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MATERIAL CONVEYER FOR FURNACES

Original Filed Jan. 3, 1927

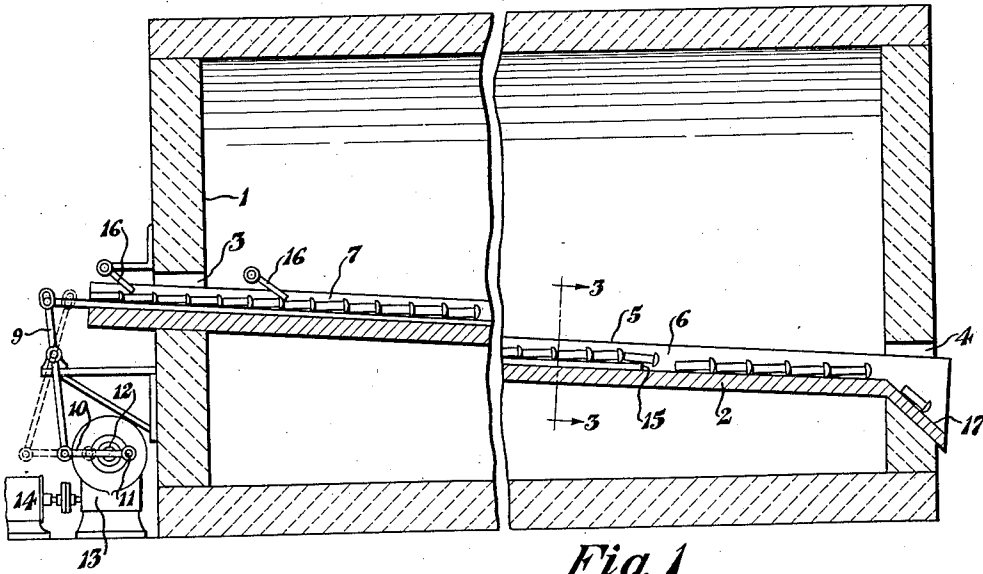


Fig. 1

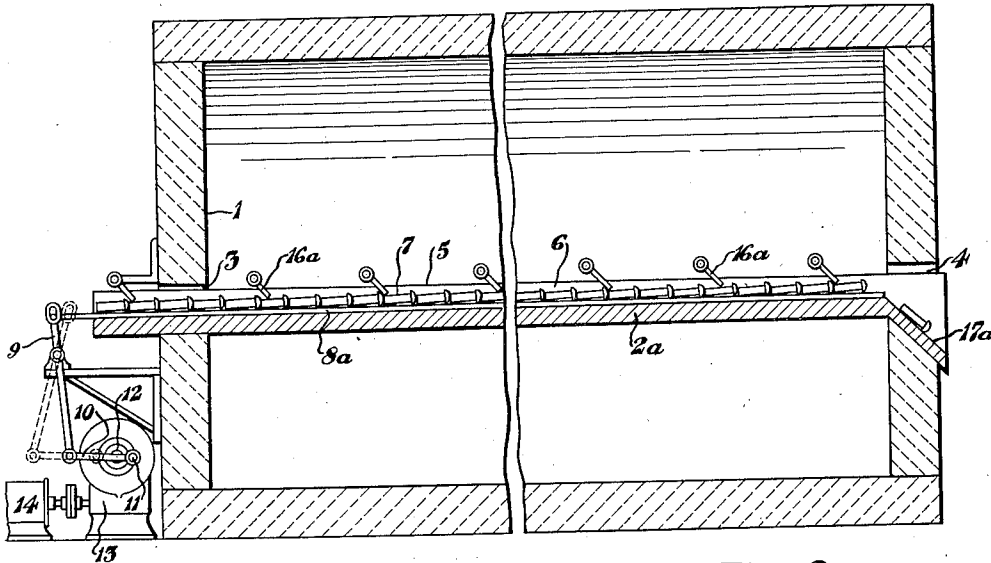


Fig. 2

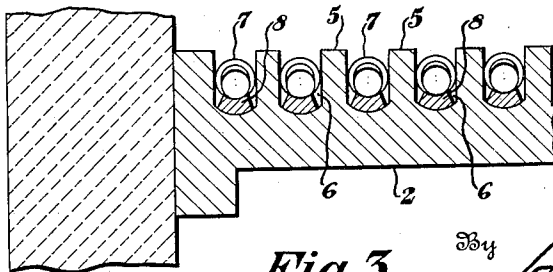


Fig. 3

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MATERIAL CONVEYER FOR FURNACES

Original application filed January 3, 1927, Serial No. 158,516. Divided and this application filed
November 30, 1928. Serial No. 322,804.

The invention relates to mechanism for conveying material through furnaces and more particularly to a conveyer apparatus for feeding small irregular shaped articles through a heat treating or annealing furnace at a uniform speed, and this application is a division of my copending application for material conveyers for furnaces, filed January 3, 1927, Serial No. 158,516.

10 In annealing or heat treating articles such as bolts, rivets and other like irregularly shaped articles, difficulty has been experienced in uniformly feeding the articles through the annealing furnace. Attempts
15 have been made to accomplish uniform feeding of the material by inclining the hearth and providing pusher means for passing the articles down the inclined hearth, but such apparatus has not proved successful, it being found that where the incline is sufficiently great to permit the articles to slide through
20 the furnace the speed of movement of the articles cannot be uniformly controlled, and where the incline is lessened sufficiently to overcome this difficulty there is a tendency for the articles to stop before they reach the end of the furnace hearth.

The object of the present improvement is to overcome the above difficulties by providing a pusher conveyer means in combination with a furnace hearth whereby the articles are continuously conveyed through the furnace step by step at a uniform rate of speed; and by providing pawls for engagement with the articles whereby the articles
35 are prevented from being moved in all the directions in which the pusher conveyer is moved.

The above and other objects may be attained by providing a reciprocating conveyer support for the articles to be heated, the articles being moved in one direction with the support with each forward reciprocation thereof, and means being provided for preventing the articles from returning with the back stroke of the conveyer support.

An embodiment of the invention is illustrated in the accompanying drawings, in which

50 Figure 1 is a longitudinal sectional view

through a furnace provided with the improved material conveyer adapted for feeding rivets, bolts and similar articles;

Fig. 2, a view similar to Fig. 1, showing a modified form of the feeding means; and

Fig. 3, a section on the line 3—3, Fig. 1.

Similar numerals of reference refer to corresponding parts throughout the several figures of the drawings.

Referring first to the structure illustrated in Fig. 1, the furnace 1 may be of any usual and well known design and is provided with the inclined hearth 2, the ends of which are preferably extending through the charging and discharging openings 3 and 4 respectively.

The hearth is provided with spaced longitudinally disposed ribs 5 forming channels 6 therebetween of a width substantially equal to one dimension of the articles shown at 7.

A reciprocating bar 8 is located upon the bottom of each channel and arranged to be reciprocated by any suitable means such as the lever 9 and pitman rod 10.

This pitman rod may be operatively connected to a crank arm 11 carried by a shaft 12 arranged to be rotated by any suitable gearing located in the gear housing 13 and driven as by the motor 14.

In the rear position each rod is arranged to be located, as shown in full lines in Fig. 1, with its free end 15 extending a portion of the length of one of the channels 6.

With a forward movement of the reciprocating conveyer support as indicated by dotted lines in Fig. 1 the articles resting thereon are carried forwardly along the channel 6.

For preventing back movement of the articles when the reciprocating conveyer support is moved backward again, there is provided one or more pivoted downwardly and forwardly inclined pawls 16 adapted to rest upon the bolts or other articles 7 and the end portions of the pawls engage the articles to prevent back movement thereof.

Upon this back movement of the conveyer support, the articles near the forward end 15 of the conveyer support drop into the channel 6 as shown at A.

Upon the next forward movement of the bar the articles in the channel 6 forward of the end 15 of the reciprocating support are pushed further forward upon the hearth by the reciprocation of the conveyer support, and by further reciprocation thereof the articles finally are passed down the inclined discharge chute 17.

Thus the rate of movement of the articles through the furnace is uniformly controlled, each row of articles moving slowly and uniformly downward through its channel, the foremost articles in each row being intermittently projected out of the furnace. Any desired rate of movement of the material through the furnace may be obtained by regulating the speed of reciprocation of the bars accordingly.

The construction shown in Fig. 2 is very similar to that shown in Fig. 1. The furnace 1 may be provided with a substantially horizontal hearth 2^a, the ends of which are preferably extended through the charging and discharging openings 3 and 4.

The hearth is provided with spaced longitudinally disposed ribs 5 forming channels 6 therebetween substantially equal to one dimension of the articles shown at 7.

The reciprocating bar 8^a, however, may extend substantially the entire length of the hearth and if desired a plurality of pawls 16^a may be provided at spaced intervals throughout the length of the hearth.

This reciprocating bar 8^a is located in the bottom of each channel 6 and is arranged to be reciprocated by the lever 9 and pitman rod 10 operatively connected to a crank arm 11 carried by a shaft 12 arranged to be rotated by any suitable gearing located in the gear housing 13 and driven as by the motor 14.

In this form the invention, with each forward movement of the bar, all of the articles are carried forwardly upon the bar and then as the bar moves backward the pawls 16^a retain the articles in the same manner as above described, permitting this bar to slide from beneath the foremost articles, which upon the next forward movement of the bar are discharged down the chute 17^a.

I claim:

1. A material conveyer for furnaces including a hearth provided with channels to receive articles to be conveyed through the furnace, bars located in the bottoms of the channels, means for reciprocating the bars for moving articles resting thereon, and downwardly and forwardly inclined pawls mounted in the furnace having their end portions extending into the channels and resting on the articles therein, and the end portions of the pawls engaging the articles when the bars are moved backward for preventing the articles from moving backward therewith.

2. A material conveyer for furnaces in-

cluding a hearth provided with channels to receive articles to be conveyed through the furnace, bars located in the bottoms of the channels, means for reciprocating the bars for moving articles resting thereon, and downwardly and forwardly inclined pawls pivotally mounted in the furnace having their end portions extending into the channels and resting on the articles therein, and the end portions of the pawls engaging the articles when the bars are moved backward for preventing the articles from moving backward therewith.

In testimony that I claim the above I have hereunto subscribed my name.

FRANK T. COPE.