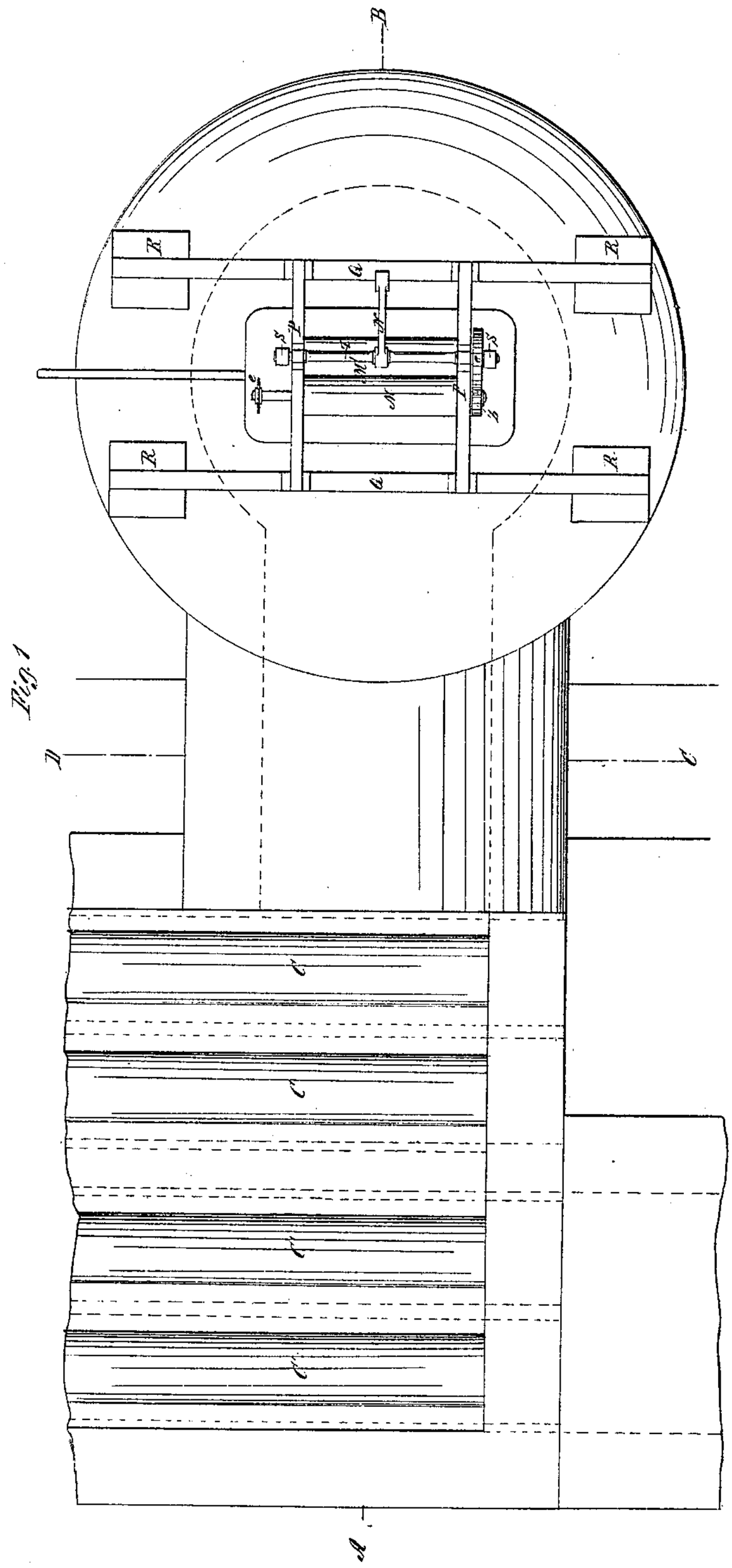
4 Sheets-Sheet 1

S. H. Gilman,

Steam-Boiler Furnace.

No. 13,873. Patented Dec. 4, 1855.



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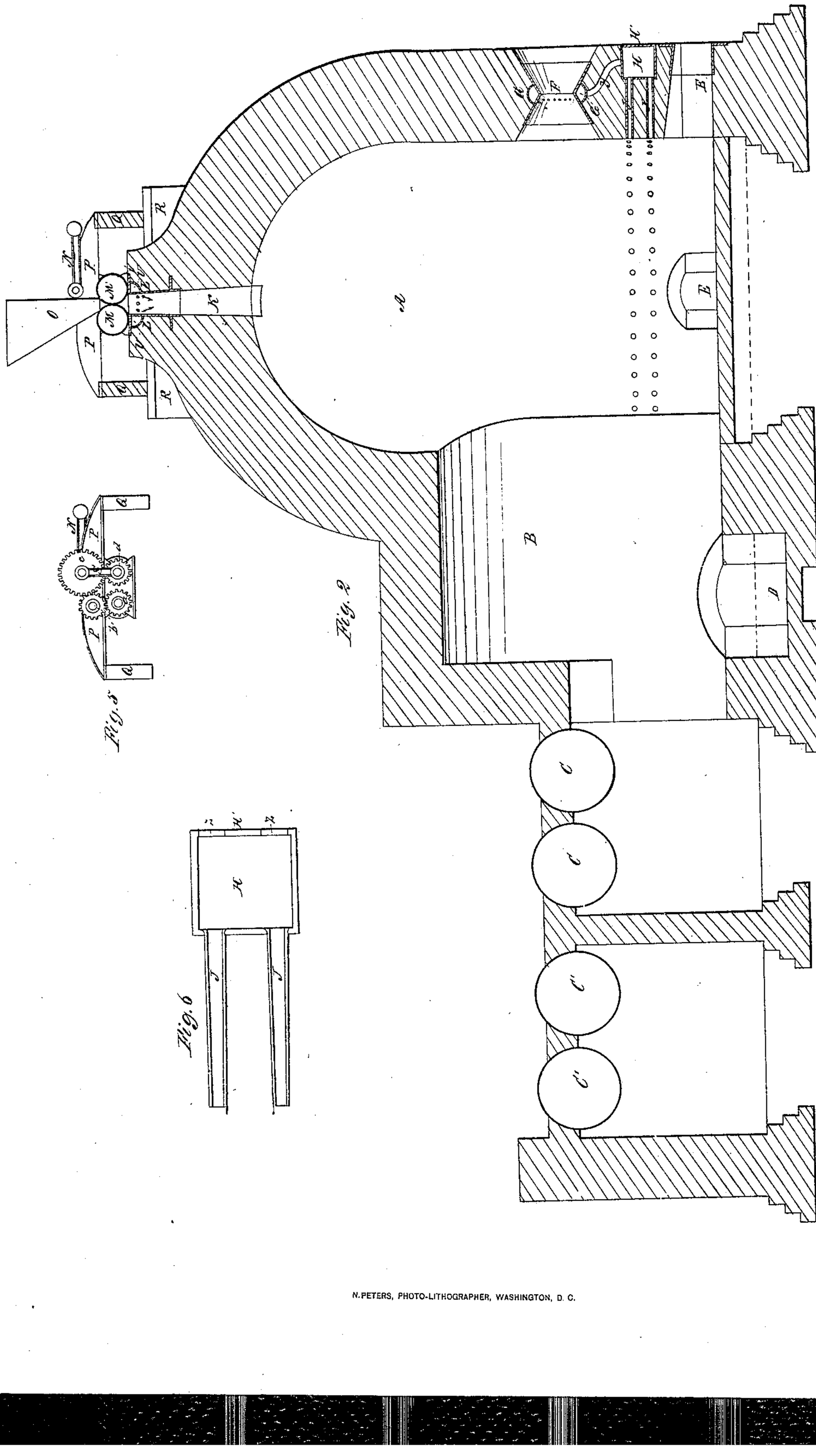

Fig. 2

Fig. 3

Fig. 6

4 Sheets-Sheet 3.

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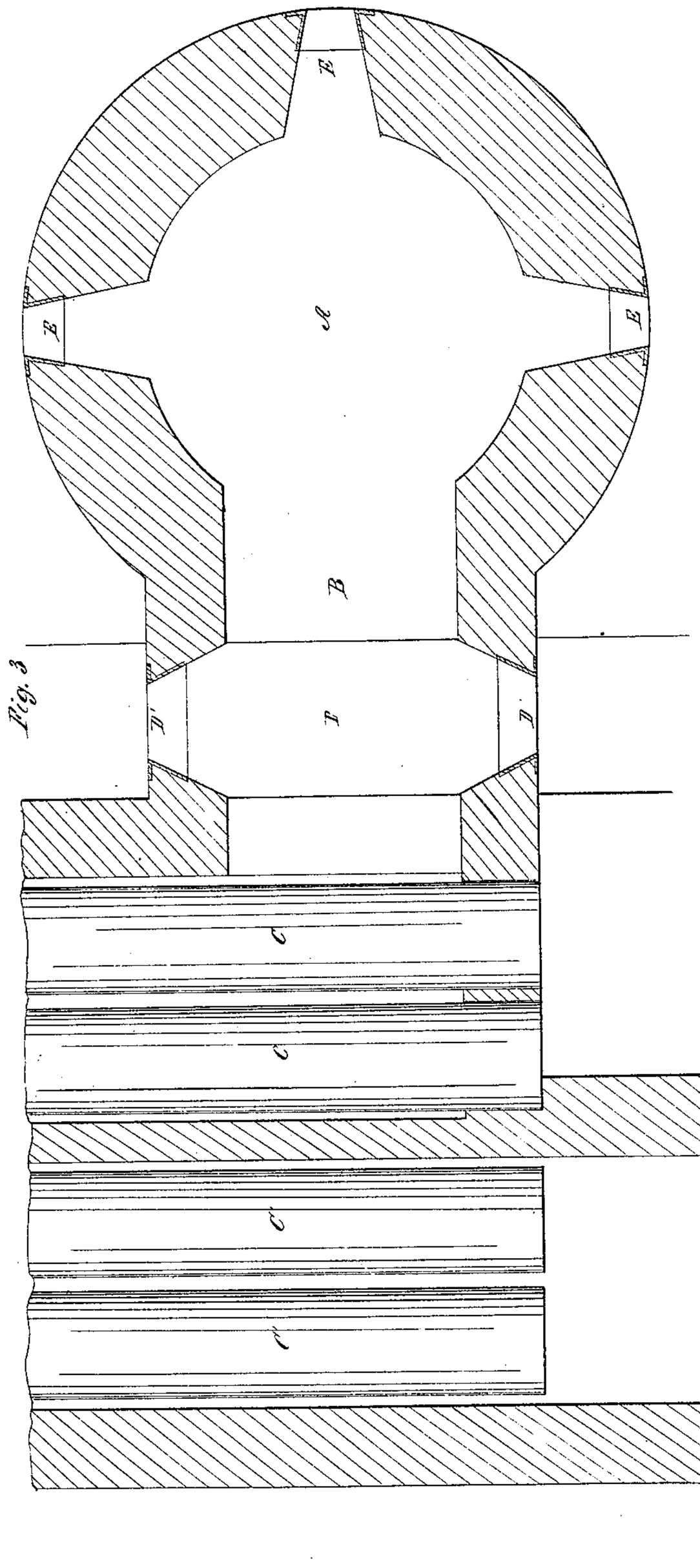

Fig. 3

4 Sheets-Sheet 4.

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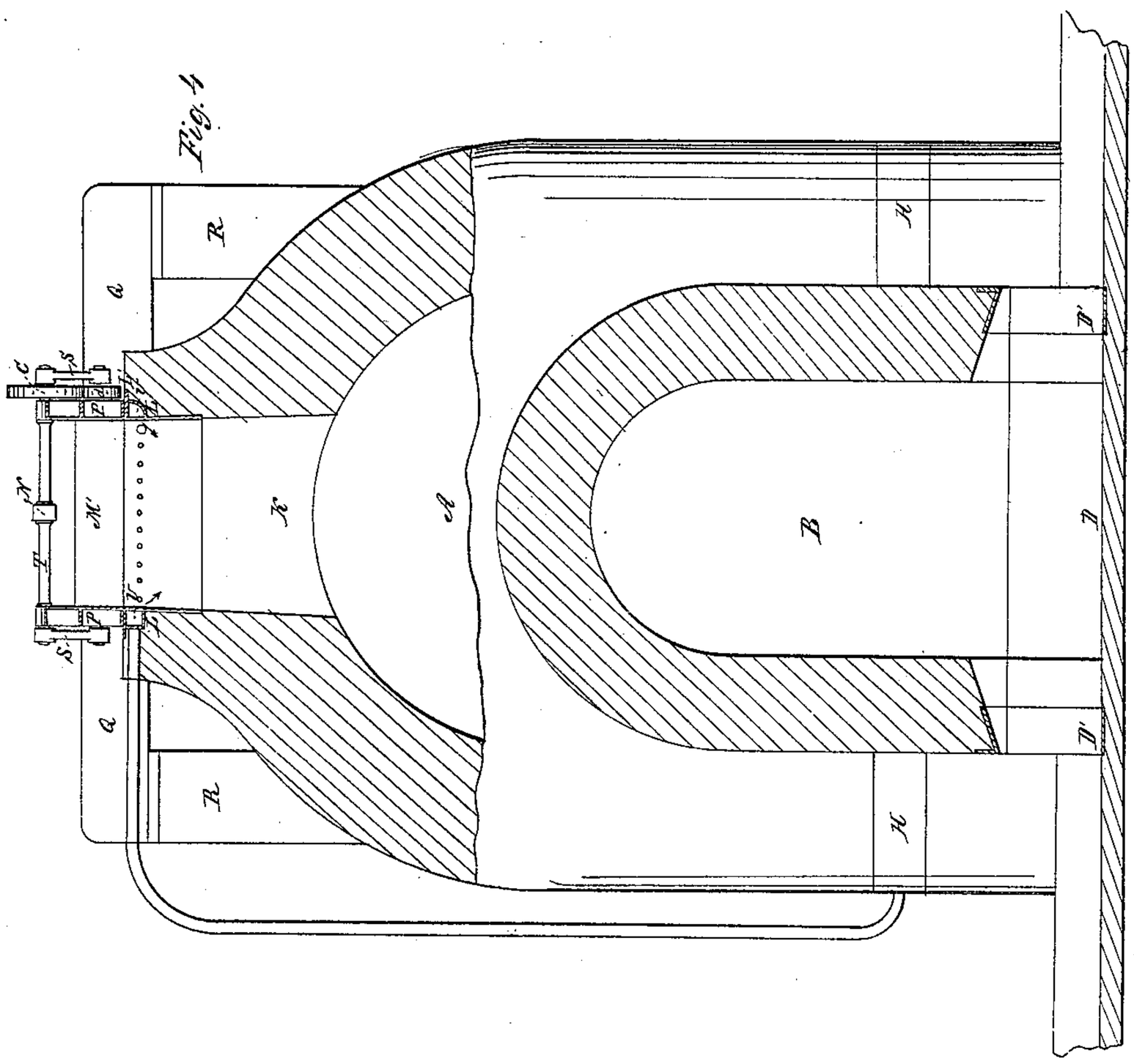
Fig. 4.



UNITED STATES PATENT OFFICE.

SAML. H. GILMAN, OF NEW ORLEANS, LOUISIANA.

BAGASSE-FURNACE.

Specification forming part of Letters Patent No. 13,873, dated December 4, 1855; Reissued August 5, 1856, No. 383.

To all whom it may concern:

Be it known that I, SAMUEL H. GILMAN, of New Orleans, Louisiana, have invented new and useful Improvements in Bagasse-Furnaces; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the annexed drawings, in which similar letters refer to similar parts, and in which drawings, made part of this specification, Figure 1 is a plan; Fig. 2, an elevation in section centrally and longitudinally in the line A—B of Fig. 1; Fig. 3, a horizontal sectional plan, part on a line level with the center of the boilers and part nearly level with the floor of the furnace and cutting the doors of the pit and the cleansing doors of the furnace; Fig. 4, a sectional elevation at the line C—D, looking toward the furnace, the dome of which is shown in section through and lengthwise the feed-openings. Fig. 5 is an end elevation of the feed-rollers and cog-gearing and supports of the same, and Fig. 6 is a cross section of the blast-pipe H with a pair of its twyers J J in longitudinal section and the openings Z in section the accessible side H of the blast-pipe for cleansing said twyers.

Many plans for burning bagasse as it leaves the mill have been tried. The following is a successful plan, owing to the parts and arrangements claimed. Other parts may be modified or made to differ essentially, for instance the blast-pipe and twyers, because the twyers are troublesome to clean and cause delay every hour of which in sugar making season is a loss of many pounds of sugar. The two main points are to prevent fire and smoke issuing from the furnace (under the force of the blast at the lower part of the furnace) when the bagasse is fed in and where the wood and other matter is put in at the ordinary furnace door, which also must be opened for inspecting the condition of things inside during contingencies while the furnace is in operation and 2nd to leave the ash-pit (so usually called) that the contents of the furnace can readily be tumbled and thrust into it without loss of time or heat or fuel. These two points I effect by the perforations around the opening and by placing the ash-pit between the furnace and the boilers in the manner to be described.

Wet bagasse as it comes from the rollers of the sugar mill being difficult to burn from its undried condition (and to dry it would cause a fatal loss of time during the sugar making season) and sugar cane being largely imbued with silica in its composition and on that account rapidly and largely productive of slag in the furnace, it becomes necessary to get rid of it before the entire mass of bagasse is consumed. To eject it from the furnace would cause a great loss of steam making power and put around the furnace an insupportably hot, troublesome and dangerous mass of candescent material. To avoid this and at the same time, to use the sluggish mass to the greatest advantage and in a place where it can be consumed at leisure till opportunity offers to cart it away I make the furnace throat leading to the boilers very large and with its floor level with the floor of the furnace and in this throat floor and athwart it I make a pit or secondary furnace into which the candescent mass (so necessary to be gotten rid of, by the primary furnace, on account of its liability to choke the primary furnace) can be thrust and left to burn up to its fullest capacity for burning and give its heat to the boilers and more or less help to retain the primary furnace in condition for a continuous charge of wet bagasse.

(A) is a circular, dome covered, brick furnace communicating by a passage way (B) to boilers (C, C). The area of the hearth of the furnace should be in the proportion of one square foot for each two hundred pounds of sugar to be made in twenty four hours. The height of the furnace, inside, should be one and a half times its inside diameter the feed opening being in the apex of the dome. The arched passageway (B) should be of a capacity to receive the contents of the furnace from time to time as such contents are thrust along it toward and to fall into the pit (D). This thrusting process is effected through the doors (E) which are three or more in number and on a level with the hearth of the furnace. The arched passage way (B) must also be of a capacity to carry off at the same time and at all times the smoke, sparks, heat and blast through the opening into the wall supporting and closing in the boiler. The pit (D) thus arranged as a secondary furnace between the furnace (A) and the boilers (C C) per-

forms the important essential and necessary function of receiving and retaining in a combustible condition, the unconsumed bagasse which when consumed can be withdrawn through the doors (D) of the pit with the debris of the furnace, thus not only economizing fuel but keeping the entire furnace at all times in a first rate condition to burn bagasse as it comes from the sugar mill.

(E) is the furnace door, facing the passage way (B) and used for the insertion of wood or coal and for inspecting the furnace. The opening should enlarge toward the inside of the furnace and on this enlarging portion, perforations from a blast-pipe (G) should open so that an inward blast can be at all times kept up. This is the essential feature and the blast may be conveyed by a pipe (Y) from the blast-pipe (H) which runs around the lower part of the furnace or in some other way. In the same way the feed-opening (K) enlarging toward the inside of the furnace is supplied with a blast-tube (L) fed by a pipe (X) from the pipe (H) and having perforations leading to the opening (K). The inward blasts kept up through these perforations force the smoke, fire, sparks and heat toward the passage way (B) and materially aid operations so much so that furnaces without these perforations and the pit as I arrange them, are condemned. The feed rollers (M M) are mounted on supports (P) which rest on cross-timbers (Q) upheld by brick pillars (R) rising out of the brick work of the furnace. The cog wheels (*a b d*) are of a diameter less than that of the feed rollers and number of teeth and the cog wheel (*c*) is of a diameter to enable it to gear at the same time with the wheel (*b*) in the support (P) and the wheel (*d*) on the feed roller (M). The wheel (*b*) meshes with the wheel (*d*) on the feed roller (M) which is put in motion through the chain-wheel (*e*), on the other end of its shaft. The wheel (*c*) runs on a shaft (T) from the pendent arms (*s*) of which the roller (*m*) is operated by the wheel (*c*) deriving its motion from the wheel (*a*) of the roller (M) deriving its motion through the wheel (*e*).

(N) is a lever projecting from the shaft (T), and can be weighted to suit and so as to keep the feed rollers pressed to their work; the accumulations of slag, cinder, ashes and unconsumed bagasse being treated in the manner described and the smoke, fire, sparks and heat controlled at the openings by the perforations admitting a blast in jets inwardly through the openings (E) being protected by the blasts from the leaks made around the bottom of the furnace for blast purposes or by means of twyers as described.

What I claim and desire to secure by Letters Patent is—

1. The pit (D) located between the furnace and the boilers in a passage way (B), as described and for the purpose specified.

2. I also claim the perforated blast pipe (G) and (L) of the feed opening and door as arranged and described and for the purpose specified.

SAMUEL H. GILMAN.

Witnesses:
A. MOULTON,
THOS. L. WILSON.

[FIRST PRINTED 1912.]