

UNITED STATES PATENT OFFICE.

WALTER KENNEDY, OF BELLEVUE, PENNSYLVANIA.

BLAST-FURNACE-CHARGING APPARATUS.

No. 827,156.

Specification of Letters Patent.

Patented July 31, 1906.

Application filed October 26, 1905. Serial No. 284,444.

To all whom it may concern:

Be it known that I, WALTER KENNEDY, a citizen of the United States, residing at Bellevue, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Blast-Furnace-Charging Apparatus, of which improvements the following is a specification.

In application Serial No. 268,558 and application Serial No. 231,131, filed July 6, 1905, and November 2, 1904, respectively, and Serial No. 284,443, filed October 26, 1905, I have described and claimed certain improvements in mechanism for insuring the even distribution of the charge into the blast-furnace.

The invention described herein relates to further and additional improvements for the same purpose.

The invention is hereinafter more fully described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a view, partly in section and partly in elevation, of the charging mechanism of a blast-furnace; and Fig. 2 is a sectional plan view on a plane indicated by the line II II, Fig. 1.

In the practice of my invention the furnace 1, bell 2, main hopper 3, skip 4, and mechanism for raising and lowering the skip are constructed in the usual or any suitable manner. A receiving-hopper is arranged above the main hopper and has arranged therein a plate adapted to direct material to any desired side or portion of the receiving-hopper. Provision is made for controlling the discharge of material from the receiving-hopper by a movement of at least a portion thereof relative to the directing-plate.

In practice it is preferred to form the distributing-hopper in two sections, the upper portion being supported by posts or standards secured to the top of the main hopper. The lower portion or extension 6 of this distributing-hopper is made movable and preferably projects when in closed position down into the main hopper. The bell 2 is connected to a rod 7, extending up through the distributing-hopper and connected to an operating-lever 8, although other means may be employed for raising and lowering this main bell. Around the rod 7 is arranged a sleeve 9, provided at its upper end with a collar resting on a beam or other suitable support, thereby sustaining this sleeve in

position. On the lower end of the sleeve is secured an inclined plate 11, arranged transversely across the distributing-hopper. It is preferred that this plate should extend from a point within the upper section of the distributing-hopper down to or slightly below the end of the movable section 6 when the latter is at its lower or closed position, but such relative arrangement of the parts is not necessary. As shown, this plate is so inclined that material charged into the receiving-hopper from the skip will be collected at one side of the lower end of the distributing-hopper; but the point of collection may be changed or shifted around by shifting the inclined plate 11. The discharge of material from the distributing-hopper is permitted by raising the movable section 6, which will allow the material to slide off from the inclined plate out of the distributing-hopper onto the main bell. While any suitable means may be employed for raising and lowering the movable section 6, it is preferred to employ a lever 13 for that purpose, said lever being forked at one end, so as to be connected to opposite sides of the upper end of the movable section and having its opposite end connected to the piston of the fluid-pressure cylinder 14. It is preferred that the plate 11 should be rotated around simultaneously with the movement of the section 6, although it may be operated at other times and independently of the movable section. A desirable construction for the simultaneous operation of the movable section 6 and the plate consists in connecting one end of a rope 15 to the piston of the cylinder 14, passing said rope around a guide-pulley 16, a grooved wheel 17, loosely mounted on the sleeve 9, another guide-pulley 18, and connecting it at a point near the charging-floor to a counterweight. The grooved wheel 17 has a pawl-and-ratchet connection with the sleeve 9, so arranged that when the rope is shifted by the cylinder in raising the section 6 the wheel 17 will rotate, carrying the sleeve and with it the plate, but when the lever 13 is shifted to lower the section 6 the rope will be pulled by the counterweight and the grooved wheel will rotate on the sleeve and the inclined plate will not be shifted. As stated in application Serial No. 284,443, the amount of rotation of the inclined plate may be regulated by placing a tappet 20 on the portion of the rope connected to the cylinder 14 and securing a stop 21 upon the

distributing - hopper. By this means the amount of movement of the rope, and consequently of the inclined plate, by the counter-weight can be regulated.

5 I claim herein as my invention—

1. A blast-furnace-charging apparatus having in combination a main hopper and bell, a receiving-hopper, a movable directing-plate extending across the receiving-hopper, 10 and means movable independently of said plate for controlling the discharge of material from the receiving-hopper.

2. A blast-furnace-charging apparatus having in combination a main hopper and 15 bell, a receiving-hopper, a directing-plate extending across the receiving-hopper, means for shifting said plate, and means movable independently of said plate for controlling the discharge of material from the receiving- 20 hopper.

3. A blast-furnace-charging apparatus having in combination a main hopper and bell, a receiving-hopper, a directing-plate arranged in the receiving-hopper, means for

shifting the directing-plate, and means for 25 shifting a portion of the receiving-hopper adjacent to said plate to permit the discharge of material from the receiving-hopper.

4. A blast-furnace-charging apparatus having in combination a main hopper and 30 bell, a sectional receiving-hopper, a directing-plate arranged in the receiving-hopper, means for shifting said plate and means for shifting a section of the receiving-hopper to permit of the discharge of material therefrom. 35

5. A blast-furnace-charging apparatus having in combination a main hopper and bell, a receiving-hopper, a directing-plate arranged in the receiving-hopper, and means 40 for simultaneously shifting the plate and a portion of the receiving-hopper adjacent to the plate relative to the latter.

In testimony whereof I have hereunto set my hand.

WALTER KENNEDY.

Witnesses:

CHARLES BARNETT,

HERBERT BRADLEY.