

J. BECK.
FURNACE GRATE.
APPLICATION FILED AUG. 29, 1910.

984,344.

Patented Feb. 14, 1911.

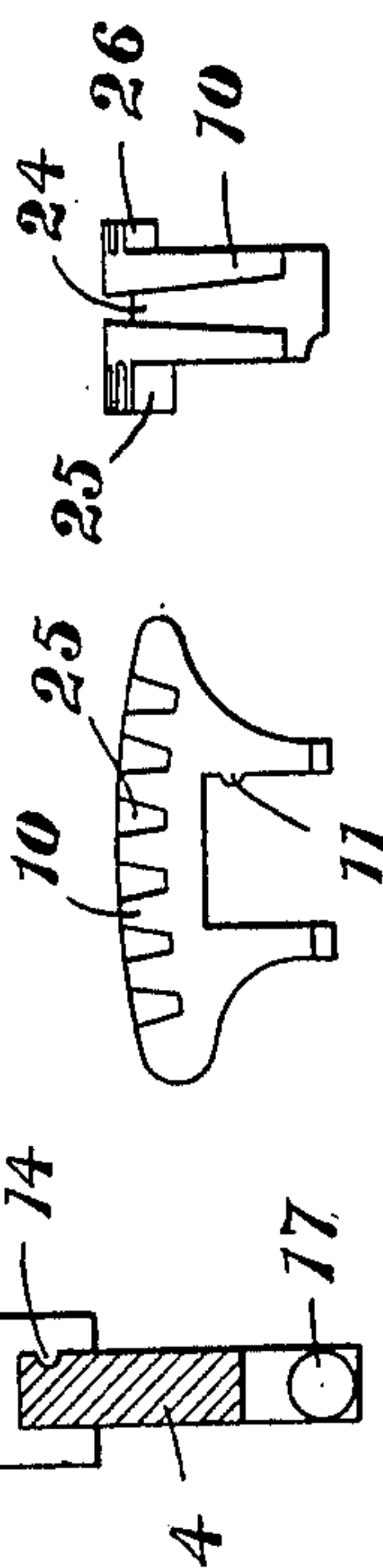
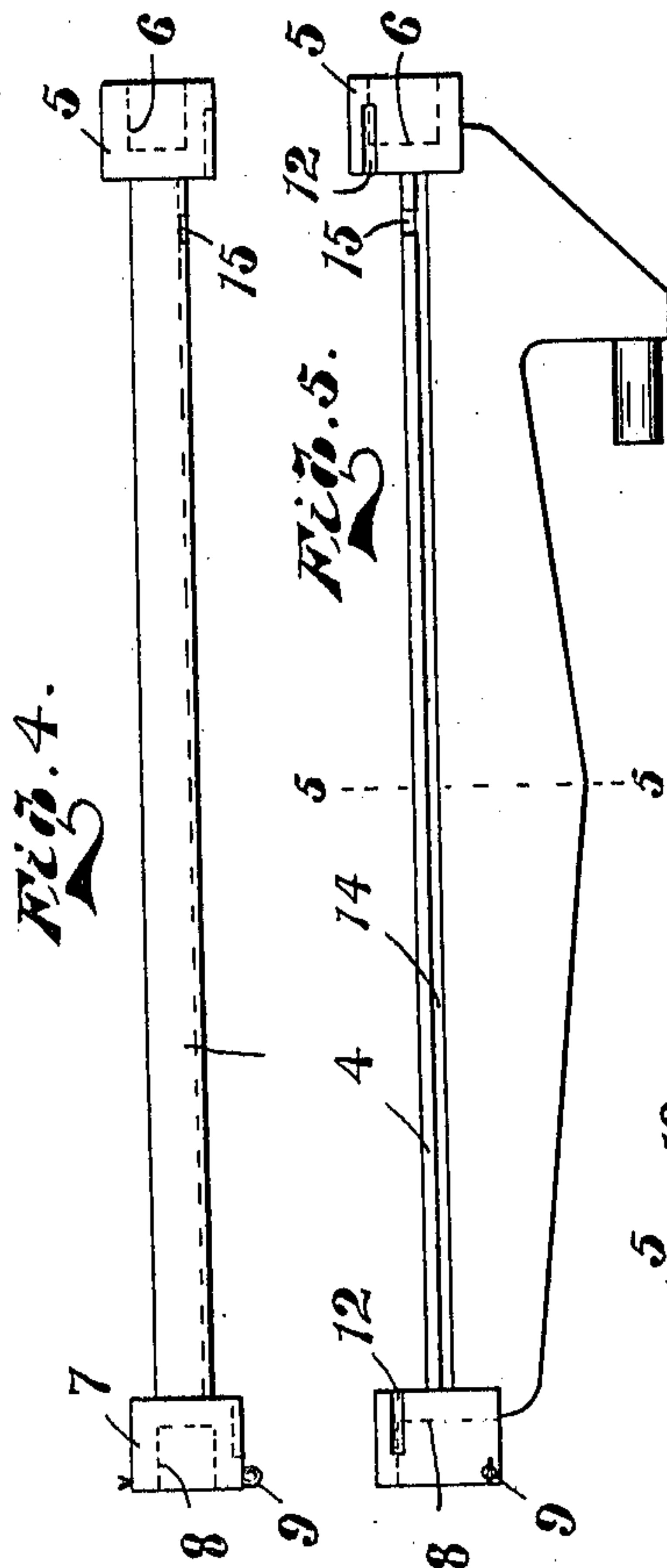
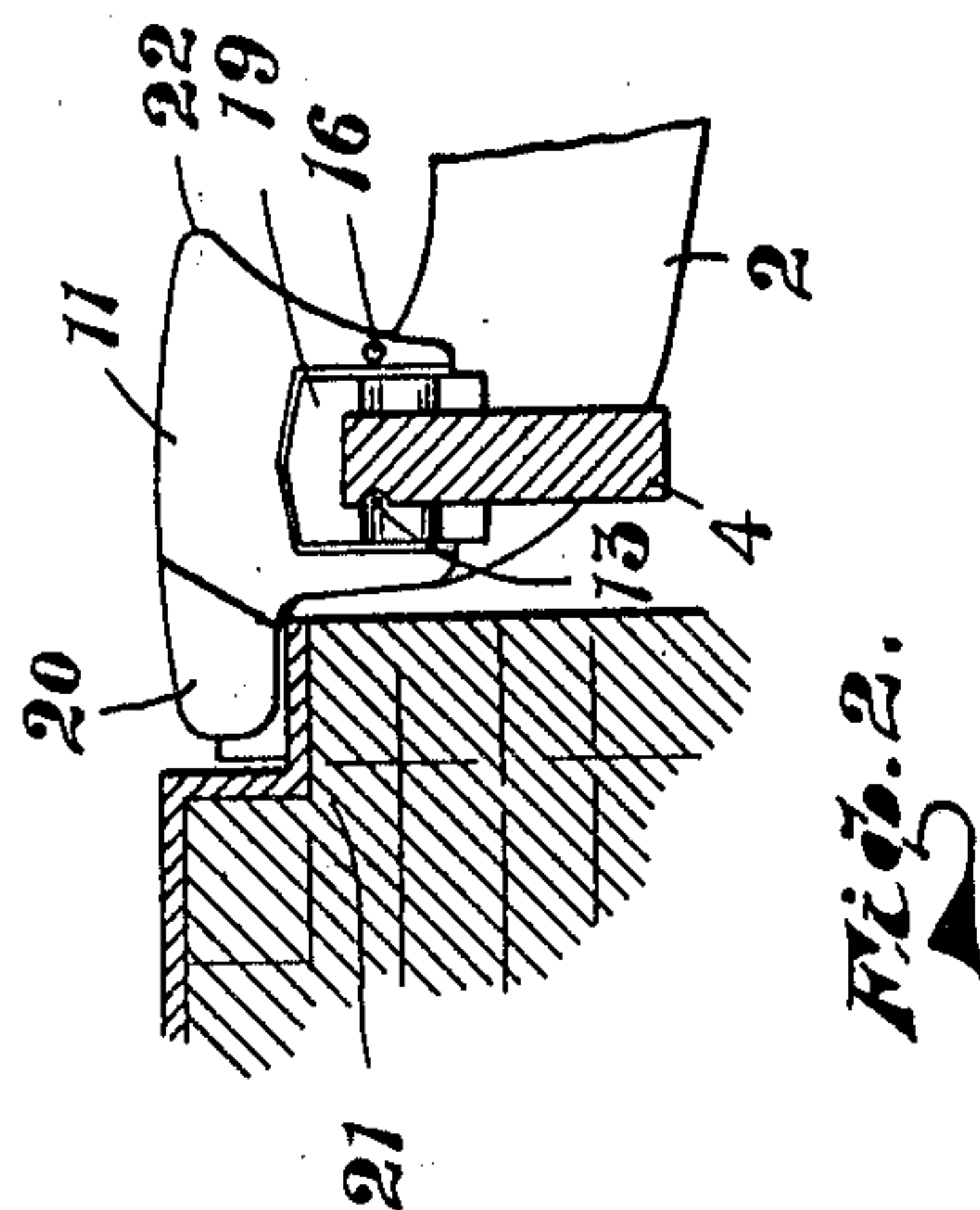
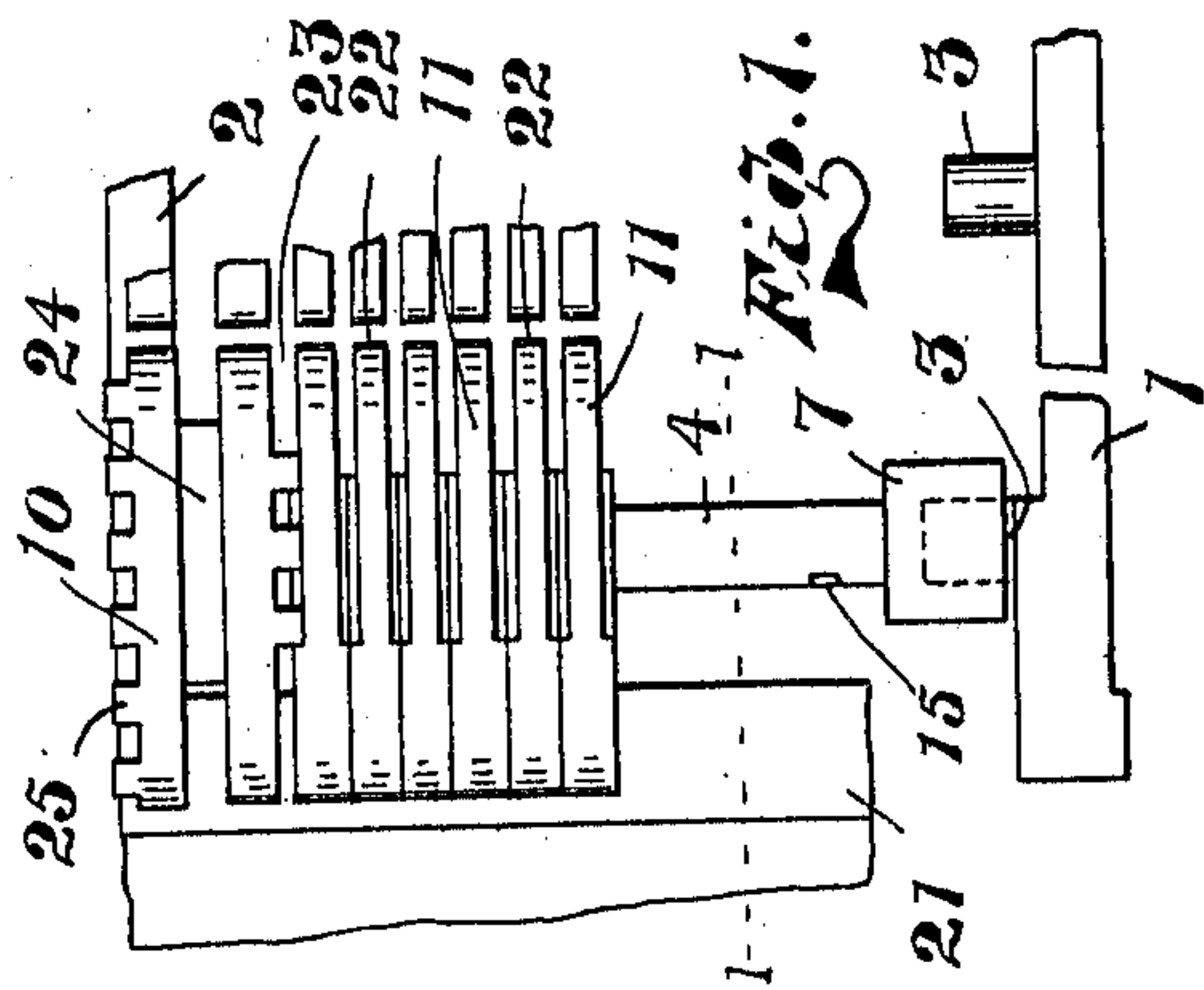


Fig. 8.

Fig. 7.

Fig. 6.

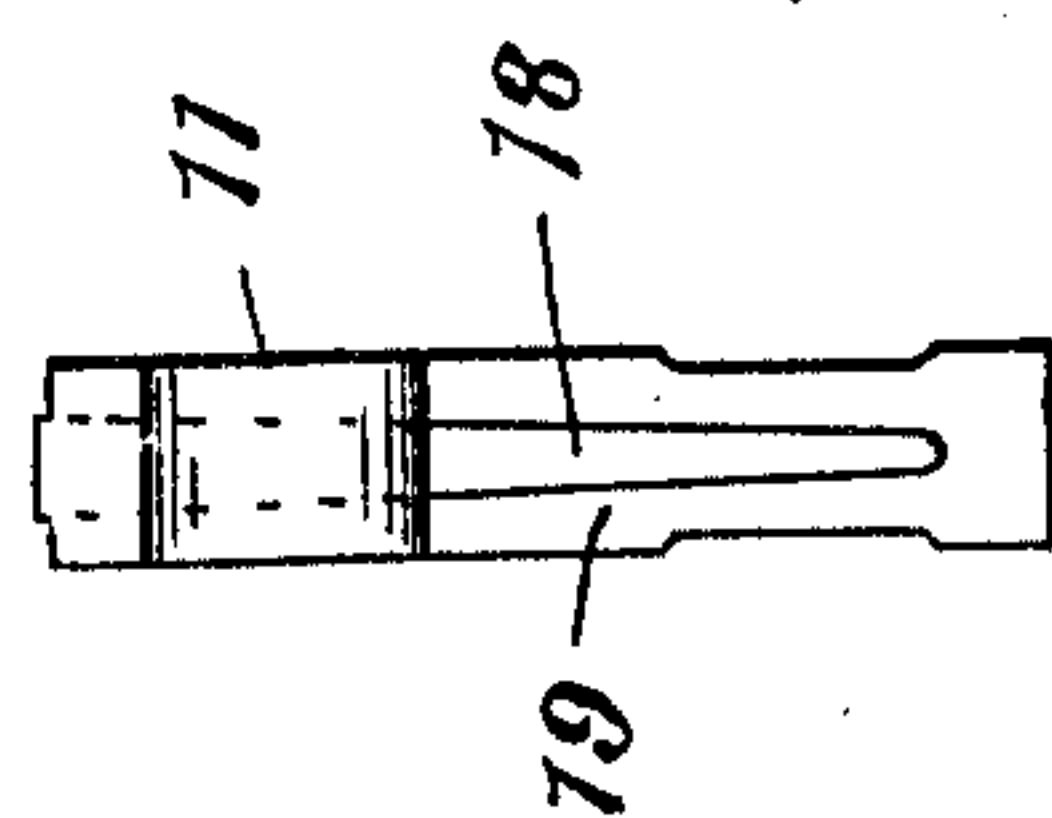


Fig. 5.

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JOSEPH BECK, OF TWO HARBORS, MINNESOTA.

FURNACE-GRATE.

984,344.

Specification of Letters Patent.

Patented Feb. 14, 1911.

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To all whom it may concern:

Be it known that I, JOSEPH BECK, a citizen of the United States, residing at Two Harbors, in the county of Lake and State of Minnesota, have invented certain new and useful Improvements in Furnace-Grates, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to improvements in furnace grates.

The object of my invention is to provide what is known as the end-grate, or some times called the dead-grate-bar, which will not warp or twist and one that will give free circulation of air and still be adapted to all grades of fuel.

Another object of my invention is to provide a more simple, cheap and effective grate of this character in which the several parts of which it is formed may be readily removed and replaced when broken or burned out.

In the accompanying drawings—Figure 1 is a top plan view of a portion of the furnace with one of my improved grate bars applied thereto. Fig. 2 is a vertical sectional view taken on the line 1—1, Fig. 1. Fig. 3 is a front elevation of one of the fuel carrying elements or fingers. Fig. 4 is a plan view of one of the grate-bars with the fingers removed. Fig. 5 is a side elevation of Fig. 4. Fig. 6 is a vertical transverse sectional view taken on the line 5—5, Fig. 5. Fig. 7 is an end elevation of one of the end fuel carrying fingers. Fig. 8 is a front elevation of Fig. 7.

Referring now to the drawings in which like parts are indicated by the same numerals throughout the several views, 1 and 2 represent the side supporting bars of the furnace, and while I have shown but two of these, it is well known that in some wide furnaces there may be a plurality of such bars. These bars are provided with trunnions or projecting bearings 3 extending toward the center of the furnace and for the purpose of supporting the cross or grate bars 4, these latter being formed with an enlarged square shaped head 5 at one end having a trunnion socket 6 therein to completely surround one of the trunnions 3 and at the opposite end with the enlarged square head 7 having an inverted U-shaped trunnion socket 8 therein to slip down over one of the trunnions 3 and is held normally thereupon by means of the

cross-cotter 9 in the lower outer corner thereof, there being a grate bar for each pair of trunnions as readily understood.

The square-shaped heads 5 and 7 are designed each to carry one of the end fuel supporting elements or fingers 10, which latter are provided with an internally projecting rib 11', which fits within the groove 12 on the side of the heads 5 and 7 when the fingers are slid longitudinally thereupon, which operation will be described more fully later.

In cross section, the grate bar 4 is rectangular in shape and the intermediate fingers 11 are designed to straddle the bar and rest upon the upper flat surface thereof, they being held in position vertically by means of the ribs 13 in each finger engaging within the longitudinal slot or groove 14 in the bar 4 when the fingers are slid thereon. The groove 14 extends the entire length of the bar 4 with the exception of at the point near one end where it extends upward through the upper surface of the bar as at 15 which is to provide means whereby the fingers may be applied to the bar and the ribs 13 made to engage the groove 14. Thus one of the end fingers 10 is slipped onto the head 5 and then the next intermediate finger 11 is applied to the bar over the entrance 15 and slid along to the head 7 and in this manner all the intermediate fingers are applied till the entrance 15 is reached, then the end finger 10 is slipped on to the head 5 and another intermediate finger 11 is applied at the entrance 15 and slid up against the head 5 when the final and last finger is applied directly over the entrance 15, thus they are all securely held in place except this last one which may be secured by means of a cotter or bolt through a suitable hole 16 to the adjoining finger.

The bar 4 is formed deeper through the center as is common in such constructions and for a shaking grate where the construction will admit, a trunnion 17 is provided to which any suitable form of shaking bar may be applied.

The intermediate fingers 11 are preferably constructed with a central tapered body-portion 18 having a laterally projecting hub 19 for surrounding the grate bar and the upper free end 20 projecting over the end wall 21 of the furnace pit is the full width of the hub 19 so that when these intermediate fingers are all assembled on the bar, the space over the end wall under the fingers is

completely occupied as clearly shown. The opposite end 22 of the fingers 11 is somewhat smaller in width to that of the hub 19, which forms an opening 23 between the 5 fingers when assembled, through which ashes may sift and air circulate.

The end fingers 10 are formed of a central hub portion 24 which straddles the bar 4 and the laterally projecting crown portions 10 25 and 26, each of which terminate laterally in a plurality of cog-like projections, these being for the purpose of air circulation and clearance.

From the foregoing, it will be seen that 15 I have provided a substantially continuous dead bar, which forms an adequate covering to the end wall to protect it from excessive heat et cetera and at the same time being of such construction as to prevent 20 warping and twisting and enables it to be removed in sections for repairs or renewal in the most convenient and inexpensive manner possible.

While I have shown and described particularly an end or dead bar of this construction, it is evident that the same may be used throughout the entire grate with the exception that the upper free end of the fingers would be the same width throughout 30 to correspond to the smaller dimension of such member as before described so as to give the necessary air circulation and freedom for ashes et cetera.

Having thus described my invention, what 35 I claim and desire to secure by Letters Patent is:

1. A grate comprising a bar, fingers removably secured on the bar having projecting portions on one side of the bar spaced 40 apart and having projecting portions on the opposite side abutting forming a solid fuel supporting portion.

2. The combination with a furnace, of trunnions carried by the sides of the fur-

nace, a grate bar rectangular in cross sec- 45 tion and having enlarged trunnions, sockets in its ends adapted to receive said trunnions, a downwardly extending enlarged portion carried by one end of the bar, a horizontal stud carried by said enlarged portion, end 50 fingers straddling the sockets and keyed thereon, one face of the bar having a longitudinal groove terminating in a vertical groove, and fingers straddling said bar and each finger having a rib adapted to enter 55 the vertical groove and moved longitudinally on the bar with the rib within the horizontal groove and means for locking the finger covering the vertical groove to its adjoining finger. 60

3. The combination with a furnace, of trunnions carried by the sides of the furnace, a grate bar rectangular in cross-section and having enlarged trunnion-sockets 65 in its ends adapted to receive said trunnions, a downwardly extending enlarged portion carried by one end of the bar, a horizontal stud carried by said enlarged portions, fingers straddling the sockets and keyed thereon, the said bar having in one face a longitudinal groove terminating in a vertical 70 groove, fingers straddling said bar and having solid abutting portions on the side of the bar and spaced portions on the opposite side, and a rib carried by each finger 75 above its lower end and adapted to enter the vertical groove and moved longitudinally on the bar with the rib within the horizontal groove and means for locking the finger covering the vertical groove to its adjoining 80 finger to prevent the vertical movement thereof.

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

JOSEPH BECK.

Witnesses:

JOHN P. PAULSON,
WILLIAM E. TRACY.