

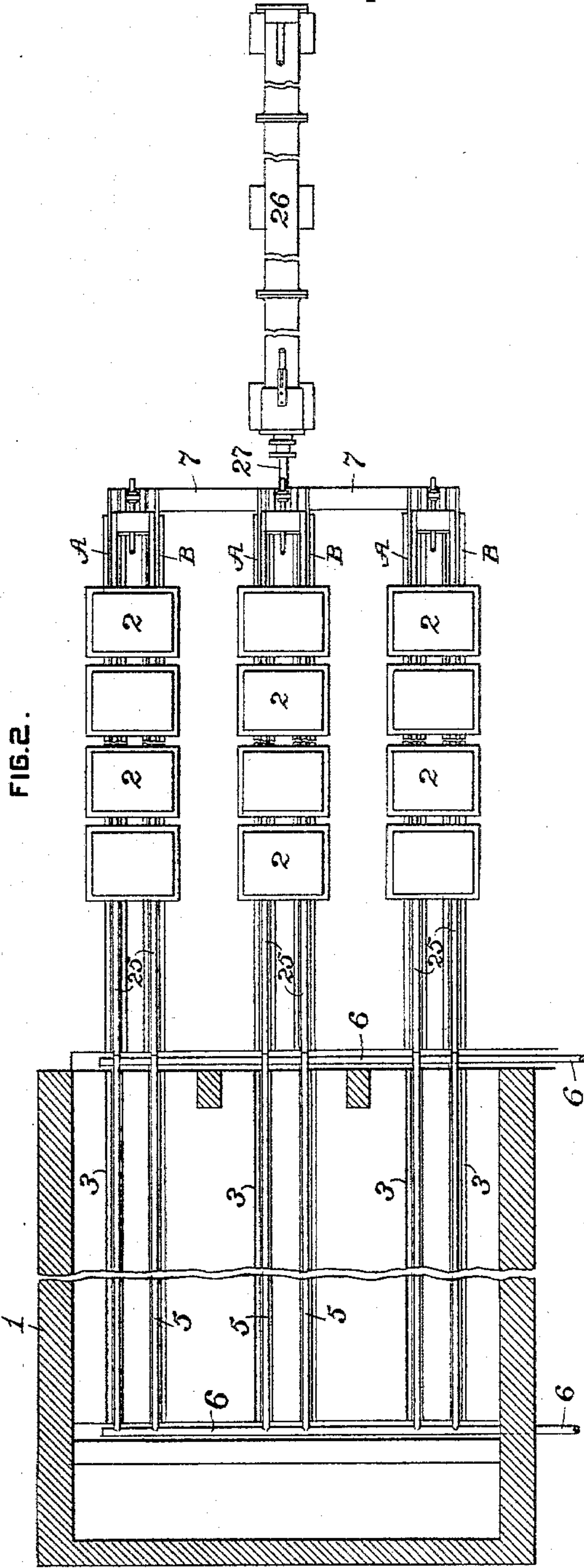
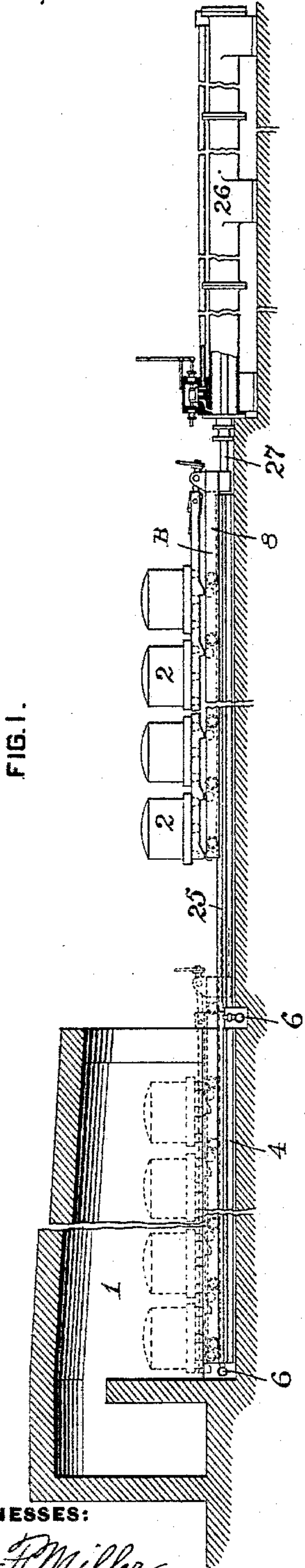
(No Model.)

4 Sheets—Sheet 1.

F. I. FREEMAN.
ANNEALING PLANT.

No. 589,597.

Patented Sept. 7, 1897.



WITNESSES:

Chas. F. Miller.
J. E. Gaither

INVENTOR.

Francis I. Freeman
by Danvers Wolcott
Att'y.

(No Model.)

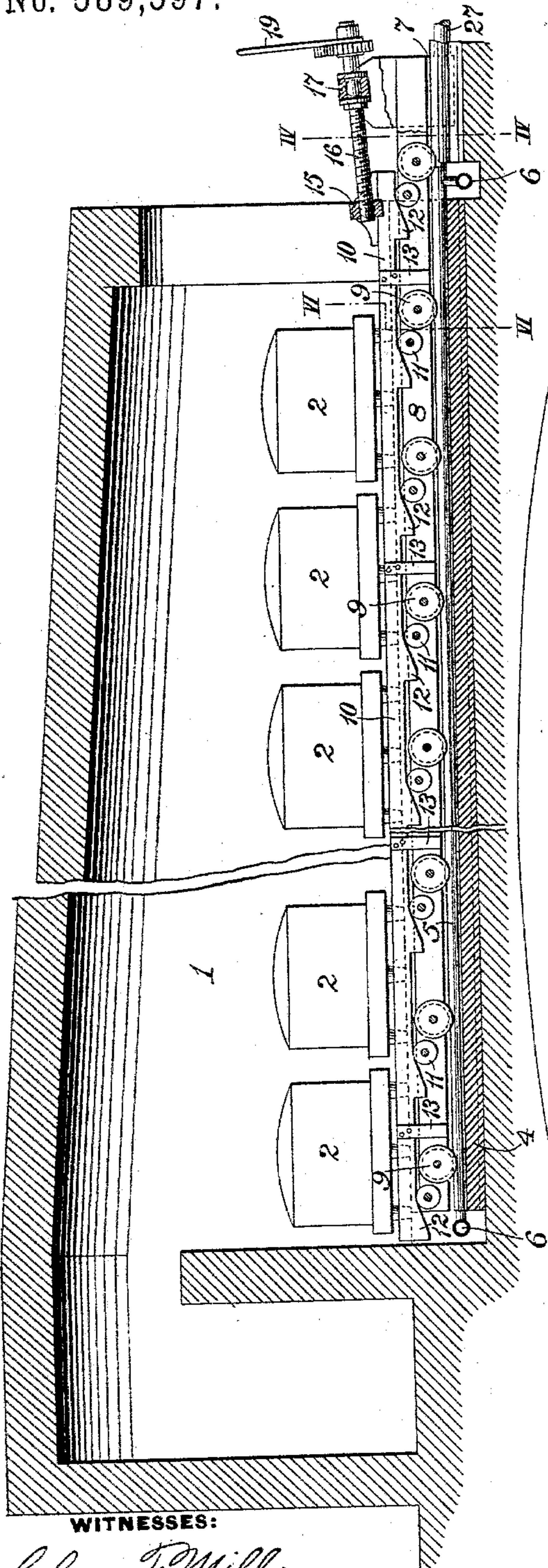
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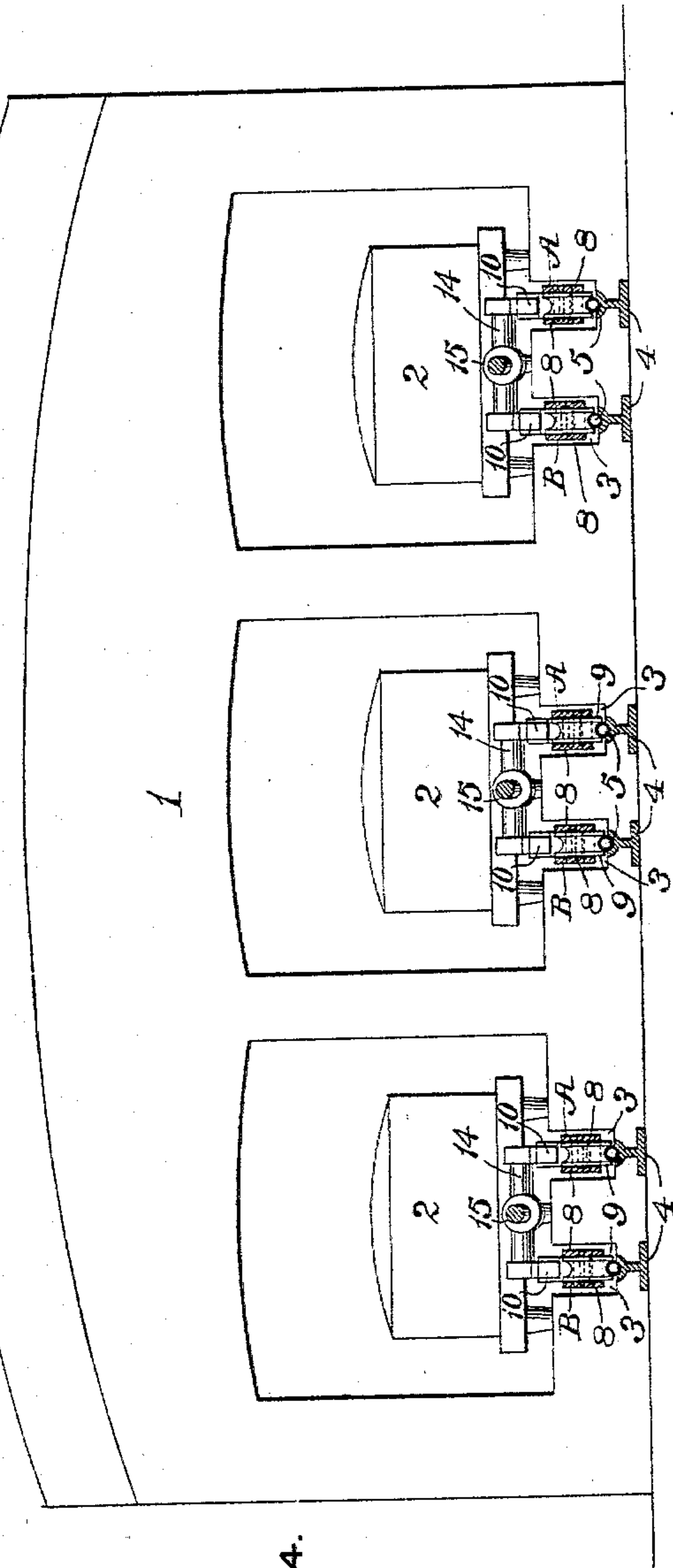
FIG. 3.



WITNESSES:

Chas. F. Miller.
J. E. Gaither

FIG. 4.



INVENTOR.

Francis I. Freeman
by Saml. S. Wolcott
Att'y.

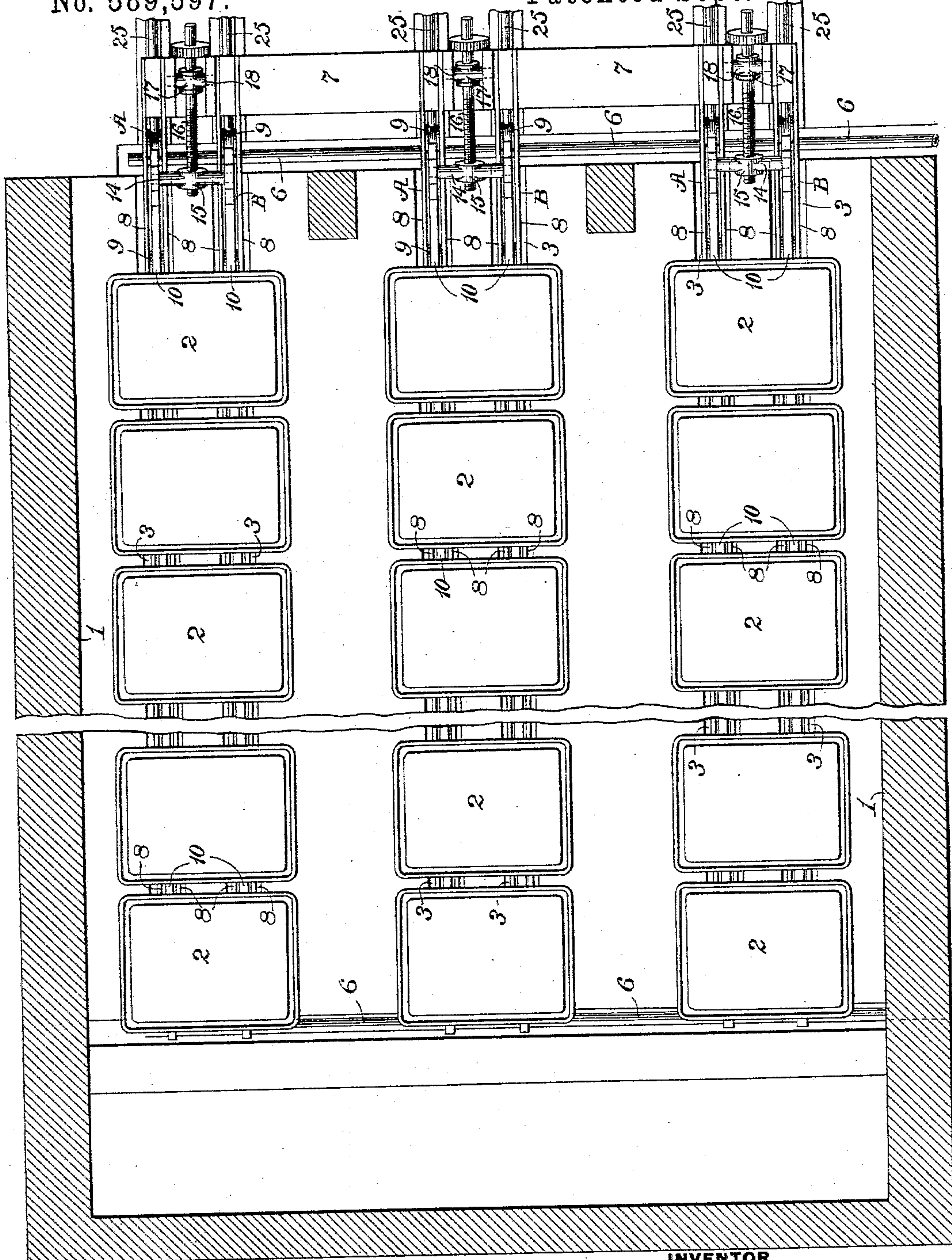
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WITNESSES:

Chas. F. Miller
J. E. Gaither

FIG. 5.

INVENTOR.

Francis I. Freeman
by Danvers W. Wolecott
Att'y.

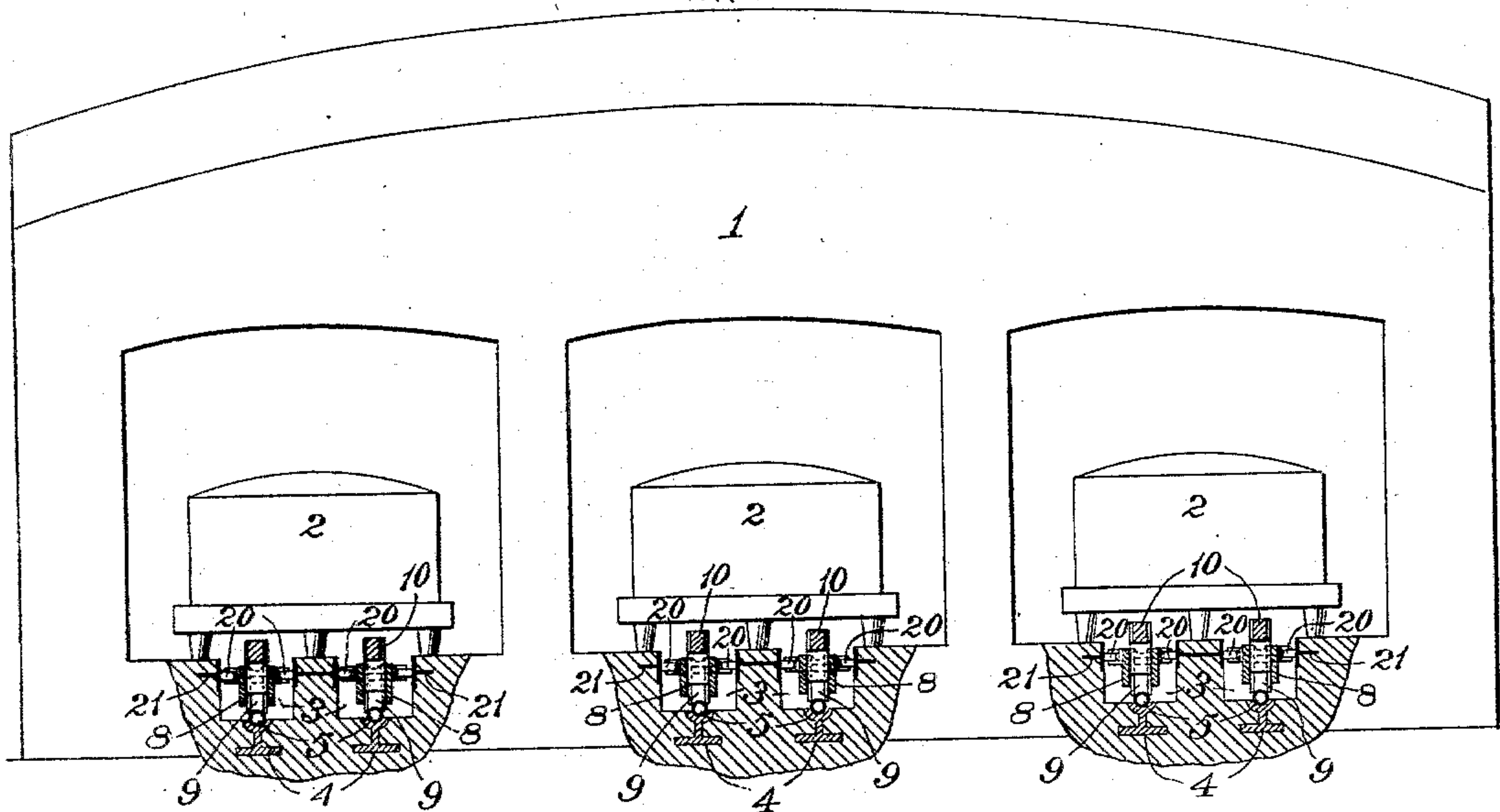
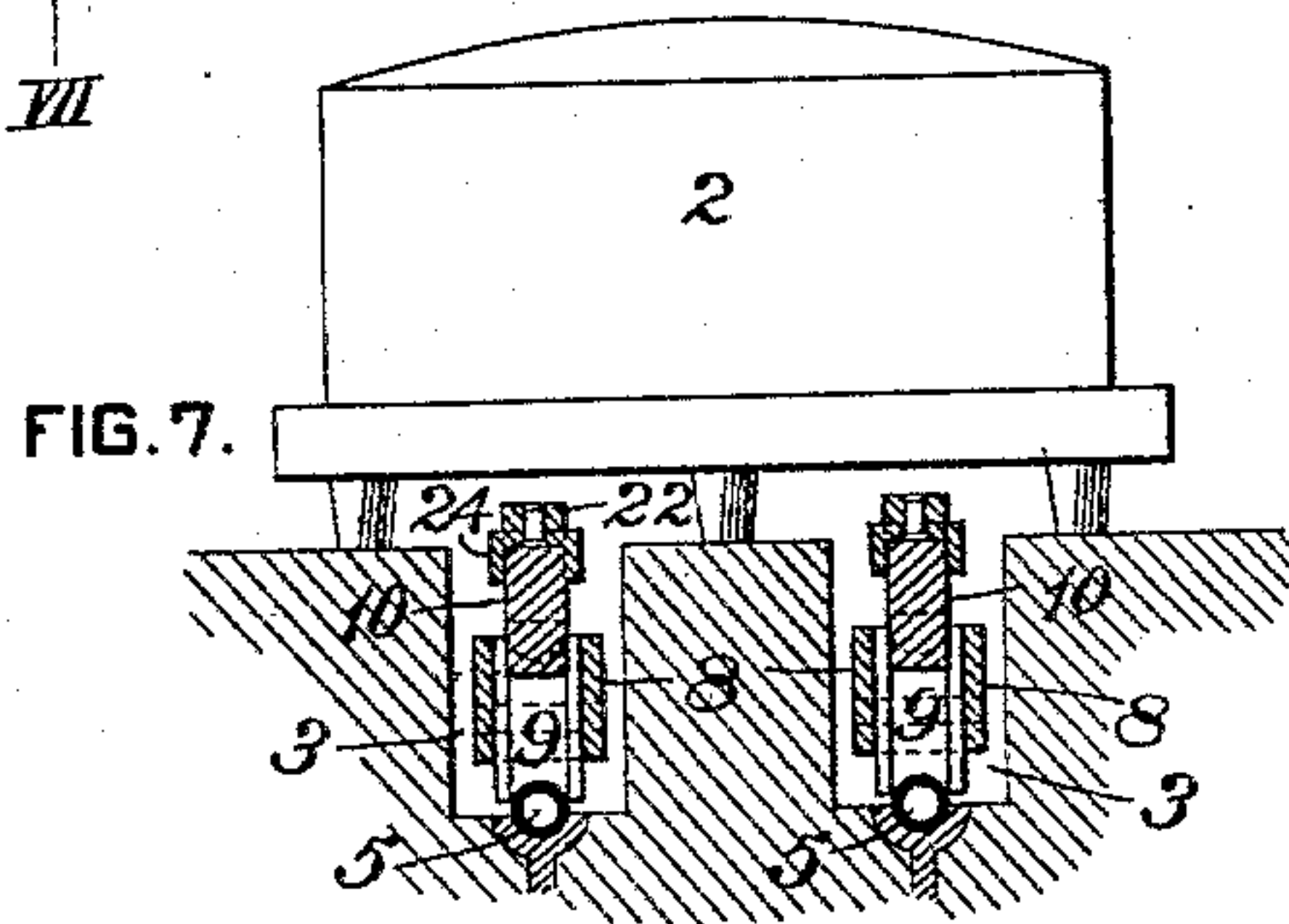
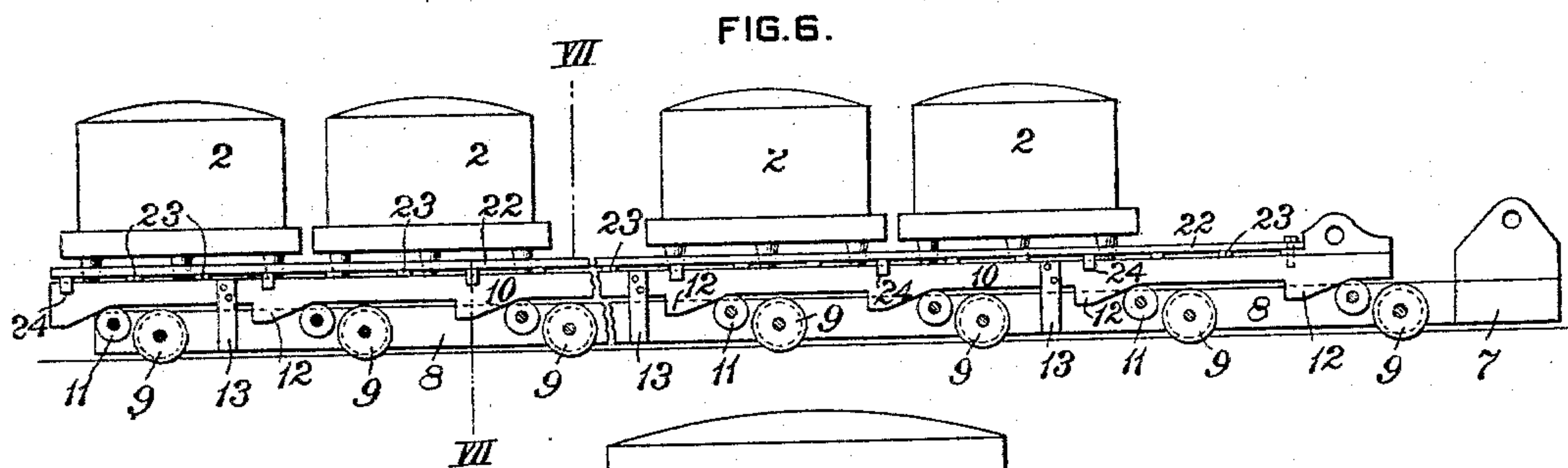
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WITNESSES:

Chas. F. Miller
J. E. Gaither

INVENTOR.

Francis I. Freeman
by Saml S. Wolcott
Att'y.

UNITED STATES PATENT OFFICE.

FRANCIS I. FREEMAN, OF PITTSBURG, PENNSYLVANIA.

ANNEALING PLANT.

SPECIFICATION forming part of Letters Patent No. 589,597, dated September 7, 1897.

Application filed May 27, 1897. Serial No. 638,394. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS I. FREEMAN, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Annealing Plants, of which improvements the following is a specification.

The invention described herein relates to certain improvements in apparatus for charging furnaces, and has for its object a construction of apparatus whereby one or a series of two or more articles may be easily and quickly placed in the furnace, deposited upon suitable supports, and the charging apparatus withdrawn.

In general terms the invention consists in the construction and operation substantially as hereinafter more fully described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a view, partly in elevation and partly in section, showing the position of charging apparatus in front of the furnace by full lines and its position in the furnace by dotted lines. Fig. 2 is a sectional plan view of the same. Fig. 3 is a sectional elevation of the furnace, showing the pots in position in the furnace and the charging apparatus also in position below the pots, the latter resting upon other permanent supports within the furnace. Fig. 4 is an end elevation of the construction shown in Fig. 3. Fig. 5 is a sectional plan view of the same. Fig. 6 is a view in side elevation of the charging apparatus, illustrating the means for protecting the lifting-bar. Fig. 7 is a transverse section, the plane of section being indicated by the line VII VII, Fig. 6; and Fig. 8 is a view, partly in section and partly in end elevation, showing the pots and charging apparatus within the furnace and illustrating a modified construction of the charging apparatus.

In the practice of my invention the annealing-furnace 1 is made of any suitable form of construction, whereby a series of two or more pots 2 may be arranged in line with each other within the furnace and also, by preference, adapted to receive a series of two or more lines of pots, as clearly shown by reference to Figs. 2, 3, and 5.

In the bottom of the furnace are formed one, two, or more pairs of grooves 3, extending longitudinally of the furnace, and in the bottom of these grooves are embedded chairs 4, adapted to form supports for the tubular rails 5. These chairs are preferably formed with bottom flanges, webs, and heads similar to the usual railroad-rail, except that the heads are provided in their upper surfaces with grooves for the reception of the tubular rails 5. As clearly shown by reference to Figs. 1, 2, 3, and 5, these rails 3 are connected at their ends to water supply and inlet pipes 6, arranged transversely of the furnace and connected to any suitable source of supply.

The trucks for shifting each line of pots consist of two members A and B, each member being similar in construction and connected at its forward end to a beam 7, arranged transversely of the line of trucks. Each member of the trucks consists of side bars 8, provided with suitable bearings for the journals of the grooved wheels 9, adapted to move along the rails 5, and the lifting-bar 10, which is movably supported above the side bars and midway between them by the rollers 11, having their journals mounted in the side bars 8. Each of these lifting-bars 10 is provided on its under side with a cam projection 12, adapted when the lifting-bars are moved longitudinally to ride upon the rollers 11 and thereby cause the lifting-bars to move vertically and lift the annealing-pots from the floor or continuous piers on each side of the grooves 3 in the bottom of the furnace.

The lifting-bars are held and guided by means of pins 13, secured to the lifting-bars and projecting down between the side plates of the members of the trucks. At their forward ends the lifting-bars are loosely connected to the trunnions 14 of the head or nut 15, which is internally threaded for the reception of the screws 16, which are secured as against longitudinal movement in a head 17, provided with journals 18, which have their ends mounted in suitable bearings secured on the transverse beam 7. The screws are provided with suitable means, as a lever 19, having a pawl-and-ratchet connection to the screws for the purpose of rotating the same.

In order to prevent the members of the trucks from lateral movement while support-

ing the pots, it is preferred to mount on the side bars 8 of the members rollers 20, adapted to bear against plates 21, secured in the side walls of the grooves 3, as shown in Fig. 8.

5 In order to prevent the lifting-bars 10 from warping and twisting by local heating, due to contact with the heated pots, it is preferred to protect such lifting-bars from the action of the heat. This can be done in any suitable manner—as, for example, by securing a bearing-plate 22 on top of the bars, but separated therefrom by means of distance-blocks 23, formed on or secured to the lifting-bars or bearing-plates 22, as shown in Figs. 6 and 7.

15 One end of the bearing-plate is bolted or otherwise secured to the lifting-bar, while the opposite end is left free, in order to permit the bearing-plate to expand and contract freely.

In order to hold the bearing-plate in line with the lifting-bar, a series of clips 24 is secured to the under side of the bearing-plate in such manner that the prongs of the clips will project down on each side of the bearing-plate.

25 As clearly shown in Figs. 1 and 2, a series of rails 25 is arranged in line with the rails 5 of the furnace, but outside of the latter, onto which the trucks are moved, so as to permit of the placing of the pots on or their removal from the trucks. The movement of the trucks with their load into and out of the furnace may be effected by any suitable power device, but preferably by means of a hydraulic cylinder 26, arranged in front of the furnace and at a suitable distance therefrom.

35 The piston 27 of this cylinder is connected either directly to the trucks or to the transverse beam secured to the front ends of the trucks.

40 In using this apparatus the trucks are hauled out of the furnace onto the rails 25 and the lifting-bar is moved by the screw mechanism described, so as to be in its raised position. The pots are then placed in position on these bars and the trucks pushed into the furnace. The screw mechanisms are then so operated as to permit the bars to move longitudinally, the cam projections thereon riding down the rollers 11, thereby lowering the

50 pots onto the piers or supports alongside of the tracks. The trucks are then withdrawn and the furnace closed. After the articles have been properly annealed the trucks are then run into the furnace under the pots and

55 the latter lifted by the longitudinal movement of the lifting-bars until freed from the furnace piers or supports, and the trucks again withdrawn with their loads.

It will be readily understood by those skilled in the art that although my improvements

have been shown and described as applied to a furnace in which it is desired to charge a number of pots such improvements are readily applicable in charging single pots, as in a sheet-metal annealing-furnace.

The improvements are also applicable for the charging of articles other than annealing-pots and heating-furnaces.

I claim herein as my invention—

1. In an annealing plant, a truck consisting of two connected members, each consisting of side plates, wheels mounted in said side plates, a lift-bar provided on its under side with cams or inclined projections and rollers mounted in the side plates for supporting the lifting-bar, in combination with means for simultaneously shifting both lifting-bars longitudinally, substantially as set forth.

2. In an annealing plant, a truck consisting of two connected members, each consisting of side plates, wheels mounted in said side plates, a lifting-bar provided on its under side with cams or inclined projections, rollers mounted in the plates for supporting the lifting-bars and a bearing-strip supported on the lifting-bar, but separated therefrom, in combination with means for simultaneously shifting both lifting-bars longitudinally, substantially as set forth.

3. In an annealing plant, a truck consisting of two connected members, each consisting of side plates, wheels mounted in said side plates, and a lifting-bar in combination with means for simultaneously moving said bars longitudinally and vertically, substantially as set forth.

4. In an annealing plant, the combination of a furnace having depressed tracks, a truck consisting of two members connected at one end, lateral supporting-rollers mounted on the sides of said members and adapted to bear against the sides of the grooves in which the tracks are arranged, lifting-bars and means for simultaneously shifting the bars for raising and lowering the annealing-pots, substantially as set forth.

5. In an annealing plant a truck consisting of connected members, wheels mounted in said members, lifting-bars, bearing-strips supported on the lifting-bars, but separated therefrom, in combination with means for simultaneously moving said bars longitudinally and vertically, substantially as set forth.

In testimony whereof I have hereunto set my hand.

FRANCIS I. FREEMAN.

Witnesses:

F. E. GAITHER,

DARWIN S. WOLCOTT.