

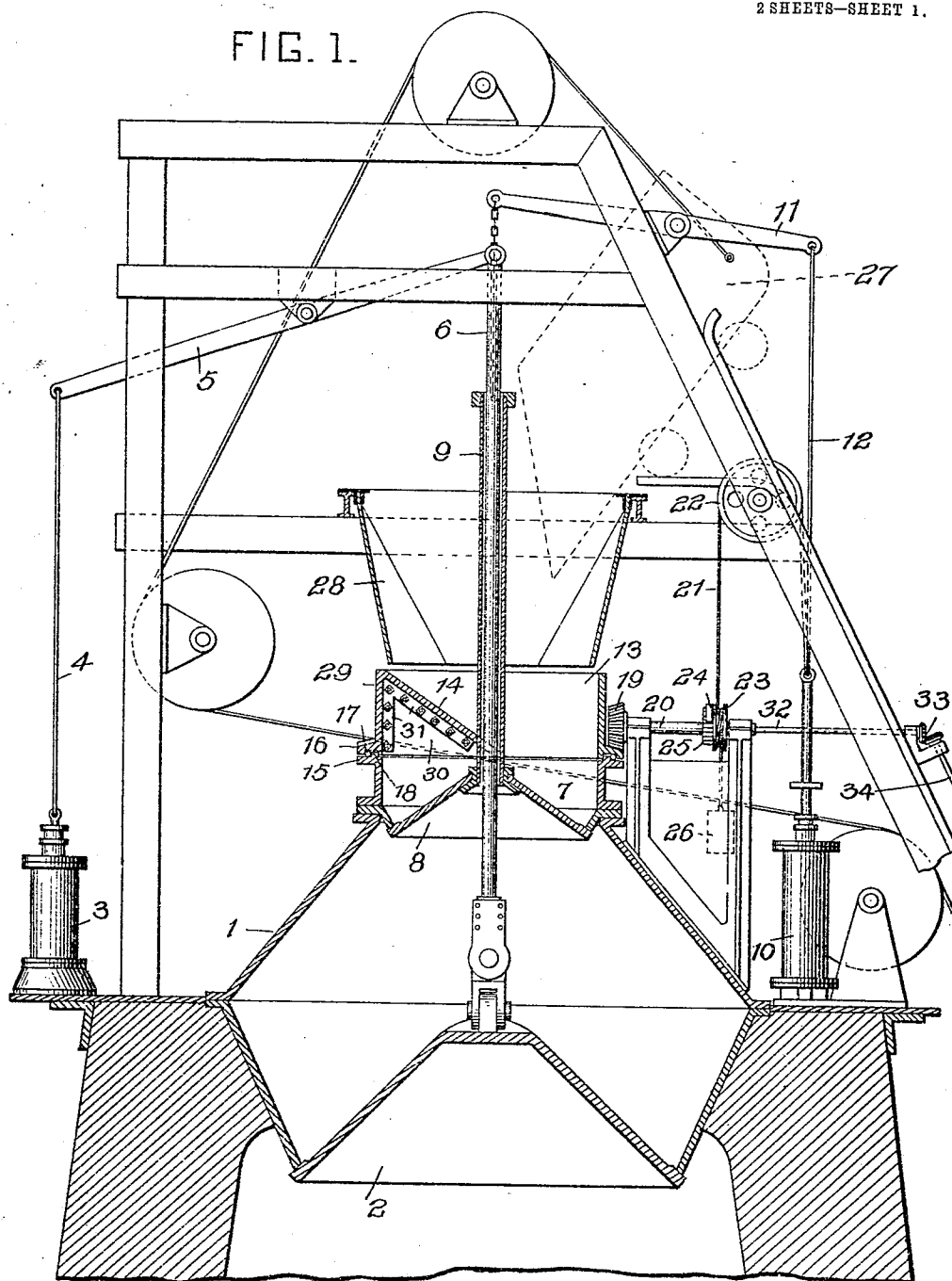
No. 857,259.

PATENTED JUNE 18, 1907.

C. H. SAMPLE.
BLAST FURNACE CHARGING APPARATUS.
APPLICATION FILED AUG. 10, 1906.

2 SHEETS—SHEET 1.

FIG. 1.



WITNESSES:

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2 SHEETS—SHEET 2.

FIG. 2.

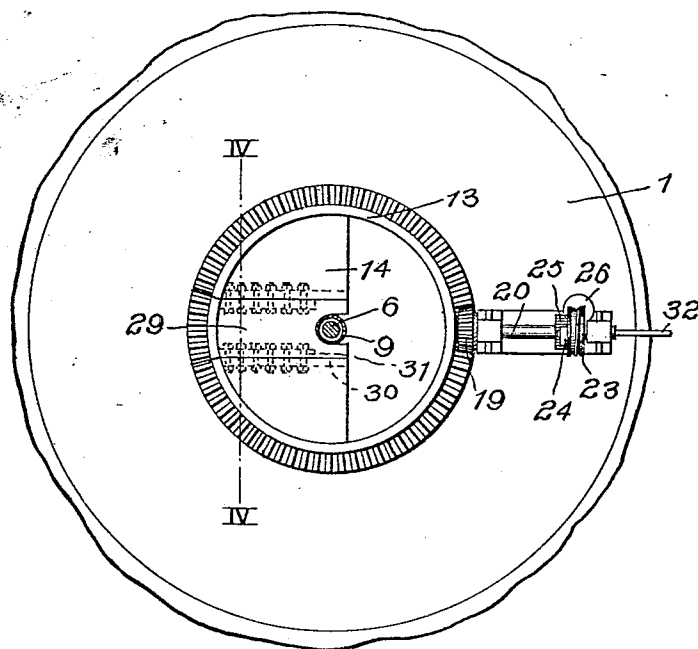


FIG. 3.

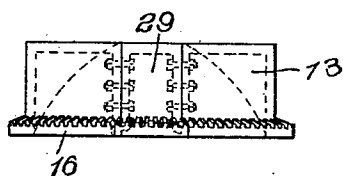
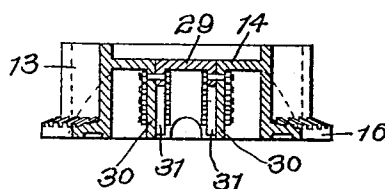


FIG. 4.



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UNITED STATES PATENT OFFICE.

CHARLES H. SAMPLE, OF HOMESTEAD, PENNSYLVANIA, ASSIGNOR TO
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BLAST-FURNACE-CHARGING APPARATUS.

No. 857,259.

Specification of Letters Patent.

Patented June 18, 1907.

Application filed August 10, 1906. Serial No. 330,019.

To all whom it may concern:

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

10 The invention described herein relates to certain improvements in charging apparatus for blast furnaces and has for its object a construction whereby the material to be charged into the furnace is prevented from separation in accordance with the size of the lumps or pieces of ore, etc., and whereby the charges of such segregated material may be deposited at different points around the furnace.

20 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 elevation and partly in section showing my improvement applied thereto. Fig. 2 is a top plan view of the distributor; Fig. 3 is a side elevation of the same and Fig. 4 is a sectional view, the plane of section being indicated by the line IV—IV Fig. 2.

30 In the practice of my invention the furnace is provided with the usual or any suitable construction of main hopper 1 and bell 2, the latter being adapted to be lowered and raised by any suitable means as the fluid pressure cylinder 3 having its piston rod connected by the rod 4 and lever 5 to the bell rod 6. A supplemental hopper 7 having a bell 8 is arranged above the main hopper and preferably supported thereby. The bell 8 is secured to a sleeve 9 surrounding the bell rod 6 and connected for raising and lowering the bell 8, to the piston of a fluid pressure cylinder 10 by a lever 11 and rod 12.

45 The distributor consisting of a cylindrical shell 13, provided with a plate or shelf 14 extending from a portion of the edge of the shell across the same for a distance preferably a little more than half the radius of the shell, is rotatably mounted on the supplemental hopper. While the drum can be mounted on the supplemental hopper in any suitable manner, it is preferred to form the hopper and shell with flanges 15 and 16 on adjacent ends and to interpose balls or rollers 55 17 between such flanges. One of the flanges

as 15 is provided with a rib 18 extending into a groove in the other flange, to prevent lateral displacement of the shell. While the shell can be rotated by any suitable means, it is preferred to construct the flange 16 with 60 teeth for engagement with the pinion 19 on the shaft 20. This shaft and the shell 13 is preferably rotated by the piston of the cylinder 10. Said piston may be connected to a rope 21 which passes around a guide pulley 65 22 and is operatively connected to a drum 23 loosely mounted on the shaft 20. A pawl 24 is pivotally mounted on the drum 23 so as to engage a toothed wheel 25 keyed to the shaft 20. By the movement of the piston to close 70 the bell 8, the drum 23 will be rotated to cause a shifting of the distributor 13. During the opposite movement of the piston a reverse movement of the drum 23 on the shaft 20 is effected by the weight 26. 75

The material to be charged into the furnace is hoisted to the top of the furnace by a skip 27, from which the material is discharged into the chute 28, constructed and arranged to direct the material into the distributor 80 preferably around the axis of the latter. The distributor is preferably so constructed as to facilitate its removal and the placing in position of a new distributor. This can be conveniently effected by forming the shell 13 85 with a removable section permitting the horizontal shifting of the shell transverse of the bell rod. The plate or shelf, which is arranged at an angle to the axis of the shell and the direction of movement of the material 90 being charged, is preferably formed integral with the shell. While the removable section of the shell can be located at any desired point around the periphery of the shell, it is preferred that it should include a portion of 95 the inclined plate or shelf. As shown in Figs. 2, 3 and 4, the removable section 29 forms the widest portion of the shelf, the edges of which adjacent to the slot for the reception of the section 29 are braced by radial 100 ribs 30, to which flanges 31 on the removable section are bolted. This removable section also includes a portion of the toothed flange 16, so that after the section has been removed and the shell is turned to bring the slot or 105 notch in line with the pinion 19, the shell can be raised and moved laterally from between the chute 28 and the hopper 7 and a new one inserted. If for any reason it should be desired to charge the furnace without the dis- 110

tributer, a cylindrical shell without the inclined plate can be secured to the hopper 7.

In order to enable operators to keep track of the distribution of the charges in the furnace, a dial or other indicator on the charging floor is operated through suitable means by the shaft 20. In the construction shown, this shaft is provided with an extension 32 having a driving connection through gearing 33 to a shaft 34, which extends down to the charging floor to operate the indicator.

I claim herein as my invention:

1. A blast furnace charging apparatus having in combination a main hopper and bell, a bell at the upper end of the main hopper, a movable shell above and movable around the axis of the upper bell and provided with an eccentric discharge opening, and means for shifting said shell.
2. A blast furnace charging apparatus having in combination a main hopper and bell, means controlling the flow of material into the main hopper, a shell movable around the axis of the main bell and provided with an eccentric discharge opening and means for shifting said shell.

3. A blast furnace charging apparatus having in combination a main hopper and bell, means controlling the flow of material into the main hopper, a shell movable around the axis of the main bell and provided with an inclined plate extending part way across the shell and means for shifting the shell.

4. A blast furnace charging apparatus having in combination a main hopper and bell, a supplemental hopper and bell, a shell movably supported by the supplemental hopper and having an eccentric discharge opening and means for shifting said shell.

5. A blast furnace charging apparatus having in combination a main hopper and bell, a shell movably supported above the main bell and provided with a plate extending at an angle partially across the shell, and having a removable section including a portion of said plate.

In testimony whereof, I have hereunto set my hand.

CHARLES H. SAMPLE.

Witnesses:

ALICE A. TRILL,
J. HERBERT BRADLEY.