J. H. COLLINS.

Improvement in Blast-Furnace Charging Apparatus.

No. 131,667. Patented Sep. 24, 1872.

FIG. 1.

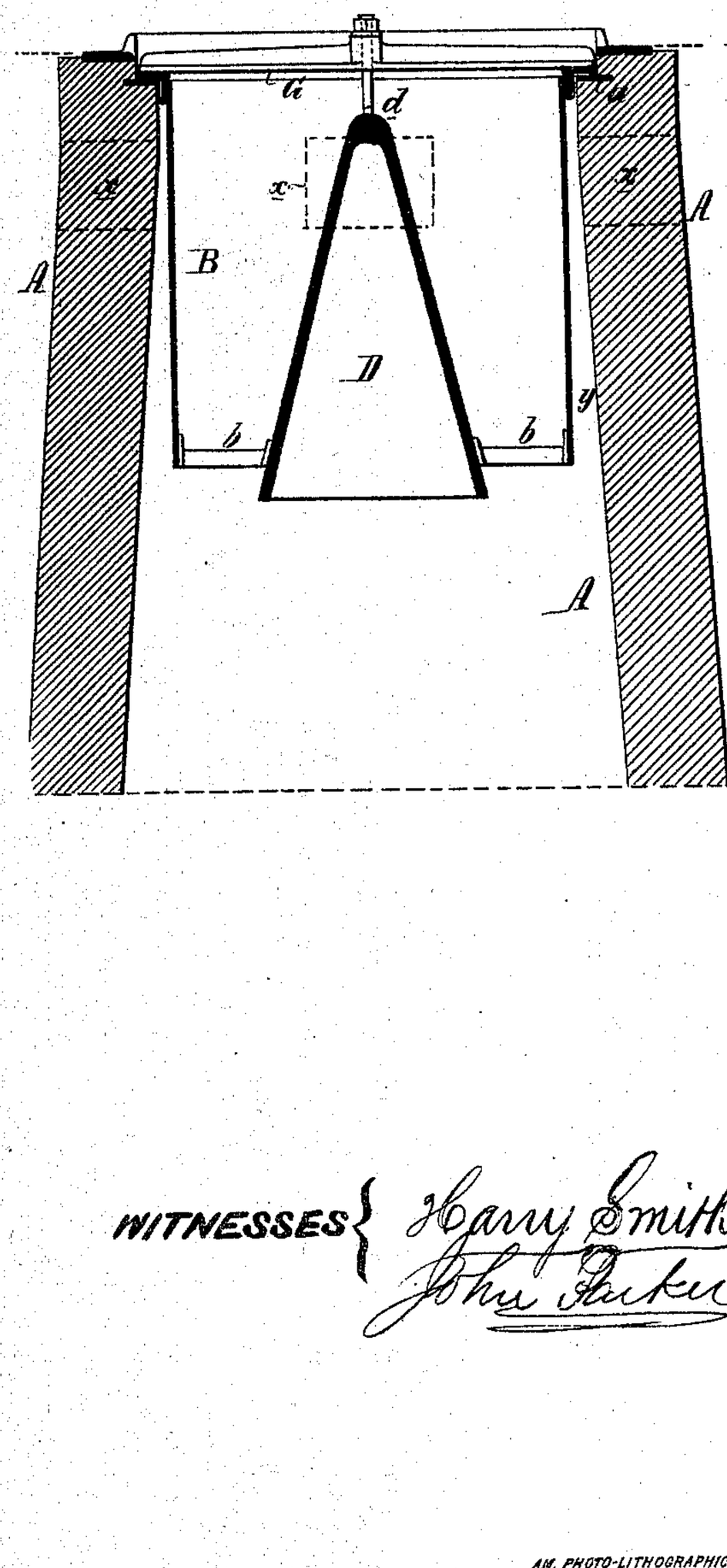
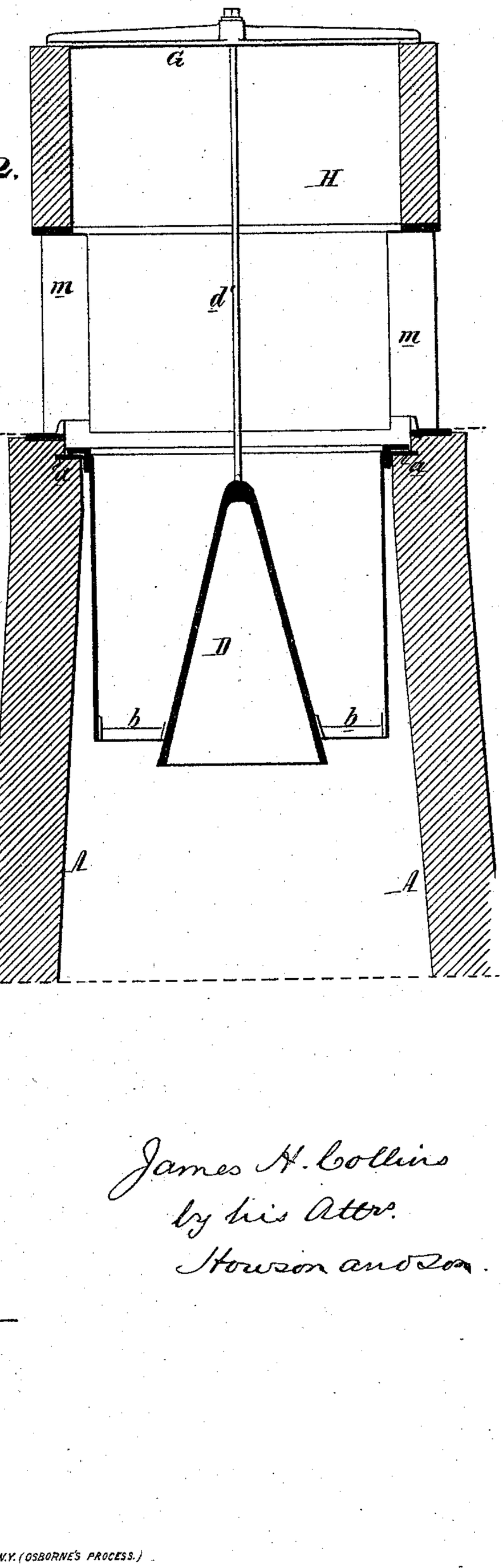


FIG. 2.



WITNESSES { Harry Smith
John Parker

James H. Collins
by his Attys.
Howson and Sons.

UNITED STATES PATENT OFFICE.

JAMES H. COLLINS, OF EDGEHILL, PENNSYLVANIA.

IMPROVEMENT IN BLAST-FURNACE CHARGING APPARATUS.

Specification forming part of Letters Patent No. **131,667**, dated September 24, 1872.

To all whom it may concern:

Be it known that I, JAMES H. COLLINS, of Edgehill, Montgomery county, Pennsylvania, have invented an Improvement in Smelting-Furnaces, of which the following is a specification:

My invention consists of the employment in smelting-furnaces, as described hereafter, of a cone and surrounding casing, by means of which the materials with which the furnace is charged are so dispersed that there will always be a free passage through the contents of the furnace for the escape of the products of combustion and a free vent for the blast. My invention further consists of the combination of the said cone with a casing and walls of the furnace in a manner and for a purpose rendered apparent hereafter.

Figure 1 is a vertical section of the upper portion of a smelting-furnace with my improvements; Fig. 2, a modification of Fig. 1.

A represents the upper portion of the wall of a smelting-furnace, and within the latter near the top a ledge, *a*, is formed by an annular plate, on which bears the flange of a cylindrical casing, B, the latter extending downward into the furnace, and being united by any convenient number of cross-bars *b* to a hollow cone, D, the apex of which is connected by a bolt, *d*, and its nut to a cross-bar, G.

In feeding ordinary furnaces with ore, fuel, limestone, &c., there is a tendency of the finer particles of these substances to accumulate in the center of the furnace, and to so choke the same as to interfere with the free escape of the gases and other products of combustion, and to obstruct the free passage of the blast through the contents of the furnace, evils which it is the design of my invention to obviate. The annular space between the cylindrical casing B and the base of the cone is wide enough to permit the passage of the largest lumps of ore, coal, or flux.

In feeding the furnace the materials are thrown into the top of the cylinder, and all particles, great and small, are directed by the cone outward toward the walls of the furnace; the larger particles, however, are the first to find their way toward the center of the furnace, the smaller particles having a tendency to remain near to the walls; hence there will always remain, through the interstices of the mass of larger particles in the furnace, a free vent for the blast. The casing B protects the walls of the furnace from the injurious effects of the large masses of ore, coal, &c., which would otherwise be thrown against the said walls, and between the latter and the casing is formed a chamber, *y*, which receives the unconsumed gases, the latter passing off through suitable openings *x*, shown by dotted lines, to any point where they can be utilized by consuming them as a substitute for more costly fuel. The cone D has a tendency to direct these unconsumed gases as they rise from the mass of ore, fuel, &c., in the furnace toward the chamber *y*.

In Fig. 2 I have illustrated my invention as applied to a furnace surmounted with a chimney, in which are openings *m m* for the introduction of the ore, coal, &c., the said openings being furnished with suitable doors. In this case the apex of the cone is connected by a long bolt, *d'*, to a bar, G, placed across the mouth of the chimney.

The cylinder B may be made of substantial plated iron riveted to the cast-iron ring, which rests on the ledge *a*, and the cone D may be made of cast-iron.

I claim as my invention—

The combination of the cone D, casing B, and walls A, of the furnace.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES H. COLLINS.

Witnesses:
WM. A. STEEL,
HARRY SMITH.