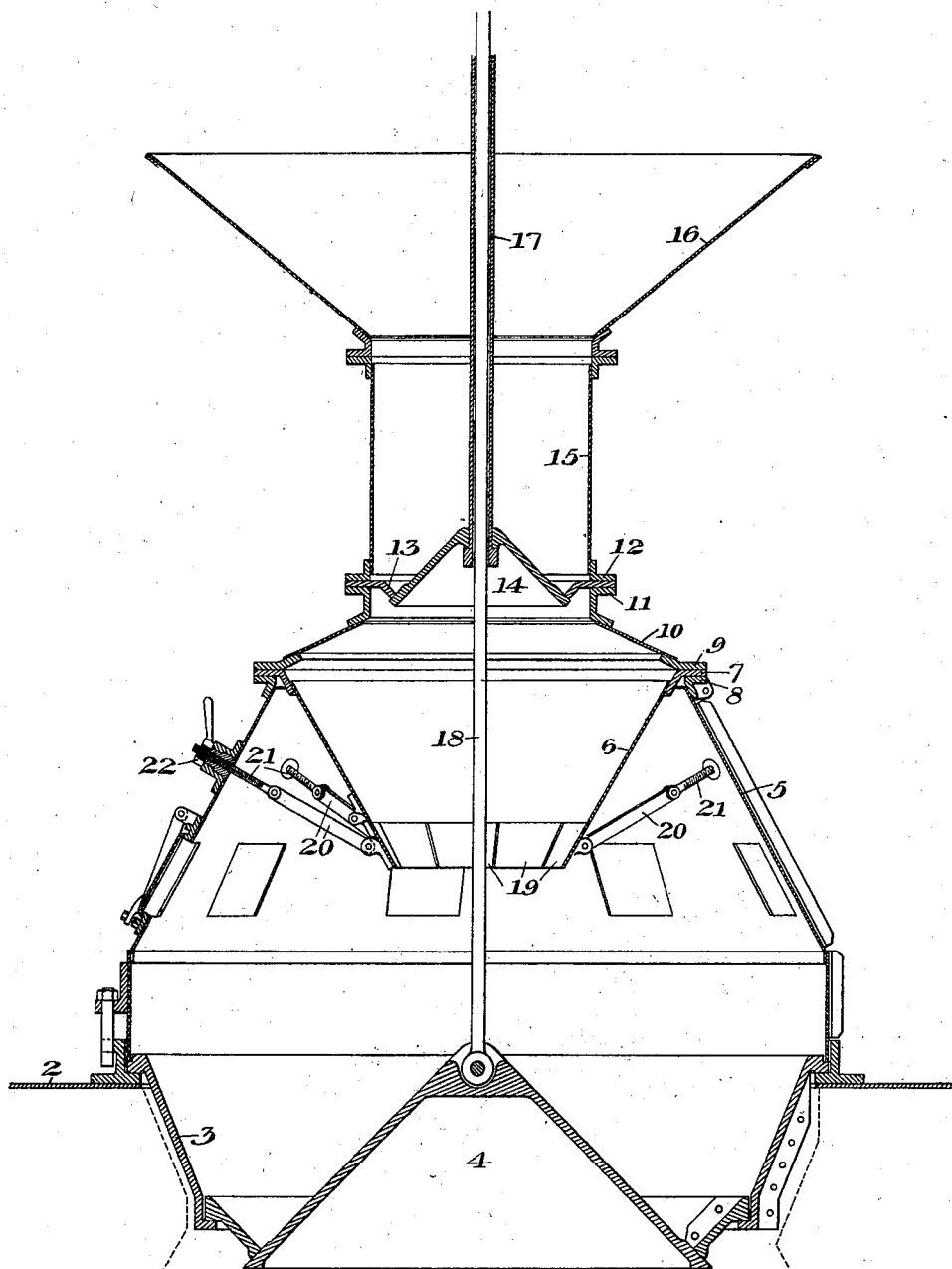


No. 727,754.

PATENTED MAY 12, 1903.

J. C. CROMWELL
BLAST FURNACE CHARGING APPARATUS.
APPLICATION FILED DEC. 6, 1902.

NO MODEL.



WITNESSES

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UNITED STATES PATENT OFFICE.

JOHN C. CROMWELL, OF CLEVELAND, OHIO, ASSIGNOR TO THE GARRETT-CROMWELL ENGINEERING COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

BLAST-FURNACE-CHARGING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 727,754, dated May 12, 1903.

Application filed December 6, 1902. Serial No. 134,378. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. CROMWELL, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented a new and useful Blast-Furnace-Charging Apparatus, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, in which the figure is a sectional side elevation showing the top of a blast-furnace provided with my improved charging apparatus.

My invention relates to apparatus for charging blast-furnaces, and more particularly to that type of apparatus wherein an inclined deflector is used between the upper bell and the lower bell, as set forth in the application of myself and C. W. A. Kolkebeck, Serial No. 117,428, filed July 29, 1902. The object of my invention is to improve the distribution of the stock, and hence make the working of the furnace more regular.

To that end it consists in providing a throat between the upper bell and the upper supplemental hopper, from which the stock drops upon the upper bell.

It further consists in the construction and arrangement of the parts, as hereinafter more fully described and claimed.

In the drawing, 2 represents the top plate of a blast-furnace, 3 the main hopper, and 4 the closing-bell therefor.

5 is a casing which extends upwardly and inwardly from the top plate of the furnace and carries the annular deflector 6. This deflector is inclined inwardly and downwardly, and I have shown it as provided with an upper flange member 7, secured between flanged members 8 and 9 of the casing. From the upper flange member 9 a casing extension 10 projects inwardly and upwardly to an annular casting 11, between which and a flange member 12 is clamped the seat 13 for the upper bell 14. A throat 15 extends in a vertical direction from the upper-bell seat, and to its upper end is secured the supplemental hopper 16. The bells may be supported and actuated by any suitable connections, and I

have shown the upper bell as having a tubular rod 17, through which the lower rod 18 of the bell extends.

I have shown the deflector as provided in its lower portion with a series of segmental curved plates 19, pivoted at their upper ends and held in adjusted position by links 20, connecting them with the screw-bolts 21, extending through hand-nuts 22, mounted on the casing. By turning the hand-nuts the sections may be swung in or out to adjust the degree of inclination of the lower part of the deflector.

In operating the apparatus the material is discharged from the skip into the upper hopper and sliding down its sloping sides drops through the throat upon the upper bell. A preliminary distribution is thus obtained, and when the upper bell is lowered the stock drops upon the deflector, which directs it inwardly, so that it is again distributed upon the lower bell. This main bell is actuated at proper intervals to drop the stock into the furnace-chamber. By adjusting the sections of the deflector the operator can change the distribution and remedy uneven working.

The advantages of my invention result from the use of the throat above the upper bell, which aids in the distribution of the stock and causes the furnace to work with more uniformity.

Variations may be made in the form and arrangement of the bells, the throat, deflector, and other parts without departing from my invention.

I claim—

1. In blast-furnace-charging apparatus, an upper hopper, a throat connected to its lower end, a downwardly and inwardly inclined deflector below the upper bell, and a lower hopper and bell; substantially as described.

2. In blast-furnace-charging apparatus, an upper hopper, a throat beneath the same, a bell arranged to close the lower end of the throat, a lower main bell and hopper, a casing extending from the lower hopper upwardly and inwardly to the throat, and a

downwardly and inwardly inclined deflector between the bells and within the casing; substantially as described.

3. In a blast-furnace-charging apparatus,
5 an upper hopper, a throat below the same, an upper and smaller bell arranged to close the lower end of the throat, a lower hopper with a bell of large size, and an inclined deflector

between the bells, and having an adjustable portion; substantially as described. .o

In testimony whereof I have hereunto set my hand.

JOHN C. CROMWELL.

Witnesses:

H. D. SMITH,

JOHN G. SHARP.