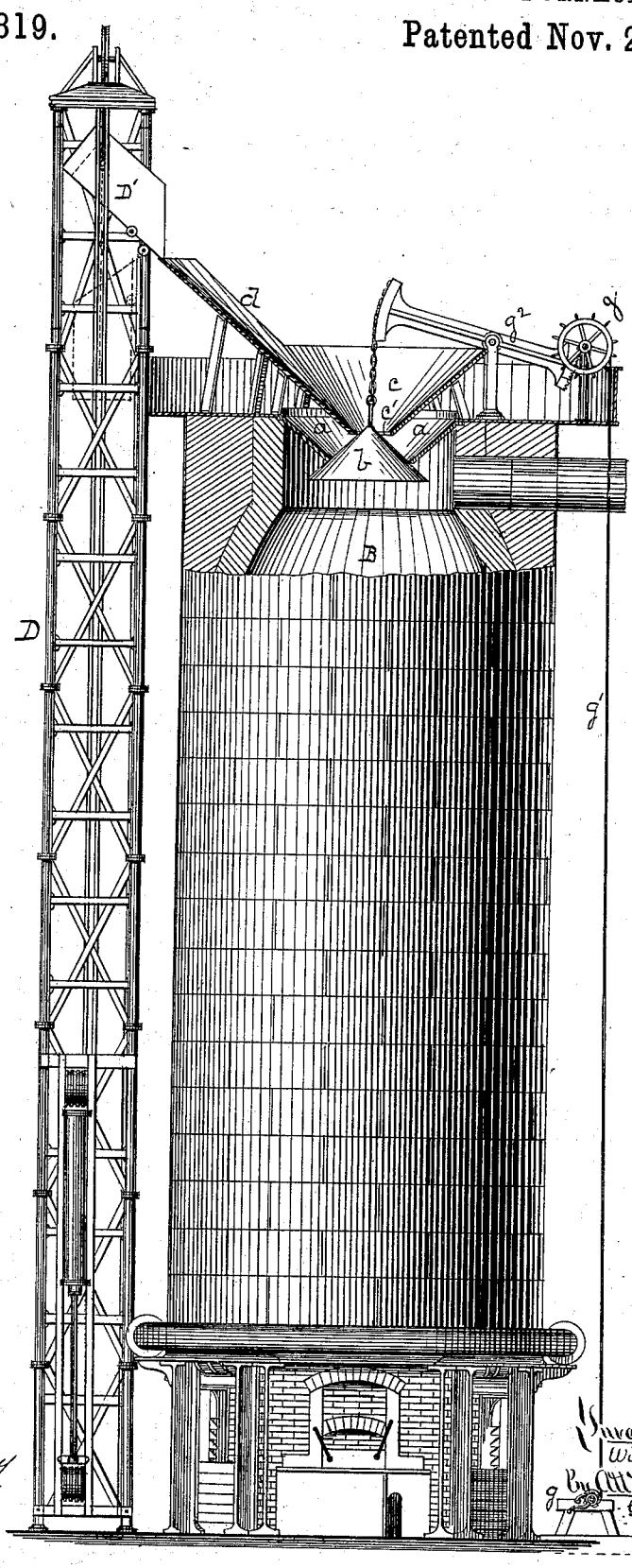
(No Model.)

W. H. ALLEN.

FEEDING DEVICE FOR BLAST AND OTHER FURNACES.

No. 267,819. Patented Nov. 21, 1882.



Witnesses
R. F. Whitlesey
C. L. Parker

Inventor
William H. Allen
By Attorney
George H. Christy

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM H. ALLEN, OF PITTSBURG, PENNSYLVANIA.

FEEDING DEVICE FOR BLAST AND OTHER FURNACES.

SPECIFICATION forming part of Letters Patent No. 267,819, dated November 21, 1882.

Application filed October 31, 1881. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. ALLEN, of Pittsburg, county of Allegheny, State of Pennsylvania, have invented or discovered a new and useful Improvement in Feeding Devices for Blast and other like Furnaces; and I do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawing, making a part of this specification, which represents a side elevation of a blast-furnace and elevator, the former being sectioned at its upper end, the better to illustrate the features of novelty hereinafter described.

My present invention relates more particularly to an improvement in the feeding apparatus of a blast, cupola, or other like furnace, wherein a cup and cone or a bell and hopper are employed.

My particular object is to enable the ordinary feeding or charging operations to be performed from the ground; and to this end I arrange immediately over the bell or cone an open-bottomed hopper, and so arrange it with reference to the bell or cone that charges of material for the blast-furnace, on being dumped or discharged into such added hopper, will be delivered through its open bottom onto the bell or cone at or near its apex, and consequently will pass down the sides of the bell or cone uniformly all around, and so will be distributed with practical uniformity around the annular receptacle formed at the junction of the bell and lower hopper. Then, when the bell is lowered to discharge such material into the furnace, such charge will be supplied to the burden below uniformly all around, or practically so. Then, by the addition of a chute from the elevator to such added hopper, and of a self tilting or dumping device, so that the car containing the material shall be automatically emptied into such chute, I enable the entire work of feeding to be done without the necessary presence of workmen at the top or mouth of the furnace to do or superintend the feeding.

B may represent a blast, cupola, or other like furnace, such as is adapted to or requires the use for feeding purposes of the ordinary or other suitable hopper or cup, *a*, and bell or cone *b*. Immediately over the bell or cone *b*, I arrange and properly support another hopper, *c*, of suitable size and capacity to receive and distribute such sized charge as may at any one time be dumped into it. I make its bottom open, as shown, and so adjust it that its open bottom will be at or near the level of the apex of the bell or cone when in its normal or raised position, and so that an annular opening, *c'*, will then be left between the edges of such opening and the apex or sides of the bell, such that a charge or a portion of a charge dumped into such added hopper *c* will slide down or fall onto the apex of the bell, or so near its apex as to be delivered or discharged therefrom through the opening *c'* all around, and slide down on all sides of the bell with practical uniformity as to quantity, so that when the bell is lowered the charge will be properly distributed to the burden below.

Such device may be used, and the material be dumped in from barrows by hand in the usual way; but I prefer to so organize the apparatus that the work of feeding may be done from the ground, and without the necessary presence of workmen for such purpose at the top or mouth of the furnace. To illustrate this I have shown an elevator, D, of any suitable construction, adapted to be operated from the ground, and to raise and lower a car, D', loaded with the material to be charged or fed into the furnace. Any suitable trip or tilting mechanism is to be added, such that when it reaches the proper height it will be tilted, as shown, or its contents will be otherwise dumped into a chute, *d*, which is suitably constructed and arranged for discharging into the hopper *c* the materials so dumped upon it. As soon as the car is thus emptied it may be lowered in the usual way and at the proper intervals. The bell *b* may also be lowered from below by the use of a windlass, *g*, and rope *g'*, and the usual interposed devices, g^2.

I have shown the windlass, rope, &c., on the side of the furnace opposite the elevator, but have done so only for convenience of illustration. For ease and facility of operation, the bell lowering and raising appliances should be arranged over and down such side of the furnace that they and the elevator can be worked from at or near the same point.

I am aware that it is not new, as in United

States Patent No. 117,246, to duplicate in a blast-furnace the ordinary bell and hopper, and to give to each bell a separate motion, so that on the lowering of the upper bell a charge may be dumped in the usual way onto the lower hopper and bell, (the latter remaining closed,) and so that after this is done the upper hopper may be closed and the lower hopper be opened by lowering the lower bell, so as to discharge the new charge onto the burden below; but this fails to embody my invention, in that, among other things, I make the upper hopper with a comparatively small opening, and arrange the bell in reference thereto so that when in its normal or raised position its apex shall be at or about the level of the hopper-opening, and thereby I insure the performance of the function indicated—namely, a uniform distribution of the charge, which, necessarily falling on the apex of the bell, will pass down with practical uniformity on all sides thereof.

I am aware that it is not new with me, broadly, to combine a self-dumping car with a blast-furnace, and hence I make no claim thereto otherwise than as an element in the combination, as hereinafter set forth.

I claim herein as my invention—

1. In a blast-furnace feeding device, the combination of the lower feed-hopper, *a*, and the upper feed-hopper, *c*, with the bell *b* and mechanism for supporting and operating the same, the two hoppers constructed as described, whereby the bell, when raised, closes the bottom of the lower hopper, and has its apex at or about the level of the bottom opening of the upper hopper, substantially as set forth.

2. A blast-furnace feeding apparatus having in combination a lower feed-hopper, *a*, an upper feed-hopper, *c*, a bell, *b*, mechanism for supporting and operating the bell, the two hoppers being constructed as described, whereby the bell, when raised, closes the bottom of the lower hopper, and has its apex at or about the level of the bottom opening of the upper hopper, and having also an elevator worked from the ground, a self-dumping car, and a chute, *d*, substantially as set forth.

In testimony whereof I have hereunto set my hand.

WILLIAM H. ALLEN.

Witnesses:
EDWARD JAY ALLEN,
R. H. WHITTLESEY.