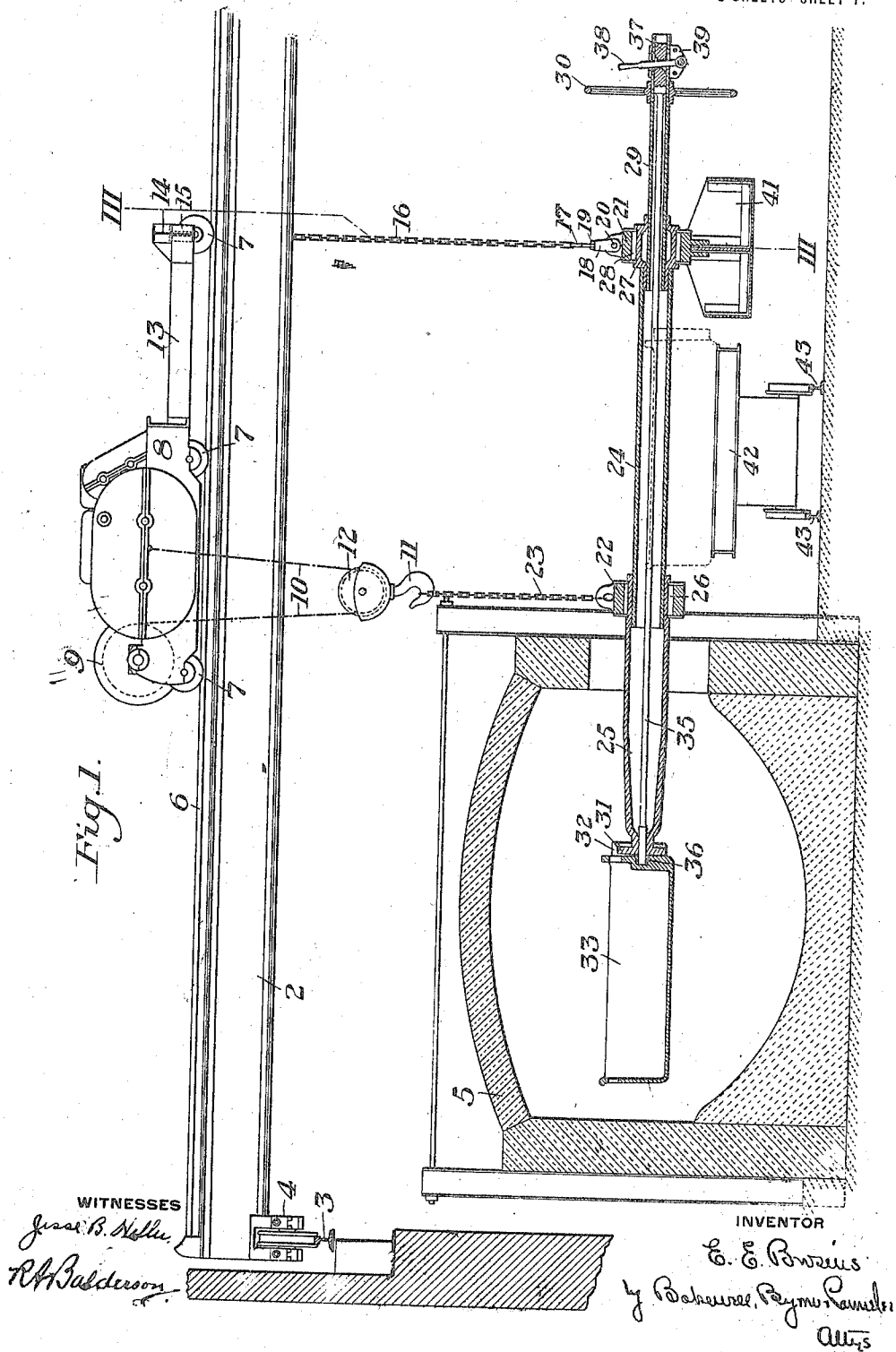


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FURNACE CHARGING DEVICE.
APPLICATION FILED DEC. 2, 1916.

Patented July 23, 1918.

3 SHEETS—SHEET 1.



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3 SHEETS—SHEET 2.



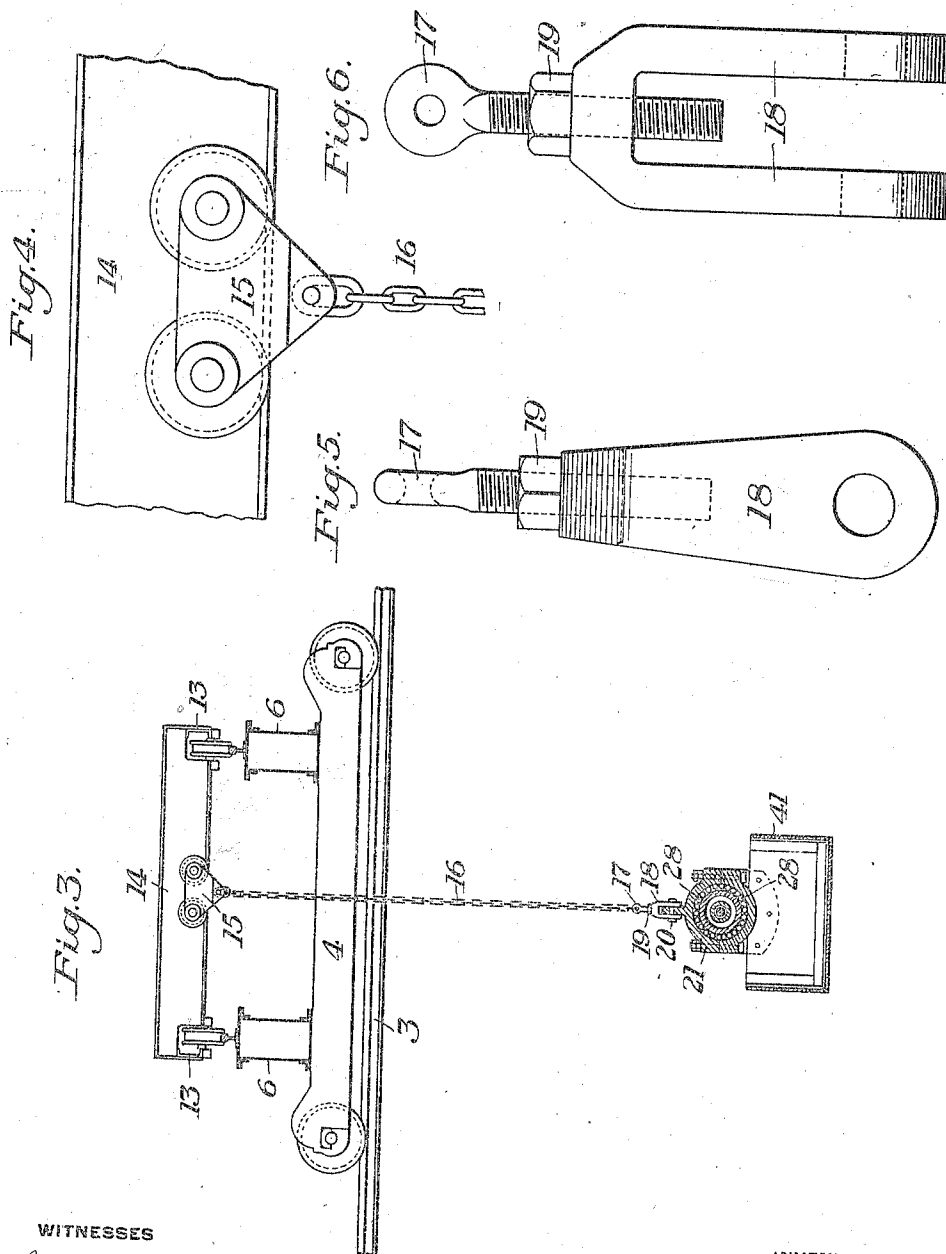
Jesse B. Miller
 R. A. Balderson

E. E. Brown
by Robert Byrnes Carver
Att.

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WITNESSES
Jesse B. Heller.
R. A. Baldwin.

INVENTOR
E. E. Brosius
J. B. Baker, J. M. Baker
Attys

UNITED STATES PATENT OFFICE.

EDGAR E. BROSIUS, OF PITTSBURGH, PENNSYLVANIA.

FURNACE-CHARGING DEVICE.

1,273,141.

Specification of Letters Patent.

Patented July 23, 1918.

Application filed December 2, 1916. Serial No. 134,608.

To all whom it may concern:

Be it known that I, EDGAR E. BROSIUS, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Furnace-Charging Devices, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation partially in section of one form of my charging device, in which the furnace is shown in section.

Fig. 2 is a plan view of the charging bar and the supporting bearings.

Fig. 3 is a sectional view on the line III—III of Fig. 1.

Fig. 4 is a detail view of a portion of Fig. 3 on a larger scale.

Fig. 5 is a side elevation of a clevis for supporting one of the charging bar bearings, and

Fig. 6 is a front view thereof.

This invention relates to an improvement in furnace charging devices and is designed to provide a cheap and efficient device, which is adapted to be used in connection with old and well known overhead cranes.

The object of my invention is to provide a device of this character in which most of the parts are of standard construction, so that they can be used in the construction of charging devices of various sizes, and also to meet the different conditions of different furnaces, due to the available space for the charging device.

Another object of my invention is to provide a device having two suspended bearings for the charging bar, one of which is fixed at a predetermined level from the crane support and which is arranged to move about a horizontal axis to permit the charging bar to be oscillated vertically. The second bearing is arranged to be suspended by the hoisting cable of the crane, and is so arranged that it can be moved about its vertical axis, to permit the bar to oscillate in a horizontal direction. A still further object of my invention is to form the charging bar of a plurality of tubular members, so that bars of various size can readily be constructed from sections of tubing cut to the required length for the particular bar to be constructed.

The precise nature of my invention will be best understood by reference to the ac-

companying drawings, which will now be described, it being premised, however, that various changes may be made in the details of construction and arrangement of the parts, without departing from the spirit and scope of my invention, as defined in the appended claims.

Referring to the accompanying drawings, the reference character 2 designates a crane bridge which is supported on a track 3 by means of trucks, such as shown at 4, in such a manner that the crane is arranged to be moved in a longitudinal direction in front of a furnace, or furnaces 5. Supported on tracks 6 on the crane bridge by means of wheels 7 is a trolley 8. This trolley is provided with the usual motor and a winding drum 9 for a hoisting cable 10. 11 is a swivel hoisting hook supported on a cable 10 by means of a sheave 12. Connected to one end of the frame work of the trolley 8 is an extension 13 having a horizontally disposed I-beam 14, supported on the lower flanges of which is a second trolley 15. Connected to this second trolley 15 is a flexible suspending member 16, which I have shown as a chain. The lower end of this chain is provided with a clevis having an I-bolt 17 and to which is connected a yoke 18. 19 is a lock nut for securing the yoke 18 in its adjusted position to the bolt 17. Pivotaly connected to the yoke 18 by means of a pin 20 is a bearing 21 for supporting one end of the charging bar, the other end thereof being supported by a bearing 22 which is connected to the hook 11 by means of a flexible member 23. The charging bar is built up of a central tubular section 24 which is telescopically connected at one end with a charging head member 25. This charging head member is provided with a groove in which are seated rollers 26 in the bearing 22. The other end of the tubular section 24 is connected to a flange of a journal member 27 having an annular groove for the reception of roller bearings 28 within the bearing member 21. Seated within the member 27 is a tubular section 29, which is rigidly connected thereto and extends to a point beyond the journal member 27 and which is provided with a hand-wheel 30 for rotating the charging bar, as hereinafter described. Formed integrally, or connected to the outer end of the charging head member 25, is a head 31, which is struck on an arc from the center of the pin 20, and which

is arranged to engage the usual head engaging recess, such as 32, of a charging box 33. Slidably mounted within the charging bar 24 is a charging box locking bolt 35, one end of which is arranged to be seated in an opening 36 in the charging box to retain it in position on the head 31 when charging. The other end of this locking bolt 35 is provided with an actuating head 37 which is mounted for reciprocation within the tubular section 29. 38 is an actuating lever for the locking bolt which is pivoted to a yoke or bearing 39 connected to the tubular section 29, and which extends through a slot in the head 37, so that the locking bolt will be moved by said lever. Connected to the bearing 21 in any desired manner is a counterweight 41 which is arranged to counterbalance the weight of the box and the load therein. The trolley 15 can readily be moved along the flanges on the I-beam 14 to move the charging bar in a horizontal direction, as indicated in dotted lines in Fig. 2.

42 is a charging box car which is arranged to be moved in a longitudinal direction in front of the furnaces on rails 43.

When it is desired to charge a furnace, the charging boxes are brought into their proper position in front of the furnace to be charged on the cars 42, and the charging apparatus is then brought into proper position with relation to the boxes. The operator then lowers the front end of the charging bar to engage it with the recess 32 in the box 33, and after the head is in its proper position, the bolt 35 is moved forwardly to lock the box in position on the head. As the end of the head 31 is of arc form and is struck from the normally fixed center of the pin 20, the head 31 will readily enter the recess 32, as the position of this center is fixed at a predetermined height with relation to the crane and the boxes on the car 42. After the box has been secured in position on the head, the drum 9 is rotated to lift the bar and the box to the proper height with relation to the furnace door, the bar moving about the center on the pin 20. The trolley 8 is then moved in a longitudinal direction with relation to the supporting bridge to move the box on the end of the charging bar into the furnace. The operator then swings the charging bar about the axis of the hook 11 in a horizontal direction to move the box to a predetermined position in the furnace, and during such movement the auxiliary trolley 15 will readily move along the I-beam 14, as the weight of the charging box is counterbalanced by the counterweight 41. After the box has been moved to the predetermined position within the furnace, it may be lowered, if desired, by means of the hoisting cable 10, and is then rotated by the hand wheel 30 in order to dump the con-

tents of the box into the furnace. After the box has been dumped, it is returned to the car 42 and the succeeding boxes are dumped in the same manner.

It will readily be understood by those familiar with the art that if desired the two bearing members may be supported in the reverse manner by means of the suspension members.

The advantages of my invention result from the provision of a charging device which can be used in connection with an ordinary crane, and in which one of the bearings is supported at a fixed height and is arranged to be bodily moved horizontally and adapted to oscillate about a horizontal axis; together with a second bearing suspended by the hoisting cable and which is arranged to oscillate about a horizontal axis and to be raised and lowered by the supporting cable. Also from the provision of a track supported on the crane trolley which is arranged to support an auxiliary trolley for the suspension cable for one of the bearings. Also from the provision of a charging bar which is built up of a plurality of tubular sections, so that charging bars of different lengths can readily be made from tubing cut to the proper length for the different sections.

I claim:

1. A charging bar having two supporting bearings, a tubular section rotatably mounted in one of said bearings and extending forwardly thereof, a charging head on the outer end of said section, a journal member rotatably mounted in the other bearing, a tubular section connected to said rotatable member and the end of the charging head in the other bearing, a third tubular section connected to the journal member and extending rearwardly thereof, a locking bar extending from the last mentioned tubular section through the other tubular section and charging head, and means on the last mentioned tubular section for actuating the locking bar; substantially as described.

2. A charging bar having two supporting bearings, a rotatable journal member mounted in one of said bearings, a tubular section connected to said rotatable member and extending to the other bearing member, a charging head section connected to the end of said tubular section and rotatably mounted within the last mentioned bearing, and a third tubular section within the rotatable journal member and connected thereto, said tubular section extending rearwardly from the journal member; substantially as described.

3. A furnace charging device, comprising a charging bar, suspended bearings for supporting said bar, a charging head on one end of said bar, actuating devices on

the other end of said bar, means for raising and lowering the bearing adjacent to the charging head, means for permitting the other bearing to be moved in a horizontal direction about the point of suspension of the other bearing member and a counterweight connected to the movable bearing to counterbalance the load on the charging end and permit the same to be moved freely in a horizontal direction; substantially as described.

4. A furnace charging device, comprising a crane having a trolley with a winding drum thereon; a charging bar having a bearing supported by the winding drum, a second bearing for the charging bar, a track

connected to the trolley, an auxiliary trolley supported upon said track, a flexible suspending member connected to said trolley and the second bearing, and a counterweight connected to said second bearing for counterbalancing the charging bar when loaded, so as to permit the auxiliary trolley to move freely along the track to swing the charging bar in a horizontal direction; substantially as described.

In testimony whereof, I have hereunto set my hand.

EDGAR E. BROSIUS.

Witnesses:

JESSE B. HELLER,
H. M. CORWIN