No. 714,558. Patented Nov. 25, 1902.

H. H. BRIDGWATER & J. HALEY.

GLASS MELTING AND MOLD CHARGING APPARATUS.

(Application filed Oct. 9, 1900.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

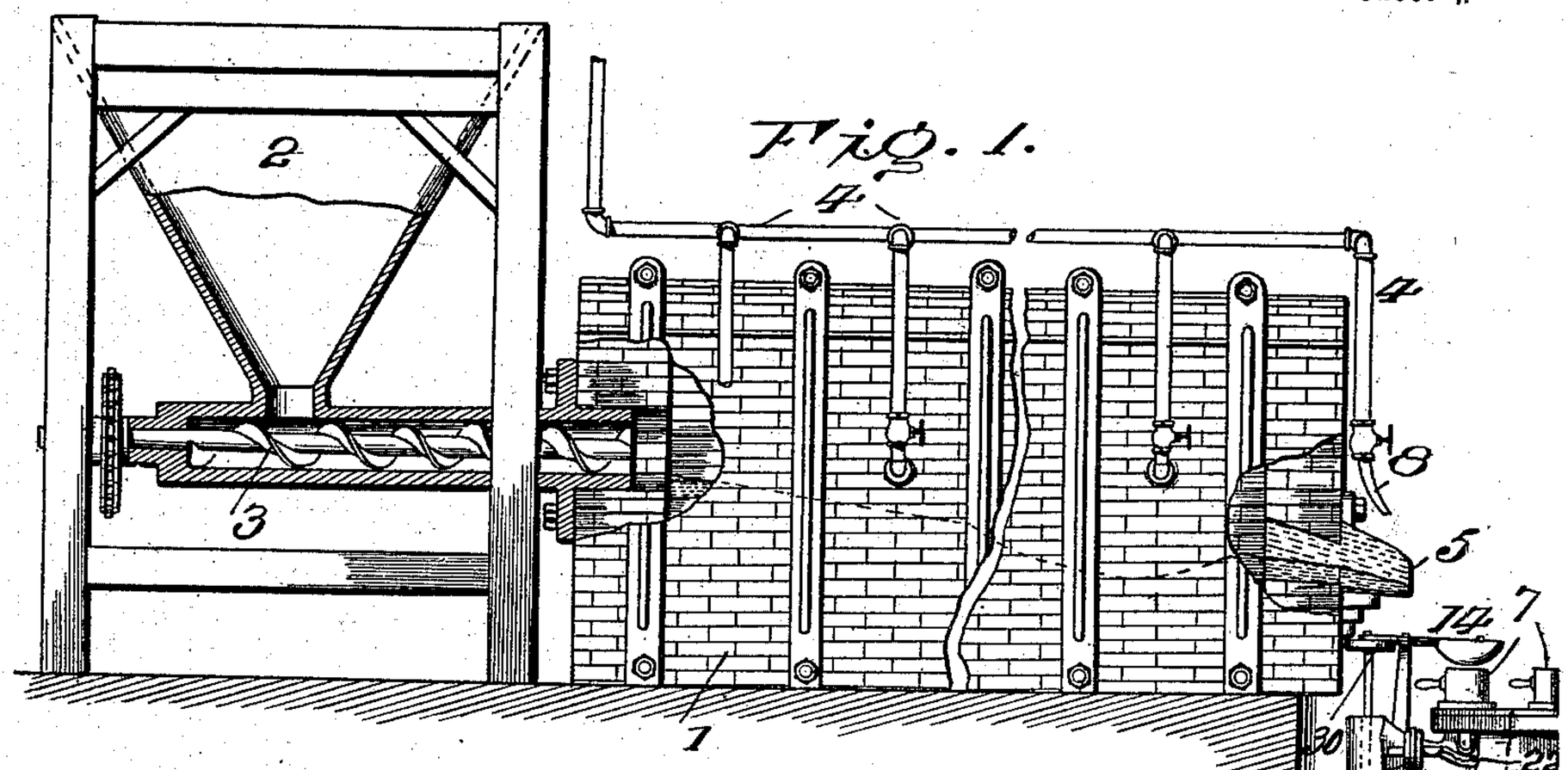

Fig. 2.

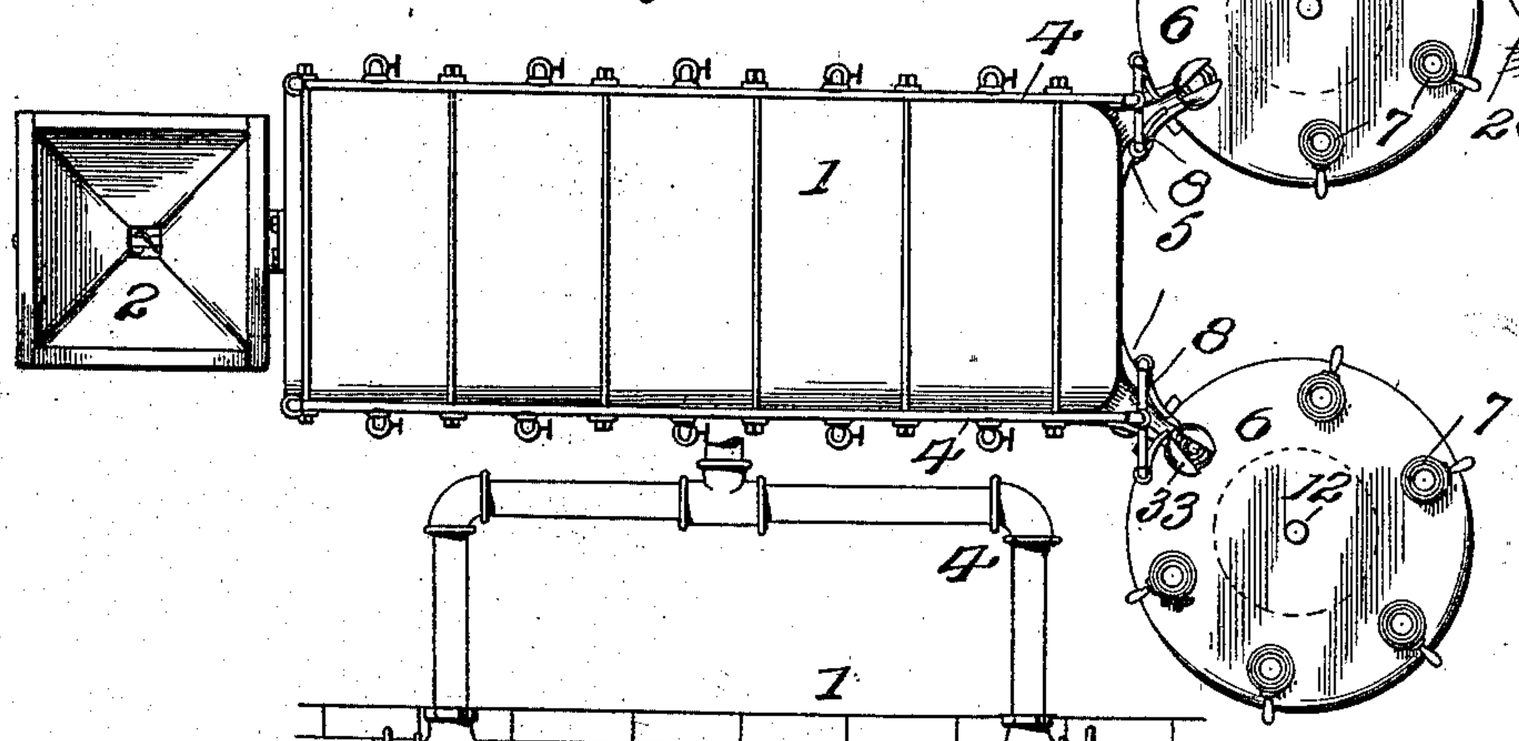

Fig. 3.

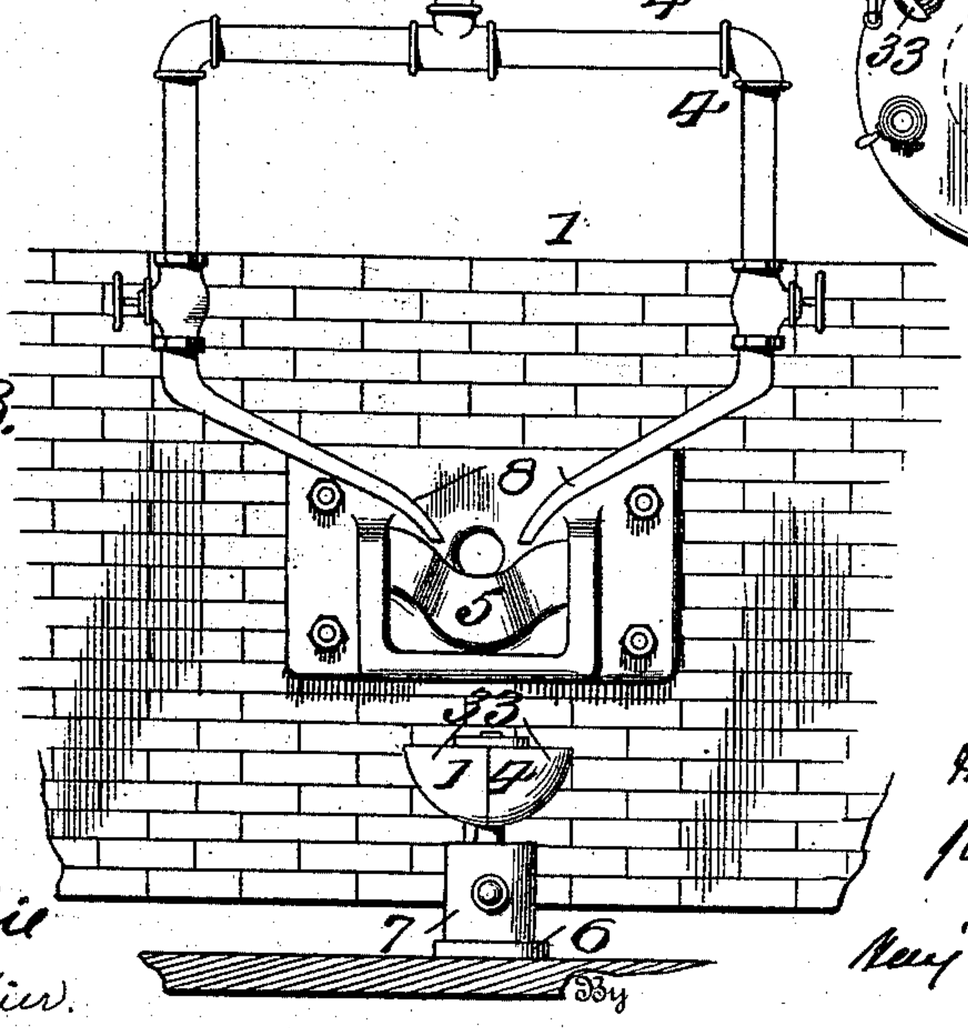

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FIG. 4.

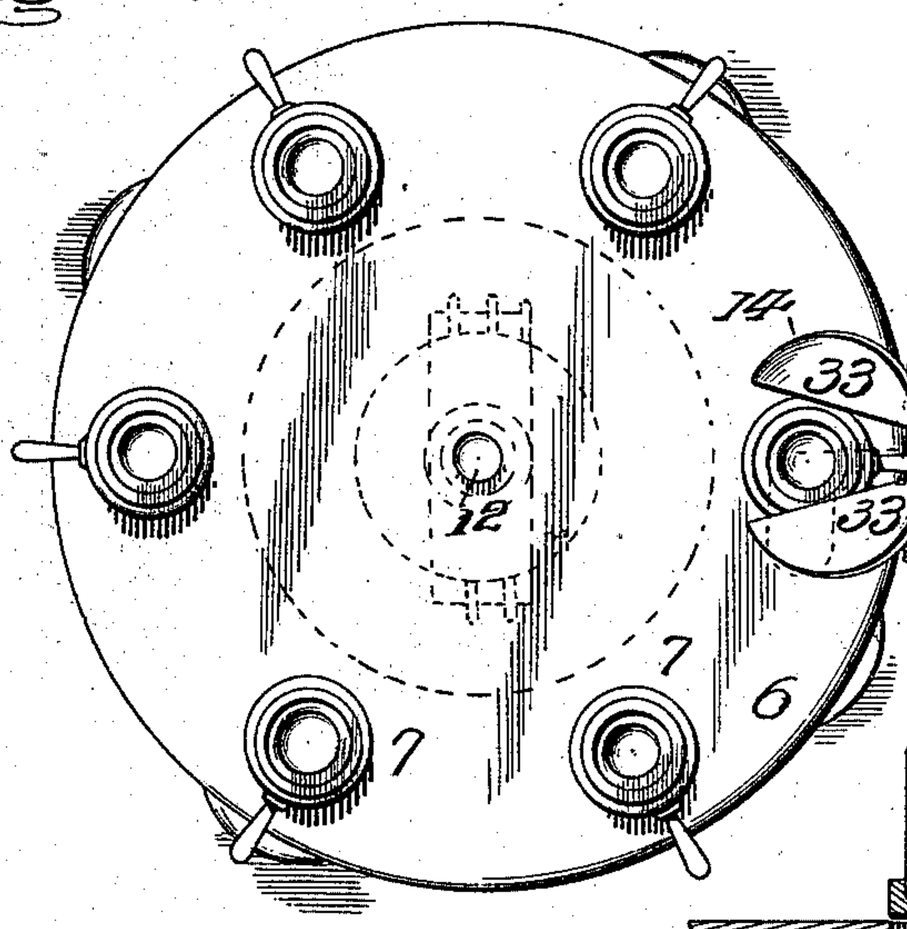


FIG. 6.

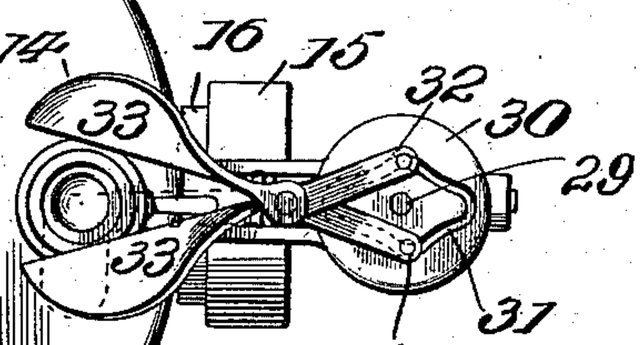
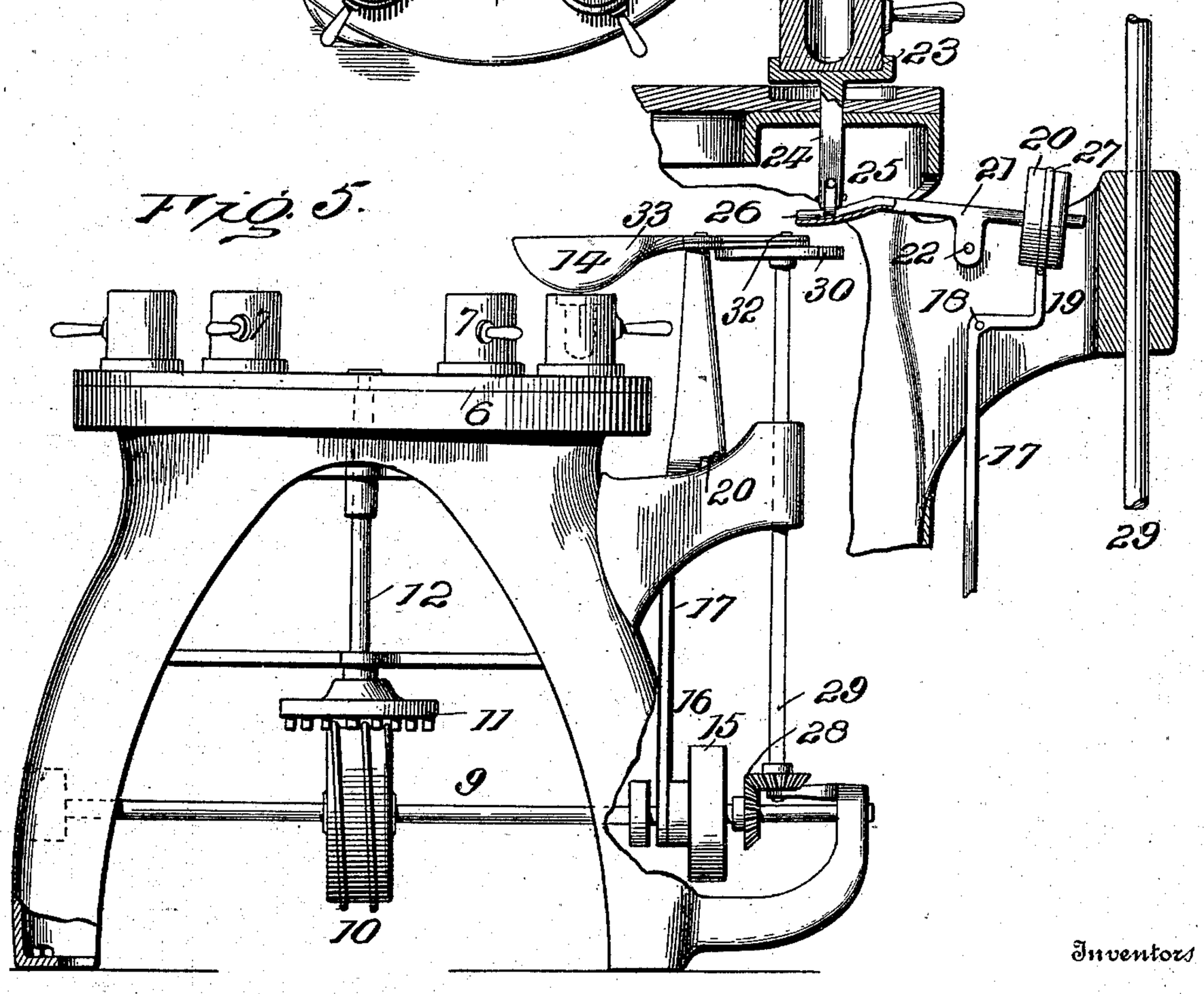


FIG. 5.



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HARRY H. BRIDGWATER AND JONATHAN HALEY, OF AKRON, OHIO, ASSIGNORS TO THE AKRON GLASS & MACHINERY COMPANY, OF AKRON, OHIO, A CORPORATION OF OHIO.

GLASS-MELTING AND MOLD-CHARGING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 714,558, dated November 25, 1902.

Application filed October 9, 1900. Serial No. 32,490. (No model.)

To all whom it may concern:

Be it known that we, HARRY H. BRIDGWATER and JONATHAN HALEY, residents of Akron, in the county of Summit and State of Ohio, have invented certain new and useful Improvements in Glass-Melting and Mold-Charging Apparatus; and we 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 pertains to make and use the same.

The invention relates to glass-melting and mold-charging apparatus. Its objects are to simplify prior constructions and increase their efficiency.

The invention consists in the construction herein described and pointed out.

In the accompanying drawings, Figure 1 is a broken side elevation of a melting-furnace. Fig. 2 is a plan of the same on a smaller scale, two rotating tables being also indicated. Fig. 3 is a partial end elevation. Fig. 4 is a partial plan showing a mold-carrying table, shears, and shears-operating cam. Fig. 5 is a broken side elevation of a table, mold, and weighing mechanism. Fig. 6 is a partial section showing a mold and weighing-lever.

Numeral 1 denotes a melting-furnace having a feeding-hopper 2.

A screw-feeder is denoted by 3.

4 indicates a system of pipes to supply fluid fuel.

5 denotes spouts for the discharge of the molten metal, and 6 denotes tables intermittently rotated to suitably present the molds 7 under the spouts to receive molten glass.

8 denotes branch pipes to supply fuel in or near the spouts to maintain the heat of the metal discharged from the furnace. All pipes are supplied with cocks substantially as indicated.

The tables or mold-carriers 6 carry molds or other receptacles 7 and are each operatively connected to a separate shaft 9, provided with a worm 10, coacting with a crown-toothed wheel 11 on a stem 12, suitably fixed to the table, only one shaft 9 being shown.

The metal flows continuously, and shears 14 are provided to sever the mold charges from the furnace-discharging stream of metal. These shears are operated automatically at intervals corresponding to a definite and weighed mold charge by the following devices.

15 denotes a pulley loose on the shaft, and 16 a sliding clutch, such as a magnetized disk or wheel, keyed in usual manner to the shaft. In the present instance the clutch is a magnet and is moved into and out of contact with the pulley 15 by means of a bell-crank lever 17, fulcrumed at 18 in a bracket fixed to the table. The lever 17 may have its short arm provided with an extension 19, situated under a weight 20, adjustably supported on an arm of a weighing bar or lever 21, having a fulcrum at 22.

The molds or receptacles 7 have each a support 23, loosely seated in the table and provided with a stem 24, having, preferably, a roll 25, which travels on the inclined part 26 of the lever 17 while the table is rotating and glass is being charged into the mold. Each table 6 constitutes a main rotary support or carrier for the molds or receptacles 7, and the parts 23 constitute each an individual intermediate or subsidiary support for a mold 7, movable vertically with respect to the main rotary table.

As soon as the accumulating weight of the glass in the mold is sufficient to counterbalance the outer end of the lever and its weight they are raised and through the medium of a strap 27 lift the short arm of lever 17 and throw the magnet 16 against pulley 15, so that the latter is thereby fixed to the shaft that then suitably moves the table and its molds and also through the medium of gears 28 and shaft 29 rotates the cam 30. Said cam has a groove or grooves 31, in which travel rolls or pins 32, connected to the handles of the shears in manner to suitably operate them to cut off the flowing glass.

The shears have their cutting edges on the lower side of the blades, which are provided with concavities 33 above said edges adapted to coöperate to form a cup to hold the flowing glass separated from the mold charge and accumulating during the interval before another mold begins to receive its charge, the shears being at such times suitably opened by the cam to drop the glass from said con-

cavities into the mold. As the next unfilled mold is brought toward its receiving position by the suitably-moved table the just-filled mold is moved from under the shears and off the weighted lever, which falls and releases lever 17 and separates the magnet 16 from the pulley.

In operation solid glass or glass-making materials are fed into the furnace by the medium of the hopper and screw conveyer or equivalent feeding devices, and the fuel consumption is so regulated as to produce a suitable continuous flow of molten metal in the discharge-spouts, which may be of any desired number, each being combined with a mold-carrier. The driving-pulley 15, which is movably loose on its shaft, is clutched thereto in the present instance by a magnet keyed to and sliding on the shaft under the operation of a lever actuated by a suitable weight of glass charged into a mold. The pulley being clutched to the shaft by a magnet or equivalent clutch, substantially as specified, the cam is rotated to operate the shears to sever the stream of glass, and simultaneously the table is moved, whereby an empty mold is brought under the shears to receive glass from its cup and from the spout, the shears being at such time opened by the cam.

The particular form of mold-support hereby illustrated is not essential nor the exact character and arrangement of shear-operating devices, including the particular clutch mechanism, and though molds are described and conventionally indicated any form of molds or other receptacles may be used. Mere mechanical changes which do not substantially depart from the herein-described principles of operation and construction are contemplated and may be adopted. For example, the movable mold-support may be modified or dispensed with and the mold-bottom itself extended to slide up the incline of the weighing-lever.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The combination of a furnace for producing a continuous flow of molten metal, molds for receiving portions of the metal directly from the furnace, devices for successively placing said molds under the flowing metal, an opening and closing device for severing the stream of metal, and means for positively opening and closing said device.

2. In combination with means for producing a continuous stream of molten metal, and with a mold for portions of such metal, shears to sever the stream of metal situated immediately above said mold, said shears having concavities to produce a closed liquid-holding cup immediately after the operation of severing the metal stream.

3. In combination with a furnace for producing a continuous stream of molten metal, a delivery-spout therefor, a mold for portions of the metal, said furnace delivering metal directly through the spout to the mold, shears to sever the stream, and shear-actuating devices comprising weighing mechanism.

4. In combination with a melting-furnace for producing a continuous stream of molten metal, and with a mold for portions of such metal, shears to sever the stream between the furnace-outlet and the mold, shear-actuating devices, said devices comprising a lever actuated by the weight of metal charged into the mold and adapted to move a magnet to connect the shear-actuating devices with a driving-pulley, and said driving-pulley.

5. In combination, a rotating table, a transversely and independently movable mold carried by the table, a clutch, a clutch-moving lever having an arm in the path of the mold whereby the rotation of the table causes the mold to move along the lever, and means including a furnace for charging molten metal into the mold to weigh down the lever and move the clutch.

6. The combination of molds for molten metal, a melting-furnace to directly charge the molds, a device for severing the stream of metal between the furnace and molds, a carrier for the molds, a driving-shaft, and connections between said shaft and the carrier and between said shaft and the severing device, whereby both the carrier and severing device are actuated.

7. The combination of a mold, a mold-carrier, means including a furnace for charging the mold, a shaft for moving the carrier, mechanism for weighing the charge, shears for cutting the mold-charging current, devices adapted to be operatively connected with the said shaft for actuating the shears, and connections intermediate the weighing mechanism and the shaft, whereby the weight of a charge connects the shaft to a source of power to move said shaft and sever the charging-current and move the mold-carrier.

8. The combination of a series of molds movable by metal charged in one of the series, a furnace supplying a continuous current of metal, devices to sever the current and separate a charge, and mechanism intermediate the mold and severing device whereby the charged mold automatically severs the stream of metal, said severing device being adapted to temporarily hold molten metal after the severing operation and subsequently charge it into another mold.

9. The combination of a melting-furnace, a series of molds movable by molten metal charged in one of the series, means for charging the metal, devices for severing the stream that effects the charging, and mechanism intermediate one of the molds and the severing device whereby the charged mold automatically severs the stream of metal, a main rotary mold support and carrier, and additional mechanism coöperating with said mechanism and thereby adapted to move the carrier and the charged mold supported thereon and carry into the place of the removed mold

and to a charging position another mold supported on said carrier.

10. The combination of a melting-furnace, a series of molds movable by metal charged in one of the series, means for charging the metal, devices for severing the stream that effects the charging, and mechanism intermediate the mold and severing device whereby the charged mold automatically severs the stream of metal, a main rotary mold support and carrier, and additional mechanism coöperating with said mechanism and thereby adapted to move the carrier and the charged mold supported thereon and carry into the place of the removed mold and to a charging position another mold supported on said carrier, said intermediate mechanism having a part extended through the rotary carrier.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

HARRY H. BRIDGWATER.
JONATHAN HALEY.

Witnesses:
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