O. P. NICHOLS.

BONE BLACK FURNACE.

APPLICATION FILED FEB. 4, 1910.

978,625.

Patented Dec. 13, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

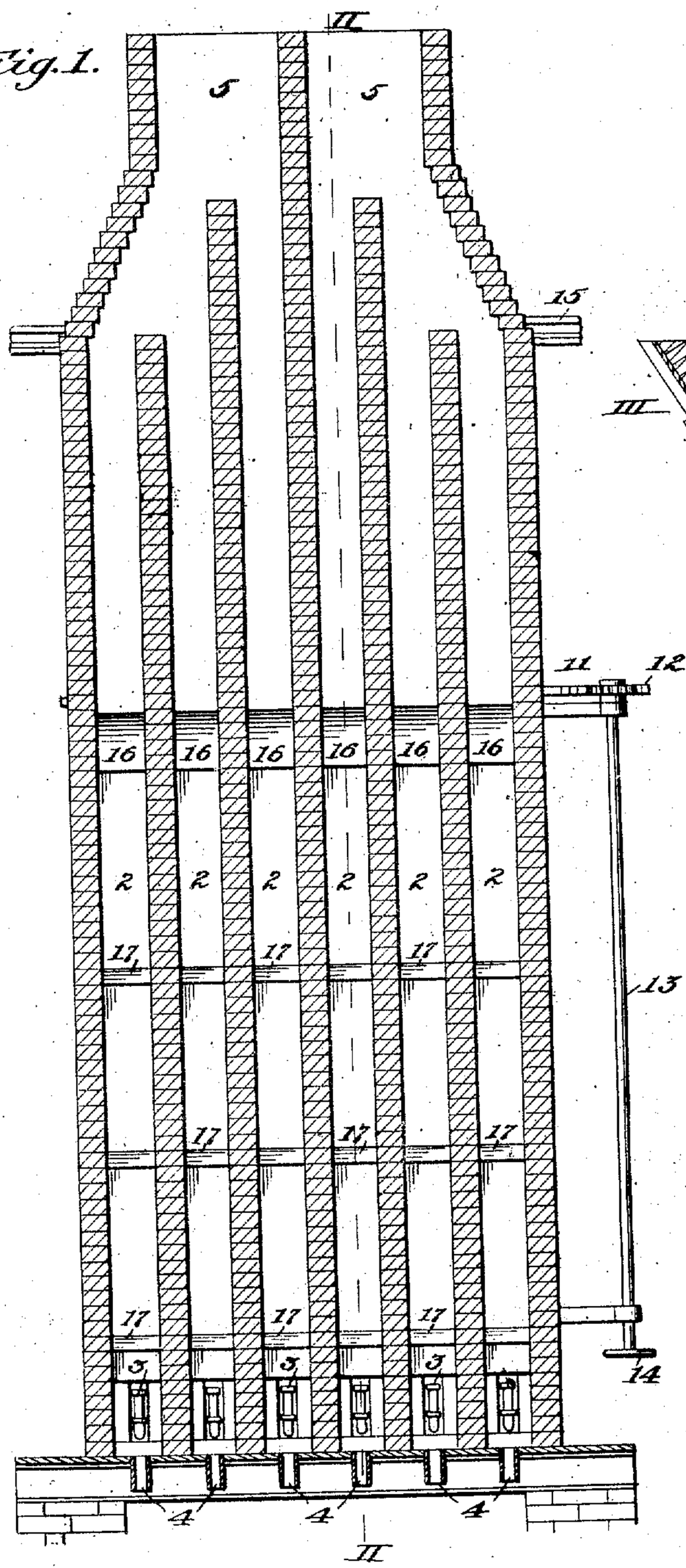
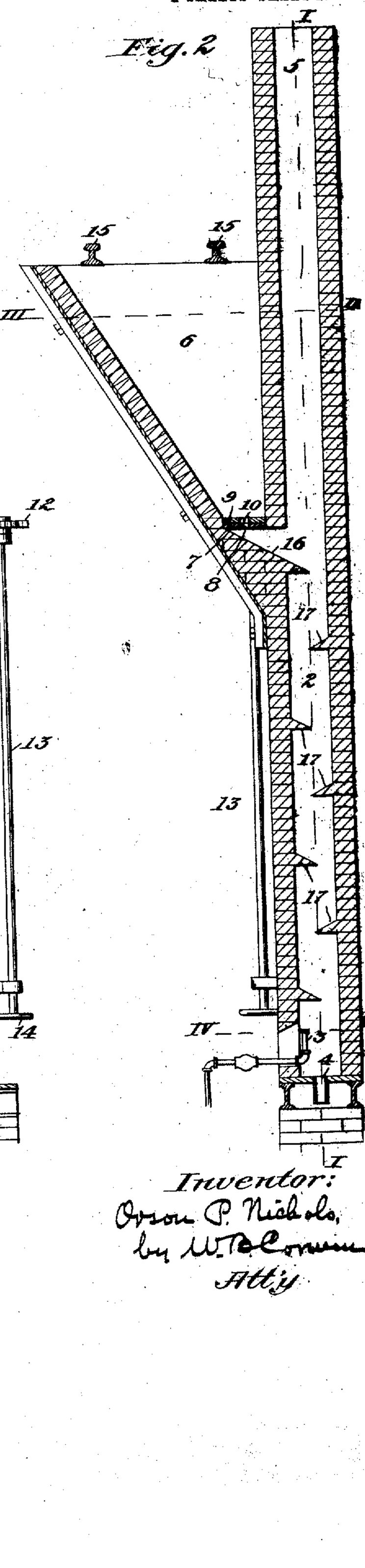


Fig. 2.



Witnesses:
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Geo. E. Gantz.

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Atty

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2 SHEETS—SHEET 2.

Fig. 3.

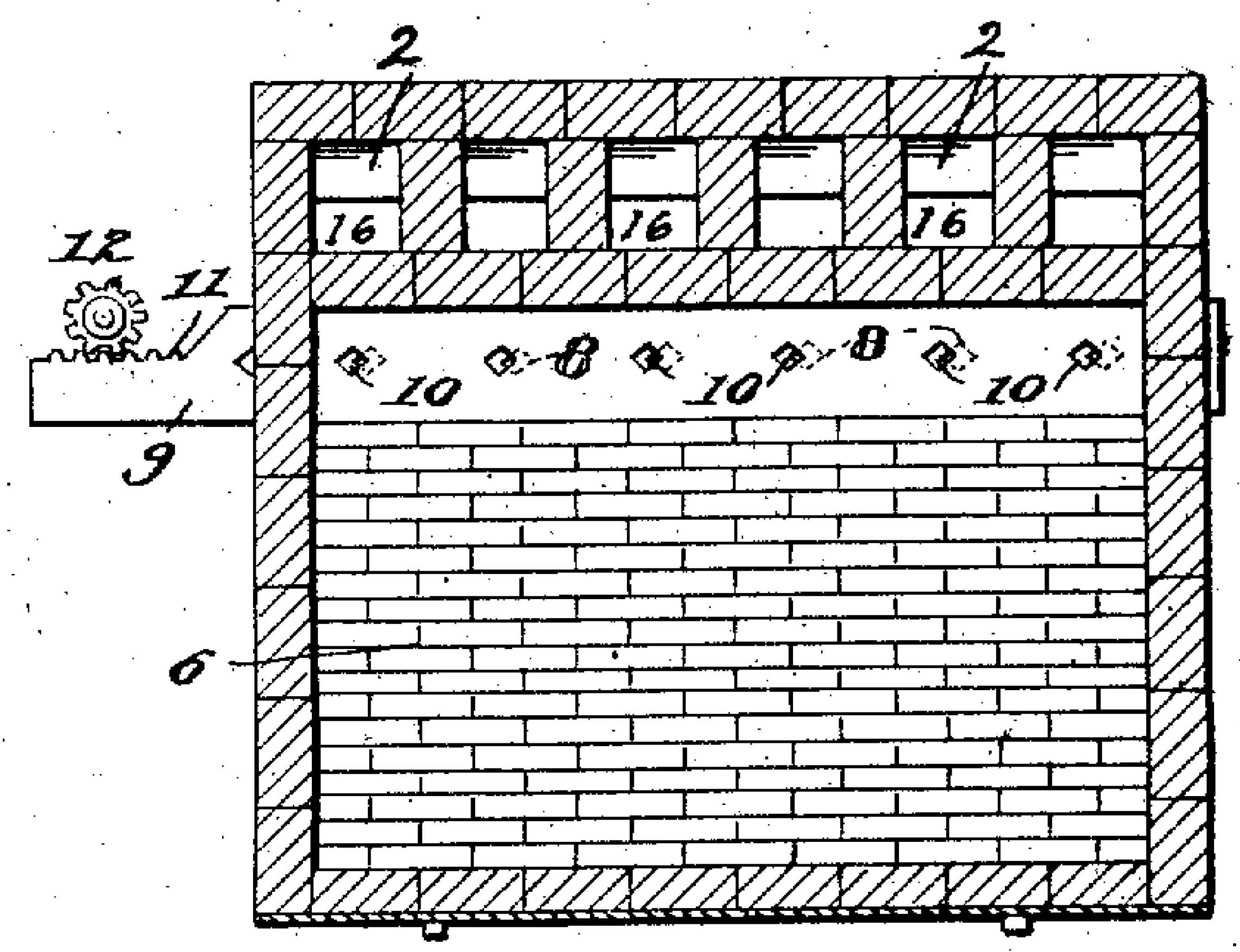


Fig. 4

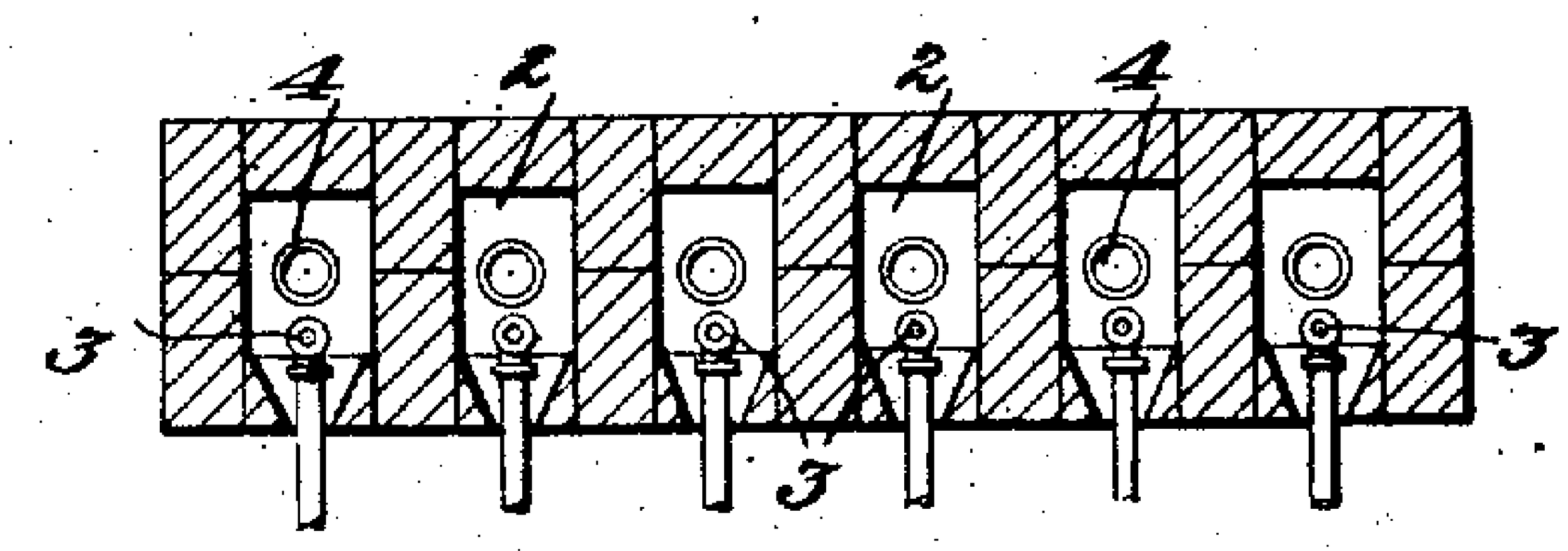
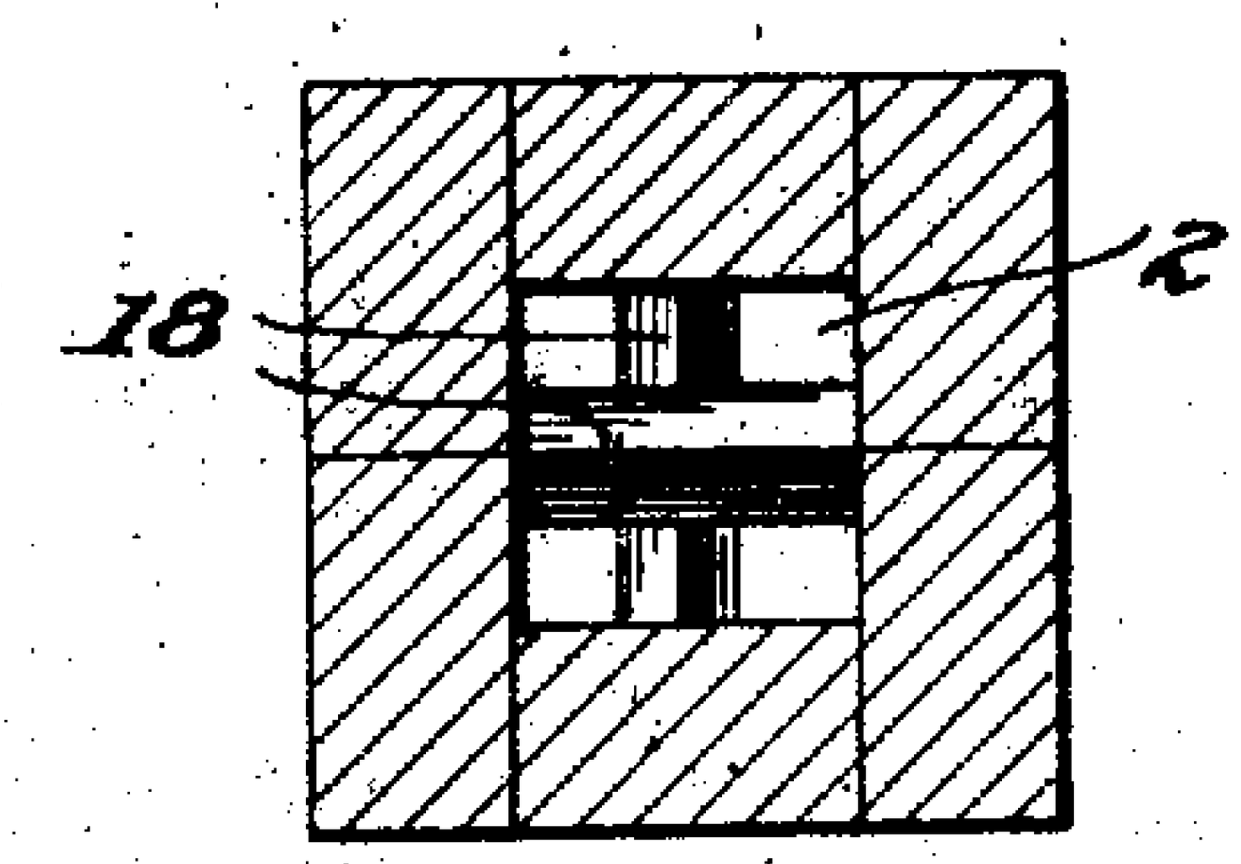


Fig. 5.



Witnesses:
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UNITED STATES PATENT OFFICE.

ORSON P. NICHOLS, OF WARREN, PENNSYLVANIA.

BONE-BLACK FURNACE.

978,625. Specification of Letters Patent. Patented Dec. 13, 1910.

Application filed February 4, 1910. Serial No. 542,079.

To all whom it may concern:

Be it known that I, ORSON P. NICHOLS, a citizen of the United States of America, and resident of Warren, in the county of Warren and State of Pennsylvania, have invented a new and useful Improvement in Bone-Black Furnaces, of which the following is a specification.

My invention relates to furnaces for burning or reclaiming bone, fullers' earth, or other filtering material which has been used in oil refineries or other places for filtering purposes.

Heretofore such furnaces have ordinarily been constructed in the greater part of iron or steel, which rendered them liable to burn out quickly and made them expensive to keep in repair and difficult to preserve in good running order.

The object of my present invention is to obviate such difficulties and to provide a furnace for the purpose mentioned which shall be inexpensive in construction, durable, easy to keep in repair, and extremely efficient in operation.

I shall now describe my invention so that others skilled in the art to which it appertains may manufacture and use the same, reference being had to the accompanying drawings forming part of this specification, in which—

Figure 1 is a vertical section on the line I—I of Fig. 2, looking toward the left. Fig. 2 is a vertical section on the line II—II of Fig. 1. Fig. 3 is a horizontal cross-section on the line III—III of Fig. 2. Fig. 4 is a horizontal cross-section on the line IV—IV of Fig. 2. Fig. 5 is a view of a modification of one of the features of my improved furnace.

Like symbols of reference indicate like parts in the several figures.

In the drawings, the furnace is shown as having six separate and individual burning-shafts 2, each provided at its bottom with a gas or other burner 3, and an outlet 4 for the burned or reclaimed bone, fullers' earth, or other burned material. At the top of the furnace the shafts 2 lead into the stacks or outlets 5. At one side of the furnace near the top thereof and extending across the same is a hopper 6 for supplying the burning-shafts 2 with the bone or other material to be burned, cleaned, and purified. The bottom of this hopper is provided with a fixed floor-plate 7 having holes or openings 8 therein, and also with an adjustable sliding plate 9 provided with holes or openings 10. The slide 9 is operated to bring the holes 10 and 8 more or less in register with each other and thus vary the size of the feed openings leading to the shafts 2 or entirely cut off the same, by means of a rack 11 on the end of the sliding plate which meshes with a pinion 12 on the upper end of a rod 13 adapted to be operated by a hand-wheel 14 on its lower end.

15 are rails by which cars carrying the bone or other material to be burned are brought over the hopper 6.

Leading from the openings 8 in the floor-plate 7, are inclines 16, which feed the material into the shafts 2. Each of the shafts 2 is provided with a series of baffle projections 17, provided with downwardly-inclined upper surfaces and extending about midway across the shaft alternately from opposite sides thereof for the purpose of giving to the bone or other material being burned a zig-zag or tortuous course down the shaft from its entrance over the incline 16 to its exit at the discharge outlet 4.

As will be observed, the outer or inclosing walls of the furnace, the inner division walls forming the shafts 2, the stack portions 5, and the baffle projections 17 are constructed of fire-brick, thus rendering the furnace exceedingly durable and not liable to get out of repair or working order.

The operation of my improved furnace will be readily apparent.

The bone or other material which is to be burned or reclaimed is dumped into the hopper 6, and the burners 3 having been lighted and the furnace brought to a proper temperature, the material is permitted to pass through the openings 8—10 into the shafts 2, down which it passes, being diverted from a straight vertical course or path by the baffle projections 17, which throw it from side to side of the shafts, thus submit it thoroughly, to the flame and heat ascending the shafts from the burners 3, so that it emerges from the outlets 4 thoroughly burned and cleaned, freed of all impurities, and ready for reuse. The feed of the bone or other material from the hopper 6 to the shafts 2 may be altered by varying the size of the openings 8, or said openings may be entirely closed and the feed stopped, by

proper manipulation of the slide plate 9 as before described.

In Fig. 5 is shown a modification, in which instead of employing the baffle projections 17 in the shafts 2, bricks 18, suitably spaced apart or abutting against each other as preferred, and having inclined upper surfaces, and alternating in direction as shown, are employed to break up the course of the material down the shafts.

I claim:—

1. A furnace for burning bone, fullers' earth, and other filtering material, having a series of burning shafts each provided with a burner and an outlet for the burned material at its bottom, and a feed hopper at the side of the furnace having a series of openings corresponding with the number of shafts and adapted to feed the material into the upper portion of said shafts, said shafts being each provided with baffle projections with inclined upper surfaces extending partially across the shafts alternately from opposite sides thereof and with a stack portion above the feed openings.

2. A furnace for burning bone, fullers' earth, and other filtering material, having a series of burning-shafts each provided with a burner and an outlet for the burned material at its bottom, and a feed hopper at the side of the furnace having a series of openings adapted to feed the material into the upper portion of each of the shafts and devices by which the size of said openings may be varied to vary the feed of material to the shafts, said shafts being provided with baffle projections with inclined upper surfaces extending partially across the shaft alternately from opposite sides thereof.

In witness whereof I have hereunto set my hand.

ORSON P. NICHOLS.

Witnesses:
HARRY S. PETERSON,
MAURICE M. REYNOLDS.

Corrections in Letters Patent No. 978,625.

It is hereby certified that in Letters Patent No. 978,625, granted December 13, 1910, upon the application of Orson P. Nichols, of Warren, Pennsylvania, for an improvement in "Bone-Black Furnaces," errors appear in the printed specification requiring correction as follows: Page 1, line 101, before the word "thus" the word *and* should be inserted, and same page, line 102, after the word "thoroughly" the comma should be stricken out; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 17th day of January, A. D., 1911.

[SEAL.]

C. C. BILLINGS,
Acting Commissioner of Patents.

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