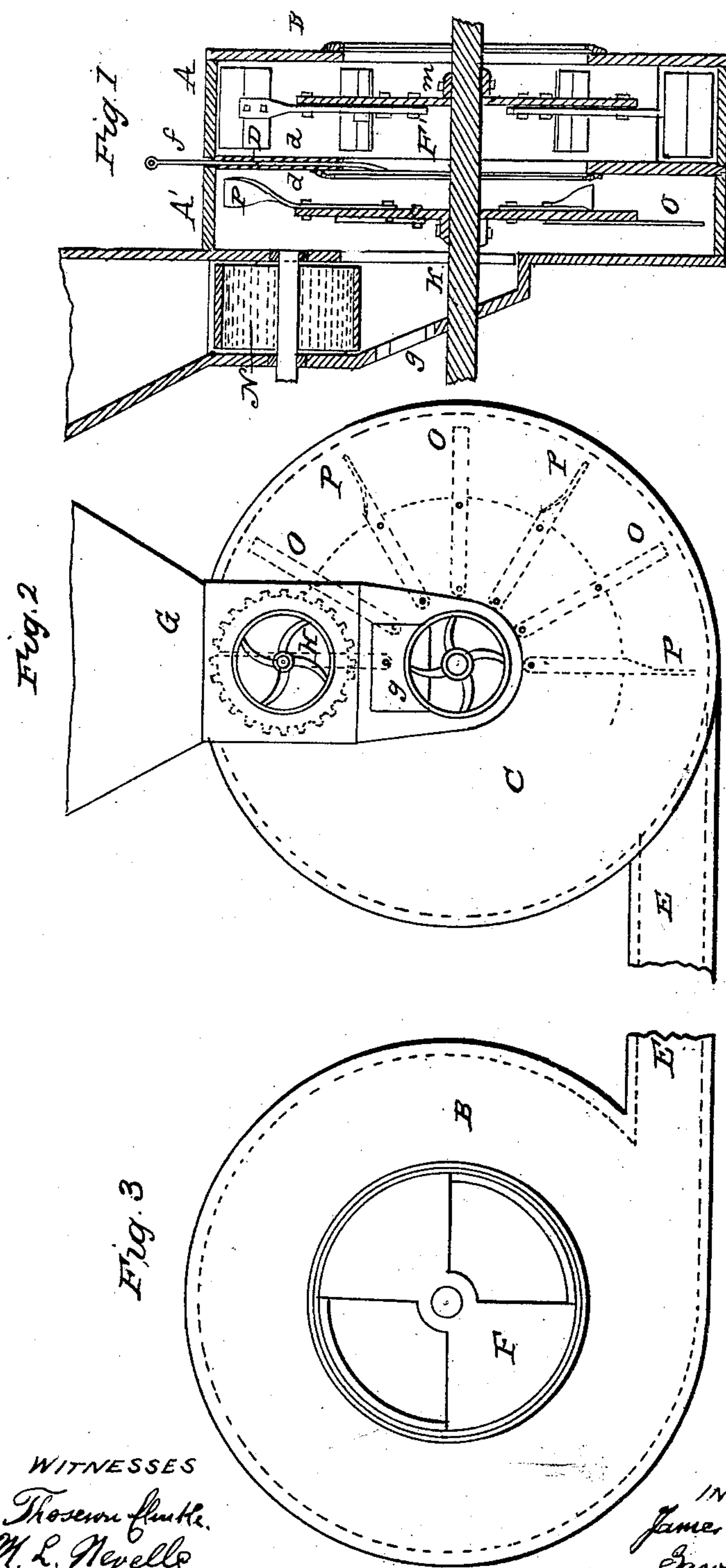


WHELPLEY & STORER.

Apparatus for Feeding Fuel to Furnaces.

No. 59,695.

Patented Nov. 13, 1866.



WITNESSES
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IMPROVED APPARATUS FOR FEEDING FUEL TO FURNACES.

Specification forming part of Letters Patent No. 59,695, dated November 13, 1866.

To all whom it may concern:

Be it known that we, JAMES D. WHELPLY and JACOB J. STORER, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Apparatus for Employing and Feeding Fibrous Substances as Floated Fuel; and we do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, forming a part of this specification.

In the patent granted us March 13, 1866, we claimed no particular apparatus for preparing and introducing finely-comminuted fuel mingled with the air used in supporting the combustion of the gases of furnaces and fire-boxes. In researches since then we have discovered that tan-bark is a desirable fuel to use in this way, and we now wish protection for an apparatus embodying in itself the means of securing a complete comminution of the bark before it enters the fire, of distributing it evenly to the air-blast, and feeding it into the fire-box or furnace.

The best air-blast for floated fuel is that from a fan-blower; but tan-bark is a substance which cannot readily be finely ground, being fibrous, and is too heavy as used in tanyards to be floated on an air-blast. We have therefore provided an apparatus to receive coarsely-broken tan-bark, and in one operation comminute it sufficiently, distribute it to the blast evenly, and feed it to the fire by a fan-blower, and having auxiliary devices to regulate the relative supply of fuel and air.

In the drawings, Figure 1 is a section of the machine. Fig. 2 is an elevation of the fuel end, showing in dotted lines the cross-section of the feed and crushing fluted cylinder N, Fig. 1, and cutting and pulverizing arms O and P; Fig. 3, an elevation of the end of the air-feed.

The case of the mill consists of two cylinders, A A', fitting into grooves *a* in the disks of the air-feed B, of the fuel-feed C, and in the separating-diaphragm D. These disks and diaphragm are centrally pierced about the shaft, as shown in Fig. 1, and disk B is furnished with a register, F, to regulate the air-blast, as shown, Figs. 1 and 2, while dia-

phragm D has a similar register, F, operated by a rod, *f*, passing through the diaphragm, as shown, Fig. 1. This register allows us to cut off the fuel-feed at will.

Near disk C is a hopper, G, into which is fed the tan-bark, either alone or mingled with any other fuel or fluxes which may be necessary. This hopper communicates by pipe H with the central opening of disk C, and this pipe is opened to the air at I, to admit air for conveying the tan-bark into the cutting-chamber.

On a revolving shaft, K, passing through the axis of the case are mounted disk L, obstructing about three-fourths of the cutting-chamber and fan-blower M, revolving in the case of the fan.

If the diaphragm D is of wood, it should have a metallic shield or cover, as shown at *d*, Fig. 1.

In the pipe H, between the hopper and the air-entrance I, is a fluted cylinder of metal, N, quite filling the interior of the pipe. This cylinder is revolved by a pulley, and the sides of the pipe around it should be of metal.

Upon the disk L are affixed steel cutters O upon the side next the bark-feed, and alternately with them, but on the opposite side of the disk, paddles P, also of steel. These paddles are slightly curved forward to throw the material, after being broken, into the track of the air-blast about the shaft. Fig. 1 shows these attachments of the disk L in the plane perpendicular to the plane of revolution.

Tan-bark is now fed into the hopper, the machinery set in motion, and register F' opened. The fan creates a draft through opening I into the cutting-chamber. The tan-bark is fed into this air-blast by cylinder N, being partially crushed in its passage against the walls of the pipe H. It is then carried by the blast into the cutting-chamber, when the revolving disk L acts as a spreader and compels the air-blast to move around it. The cutting-blades strike the particles of tan-bark as they pass, and comminute them, while the paddles complete the operation. The air of the blast then rises and conveys the bark, sufficiently comminuted, into the case of the fan, when, if desirable, further air may be mingled with it through register F. The air thus charged with floated

fuel is discharged into the furnace or fire-box through tangential exhaust or blast pipe O.

It is obvious that any and all fibrous substances can be thus powdered and fed as fuel, such as peat, corn-cobs, bagasse, dried grass, exhausted grain from the malt-tub, such as brewers' grains, oil-cake from linseed, refuse leather, spoiled or rusted cereals, chopped straw, husks, and even what the French call "chiffonerie," being the rags, paper, and other combustibles to be gathered from the sweepings of streets.

Instead of one disk L, carrying blades and paddles, as described, two or more disks may be used, each of them provided with blades and paddles, or one or more provided with blades alone or paddles alone, while the other carries instruments of the complementary character.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The construction of a machine containing a comminuting apparatus for fibrous fuel, substantially as described, in combination with the fan-blower of an air-blast, as and for the purpose described.

2. The arrangement of cutting-blades O and air-wheel paddles P upon one or more revolving disks L in the cutting-chamber, substantially as described, and the same in combination with crushing-cylinder N, substantially as described, and for the purpose stated.

3. The combination of a register, F F', with the air or fuel feed of the fan-blower, as and for the purpose described.

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Witnesses:

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