

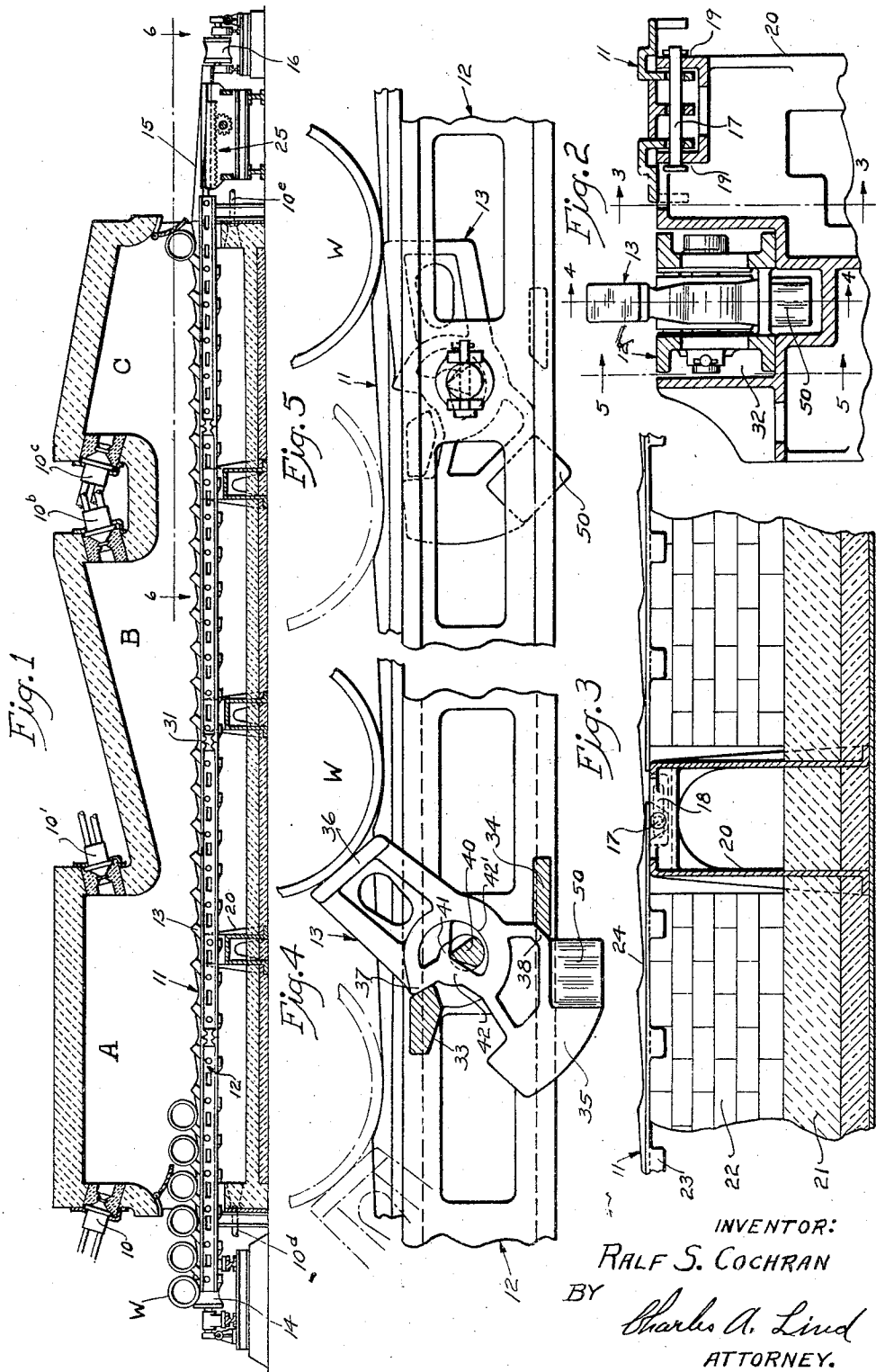
March 7, 1933.

R. S. COCHRAN
CONVEYER FOR FURNACES

1,900,428

Filed March 21, 1931

2 Sheets-Sheet 1



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Fig. 6

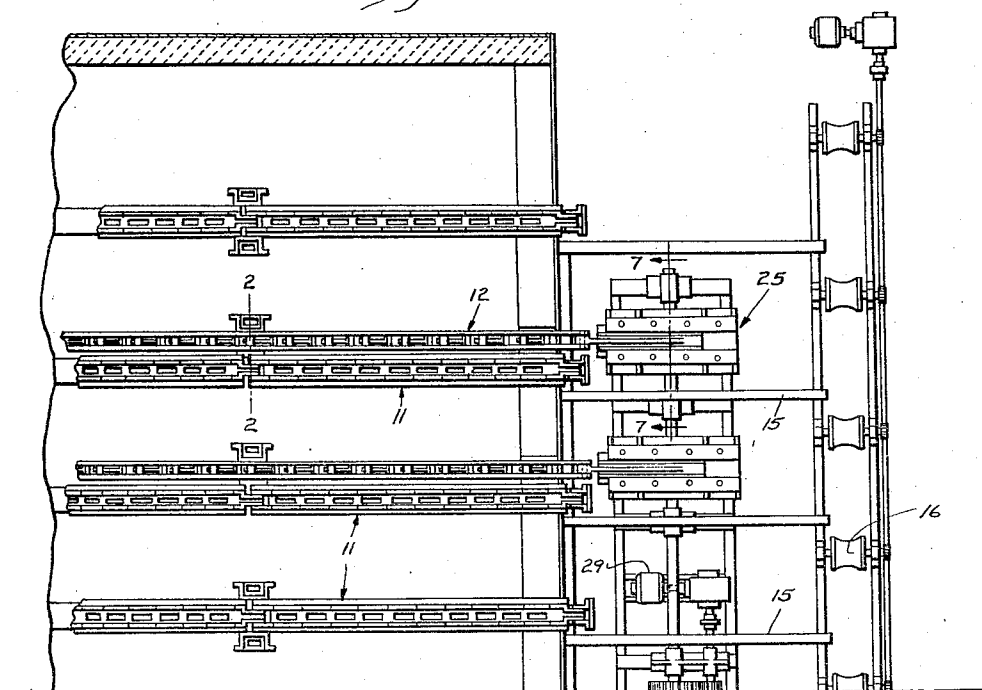


Fig. 8

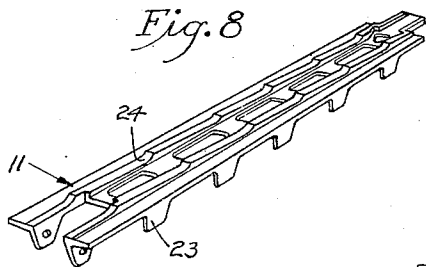


Fig. 7

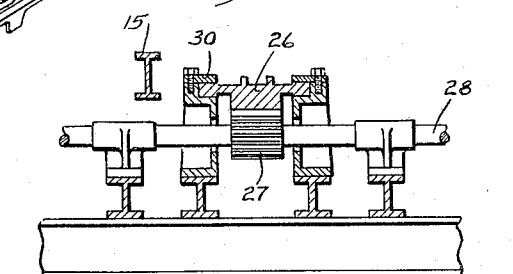
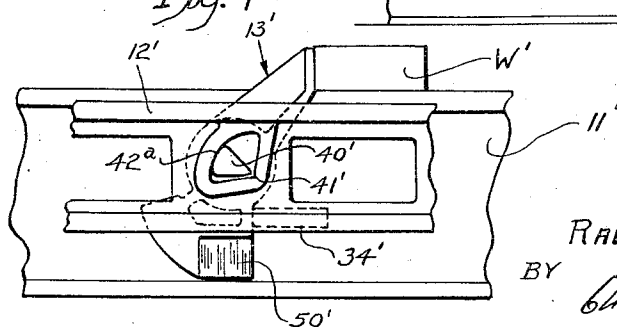


Fig. 9



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CONVEYER FOR FURNACES

Application filed March 21, 1931. Serial No. 524,290.

This invention relates to conveyers for moving material through a heat treating furnace and more particularly to a conveyer including a reciprocating member having trip dogs adapted to engage the work in one direction of movement of the reciprocating member.

The invention has among its objects to provide for the trip dogs a type of bearing or mounting which regardless of the adverse conditions of use will always permit the dogs to function in their intended manner; and in general to provide a conveyer which shall be simple in construction and reliable in operation.

Referring to the drawings wherein the preferred form of the invention is shown:

Fig. 1 is a longitudinal section through a furnace showing the improved conveyer associated therewith;

Fig. 2 is a section on line 2—2 of Fig. 6;

Fig. 3 is a section on line 3—3 of Fig. 2;

Fig. 4 is a section on line 4—4 of Fig. 2, the pedestal being omitted;

Fig. 5 is a section on line 5—5 of Fig. 2, the pedestal being omitted;

Fig. 6 is a section on line 6—6 of Fig. 1;

Fig. 7 is a section on line 7—7 of Fig. 6;

Fig. 8 is a perspective view of one of the work-supporting rails; and

Fig. 9 illustrates a modified form of bearing for the gravity dog.

This invention finds special utility in connection with furnaces of a width to permit relatively long objects such as bars or pipes to be passed therethrough crosswise thereof. The furnace itself may be of any preferred construction and may be fired in any preferred manner. The furnace shown in the drawings is provided with three consecutive firing chambers A, B and C of which A is the first or main heating chamber fired by opposed burners 10 and 10'; burners 10^b and 10^c for the other chambers being of the same type as the burners for chamber A. Burn-

ers 10^d and 10^e are also shown at opposite ends of the furnace below the conveyer. The work to be heat treated is shown as pipe W.

The work is advanced through the furnace on a bed of fixed rails 11 which extend longitudinally of the furnace in laterally spaced relation. The work is advanced along said rails by a series of reciprocating members 12 arranged alongside said rails, said members being provided with a series of trip dogs 13 which are normally held by gravity in an upright position for engaging the work on forward movement of the reciprocating member. The work to be heat-treated is brought to the front end of the furnace in any suitable manner as by rolls 14 and after being heat-treated is received on ways 15 which lead to conveyer rolls 16 as will be readily understood.

The rails 11 are made up of sections of convenient or suitable length, the adjacent ends of the sections being coupled by a pin and slot connection, of which the pin is indicated at 17 and the slot at 18, whereby to provide expansion joints. Said pins extend through upright flanges 19 formed on individual pedestals 20 which are anchored to and which rise from the floor 21 of the furnace. Masonry piers 22 extend between the pedestals 20, the rails 11 resting on the piers, the rails being provided with depending side flanges 23 disposed on opposite sides of the piers whereby to prevent relative lateral movement between the rails and piers. In order to prevent round work from freely rolling along the rails the latter may be provided with a series of inclines or serrations 24 wherein the work tends to rest until positively pushed therefrom by said dogs 13.

The reciprocating members 12 are reciprocated in unison by any suitable mechanism generally indicated at 25. For illustrative purpose said mechanism is shown as comprising a rack and pinion arrangement of which the racks are indicated at 26 and the

pinions at 27, the pinions being mounted on a common driving shaft 28 driven by any suitable prime mover 29. The racks are shown as individual elements hinged to the end of their respective members 12, the racks being confined in suitable guide ways 30.

The reciprocating members 12 are made up of sections of convenient length rigidly connected together by any suitable means 31. Said members are supported by the aforementioned pedestals in a channel 32 provided for that purpose. Individually said members preferably comprise a pair of channel-type beams rigidly connected by a series of cross pieces 33 and 34 which also serve a purpose hereinafter set forth.

The manner of mounting the trip dogs 13 constitutes the important feature of the present invention and will now be described. The dogs have a pivotal bearing intermediate their ends, the lower end being weighted as at 35 whereby the dog will normally assume the position shown in Fig. 4, and when passing under the work will assume the position shown in Fig. 5. The pivotal connection for the dogs is of the line or knife-edge type. In the preferred form as shown in Figs. 2, 4 and 5, the dog itself provides the anvil for the bearing whereas in the modified form of the invention, the side members comprising the rail 12 are formed to provide the anvil.

Referring first to the form of the invention shown in Figs. 2, 4 and 5: The dog is provided with an opening wherethrough extends a bearing pin 40 non-rotatably secured in the sides of the rail 12 in any approved manner. The pin intermediate its ends is shaped to provide upwardly converging sides the apex of which constitute the line or knife-edge bearing. The anvil part of the bearing is indicated at 41 the same being formed as an inwardly projecting portion of the hub 42 of the dog. It will be noted that the dog extends between the cross pieces 33 and 34 and is provided with shoulders 37 and 38 for engagement therewith, the cross pieces serving as abutments for effectively locking the dog against turning when it is pushing the work as will be readily understood.

While it is preferred to have the dog abut the cross piece 33 as well as the cross piece 34, nevertheless it is within the spirit of the invention to omit the abutment 33. In the absence of the abutment 33, the underside of the pin 40 serves as an abutment against which the hub wall 42' of the dog comes into contact under thrust of the work. However, there is no particular advantage in not having the dog engage the cross piece 33. On the contrary there is a distinct advantage in providing an upper as well as lower abutment independent of the bearing pin since there will then be less stress on the bearing parts as will be readily appreciated. The abutment 33 is particularly useful where the nor-

mal position of the dog instead of being in the vertical is disposed at a forward incline to the vertical as in Fig. 4, and more especially where the work engaging surface of the dog is across the end of the dog. In such case the major portion of the thrust of the work is taken by the abutment 33 as will be readily appreciated by reference to Fig. 4.

In the modified form of the invention shown in Fig. 9, the bearing pin 40' is non-rotatably secured to the dog 13' the ends of the pin being shaped to provide converging walls the apex of which is at the forward side of the pin instead of at the upper side thereof as in Fig. 4. Formed in the sides of the rail 12' are anvils 41'. A lower cross piece 34' cooperates with the pin 40' to lock the dog against turning when the dog is pushing the work, it being noted that the dog is normally in the vertical and is adapted to engage the work W' from behind in a direct pushing contact. The backward thrust by the work against the dog is taken not by the anvils 41' but by the back 42^a of the pin in engagement with the rail.

As indicated at 50 in Fig. 2, 4 and 5, and at 50' in Fig. 9, the lower forward end of the dog is provided with a diagonal face for dislodging debris from the channel in the pedestal.

What I claim is:

1. In apparatus for pushing work along a support, the combination of a reciprocable member, a trip dog carried by said member for engaging the work, a knife-edge bearing for rotatably supporting said dog, and means independent of said bearing for taking the thrust of the work against the dog, said knife-edge bearing comprising a pin secured to said member and an anvil on said dog overlying said pin.

2. In apparatus for pushing work along a support, the combination of a reciprocable member, a trip dog carried by said member for engaging the work, a knife-edge bearing for rotatably supporting said dog, and means independent of said bearing for taking the thrust of the work against the dog, said member comprising a pair of similar elements tied together by means including upper and lower cross pieces, the dog having its knife-edge bearing between said pieces.

3. In apparatus for pushing work along a support, the combination of a reciprocable member, a trip dog carried by said member for engaging the work, the upper end of the dog being adapted to engage the work, said end having a backward incline, a pair of abutments between which the dog extends and which hold the dog against rotation in one direction, a pivot pin for the dog, said pin being disposed between said abutments, and a shoulder on the dog adapted to engage the upper surface of the upper of said abutments.

4. A conveyer for moving material through
a heat treating furnace along a support, com-
prising a reciprocable member, a trip dog
carried by said member having its upper end
5 adapted for engaging the work and having a
plow on its lower forward end, a line bearing
for rotatably supporting said dog and a
channel mounting for the reciprocating mem-
ber, said channel having a depressed central
10 portion wherein the plow end of the dog is
reciprocable.

In testimony whereof I affix my signature.

RALF S. COCHRAN.

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