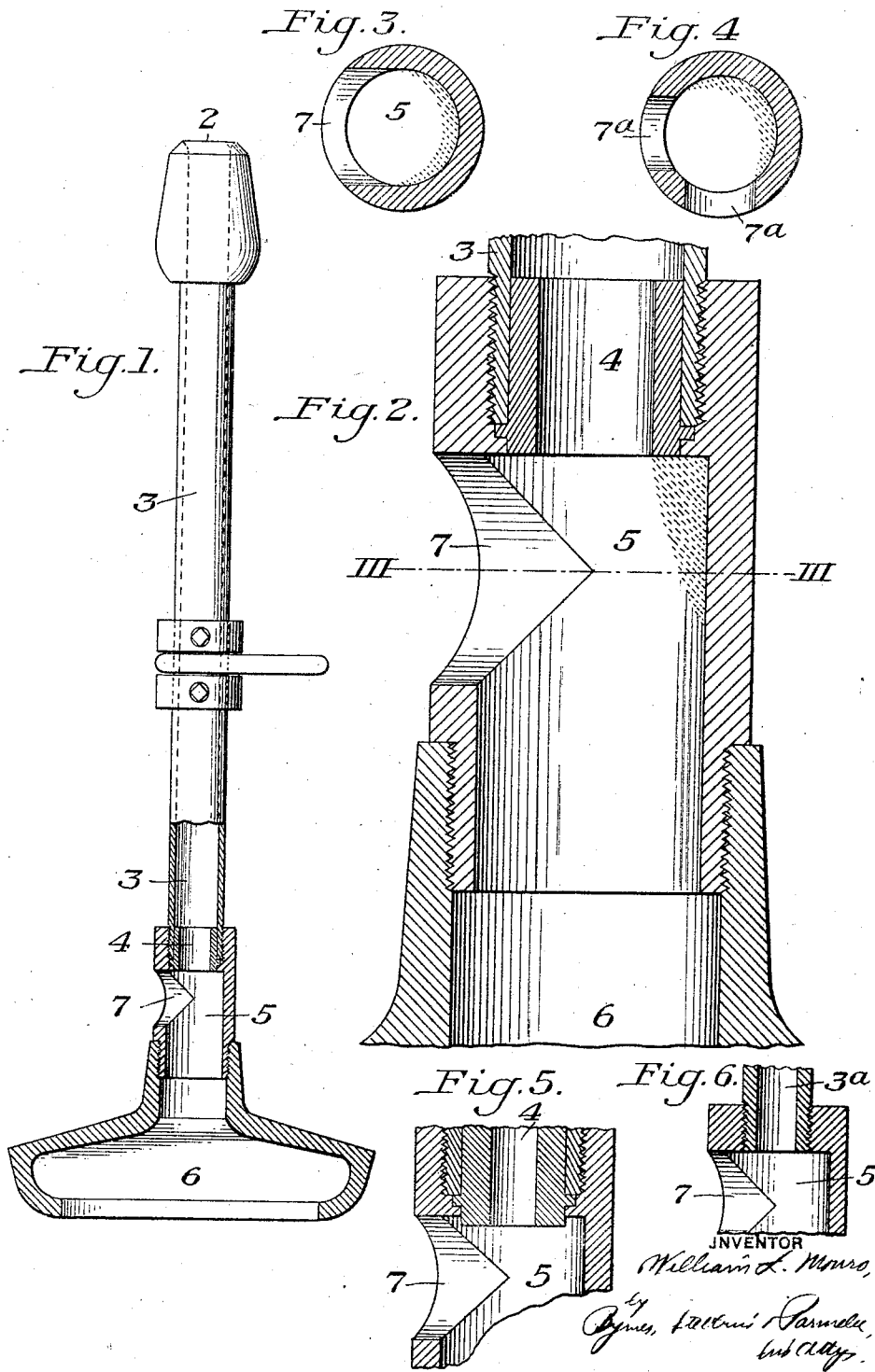
Jan. 26, 1926.

1,570,695

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GLASS DRAWING APPARATUS

Filed Nov. 6, 1922



UNITED STATES PATENT OFFICE.

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GLASS-DRAWING APPARATUS.

Application filed November 6, 1922. Serial No. 599,236.

To all whom it may concern:

Be it known that I, WILLIAM L. MONRO, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Glass-Drawing Apparatus, of which the following is a full, clear, and exact description.

This invention relates to glass drawing apparatus, and more particularly to the Lubbers venting system used in the drawing of glass cylinders. While the original Lubbers system of venting was effectual in reducing bumps or pulsations to within commercial flattening limits, this invention still further reduces such pulsations, and is effective to produce a more uniform cylinder under varying operating conditions.

In the co-pending application of *Monro, Clark and Pierce*, Serial No. 231,332, filed April 29, 1918, there is shown a venting system in which a jet of air is forced into a venting chamber of larger cross sectional area than the jet, thence through a long enclosed conduit to the cylinder. I have discovered that pulsations are still further reduced or avoided if the venting chamber is moved to a position adjacent the bait.

Another distinguishing feature of the present invention is the location of the venting opening with respect to the jet opening. I have found that the action of the vent is rendered much more sensitive if the vent opening extends at least as far as the plane of the air jet opening.

In the accompanying drawings, illustrating the preferred embodiment of my invention,—

Figure 1 is a view, partly broken away, showing my improved vent applied to the usual form of blow-pipe;

Figure 2 is a detail sectional view of a portion of Figure 1;

Figure 3 is a section, to reduced scale, on the line III—III of Figure 2;

Figure 4 is a view corresponding to Figure 3, but showing a two-hole form of vent;

Figure 5 is a detail sectional view showing a slightly modified form of apparatus; and

Figure 6 is a detail sectional view showing another modification.

In the preferred embodiment of the invention, air is supplied from an air line, not shown, through the usual ball connec-

tion 2 of a blow-pipe 3, thence through a restrictor 4 into a venting chamber 5. The venting chamber 5 is located adjacent the drawing bait 6.

A venting opening 7 is provided in the side wall of the chamber 5. The opening 7 may be of any shape, but it should extend at least as far as, and preferably be tangent to, or terminate in, the plane of the jet opening. I have found that the sensitivity of the vent is greatly increased by such an arrangement. The form shown in Figure 5 has also given good results. In this form the restrictor 4 projects slightly into the chamber. While the best results are apparently attained when the vent opening terminates in the plane of the jet opening, it may be shifted slightly upwardly without materially affecting the sensitivity. In other words, the jet opening should be at or below the upper edge of the vent opening.

The effect of the restrictor 4 is to cause the air to enter the chamber 5 in jet form. This results, I believe, in the formation of regions of sub-atmospheric pressure adjacent the chamber walls lateral to the air stream, as indicated by dotted section lines in Figures 2, 3 and 4. The space thus taken up I have designated generally as a "pocket", since there is a partially enclosed space back of the current of air moving through the chamber. This tendency to create a region of reduced pressure is of course obviated on one side by the vent opening, where atmospheric pressure will always tend to prevail. These two conditions, I believe, cause the air stream to be drawn slightly out of line toward the pocket, and any variation in pressure in the cylinder is reflected in the swaying of the air stream back and forth. This swaying causes greater or less air flow through the vent opening 7, depending on whether the air stream sways toward or away from the vent, and serves to very accurately regulate the cylinder pressure. I do not, however, limit myself to this theory.

In Figure 4 a modified form of apparatus embodying two vent openings 7^a is shown. The vents are so disposed with respect to the chamber wall that each has a pocket opposite it. Such a form has been found satisfactory in practice, whereas other forms, in which one hole was placed opposite the

other, thus eliminating the pocket, have not been satisfactory.

In Figure 6, an air supply pipe 3^a of smaller cross sectional area than the chamber 5 is used to give the jet action which I secure in the preferred form by the restrictor 4.

While I have shown the preferred form of my invention, it will be understood that it is not limited to the illustrated details, but may be embodied in other constructions without departing from the spirit of the invention or the scope of the following claims.

I claim:

15 1. In apparatus for drawing glass cylinders, a bait, a chamber adjacent the bait, and a nozzle of smaller cross sectional area than the chamber adapted for the discharge of air in jet form through the chamber and
20 into the bait, the chamber having a substantially continuous wall at one side of the path of said air jet and having an opening opposite such wall, substantially as described.

25 2. In apparatus for drawing glass cylinders, a chamber through which air is supplied to the cylinder being drawn, the chamber having an air inlet opening which is of smaller cross sectional area than the cham-

ber and adapted to deliver air in jet form, 30 the chamber also having a venting opening extending at least as far as the plane of the air inlet opening, substantially as described.

3. In apparatus for drawing glass cylinders, a chamber through which air is supplied 35 to the cylinder being drawn, the chamber having an air inlet opening which is of smaller cross sectional area than the chamber and adapted to deliver air in jet form, the chamber also having a venting opening 40 terminating in the plane of the air inlet opening, substantially as described.

4. In apparatus for drawing glass cylinders, a bait and a chamber immediately adjacent thereto through which air is supplied 45 to the cylinder being drawn, the chamber having an air inlet opening which is of smaller cross sectional area than the chamber and adapted to deliver air in jet form, the chamber also having a venting 50 opening terminating in the plane of the air inlet opening and having a pocket opposite the venting opening, substantially as described.

In testimony whereof I have hereunto set 55 my hand.

WILLIAM L. MONRO.