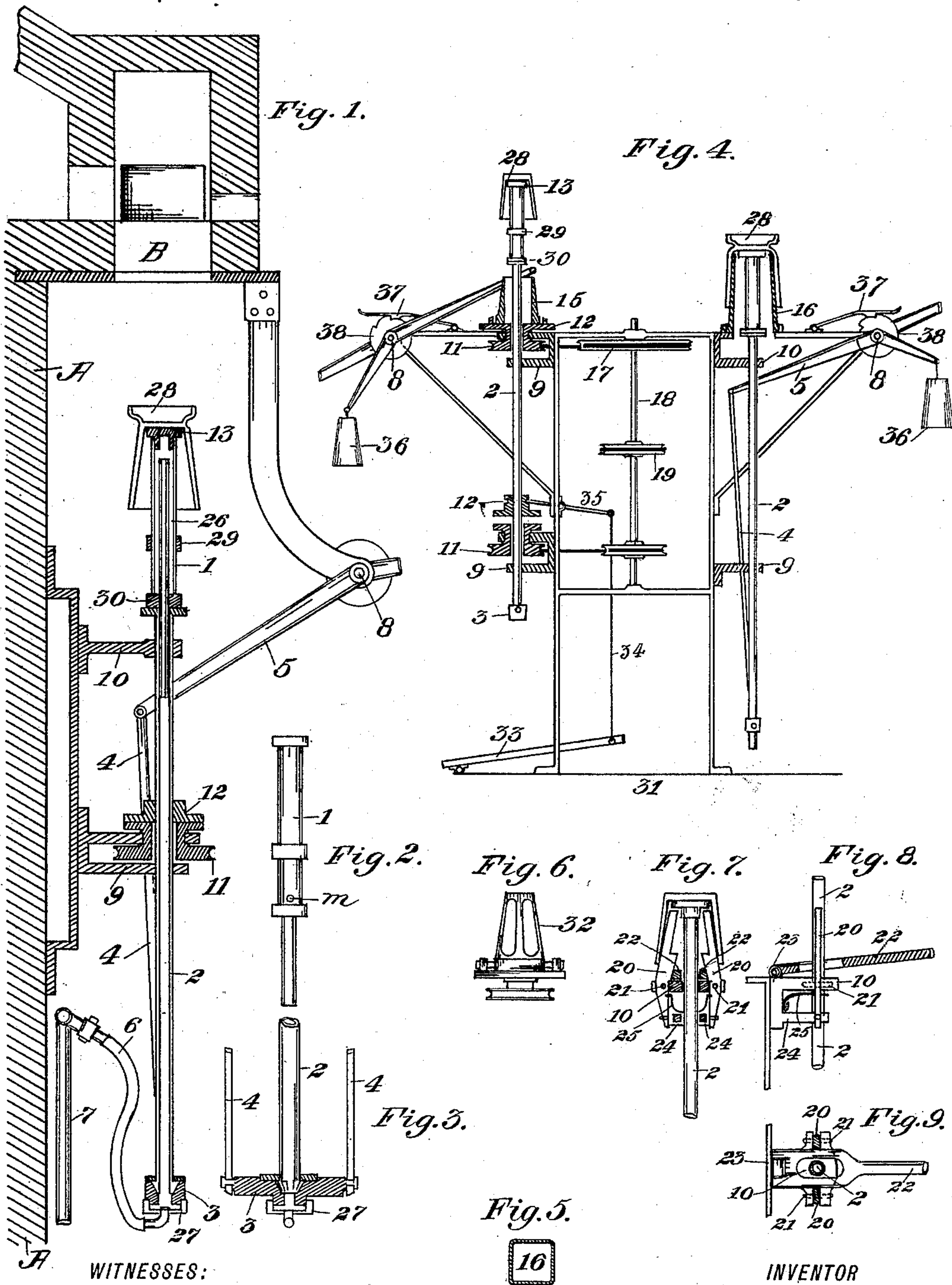


(No Model.)

H. SCHULZE-BERGE.  
MANUFACTURE OF GLASSWARE.

No. 418,235.

Patented Dec. 31, 1889.



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# UNITED STATES PATENT OFFICE.

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## MANUFACTURE OF GLASSWARE.

SPECIFICATION forming part of Letters Patent No. 418,235, dated December 31, 1889.

Application filed May 18, 1889. Serial No. 311,243. (No model.)

### *To all whom it may concern:*

Be it known that I, HERMANN SCHULZE-BERGE, a citizen of the Empire of Germany, and a resident of Rochester, Beaver county, Pennsylvania, have invented a new and useful Improvement in the Manufacture of Glassware, of which the following is a specification.

My present invention relates to an improvement in the manufacture of glassware; and it more particularly consists in apparatus for reheating and finishing glassware at the glory-hole.

In the accompanying drawings, forming part of this specification, Figure 1 is a vertical section through the apparatus and glory-hole. Figs. 2 and 3 are detail views. Fig. 4 is a vertical section through the apparatus attached to a table. Figs. 5 to 9 are detail views of modified formers.

Like symbols of reference indicate like parts in all the figures.

In a previous application, Serial No. 295,103, I have described an improvement in apparatus for reheating and finishing glassware, in which a vertical supporting-rod is provided with a head to receive the glass article thereon. In operating with this device the glass, when heated to a proper heat for finishing, sometimes partly sticks or melts upon such supporting-head and the ware is apt to be thereby spoiled.

It is the object of my present improvement to provide means for avoiding such an accident, and I obviate it by constructing the supporting-rod and the head thereof in such manner that it may be kept moderately cool. For such purpose I use a hollow supporting-rod, and provide means for withdrawing the heat from such supporting-rod and from the head by causing a cooling medium—such as a cold-air blast or water—to circulate within the supporting-rod.

Another difficulty in finishing and shaping glassware incident to my said prior apparatus consisted in the metallic former keeping too cool and thereby chilling the glass too quickly. This difficulty varies with the arrangement of the apparatus and according to the thickness of the glass to be shaped. It can be overcome to a considerable extent by constructing the former of a comparatively

small amount of metal, or by constructing it so as to touch the surface of the revolving glass article in narrow bands. I have, however, found it more expedient for such purpose to use the same former or shaper for several glass objects heated in succession in various openings of the glory-hole furnace. In this way the former or reshaping-tool can be kept at the required temperature, so that no trouble results from the chilling of the glass, but if found necessary a supplementary gas-flame may be used to keep the former at a proper temperature. The former or reshaping arrangement is constructed in general upon the same principles as described in my said application, Serial No. 295,103, and consists of the vertically-movable carrying-rod, constructed to receive or support the article heated in the glory-hole, and preferably made so that the carrying-rod may receive interchangeable supporting-rods.

As represented in Fig. 1, A A is the furnace, and B a glory-hole opening accessible from below. The supporting-rod consists of two separate parts—a removable upper part 1 and a lower part 2—which can be rotated, and also slides in stationary bearings. The two parts of the supporting-rod are detachably jointed or connected at *a*, so that their respective axial lines are parallel or coincident. This may be accomplished by inserting a protruding part of one rod into a correspondingly-shaped recess of the other rod.

As represented in Figs. 1 and 2, inside the upper and removable or interchangeable part 1 of the supporting-rod is slipped a narrow pipe 26, protruding some distance out of the wider one and into the hollow rod 2. The tubular rod or pipe 2 revolves in the socket 3, which socket can be raised or lowered by means of the connecting-link 4 and lever 5, connected with the axle 8. The rod 2 slides vertically in the bearings 9 and 10, and is made rotary in such bearings by means of a pulley 11 and clutch 12.

The cooling medium—such as compressed air, water, &c.—is introduced into the rod 2 from the conducting-pipe 7 through the flexible rubber tubing 6 and cap 27, which is screwed to the lower part of the socket 3. The prolongation 26 of the removable or upper part of the supporting-rod consists of a



tube through which the cooling medium introduced into the rod 2 is conducted directly underneath the top plate or head 13, upon which the glass article 28 rests. After striking the top plate 13 the cooling medium passes downward, chilling in its descent the outer or wider pipe of the carrying-rod, which otherwise, when the glass is raised into the glory-hole, would easily become heated to a red heat. The cooling medium may be discharged from the supporting-rod through an opening *m*, (shown in Fig. 2,) or it may be discharged in any other suitable manner. By the arrangement described the supporting-rod can be maintained cool in any position and whether revolving or stationary.

Upon the detachable upper part of the carrying-rod are shown two collars or rings 29 and 30, the upper one facilitating the removal of the part 1 by a tool similar to pipe-tongs, taking hold of the pipe directly underneath such ring or collar, while the lower one fits upon a similar ring or collar *a* of the part 2 of the supporting-rod. After being removed from the carrying-rod the supporting rod or head may be placed with the glass article on the end of one of the supporting-rods, (shown in Fig. 4,) in order to be shaped as hereinafter described.

Fig. 4 represents the same construction of carrying or supporting rod in connection with the former or reshaping-tool attached to a table or other constructional device to which the bearings of the carrying-rod may be attached. The former or reshaping-tool 15 surrounding the rod 2 is rotated by the grooved pulley 17 upon the spindle 18, which receives its revolving motion from the pulley 19. On the table 31 is also shown, at the right, a reshaping-tool 16, which, as represented by Fig. 5, is square in cross-section, and as it is of no benefit to construct a square reshaping-tool rotary neither the reshaping-tool 16 nor the supporting or carrying rod 2 are rotary, but the latter is simply capable of a vertical movement by means of the connecting-link 4, lever 5, and axle 8, the rod 2 being vertically movable in the bearings 9 and 10, for the purpose of lifting the glass article (in this case a square measuring-jar) from the reshaping-tool 16 by raising the same and supporting it from the inside.

In Fig. 6 a rotary reshaping-tool or former 32 is represented, which may replace the former 15 of Figs. 4 and 5. It is a metallic cone, similar to the former 15, but its walls or sides are perforated so that it is only a skeleton shaper, and in revolving runs through the same path as the former or shaper 15. 33 is the usual treadle with link 34 and lever 35 to raise the clutch 12. 36 are weights which, by the pawls 37 and ratchets 38, support the shapers when desired.

In Figs. 7, 8, and 9 another modification of the former or reshaping-tool is shown. It consists of a stationary bearing 10, through

which the revolving rod 2 slides. In such bearing 10 are also journaled two shanks 20, which are pivotally connected with the bearing 10 at places opposite each other. These shanks 20 are movable in an axial plane of the rod 2. The pivots or axles around which the shanks 20 are movable are marked 21. The shanks 20 have inclined noses, as clearly shown in Fig. 7, and such noses of both shanks bear against a forked lever 22, which passes loosely around the rod 2. The lever 22 is pivotally connected at 23 to the bearing, or to the table to which the bearing 10 may be attached, as indicated in Figs. 8 and 9. It is evident that if the lever 22 be raised, as in Fig. 8, both shanks 20 will be caused simultaneously to move around their respective pivots 21, and the upper part of the shanks will be moved away from the rod 2 in the axial plane of such rod, while the lower part of the shanks will be caused to approach more and more to the rod. In the path of the lower part of the shanks are arranged stop-blocks 24, so that the shanks can be moved around their pivots for a certain limited distance only. This distance can be made adjustable by set-screws in the lower part of the shanks engaging with the stop-blocks 24. A spring 25, attached to the bearing 10, bears against the lower part of the shanks 20, so as to force the upper parts of the shanks against the forked lever 22. If, therefore, the forked lever 22 be raised, the distance between the upper parts of the two shanks will be widened, while if it be lowered the spring 25 will cause the upper parts of the shanks to come nearer together. The upper part of the shanks 20 constitutes a reshaping-tool and is preferably made of steel. The glass article, if reheated to a temperature for finishing, lengthens out or drops and becomes narrower. By lowering the article over this reshaping-tool, while it is supported and revolved upon the rod, it may be flared out and reshaped by the shanks 20, which are caused simultaneously to move away from the rod 2 by the lever 22 being slowly raised.

I claim—

1. In an apparatus for reheating or finishing glassware, a supporting-rod constructed to receive the glassware thereon and provided with means for the circulation of a cooling medium, substantially as and for the purposes described.

2. In an apparatus for reheating and finishing glassware, a hollow rotary supporting-rod constructed to receive the glassware thereon and provided with means for the circulation of a cooling medium within such supporting-rod, substantially as and for the purposes described.

3. In an apparatus for reheating or finishing glassware, a hollow rotary supporting-rod provided with a head to receive the glass article, said supporting-rod revolving in a socket in which it is stepped, and an inlet-pipe for



a cooling medium, and an outlet for the discharge of the cooling medium, substantially as and for the purposes described.

4. In an apparatus for reheating and finishing glassware, a rotary longitudinally-movable supporting-rod, and a former or reshaping-tool around the supporting-rod, consisting of two pivotally-divergent shanks, and a lever for actuating the same, substantially as and for the purposes described.

5. An apparatus for reheating and finishing glassware, consisting in a supporting-rod suspended in an upwardly-movable bearing and guided in stationary bearings and adapted to slide therein, said rod being constructed to receive in its axial line other and interchangeable supporting-rods, in combination with a former or reshaping-tool in the

path of such rod, substantially as and for the purposes described.

6. In an apparatus for reheating and finishing glassware, a longitudinally-movable carrying-rod having at its end a removable supporting rod or head adapted to receive and hold the glass article and to be removed with the same from the carrying-rod, substantially as and for the purposes described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 4th day of May, 1889.

HERMANN SCHULZE-BERGE.

Witnesses:

CHAS. W. HURST,  
CHAS. RUNYON.