J. KENNEDY.

CHARGING APPARATUS FOR BLAST FURNACES.

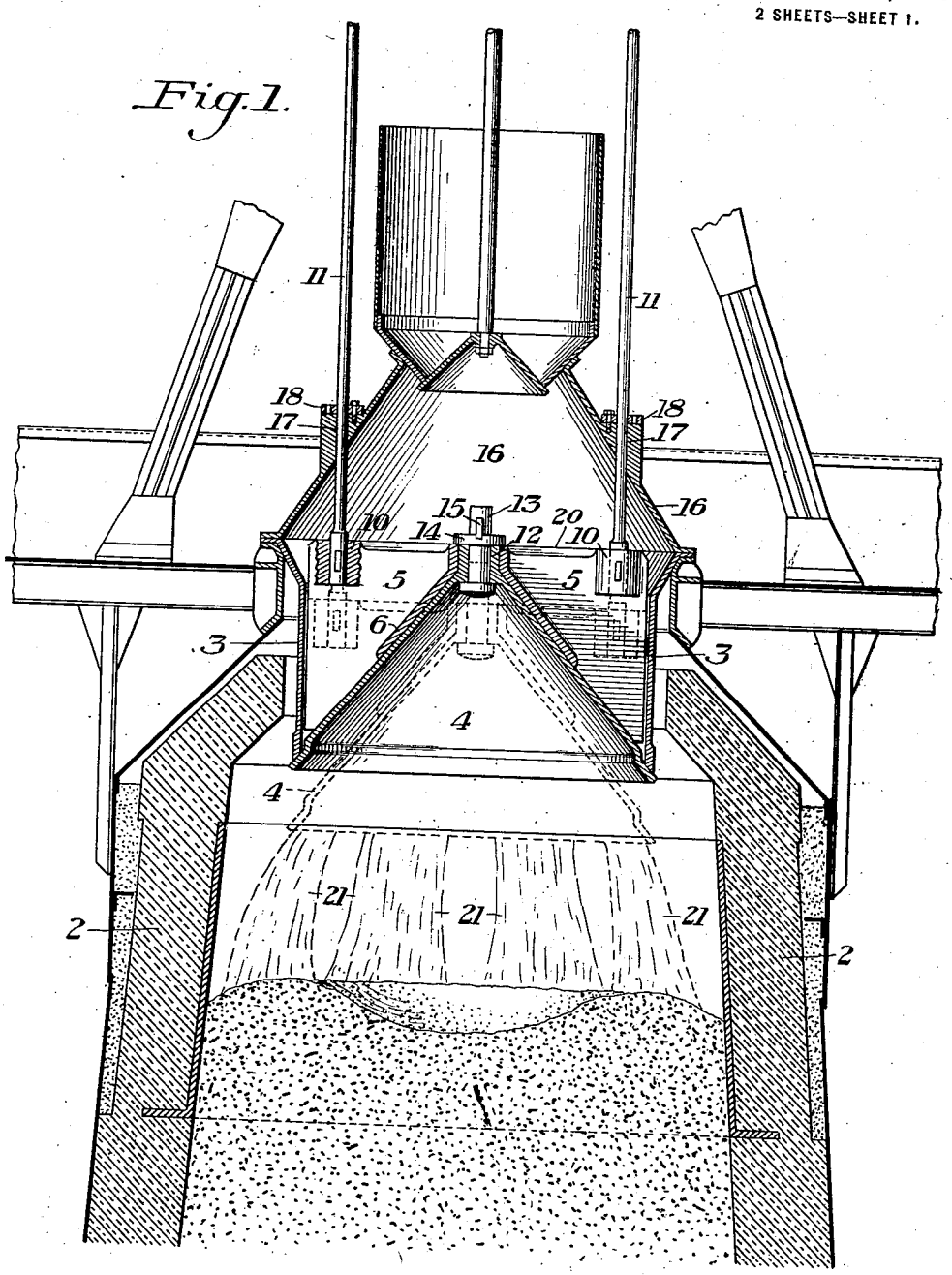
APPLICATION FILED OCT. 14, 1916.

1,291,019.

Patented Jan. 14, 1919.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

R. A. Balderson

G. B. Bleming

INVENTOR

Julien Kennedy

by Baldwin, Byrne & Saunders

his Attys

J. KENNEDY.

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2 SHEETS—SHEET 2.

Fig. 2.

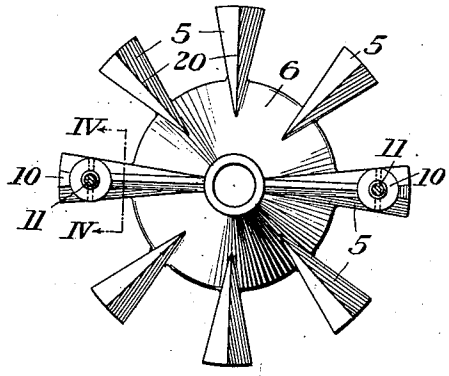


Fig. 5.

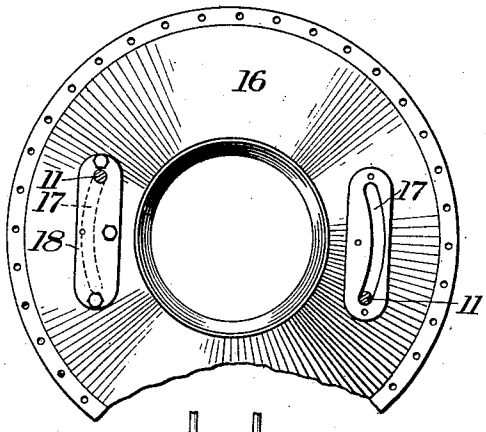


Fig. 3.

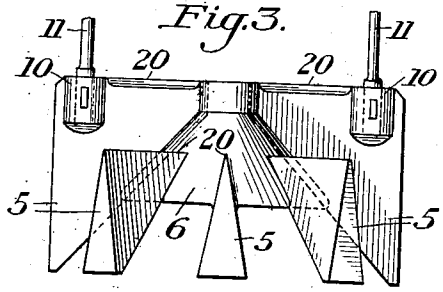


Fig. 4.

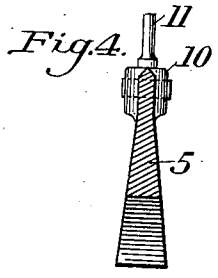
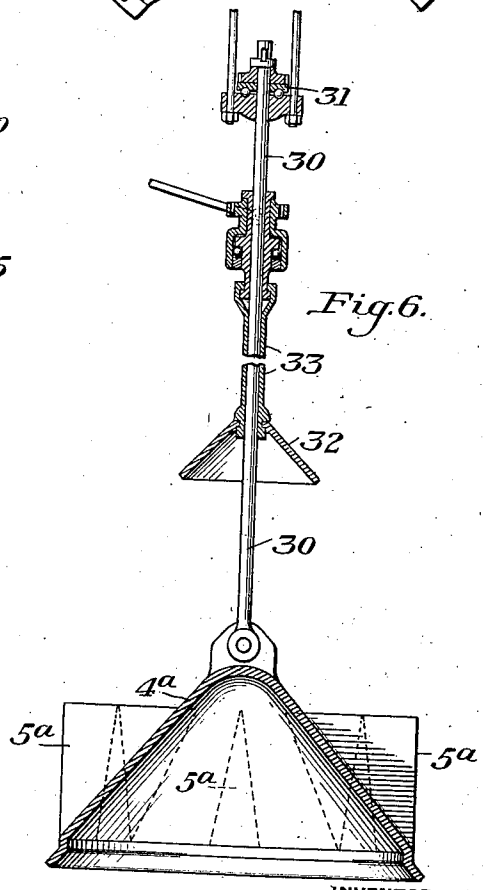


Fig. 6.



WITNESSES

R. A. Balderson

G. B. Fleming

INVENTOR

Julien Kennedy

by Bakewell, Byrnes & Carmalee

his Attys.

UNITED STATES PATENT OFFICE.

JULIAN KENNEDY, OF PITTSBURGH, PENNSYLVANIA.

CHARGING APPARATUS FOR BLAST-FURNACES.

1,291,019. Specification of Letters Patent. Patented Jan. 14, 1919.

Application filed October 14, 1916. Serial No. 125,586.

To all whom it may concern:

Be it known that I, JULIAN KENNEDY, a citizen of the United States, residing at Pittsburgh, Allegheny county, Pennsylvania, have invented a new and useful Charging Apparatus for Blast-Furnaces, 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 vertical section through the charging apparatus and top of a blast furnace.

Fig. 2 is a plan view of the guiding wings.

Fig. 3 is a side elevation of the guiding wings.

Fig. 4 is a vertical section taken along the line IV—IV of Fig. 2.

Fig. 5 is a plan view of the hopper, and

Fig. 6 is a vertical section showing a modified form of the supporting means for the bells.

The present invention relates to charging apparatus for blast furnaces, and particularly to an improvement in the type of charging apparatus shown in my prior Patent No. 1,178,522, issued April 11, 1916. In my prior patent I have shown a number of radially disposed discharge wings or guides formed by vertical plates located just above and coacting with the discharge bell. I have found that by making the discharge guides wedge-shaped the charge as it is discharged from the hopper into the furnace can be divided into a series of separate streams. This not only causes a more thorough mixing of the charge, but also permits a freer escape of the furnace gases, which can flow between the streams.

Referring to the drawings, which illustrate the preferred embodiment of the invention, the blast furnace 2 is provided with a discharge hopper 3. The hopper 3 has a bell 4. Coöperating with the bell are a series of wedge-shaped wings or guides 5. As shown in Figs. 2 and 3 the wings 5 are preferably formed integral with a conical hub 6, which fits over the upper part of the bell 4. Two of the wings are extended upwardly and are provided with sockets 10, in which are received the supporting rods 11 which support the wings and bell 4. The central boss 12 of the bell 4 is provided with a pin 13 which is received through a washer 14 which bears over the edges of the central hole in the wing bearing frame 6. A key 15 removably secures the pin 13 and thereby supports the bell 4 from the wing carrying hub 6. The outer edges of the wings 5 extend to the inner walls of the hopper, so that the wings serve to center the bell 4. The supporting rods 11 extend through the conical top 16 of the hopper 3, curved slots 17 being formed through thickened portions of said top. Over the slots 17 are secured plates 18, one of said plates being shown in Fig. 5 and the other of said plates being removed. Each plate 18 has a hole near one end through which passes one of the rods 11. By removing the holding screws for the plates 18, the rods 11 may be swung in the slots 17, thus turning the guiding wings and distributing the wear on the hopper. After the rods are swung, each plate 18 is turned end for end around the rod and screwed again in place. This permits the rods to be moved back and forth without removing the plates 18 from the rods, and at the same time provides a tight closure for the slots 17.

The upper edges of the guides 5 are provided with knife edges 20 which serve to split the charge as it passes between the guides. The wedge-shaped guides separate the charge into a series of separate streams, indicated at 21, in Fig. 1, which are annularly disposed around the interior of the furnace. This breaking up of the discharge into a series of streams not only serves to distribute the charge uniformly around the inside of the furnace, but also serves to better mix the charge. Moreover, the spaces left between the streams permit a free escape of the furnace gases during the charging operation.

In Fig. 6 is shown a modification in which the guides 5^a are formed integral with the bell 4^a. The bell 4^a is hung on a central supporting rod 30 which is pivotally mounted at 31 to permit the bell to be turned and thereby distribute the wear on the inside of the hopper. The bell 32 for the upper or receiving hopper is supported by a sleeve 33 sliding on the rod 30.

While the preferred embodiment of the present invention has been illustrated and described, it is to be understood that the present invention is not limited to its illustrated embodiment, but may be embodied in

other constructions of blast furnace charging apparatus, within the scope of the following claims.

I claim:

1. A charging apparatus for blast furnaces, comprising a hopper and bell coöperating therewith, a plurality of radial charge guides spaced around the bell, rods for supporting the guides, and supporting means connecting the bell to the guides whereby the bell is supported by the guides, substantially as described.

2. A charging apparatus for blast furnaces, comprising a hopper and a conical bell co-acting with the hopper and seating upwardly against the same, and a plurality of charge guiding wings spaced around the conical surface of the bell, said wings having the form of radially extending upwardly pointing wedges and having outer substantially vertical edges adjacent to and fitting within the hopper, said wings terminating at their lower edges against the conical surface of the bell, so that the charge as delivered from the conical surface of the bell is divided into streams separated by air spaces between the bell and the lower edge of the hopper; substantially as described.

3. A charging apparatus for blast furnaces, comprising a hopper and conical bell co-acting with the hopper and seating upwardly against the same, and a plurality of charge guiding wings spaced around the conical surface of the bell, said wings having the form of radially extending upwardly pointing wedges and having outer substantially vertical edges adjacent to and fitting within the hopper so as to be drawn into the hopper when the bell is raised and so as to form centering means for the bell and air spaces between the streams within the hopper; substantially as described.

4. A charging apparatus for blast furnaces, comprising a hopper and a conical bell co-acting with the hopper and seating upwardly against the same, a conical hub fitting over the upper part of the bell, and a plurality of radially disposed charge guiding wings carried by the hub and extending beyond the hub down along the conical surface of the bell; substantially as described.

5. A charging apparatus for blast furnaces, comprising a hopper and a conical bell co-acting with the hopper and seating upwardly against the same, a hub and a plurality of radially disposed charge guiding wings secured thereto and spaced over the conical surface of the bell, a plurality of rods connected to the guides for supporting them, and a pin secured to the upper part of the bell and extending through the hub for supporting the bell; substantially as described.

6. A charging apparatus for blast furnaces, comprising a hopper, a conical bell co-acting with the hopper and seating upwardly against the same, a plurality of radially disposed charge guides spaced around the bell, a plurality of rods for supporting the guides and connected thereto at a distance from the axis of the bell, and supporting means connecting the bell with the guides whereby the bell is supported by the guides; substantially as described.

In testimony whereof, I have hereunto set my hand.

JULIAN KENNEDY.

Witnesses:
H. W. Rano,
Margery Fitzgerald.