

No. 832,511.

PATENTED OCT. 2, 1906.

E. A. STOREY.
ELECTRIC FURNACE.
APPLICATION FILED SEPT. 13, 1905.

3 SHEETS—SHEET 1.

Fig. 1.

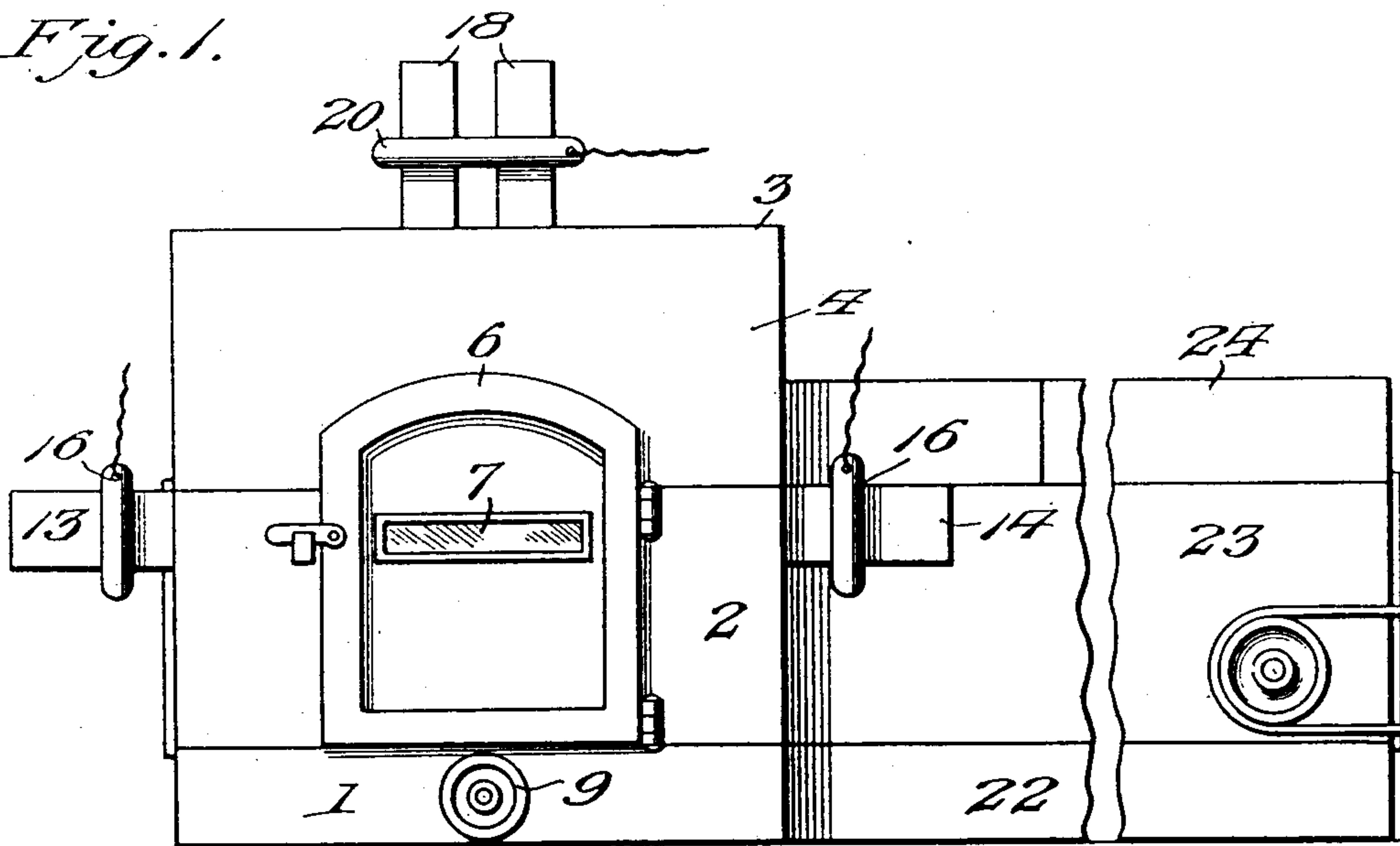
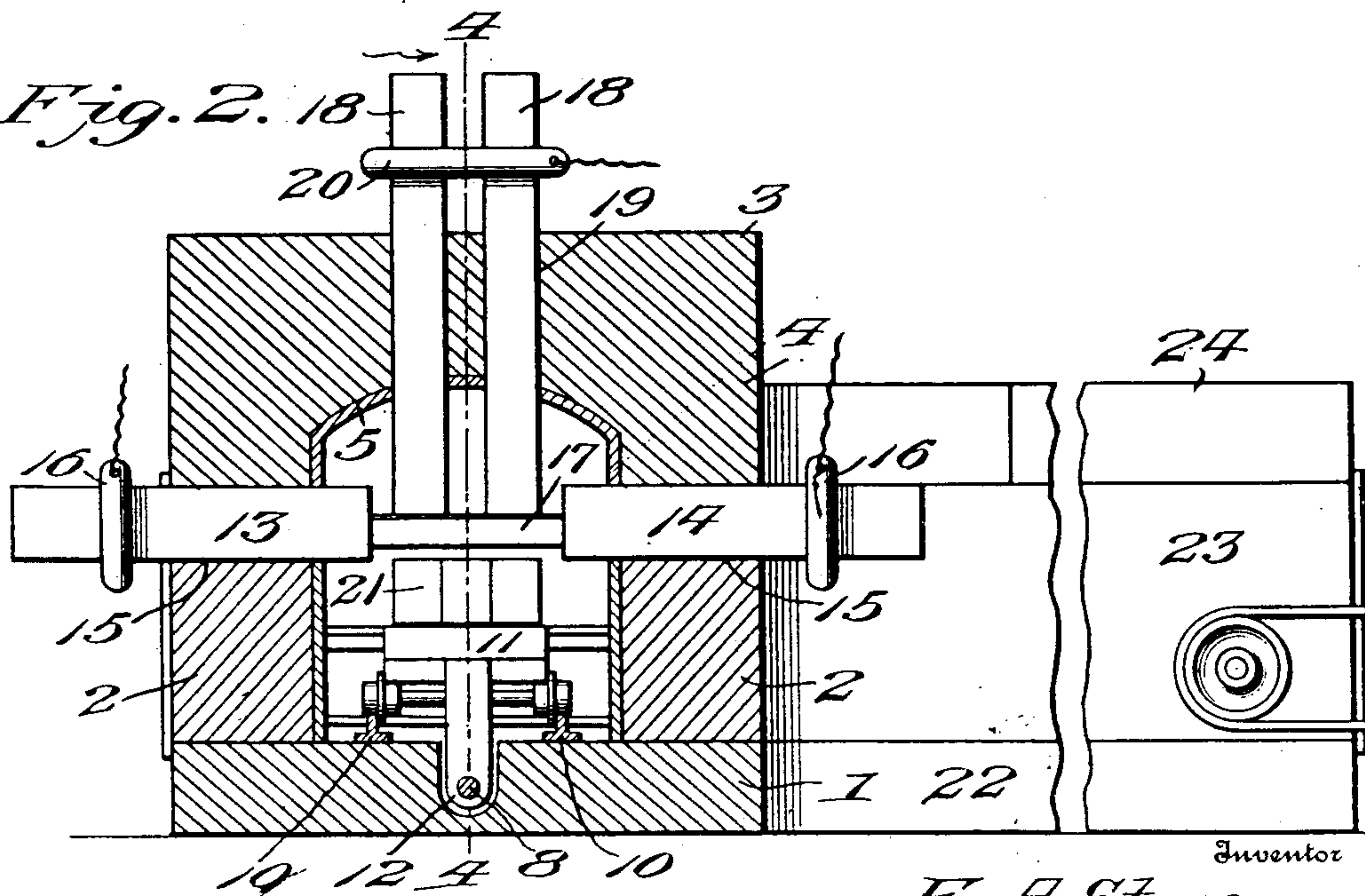


Fig. 2.



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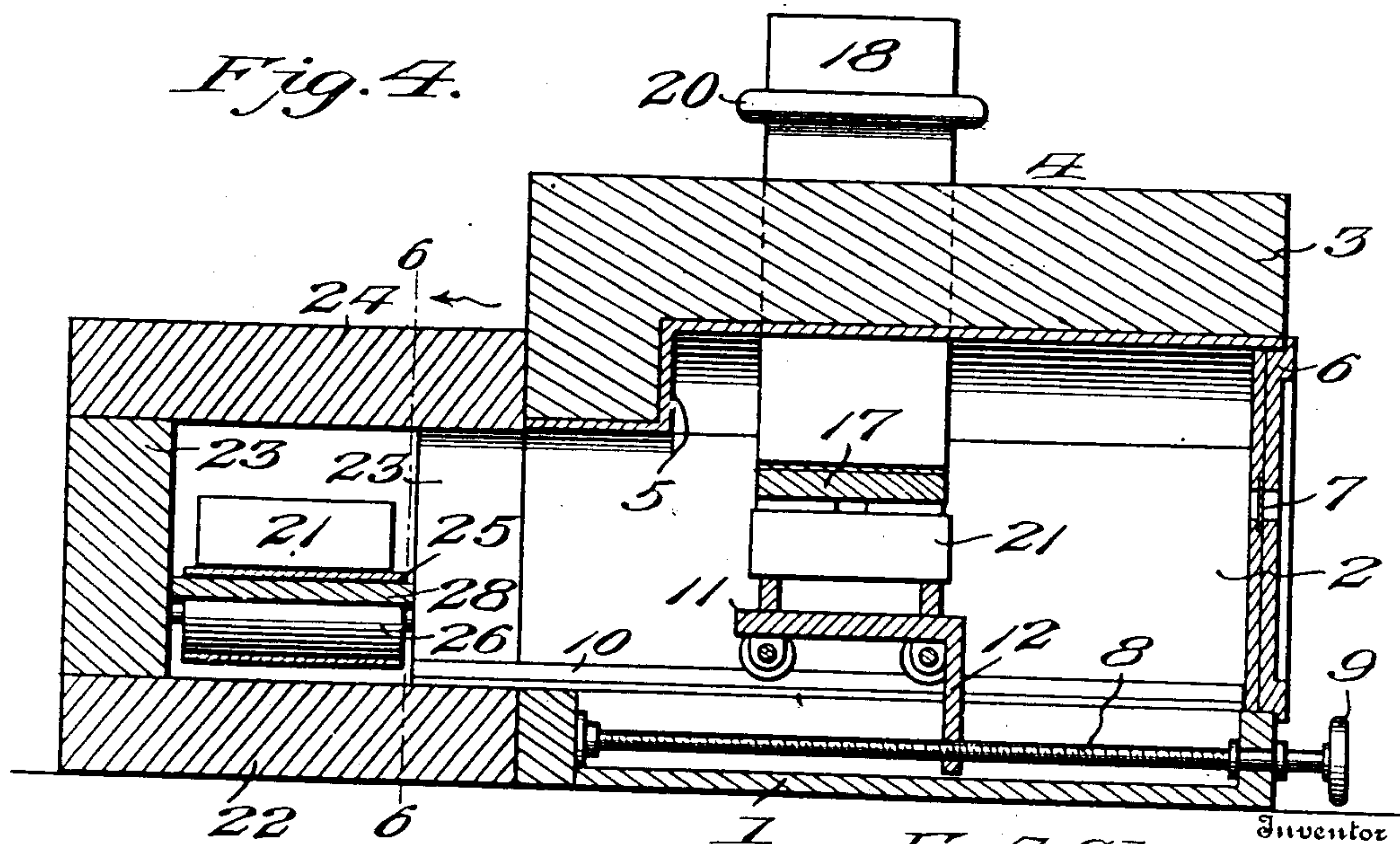
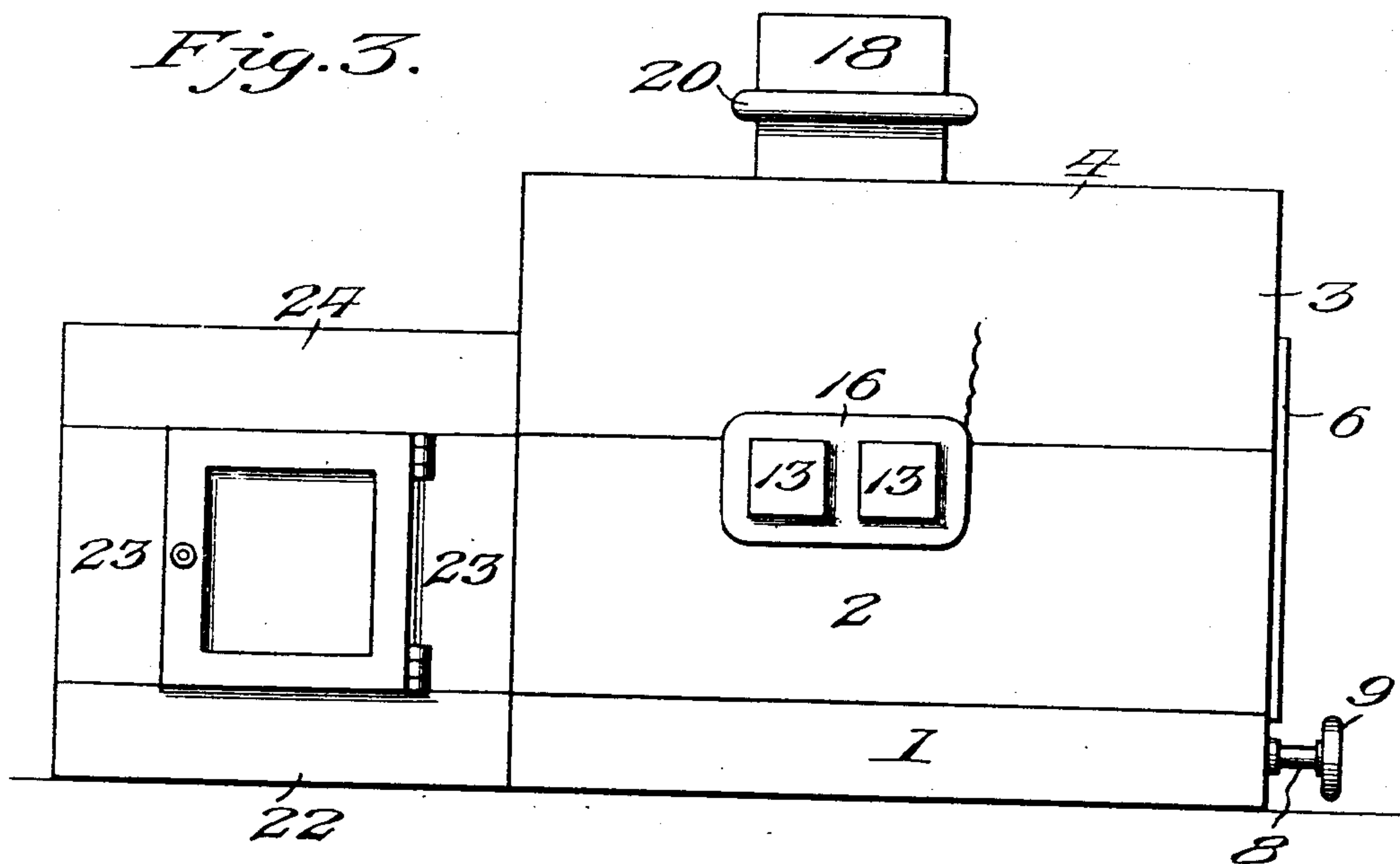
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3 SHEETS—SHEET 3.

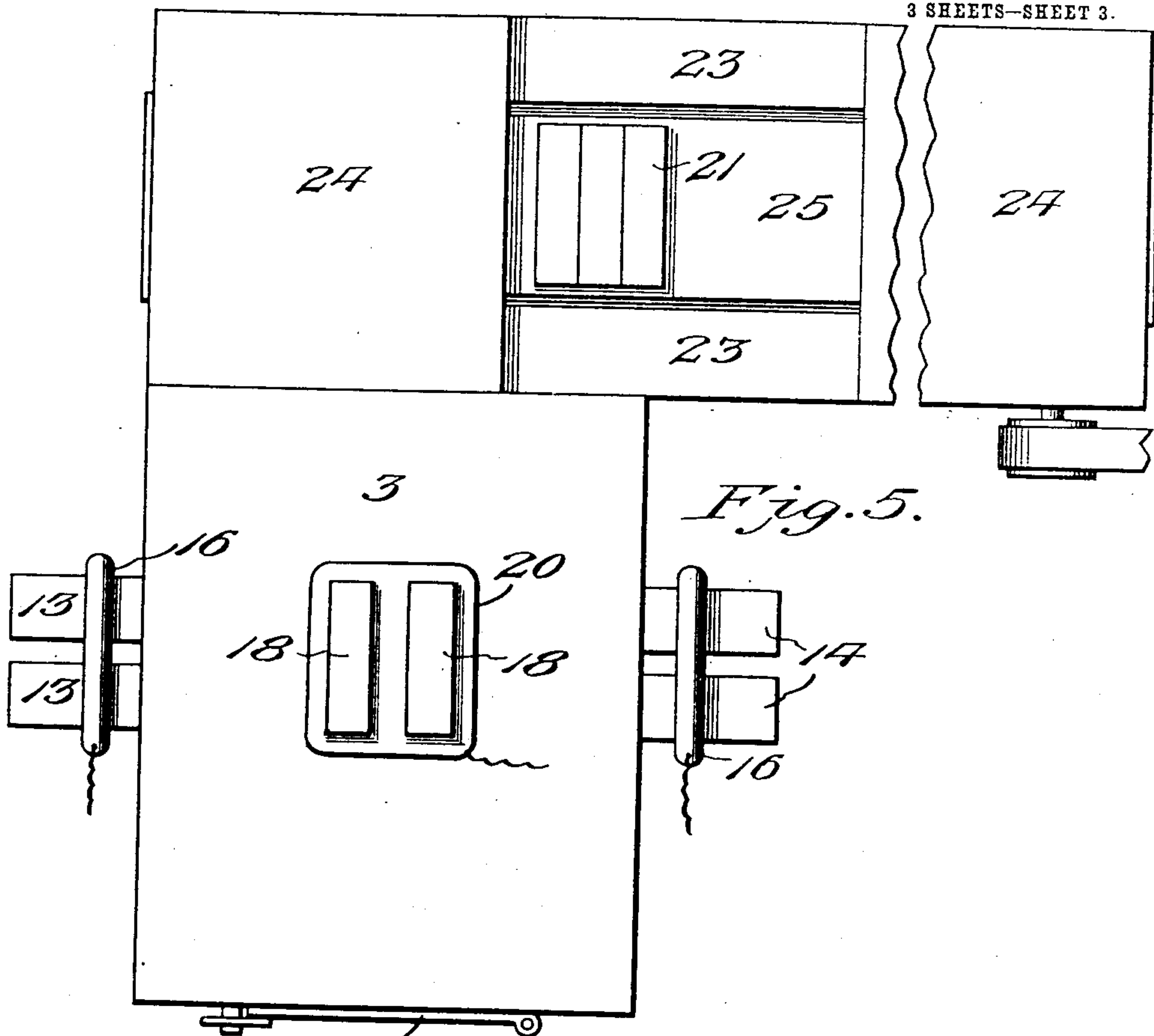


Fig. 5.

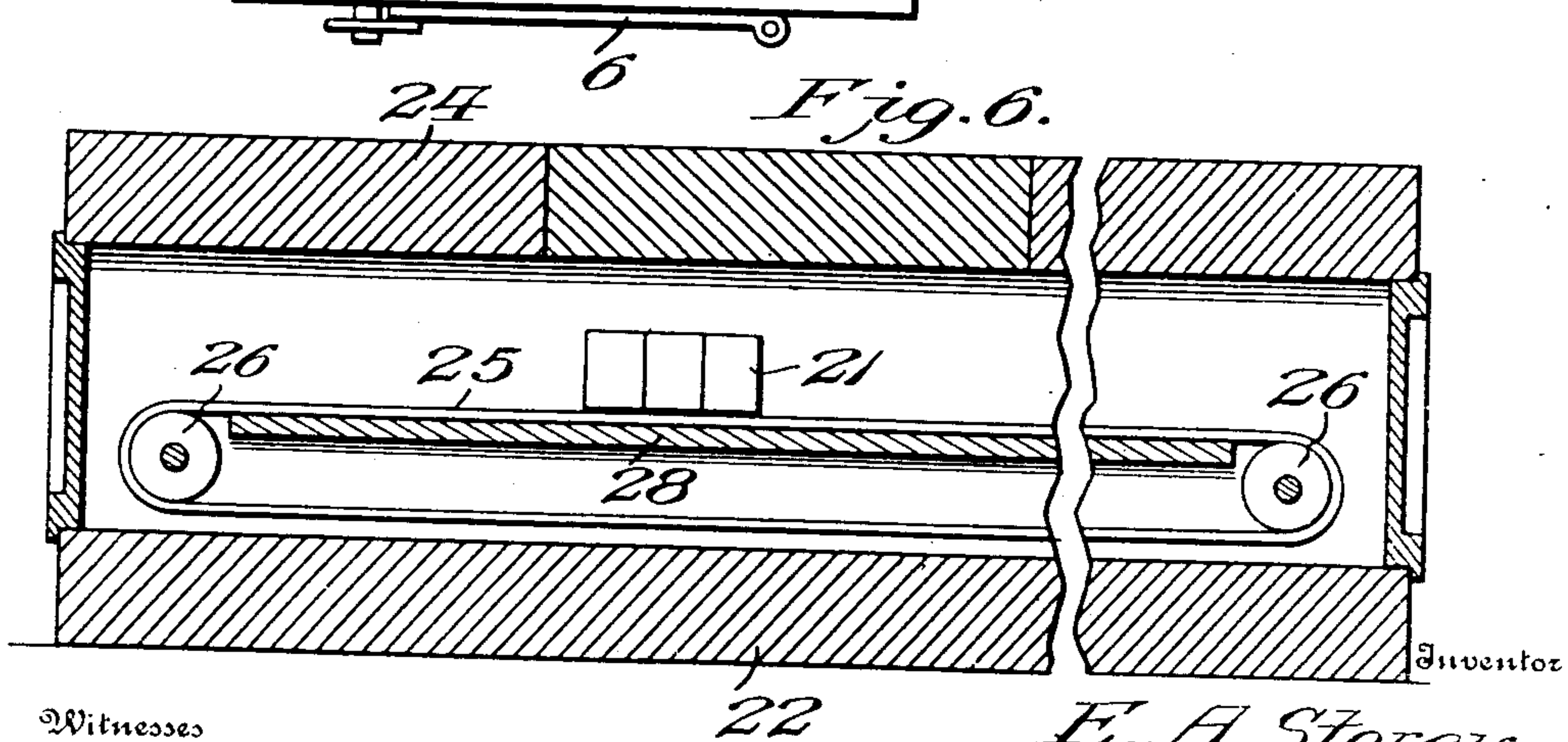


Fig. 6.

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ELECTRIC FURNACE.

No. 832,511.

Specification of Letters Patent.

Patented Oct. 2, 1906.

Application filed September 13, 1905. Serial No. 278,356.

To all whom it may concern:

Be it known that I, EDWIN A. STOREY, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented new and useful Improvements in Electric Furnaces, of which the following is a specification.

The invention relates to an improvement in electric furnaces designed primarily for fusing refractory substances, such as vitrifying enamel or like products of various articles.

The main object of the present invention is the production of a furnace in which the resistance-conductors are connected within the furnace by a slab or case of resisting material of a particular nature.

A further object of the invention is the production of a furnace constructed in sections and having portions arranged for convenient removal, whereby to permit ready access to the interior of the furnace.

The present invention will be described in detail in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 is a view in elevation of a furnace constructed in accordance with my invention. Fig. 2 is a transverse section through the furnace proper. Fig. 3 is a side elevation of the same. Fig. 4 is a longitudinal section on the line 4 4 of Fig. 2. Fig. 5 is a plan view of the furnace, and Fig. 6 is a sectional view on the line 6 6 of Fig. 4.

In the use of the ordinary furnace for vitrifying the enameling material serious objection has been encountered in that the length of time required to effect the result in such a furnace will, in addition to vitrifying said material, highly heat the material of the article being enameled, and owing to the difference in coefficients of expansion of the enamel and article will tend to crack or crease the enamel in cooling. Furthermore, it has been found very difficult in the usual furnace to accurately control the degree of heat or to maintain uniformity therein when once secured.

With the object of avoiding these defects in the ordinary construction my furnace comprises a furnace proper consisting in a base 1 and vertically-projecting walls 2, supported on said base and spaced apart to provide the interior dimension of furnace required. The upper part or top of the furnace is made in a single section comprising a top plate 3 and depending walls 4 to rest squarely

upon the upper ends of the walls 2. By this arrangement the cover of the furnace may be moved when desired to permit change in the interior of the furnace.

The structure so far described is composed of any desirable refractory material, the walls of the opening within the furnace being preferably lined with a suitable non-conducting material 5, as asbestos. The furnace proper is opened at front and rear, the former opening being provided with the asbestos-lined closing-door 6, having the usual mica-covered inspection-opening 7, while the rear furnace-opening communicates directly with what I term a "tunnel" or hot-air chamber, which extends at right angles to the length of the furnace and will be more specifically described hereinafter. The base 1 of the furnace is centrally and longitudinally recessed for the reception of the feed-screw 8, having an operating wheel or handle 9 located beyond the furnace and mounted at its rear end in a suitable bearing provided at the end of the recess. Tracks 10 are supported on the furnace-bottom on either side of the plane of the feed-screw, being adapted to movably support a truck 11, from which depends an arm 12, extending to and having threaded engagement with the feed-screw, whereby revolution of said screw will move the truck longitudinally of the tracks—that is, lengthwise of the furnace.

The heating agent of my improved furnace is the electrical current, and its utilization in the interior of the furnace is gained through a plurality of carbon or like conductors mounted in the furnace-walls. In the preferred construction two of the carbon conductors 13 are mounted for longitudinal movement through suitable openings formed in one vertical wall of the furnace, similar carbons 14 also arranged in pairs being mounted for longitudinal movement in suitable openings formed in the opposite vertical wall of the furnace, the arrangement being such that the terminals of said carbons are in direct alignment transverse the furnace. By preference the openings in which the carbons 13 and 14 are slidably mounted are formed as recesses 15 in the upper ends of the vertical walls 2, the recesses being practically coextensive in depth with the thickness of the carbons, so that when the cover-section of the furnace is in place the lower ends of the walls 4 close the mouths of said recesses and thereby provide the walled openings for the reception of the

carbons. Each pair of carbons 13 and 14 are connected by a bonding-conductor 16, which is connected directly to a source of electricity.

As the heating medium within the furnace
 5 I arrange a slab or casing 17 of a peculiar nature, such as thoria, magnesia, or kaolin, which when cold is substantially non-conductive, but of increased conductivity under the action of heat, generated in the induction of
 10 the current. This heating medium will be hereinafter referred to as the "resistor." In addition to the carbon strips 13 and 14 I provide an additional pair of conductors 18, also of carbon or like material, and vertically movable through opening 19, formed in the cover-
 15 sections 3 of the furnace. Beyond the furnace these carbons are connected with a source of electricity through a bonding-clamp 20 encircling both carbons and connected to the generator by suitable connections. The
 20 carbons 18 are of a length to project through the cover-sections of the furnace and rest upon the resistor therein when desired, though it is to be understood that the opening within
 25 which said carbons are arranged is of such nature as to permit vertical and horizontal adjustment of the respective pairs of carbons to adjust the degree of heat as desired. It is to be understood that the strips 13 and 14, together with the resistor, constitute one conductor, while the strips 18 constitute the other conductor. The resistor is so positioned within the furnace as to be supported immediately above the plane of the movement of the truck, so that bricks 21 or other
 30 articles to be vitrified will on a proper adjustment of the truck be positioned immediately beneath and slightly spaced from said resistor. The tunnel or hot-air chamber, which extends at right angles to the length of the furnace and is in open communication at one end with the rear wall of the furnace, is also formed in sections, comprising a bottom or base 22, side walls 23, resting upon said
 40 base, and a top wall or cover 24, resting loosely upon the upper ends of the vertical walls. This construction provides for the ready access to the hot-air chamber when desired through the simple removal of the cover-wall, as will be obvious. An endless conveyor 25, mounted upon suitable rollers 26, supported within the hot-air chamber and driven by any suitable power, is arranged to receive the vitrifying material from the trucks 11 and
 55 carry the same longitudinally of the hot-air chamber to a point of exit. If desired, a supporting-plate 28 may be arranged to normally underlie the upper face of the conveyor, whereby to support the same against sagging when in loaded condition. The operation

and use of my improved furnace will be fully obvious from the above description, taken in connection with the drawings, it being noted that the interior of the furnace is readily accessible through its sectional construction. 65
 The passage of the current through the carbon-conductors of the resistor described will induce a great degree of heat within the furnace, which, operating upon the enameling carried by the articles, will flash or quickly 70 fuse said enameling without materially increasing the heat of the article.

Having thus described the invention, what is claimed as new is—

1. An electric furnace comprising a furnace proper, horizontally-arranged conductors extending through opposite walls of the furnace, a resistor supported by the inner ends of said conductors, and a conductor supported by the furnace and movable in a plane 80 at right angles to the plane of the first-mentioned conductors.

2. An electric furnace comprising a furnace proper, horizontally-arranged conductors extending through opposite walls of the furnace, a resistor supported by the inner ends of said conductors, and conductors vertically movable in the furnace and arranged to contact with said resistor. 85

3. An electric furnace comprising a furnace proper, horizontally-arranged conductors extending through opposite walls of the furnace, a resistor supported by the inner ends of said conductors, and conductors vertically movable in the furnace and arranged to contact with said resistor, all of said conductors being freely movable into and out of operative position. 90

4. An electric furnace comprising a furnace proper, horizontally-arranged conductors extending through opposite walls of the furnace, a resistor supported by the inner ends of said conductors, conductors vertically movable in the furnace and arranged to contact with said resistor, tracks supported within the furnace, a truck movable on said tracks, and means for feeding the truck lengthwise of the furnace. 100

5. In a dielectric furnace duplicate conductors extending through the walls of the furnace, a resistor supported by said conductors, and an additional conductor adapted to contact with said resistor. 110

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

EDWIN A. STOREY.

Witnesses:

M. K. WILLOUGHBY,
 WILLIAM P. BONNELL.