(No Model.)

F. WRIGHT & M. W. W. MACKIE.

APPARATUS FOR BLOWING AND SHAPING GLASS.

No. 267,962. Patented Nov. 21, 1882.

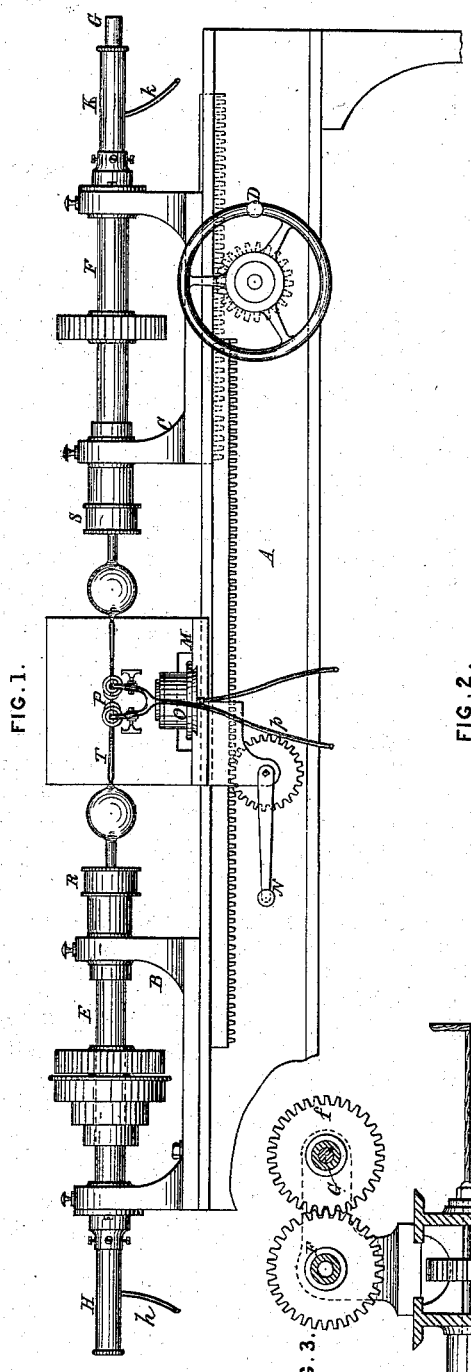

FIG. 1.

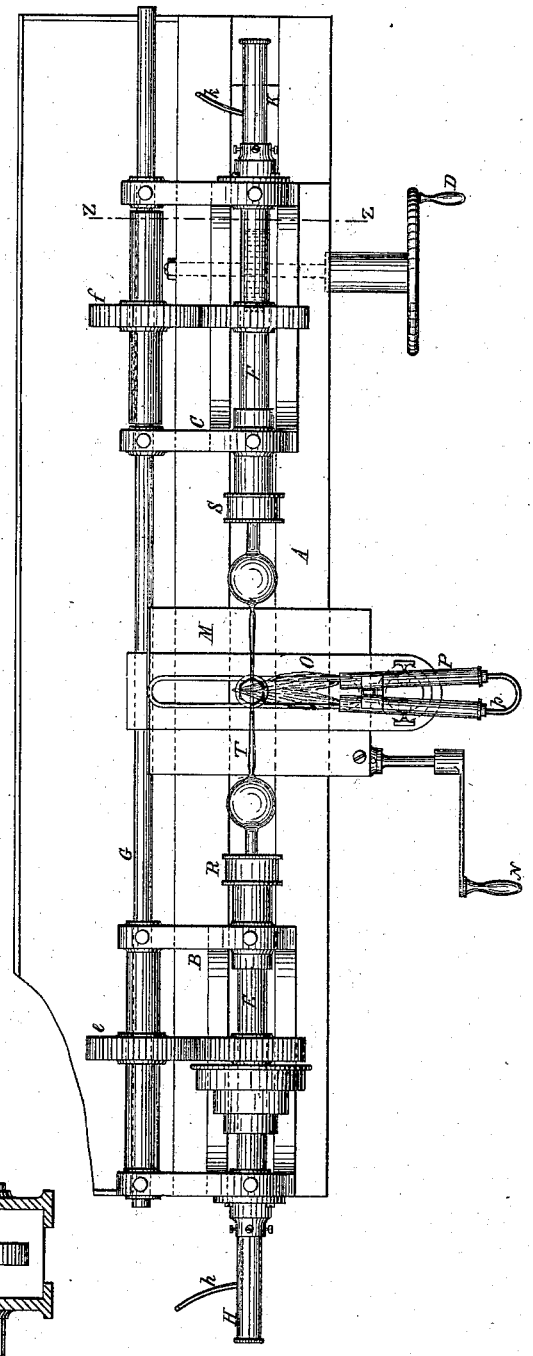

FIG. 2.

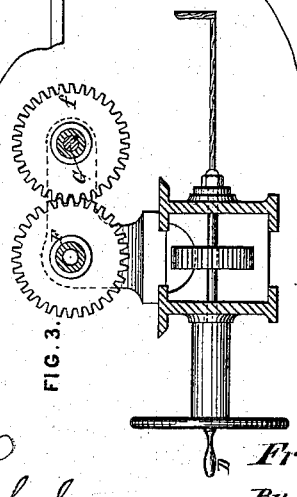

FIG. 3.

Witnesses.
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UNITED STATES PATENT OFFICE.

FRANK WRIGHT AND MATTHEW W. W. MACKIE, OF GRAY'S INN ROAD, COUNTY OF MIDDLESEX, ENGLAND.

APPARATUS FOR BLOWING AND SHAPING GLASS.

SPECIFICATION forming part of Letters Patent No. 267,962, dated November 21, 1882.

Application filed October 6, 1882. (No model.) Patented in England March 3, 1882, No. 1,033.

To all whom it may concern:

Be it known that we, FRANK WRIGHT and MATTHEW WILLIAM WALLBANK MACKIE, citizens of England, both residing at Gray's Inn Road, in the county of Middlesex, England, have invented a new and useful Improved Apparatus for Blowing and Shaping Glass, (for which we have obtained a patent in Great Britain, No. 1,033, bearing date March 3, 1882,) of which the following is a specification.

Our invention relates to apparatus for blowing and shaping glass heated by the blow-pipe to forms which are usually those of solids of revolution, the object which we have in view being to insure equable heating of the glass, and to hold it and move it without undue strains while it is being operated on, so that it can be readily manipulated by comparatively unskilled operatives.

The accompanying drawings show the apparatus which we employ for this purpose, Figure 1 being a side view, Fig. 2 a plan, and Fig. 3 a transverse section on Z Z.

On a bed, A, like that of an ordinary lathe, we fit two head-stocks, B and C, one of which, B, may be fixed, and the other, C, capable of being slid to and fro by a rack and pinion worked by a handle, D. In bearings in each of the head-stocks is fitted a tubular mandrel, E and F, of which E is driven by a belt or otherwise, and F by gearing from E, so as to revolve at the same speed. The gearing for this purpose consists of a pinion, *e*, driven from a wheel on E, a horizontal spindle, G, and on it another pinion, *f*, driving a wheel on F. The pinion *f* is fitted with a key or feather on the spindle G, so that it must revolve with it, but may slide freely along it with the head-stock C. At the end of each head-stock is fixed a tube, H and K, closed at their outer ends, but communicating freely with the respective tubular mandrels, and to each of the tubes H and K there is a communication by a flexible tube, *h* and *k*, from a reservoir of compressed air, each of those communications being provided with a cock or valve, so that the operator can open or close it at pleasure. Between the two head-stocks B and C is fitted a slide, M, that can be moved along the bed by a rack and pinion worked by a handle, N. On this slide is fitted a transverse slide, O, carrying a blow-pipe, P, which may be double, as shown, supplied with gas and air by flexible pipes *p*, each pipe being provided with a cock or valve, so that the quantity of air and gas can be regulated by the operator. The blow-pipe P is fitted to turn on a vertical axis on the slide O, so that the flames can be directed on the glass at any desired angle. Each of the mandrels E and F has at its front end a chuck, R and S, which is lined internally with soft or elastic packing material—such as leather, felt, or caoutchouc—capable of clamping a glass tube without unequal strain, and at the same time preventing escape of air from the hollow mandrel.

The apparatus is worked in the following manner: A glass rod or tube, T, is inserted into and clamped in the two chucks R and S and caused to revolve. The blow-pipe flame is directed on any part of it, and the part thus heated can be drawn out thinner or set up thicker by moving the head-stock C away from or toward B. By admitting air under pressure into either or both the tubes H K the glass tube can be blown at the heated part into a bulb, which can be elongated or flattened by moving the head-stock C. Again, if it be desired to join two glass rods or tubes, each is clamped in one of the chucks R and S, the free ends are brought together, and, being heated, can be joined; and it is obvious that pieces of glass held as described and caused to revolve under the influence of the blow-pipe flame can be variously shaped or molded, separated or joined, as may be desired

Having thus described the nature of our invention and the best means we know of carrying it into practical effect, we claim—

1. In an apparatus for blowing and shaping glass, the combination of the bed A, the head-stocks B and C, the tubular mandrels E and F, carried by the head-stocks, the slide M, arranged between the mandrels and adapted to slide longitudinally on the bed, and the blow-pipe P, carried by and moving with the slide, substantially as described.

2. In an apparatus for blowing and shaping glass, the combination of the bed A, the head-stocks B and C, mechanism for sliding one of

the latter, the tubular mandrels carried by the head-stocks, the slide M, arranged between the mandrels and adapted to move longitudinally on the bed, and provided with the transverse slide O, and the blow-pipe P, fitted to turn on or with a vertical axis attached to the transverse slide, substantially as described.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, this 21st day of September, A. D. 1882.

FRANK WRIGHT.
MATTHEW WILLIAM WALLBANK MACKIE,

Witnesses:
OLIVER IMRAY,
W. J. SKERTEN.