

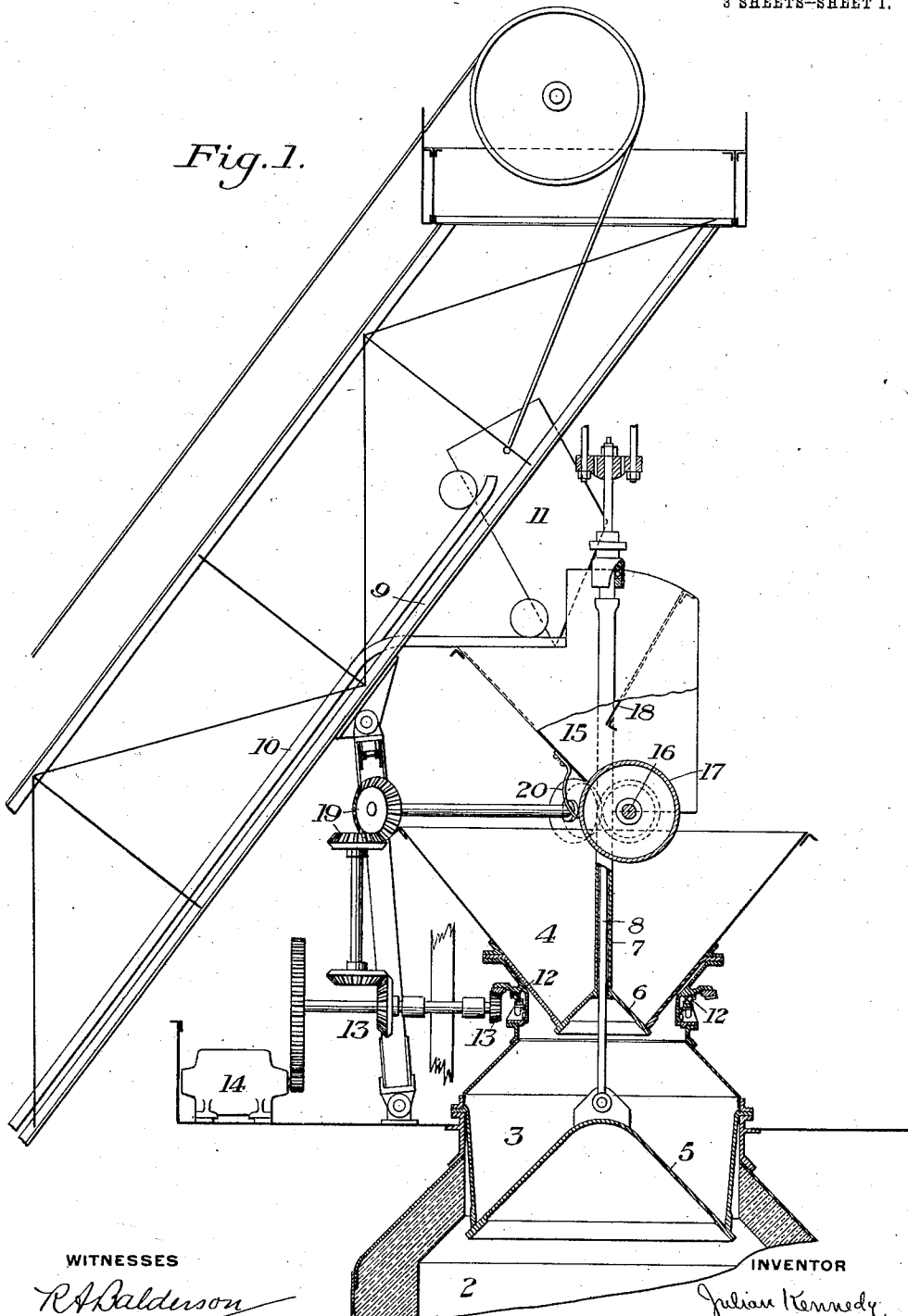
J. KENNEDY.
BLAST FURNACE CHARGING APPARATUS.
APPLICATION FILED MAR. 31, 1911.

1,021,534.

Patented Mar. 26, 1912.

3 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

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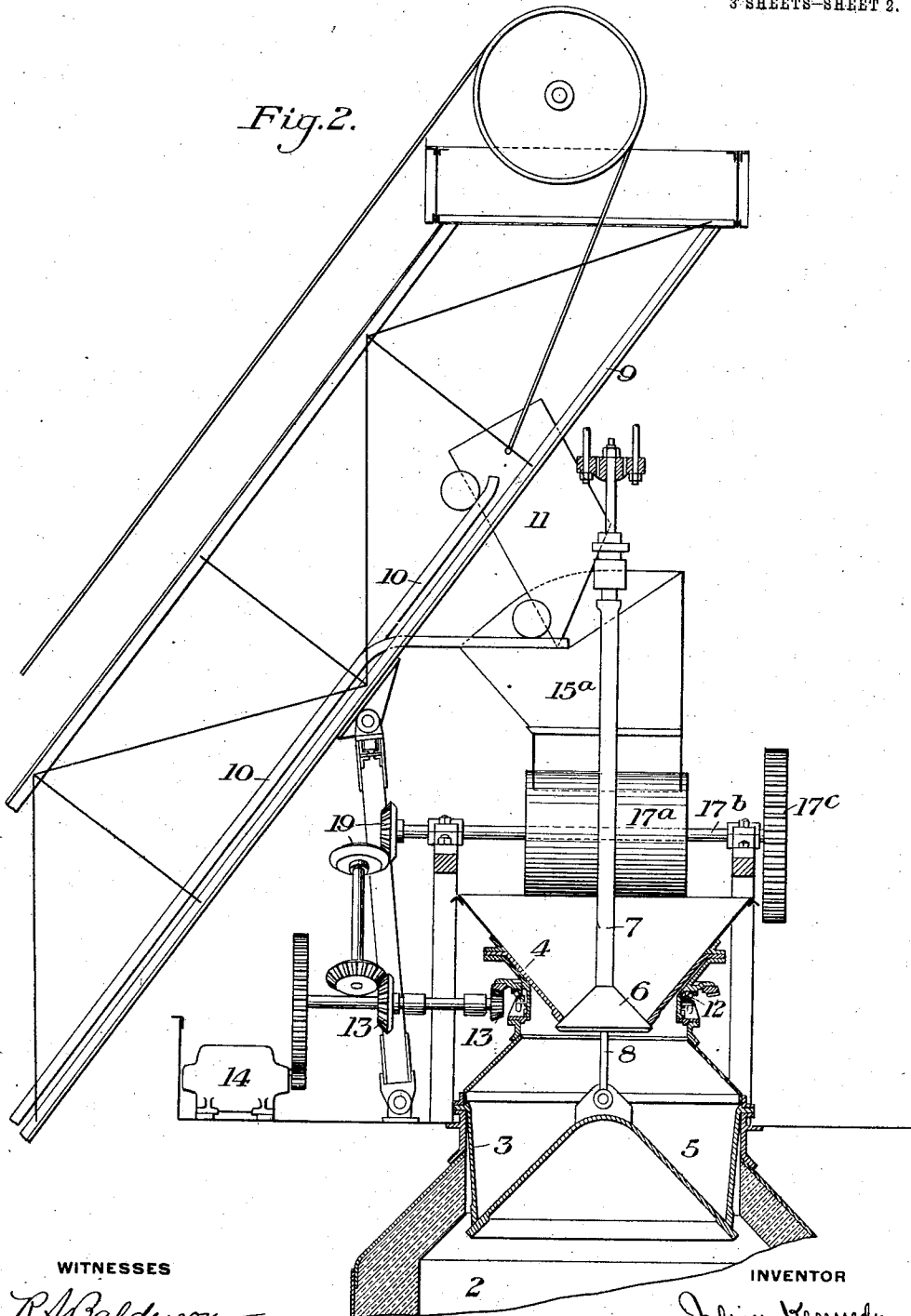
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3 SHEETS-SHEET 2.



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3 SHEETS—SHEET 3.

Fig. 3.

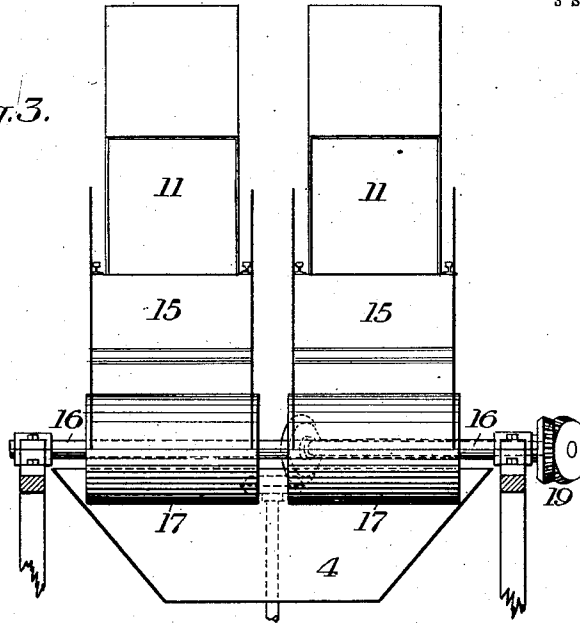
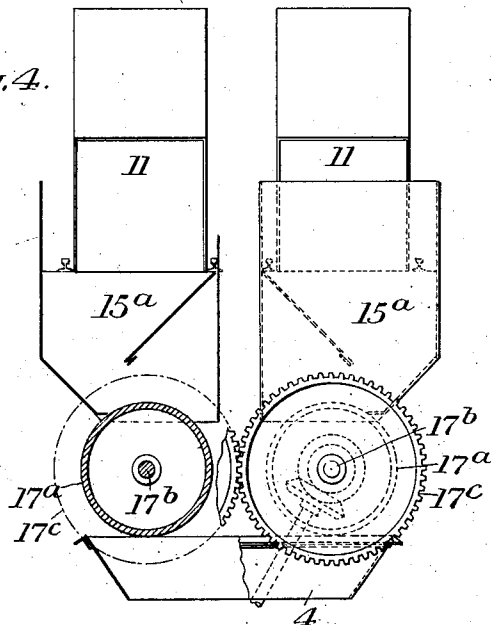


Fig. 4.



WITNESSES

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UNITED STATES PATENT OFFICE.

JULIAN KENNEDY, OF PITTSBURGH, PENNSYLVANIA.

BLAST-FURNACE-CHARGING APPARATUS.

1,021,534.

Specification of Letters Patent. Patented Mar. 26, 1912.

Application filed March 31, 1911. Serial No. 618,220.

To all whom it may concern:

Be it known that I, JULIAN KENNEDY, a resident of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Blast-Furnace-Charging Apparatus, 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 sectional elevation of the upper portion of my blast furnace structure; Fig. 2 is a similar view showing a modification of the invention; Fig. 3 is a sectional elevation showing the arrangement of distributing rolls of Fig. 1; and Fig. 4 is an end elevation showing the arrangement of the distributing rolls of Fig. 2.

My invention has relation to blast furnace charging apparatus, and is designed to provide means for securing a better and more effective distribution of the furnace charge preparatory to its discharge into the furnace than has heretofore been possible.

The nature of my invention will be best understood by reference to the accompanying drawings, which will now be described, it being premised, however, that various changes can be made in the details of construction and arrangement of the parts by those skilled in the art, without departing from the spirit and scope of my invention as defined in the appended claims.

Referring first to that form of my invention which is shown in Figs. 1 and 3, the numeral 2 designates the upper portion of a blast furnace stack or shaft, 3 a lower charging hopper, 4 an upper charging hopper, 5 the lower bell which controls the discharge from the hopper 3 into the furnace, and 6 the upper bell which controls the discharge from the hopper 4 into the hopper 3.

7 and 8 designate the usual actuating connections for effecting vertical movements of the bells.

9 designates the upper portion of the inclined track structure, carrying the usual tracks 10, for the skip cars. One of these cars is shown diagrammatically at 11.

The upper hopper 4 is mounted for rotation upon suitable bearings 12, and is rotated in any suitable or usual manner, as by means of the gearing 13, driven by a motor 14.

The skip cars are arranged to discharge

respectively into the hopper-like receptacles 15, which are located above hopper 4, and which have a contracted discharge at their lower end portion. Journaled across the lower end of these hoppers 15 is a shaft 16, upon which are arranged two charge-distributing rollers 17.

18 designates suitable baffles arranged within the hoppers 15, for directing the material discharged by the skip cars on to the surface of the feed rollers.

The operation is as follows: The material discharged by the skip cars is deposited in the hoppers 15, and upon the feed rollers 17. By the revolution of these rollers, the charge material is gradually fed into the lower hopper 4 and by reason of the rotation of the hopper 4, the material will be deposited in said hopper upon the bell 6, in spiral layers. In this manner, there is obtained a very effective distribution of the charge material with respect to its relatively finer and coarser contents. The material distributed by the rollers upon the upper bell is discharged into the lower hopper upon the lower bell, and thence, into the furnace.

In the modification of my invention shown in Figs. 2 and 4, the action is substantially the same as that first described, but instead of mounting the two feed rollers 17 upon a single shaft, each of the hoppers 15^a is provided with a separate feed rollers 17^a at the bottom thereof, the shafts 17^b of these rollers extending at right angles to the shaft 16 of Figs. 1 and 3. The rollers are shown as connected by gears 17^c.

In both forms of my invention the feed rollers may be driven in any suitable manner. I have shown them as driven by means of gear connections 19 from the motor 14.

The advantages of my invention result from the manner in which the charge material is distributed in the upper hopper by reason of the rotation of the hopper and the distributing device. A further advantage of my device results from the fact that inasmuch as the feed roller or rollers are geared to the same motor which operates the rotating hopper, it is impossible for any of the charge material to enter the hopper until the latter has commenced to rotate. Heretofore, where the starting of the bell was dependent upon an operator it might frequently happen that a skip charge would be

deposited without starting the rotation of the hopper. In the present case, inasmuch as the feed roller must be started before any material can be delivered into the rotating hopper, I guard against this occurrence. I do not, however, limit myself to the use of the rollers shown and described as the distributing means, since it will be obvious that various other distributing devices can be employed instead.

While I have shown the rollers 17 and 17^a as being plain separate rollers, they may be provided with any suitable feeding surface. Suitable scrapers 20 may be provided for keeping the roll surfaces clean.

Various other changes may be made in the details of construction and arrangement of the parts, without departing from my invention.

I claim:

1. In blast furnace charging apparatus, the combination with a receiving hopper or receptacle, of a rotary hopper below the same, connections arranged to rotate the latter hopper, and mechanism for the receiving hopper arranged to supply a continuous stream of material to the lower rotating hopper, substantially as described.

2. In blast furnace charging apparatus, the combination with upper and lower hoppers and bottom closures therefor, of means for rotating the upper hopper, and means for obtaining a regulated feed of the ma-

terial into the rotating hopper, substantially as described.

3. In blast furnace charging apparatus, the combination with upper and lower hoppers and bottom closures therefor, and means for rotating the upper hopper, of a receiving hopper above the rotating hopper, and a rotating feed device in the discharge opening of the receiving hopper, substantially as described.

4. In blast furnace charging apparatus, the combination of a rotary hopper, a receiving hopper above the rotary hopper, and a feed-regulating device in the discharge opening of the receiving hopper, the rotary hopper and feed device having driving connections with a common source of power, substantially as described.

5. In blast furnace charging apparatus, the combination with a receiving hopper or receptacle, of a rotary hopper below the same, connections arranged to continuously rotate the latter hopper, and a rotary distributing device for the first hopper arranged to supply a continuous stream of material to the continuously rotating hopper, substantially as described.

In testimony whereof, I have hereunto set my hand.

JULIAN KENNEDY.

Witnesses:

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