

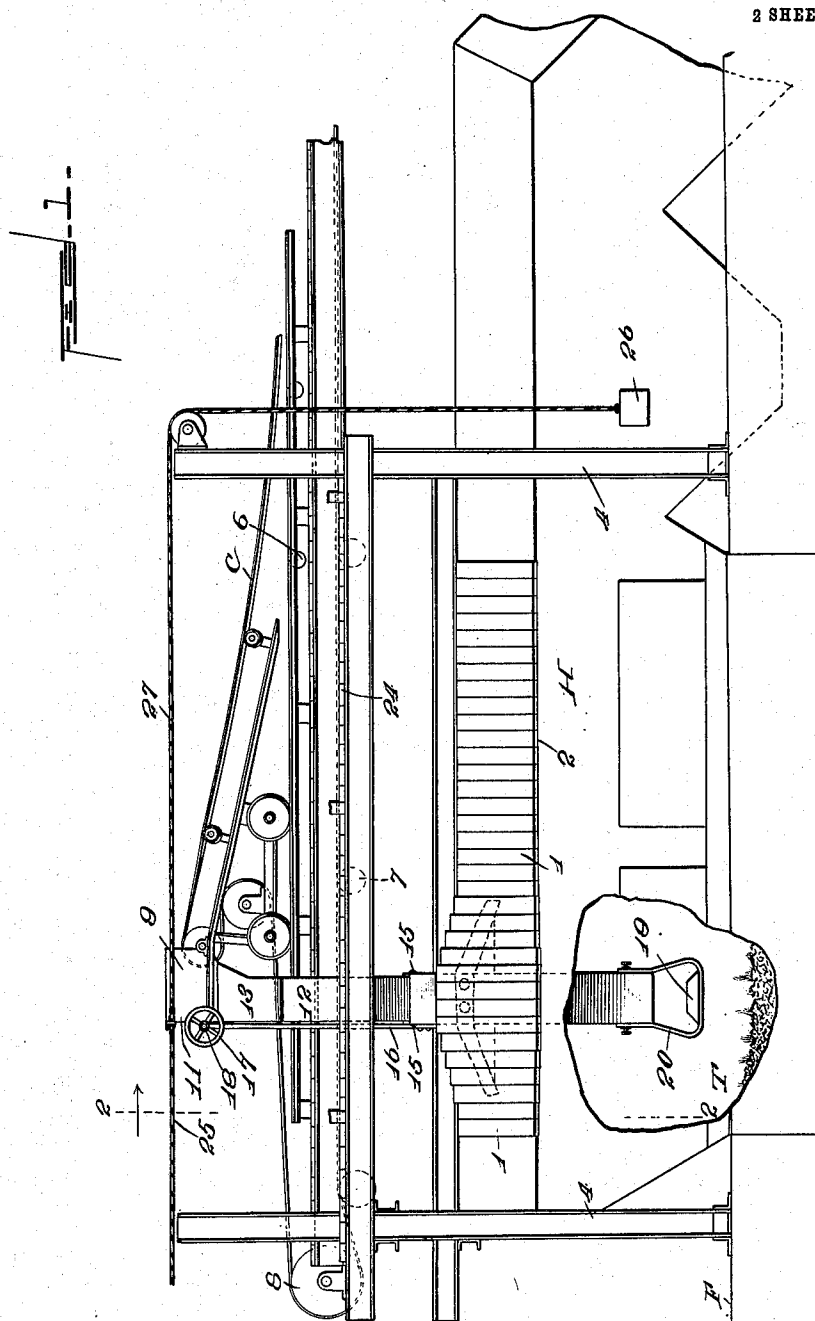
No. 840,575.

PATENTED JAN. 8, 1907.

E. H. MESSITER.
FURNACE CHARGING APPARATUS.

APPLICATION FILED FEB. 7, 1905.

2 SHEETS—SHEET 1.



WITNESSES:

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Ralph C. Hancock

INVENTOR

Edwin H. Messiter

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his ATTORNEY

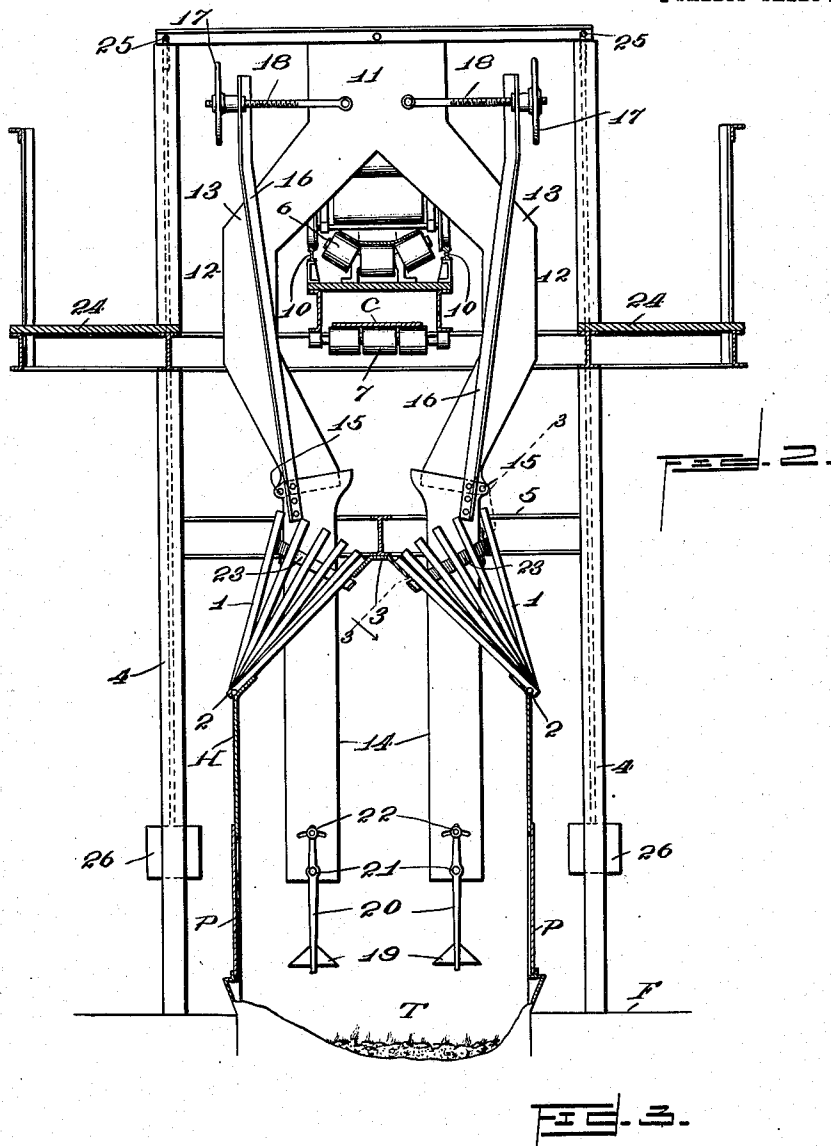
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UNITED STATES PATENT OFFICE.

EDWIN H. MESSITER, OF NEW YORK, N. Y.

FURNACE-CHARGING APPARATUS.

No. 840,575.

Specification of Letters Patent.

Patented Jan. 8, 1907.

Application filed February 7, 1905. Serial No. 244,678.

To all whom it may concern:

Be it known that I, EDWIN H. MESSITER, a citizen of the United States, residing in the city, county, and State of New York, have invented a new and useful Furnace-Charging Apparatus, of which the following is a specification.

This invention relates to furnace-charging apparatus, and especially to apparatus for charging furnaces for smelting lead, copper, and other metals requiring similar treatment.

The present invention is closely related in character and in objects to those disclosed in my companion applications, Serial Nos. 244,676 and 244,677; and it has for its specific object the provision of a furnace-charging apparatus in which the charging material is delivered from a conveyer having a shifting point of discharge and passes directly downward from the conveyer to the charge within the furnace.

In attaining the object above stated I employ a conveyer extending over the top of the furnace and having a tripper or other suitable delivery apparatus arranged for reciprocatory movement over the furnace. From the tripper or other delivery apparatus one or more spouts or conduits extend downward through the furnace-top, and the furnace-top is so constructed that it will not interfere with the movement of the spouts which extend downward into the furnace.

One form of apparatus embodying the features mentioned in the foregoing paragraph is illustrated in the accompanying drawings and will be hereinafter described in detail; but it is to be understood that changes in the apparatus may be made without departing from the spirit of the invention or sacrificing any of its advantages, and I reserve the right to make such changes, the scope of the invention being clearly pointed out in the appended claims.

In the drawings, Figure 1 is a view, principally in side elevation, of the top of a furnace provided with a special form of hood and having the charging apparatus in position above the top of the furnace, a portion of the side wall of the hood being broken away to show the lower part of one of the charging-spouts. Fig. 2 is a view in vertical section on the line 2 2 of Fig. 1. Fig. 3 is a sectional view, on line 3 3 of Fig. 2, of the devices employed for shifting the cover-sections at the top of the hood to permit the horizontal movement of the charging-spouts.

Referring to the drawings, in which corresponding parts are designated by similar characters of reference, H designates the hood at the top of the furnace, F designates the charging-floor, and T designates the top of the charge within the furnace. The hood H extends horizontally at one end and is connected in the usual manner with the flues for removing the fumes that rise from the charge, and at the sides the hood is preferably provided with removable plates or doors P to permit access to the furnace for "barring out" or for inspection. The top of the hood above the furnace is preferably formed of a plurality of movable sections 1. These sections are arranged in two series, as shown in Fig. 2, each series of sections being pivotally mounted at 2 on one of the side walls of the hood and having their upper ends resting upon a ridge-piece 3, extending horizontally above the furnace in the median line. The ridge-piece 3 is mounted upon a superstructure comprising uprights 4 and suitable transverse pieces 5, and this superstructure extends upward beyond the ridge-piece to afford support for the conveyer and the apparatus for discharging the material therefrom.

The charging apparatus proper comprises a conveyer-belt C, supported upon troughing-idlers 6 and return-idlers 7, carried by the superstructure above named. The belt C passes around a tail-pulley 8 at one end of the superstructure and also travels around the bend-pulleys of a tripper or deliverer, (designated generally as 9.) This tripper is arranged for travel upon the track-rails 10, carried by the superstructure in suitable relation to the troughing-idlers, and from the hopper 11 of the tripper spouts 12 extend downward through the sectional portion of the top of the furnace-hood. The spouts 12 are preferably formed in sections, as shown, the upper section 13 of each spout being rigidly connected with the hopper 11 and the lower section 14 of each spout being adjustably connected with the upper section for reasons that will hereinafter appear. The upper sections 13 of the spouts diverge from the hopper 11 to straddle the conveyer, and below the conveyer the ends of the said upper sections converge somewhat to bring the lower sections nearer to the median line of the furnace. Each of the lower spout-sections 14 is shown as pivoted at 15 to one of the upper sections 13, and a lever-arm 16,

which is rigidly attached at its lower end to one of the sections 14, extends upwardly at each side of the hopper 11, where a hand-wheel 17, which is threaded on a screw 18, attached to the hopper, serves to adjust the position of the lever-arm and also the position of the corresponding spout-section. At the bottom each spout-section 14 is preferably provided with a deflector 19, which may be of different forms to suit different conditions.

In the form illustrated each deflector 19 is suspended in a hanger or stirrup 20, which is pivoted at 21 to the corresponding spout-section 14. The sides of each stirrup 20 extend upward beyond the pivots, and at their upper ends the side pieces of the stirrups are provided with adjusting devices 22 of any suitable character. These adjusting devices permit the stirrups or hangers to be set so that the deflectors 19 will throw the charging material toward the median line of the furnace or toward the side walls, as may be desired.

Upon each of the spout-sections 14, in suitable position to engage with the pivoted top sections 1 of the furnace-hood, I provide a shifting device 23, which is of trapezoidal form, as shown in Fig. 3, and presents a triangular extension at each end, along one side of which the cover-sections will slide easily as the shifter is advanced. The triangular extensions at each end of each shifter are of precisely the same form, as the spouts have a reciprocatory movement within the furnace-hood, and each end of each shifter serves alternately to raise the cover-sections and to permit them to descend gradually into their normal position. The shifters 23 also serve as partial closures for the openings that are formed at the top of the furnace-hood when the cover-sections are raised to permit the movement of the charging-spouts, thus preventing the escape of large quantities of fumes at the top of the hood and insuring the comfort and convenience of the inspector whenever he occupies a position upon one of the footboards 24, which are arranged at the sides of the superstructure at the level of the return-idlers of the conveyer.

The reciprocatory movement of the tripper and the charging-spouts necessary to effect the distribution of the charging material over the top of the charge in the furnace is produced by any suitable apparatus for that purpose—such, for example, as that disclosed in my companion application, Serial Number 244,676; but the mechanism for imparting movement to the tripper forms no part in the present invention, and hence is not described in this application. A cable 25 is shown as extending from the top of the tripper to the reciprocating mechanism, adapted to impart movement to the tripper in one direction, and a counterweight 26, attached

to the end of a cable 27, which extends in the direction opposite to the cable 25, serves to impart return movement to the tripper.

In the operation of the charging apparatus the charging material is carried by the conveyor-belt C to the hopper 11 of the tripper 9, into which it is discharged in a substantially continuous stream. This stream is divided into two streams of substantially equal size, which pass downwardly through the charging-spouts 12 and are distributed in any desired manner by the deflectors 19, arranged beneath the charging-spouts. The reciprocatory movement of the tripper may be controlled by adjusting the driving mechanism to effect a uniform distribution of the charging material over the top of the charge or to distribute it unevenly if the conditions existing within the furnace require such distribution. The adjustment of the lower spout-sections 14 to determine the proper points of discharge for the streams of charging material is effected by the operator without leaving the footboards 24, and the adjustment of the deflectors beneath the charging-spouts may be readily effected by removing the plates P, which form parts of the side walls of the furnace-hood and reaching through the openings left when the plates P are removed.

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

1. The combination with a smelting-furnace of an endless conveyer having a fixed supporting-frame, said conveyer having a movable point of discharge and being adapted to deliver material at the movable point of discharge to the furnace.

2. In furnace-charging apparatus, the combination with an endless conveyer having a fixed supporting-frame and a shiftable point of discharge, of means for directing the material discharged from the conveyer into the furnace.

3. In furnace-charging apparatus, the combination with an endless conveyer having a fixed supporting-frame, of traveling apparatus for discharging material from said conveyer and directing it into the furnace.

4. In furnace-charging apparatus, the combination with an endless conveyer having a shiftable point of discharge and a fixed supporting-frame, of a discharge spout or conduit shiftable with the point of discharge for the conveyer and arranged to deliver material to said furnace.

5. In furnace-charging apparatus, the combination with a conveyer having a movable point of discharge, of a discharge-spout extending downwardly from said conveyer, and formed in relatively adjustable sections.

6. In furnace-charging apparatus, the combination with a conveyer having a movable point of discharge, of a discharge-spout ex-

tending from the conveyer toward the furnace, and having its lower end adjustable toward and away from the median line of the furnace.

7. In furnace-charging apparatus, the combination with a conveyer and a traveling tripper or deliverer for said conveyer, of a discharge-spout carried by said tripper or deliverer and having its lower end adjustable so as to control the delivery of material within the furnace.

8. In furnace-charging apparatus, the combination with an endless conveyer and a traveling deliverer for said conveyer, of a discharge-spout extending from said deliverer and having the upper section rigidly attached to the deliverer and the lower section pivotally connected with the upper section.

9. In furnace-charging apparatus, the combination with a conveyer having a shiftable point of discharge, of a discharge-spout extending downwardly from the conveyer at the point of discharge and shiftable with its point of discharge, and a deflector disposed beneath the lower end of said discharge-spout.

10. In furnace-charging apparatus, the combination with means for supplying charging material, of a spout or conduit for conducting said material into the furnace, said discharge-spout being arranged for reciprocatory movement within the furnace and an adjustable deflector arranged beneath the end of said discharge-spout.

11. In furnace-charging apparatus, the combination with a conveyer having a fixed supporting-frame, and a traveling deliverer or discharger for said conveyer, of a discharge-spout extending downwardly from said deliverer or discharger, and means at the lower end of said discharge-spout for deflecting the material passing therethrough.

12. In furnace-charging apparatus, the combination with a furnace having the top formed in sections, of a conveyer extending above the furnace-hood, and having a movable point of discharge, a traveling discharge-spout extending through the top of said hood, and means carried by the spout for shifting the sections of the top of said hood as the spout is moved.

13. In furnace-charging apparatus, the combination with a furnace having the top formed in sections, of a conveyer, a deliverer for said conveyer arranged for movement above the top of said hood, a spout extending from said deliverer through said top, and devices carried by said spout for gradually lifting said top sections as the spout advances.

14. In furnace-charging apparatus, the combination with a furnace having the top formed in sections, of a discharge-spout extending through said top, and arranged for horizontal movement, means for supplying charging material to said discharge-spout, and devices carried by the spout for lifting said top sections as the spout advances.

15. In furnace-charging apparatus, the combination with a furnace having a top formed in sections, of a spout extending through said top and arranged for horizontal movement, means for supplying charging material to said spout, and means carried by said spout for lifting said top sections as the spout advances and partially closing the opening caused by the raising of said top sections.

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

EDWIN H. MESSITER.

Witnesses:

BAXTER MORTON,
ROSCOE L. PETERSON.