

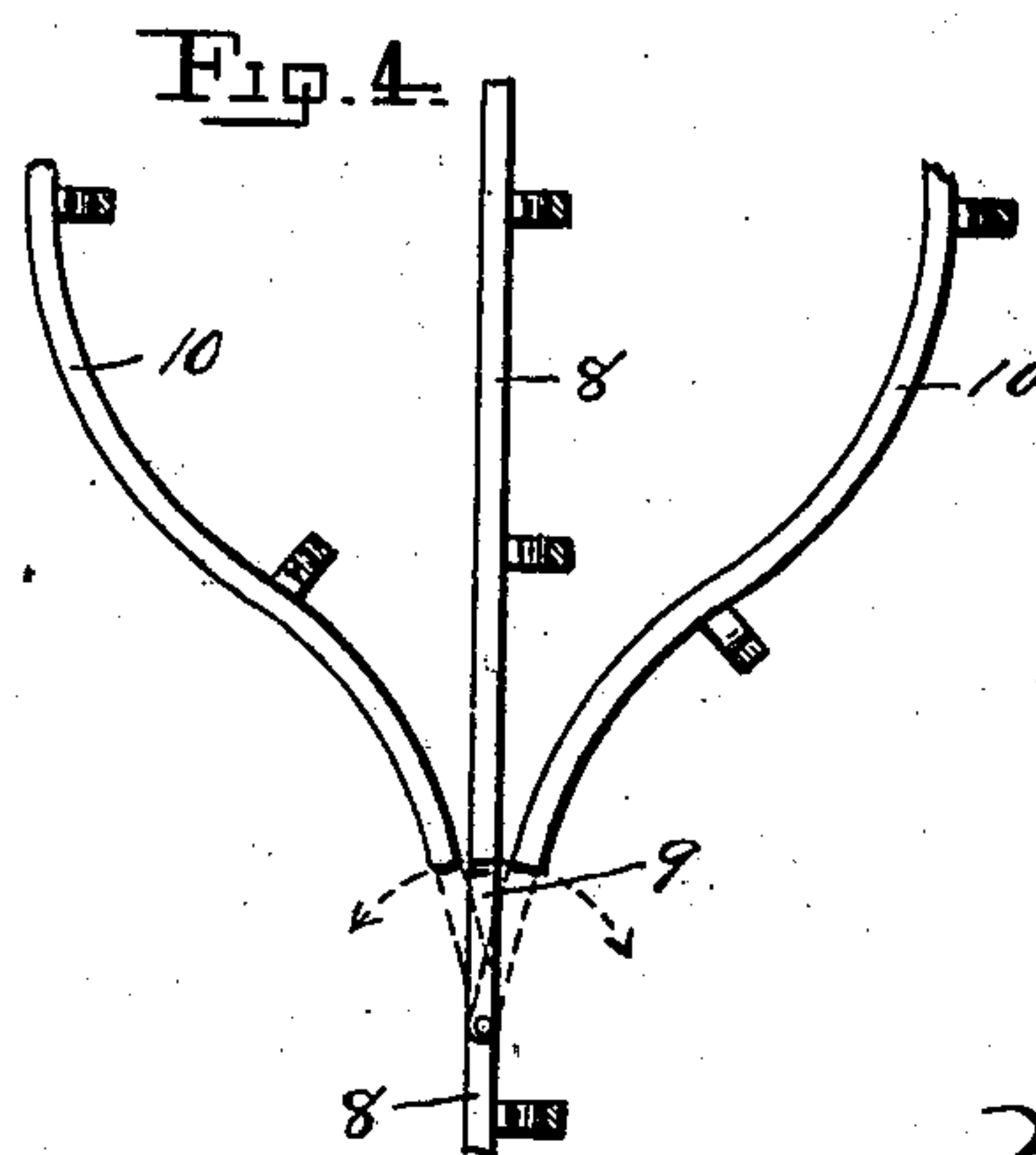
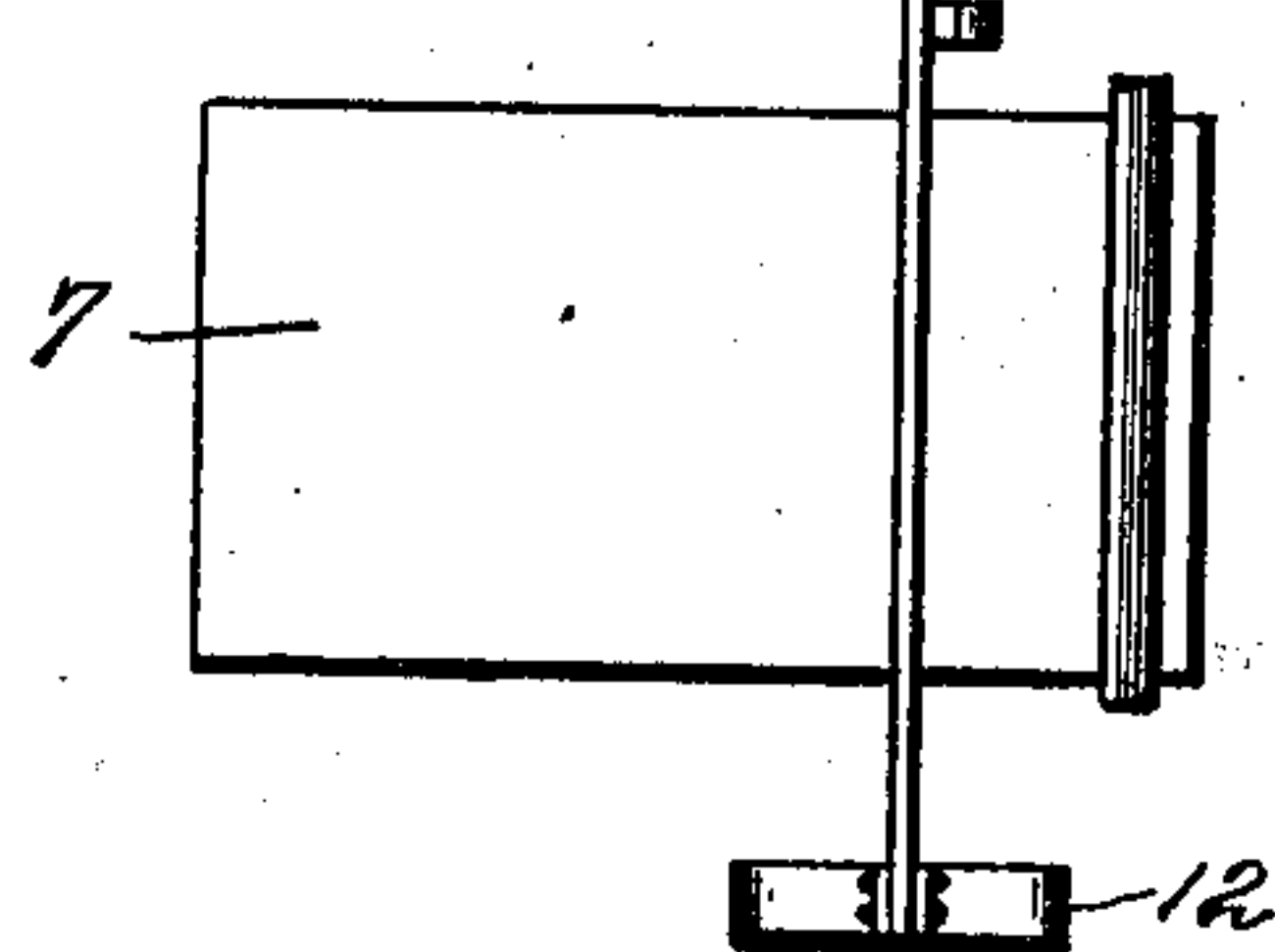
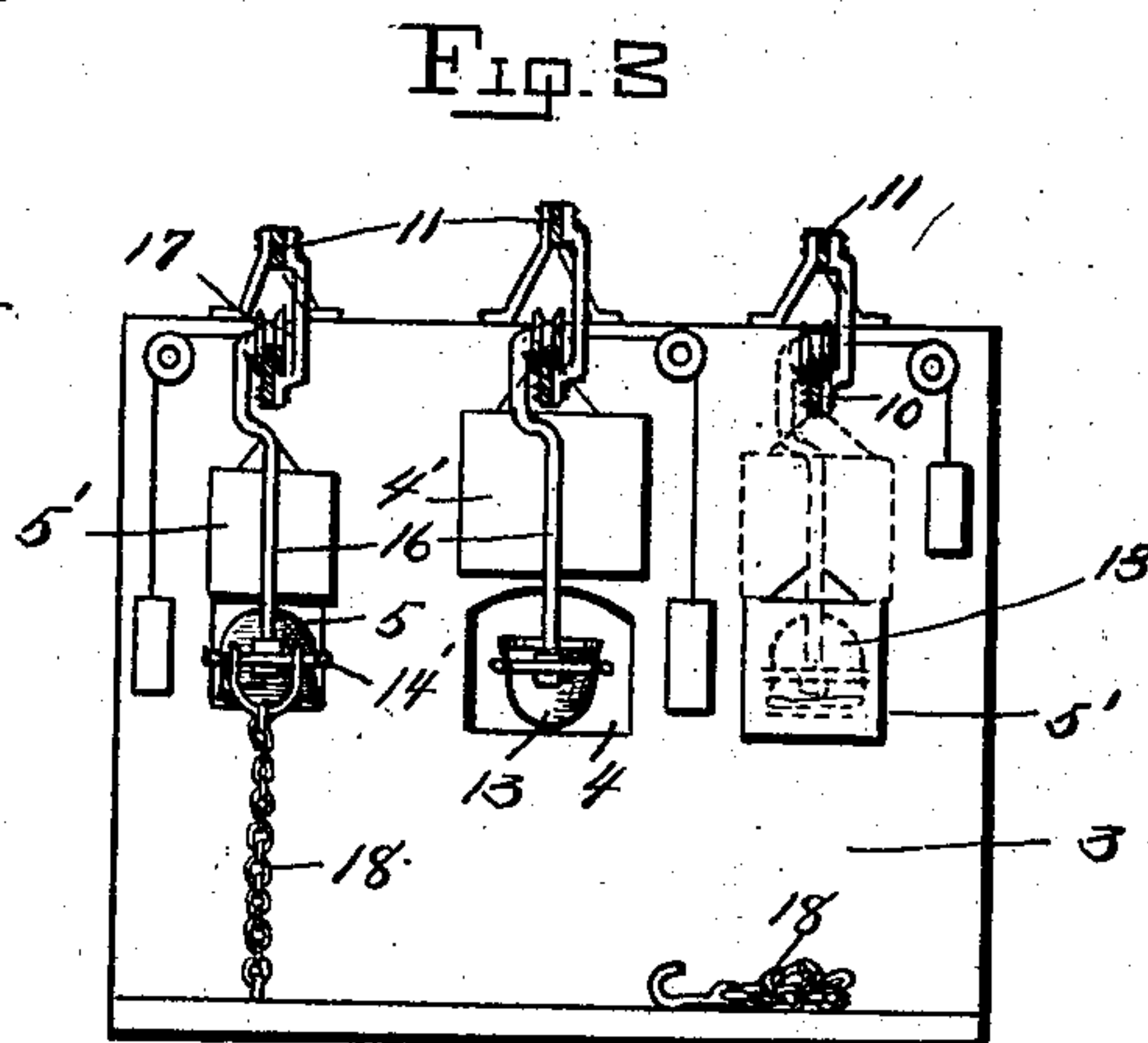
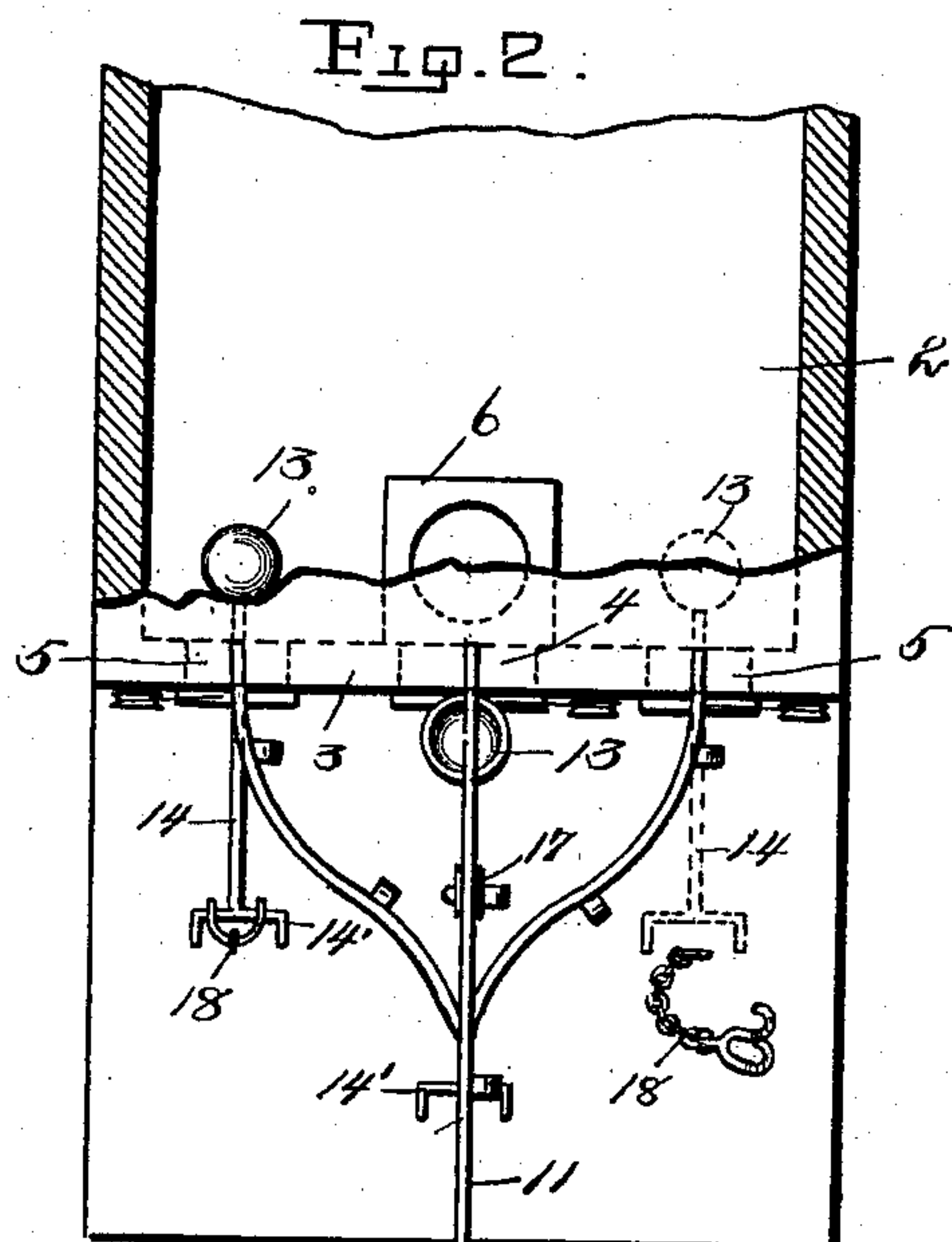
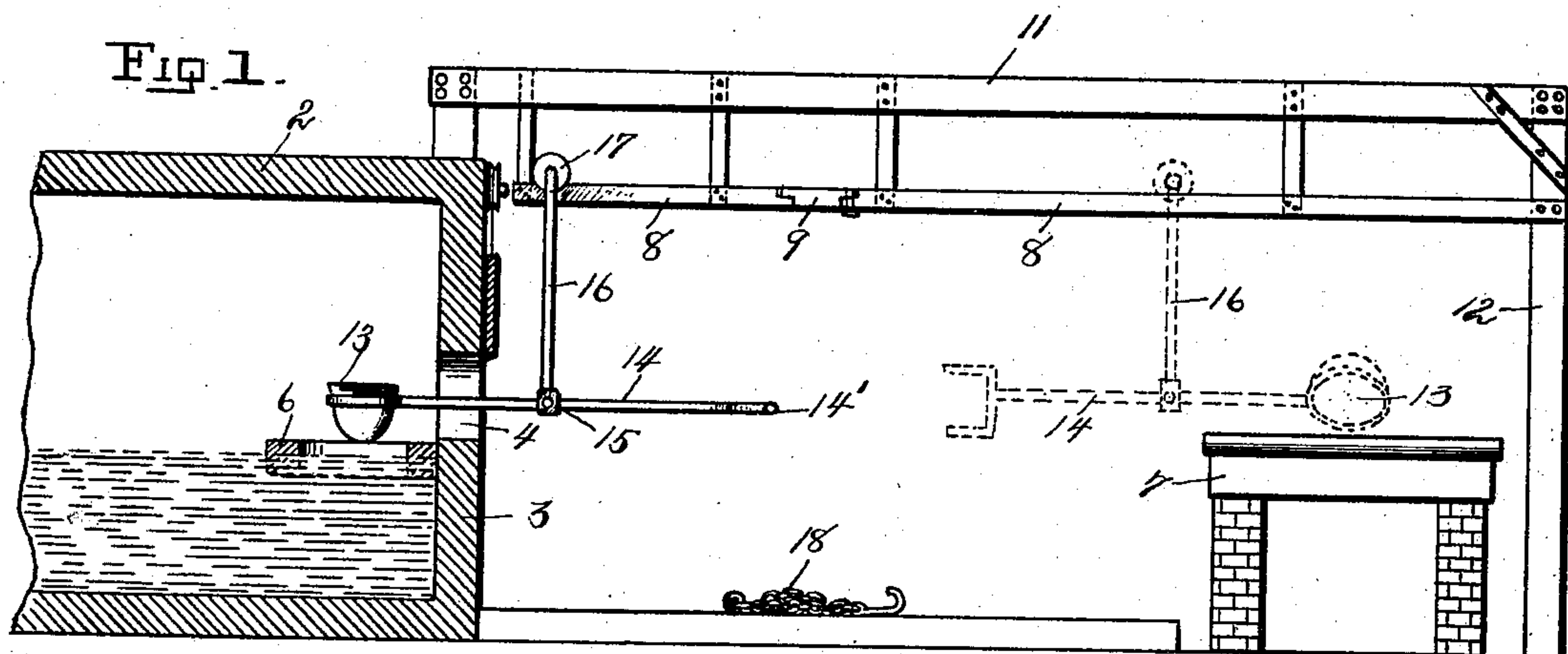
No. 700,428.

Patented May 20, 1902.

W. D. KEYES.
GLASS DELIVERING APPARATUS.

(Application filed Sept. 4, 1901.)

(No Model.)



WITNESSES.

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UNITED STATES PATENT OFFICE.

WASHINGTON D. KEYES, OF BLAIRSVILLE, PENNSYLVANIA.

GLASS-DELIVERING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 700,428, dated May 20, 1902.

Application filed September 4, 1901. Serial No. 74,286. (No model.)

To all whom it may concern:

Be it known that I, WASHINGTON D. KEYES, a citizen of the United States, residing at Blairsville, in the county of Indiana and State of Pennsylvania, have invented certain new and useful Improvements in Glass-Delivering Apparatus, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to the manufacture of plate-glass, and has particular reference to apparatus for transferring molten glass from the melting and refining tank or other furnace to the casting-table.

15 The invention consists in the novel features of construction, and in the combination and arrangement of parts hereinafter fully described and claimed, and illustrated by the accompanying drawings, wherein—

20 Figure 1 is a vertical sectional view of the delivery end of a tank-furnace with my improved apparatus shown in connection therewith. Fig. 2 is a plan view of the same partly in section. Fig. 3 is an end view of the tank. Fig. 4 is a detail view of a portion of the track for the ladle-carrying trolley.

Referring to the drawings, 2 represents a portion of a tank, and 3 the end wall thereof constructed with the central delivering-port 4 and the two side ports 5, preferably smaller than port 4.

6 is the float-ring beneath port 4, and 7 the casting-table.

Extending outward from above the center of port 4 and over table 7 is track 8, provided with switch 9 to connect with either of tracks 10, the inner ends of the latter having position over ports 5, respectively. The tracks are preferably supported from above by bar-frame 11, the latter being here shown sustained at its inner end by the tank and at its outer end by post 12.

13 is a ladle provided with an elongated stem 14, which is swiveled between its ends at 15 to the lower extremity of hanger 16, depending from trolley 17, mounted and adapted to travel on tracks 8 and 10. Two of these trolley-mounted ladles are employed, and the side ports are utilized alternately for admitting the inactive ladle to the tank, for the purpose presently to be explained, while glass is being withdrawn and delivered to the casting-

table by the other ladle. The active ladle is introduced through port 4, as shown in Fig. 1, and the glass dipped from ring 6. The 55 filled ladle is then withdrawn, turned on swivel 15, and moved outward over the casting-table, as seen in dotted lines in Fig. 1, when the glass is discharged. Switch 9 is then set so as to direct the trolley to the then 60 vacant track 10, over which it is moved, and the ladle introduced in inverted position through corresponding port 5, this position being maintained by chain 18, secured to the floor and engaging handle end 14' of the ladle. 65 The previously-inactive ladle is then withdrawn from the other port 5, switched onto the main track 8, filled and discharged, as above described, and returned to its port 5. The ladles may thus be used alternately and 70 interchangeably as long as the operation of casting is continued. When not in use, the ports 4 and 5 may be closed by doors 4' and 5', respectively.

The tank-furnace is so constructed and operated that when the molten glass reaches the delivery end thereof it is refined, ready for casting.

In the manufacture of plate-glass it is essential that agitation of the refined molten 80 glass be prevented. If materially agitated, whether by contact with surfaces of different temperature or by unskilful manipulation, the quality of the glass is impaired, as is well known to those skilled in the art. With the 85 ladles positioned in the furnace before and up to the time of dipping they acquire approximately the same temperature as the molten glass, so that when introduced thereto, as when dipping, the glass is not injuriously 90 disturbed or agitated, as would be the case if the ladles were of higher or lower temperature. Also by this arrangement the glass which hardens and adheres to the ladles during the operation of dipping and delivering 95 is softened and drips from the purposely-inverted ladles into the furnace. Thus a cleansed and heated ladle is in readiness for each operation.

While I have here shown only two ladles 100 arranged for use alternately, it will be understood that a greater number may be employed, if desired. As the invention contemplates the heating of the glass ladling or delivering

means to approximately the same temperature as the glass within the tank, also the employment of a plurality of glass-delivering apparatuses arranged for operating one after the other, it will be understood that the above-described embodiment of the invention may, within the scope of the appended claims, be changed or varied without departing from the spirit of the invention.

10 Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

15 1. The combination of a glass-furnace constructed with a delivering-port and ladle-conditioning ports or openings, a plurality of ladling devices, and a conveying means for each of said devices accessible interchangeably to the delivering-port and to one or more of the conditioning ports.

20 2. The combination of a glass-furnace constructed with a plurality of ports, connected tracks leading to said ports, and a plurality of glass-removing devices movable on the tracks and common to all of said ports.

25 3. The combination of a glass-furnace constructed with a plurality of ports, a track leading from each of said ports, a single track

operatively connected to each of said first-mentioned tracks, and a plurality of glass-removing devices common to all of said tracks 30 and furnace-ports.

4. The combination of a glass-furnace constructed with a delivery-port and auxiliary ports, the latter being at opposite sides of the delivery-port, a plurality of ladling devices, 35 ladle-conveying means, a main trackway for the latter extending from the delivery-port, and auxiliary ways extending from the main trackway to each of the auxiliary ports.

5. The combination of a furnace constructed with a delivery-port and an auxiliary port 40 at each side of the delivery-port, a main overhead track extending from the delivery-port, a track extending from each of the auxiliary ports and communicating with the main track, 45 trolley-carriages movable interchangeably over said tracks, and a ladling device carried by each carriage.

In testimony whereof I affix my signature in presence of two witnesses.

WASHINGTON D. KEYES.

Witnesses:

J. M. NESBIT,

ALEX. S. MABON.