

No. 671,073.

Patented Apr. 2, 1901.

W. H. SMYTH.
MECHANICAL STOKER.

(No Model.)

(Application filed June 22, 1899.)

2 Sheets—Sheet 1.

Fig. 2.

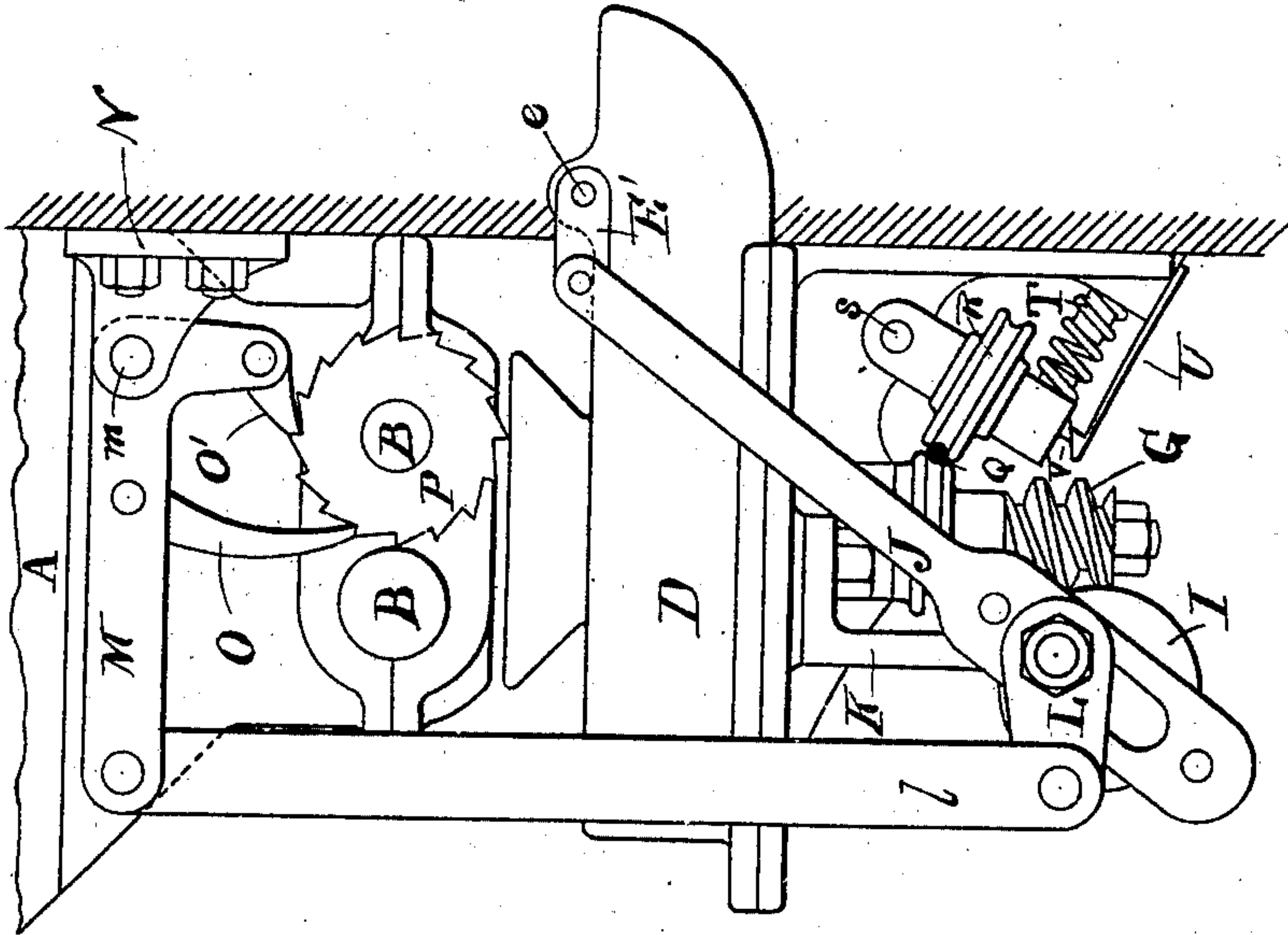
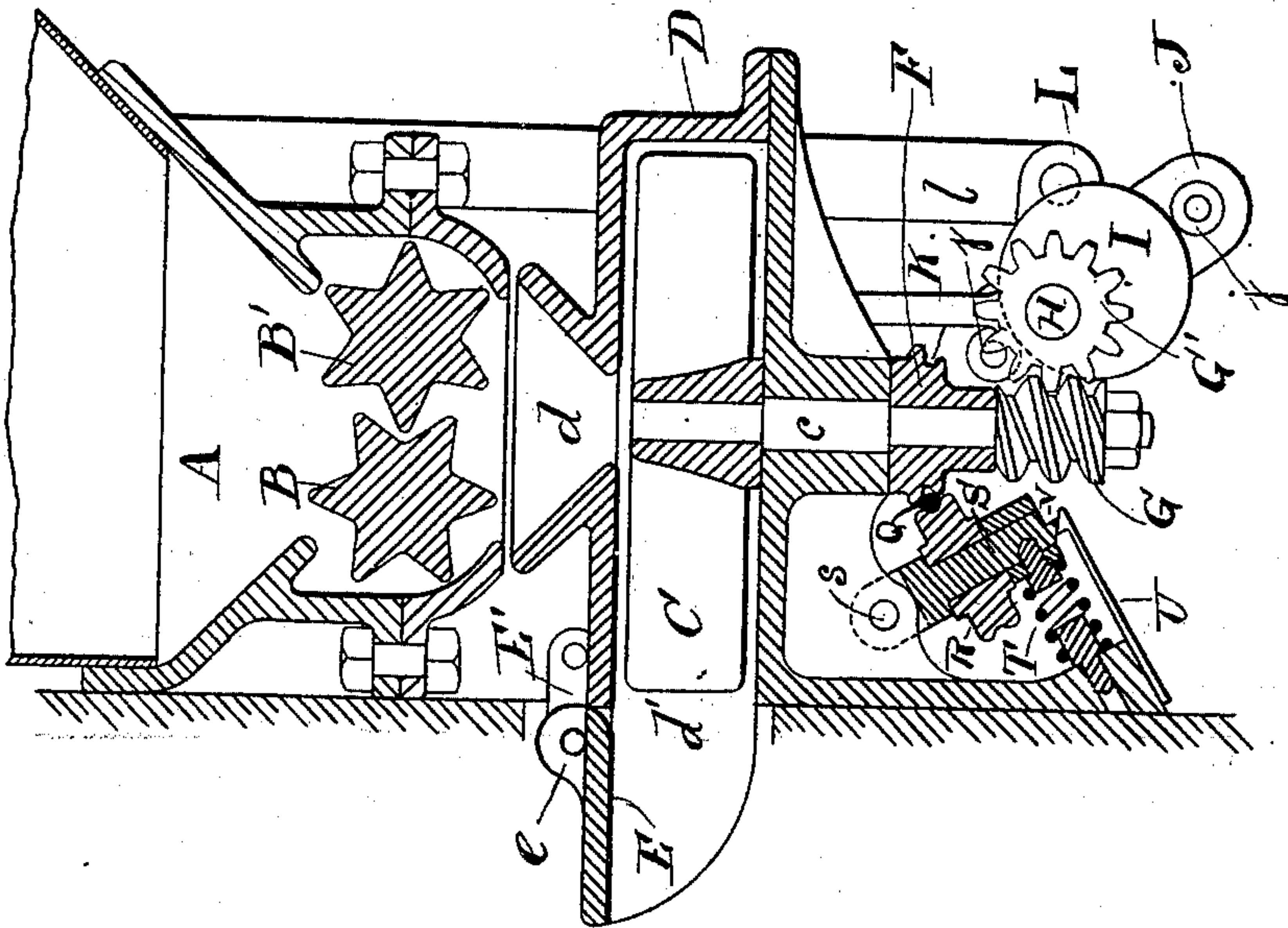


Fig. 1.



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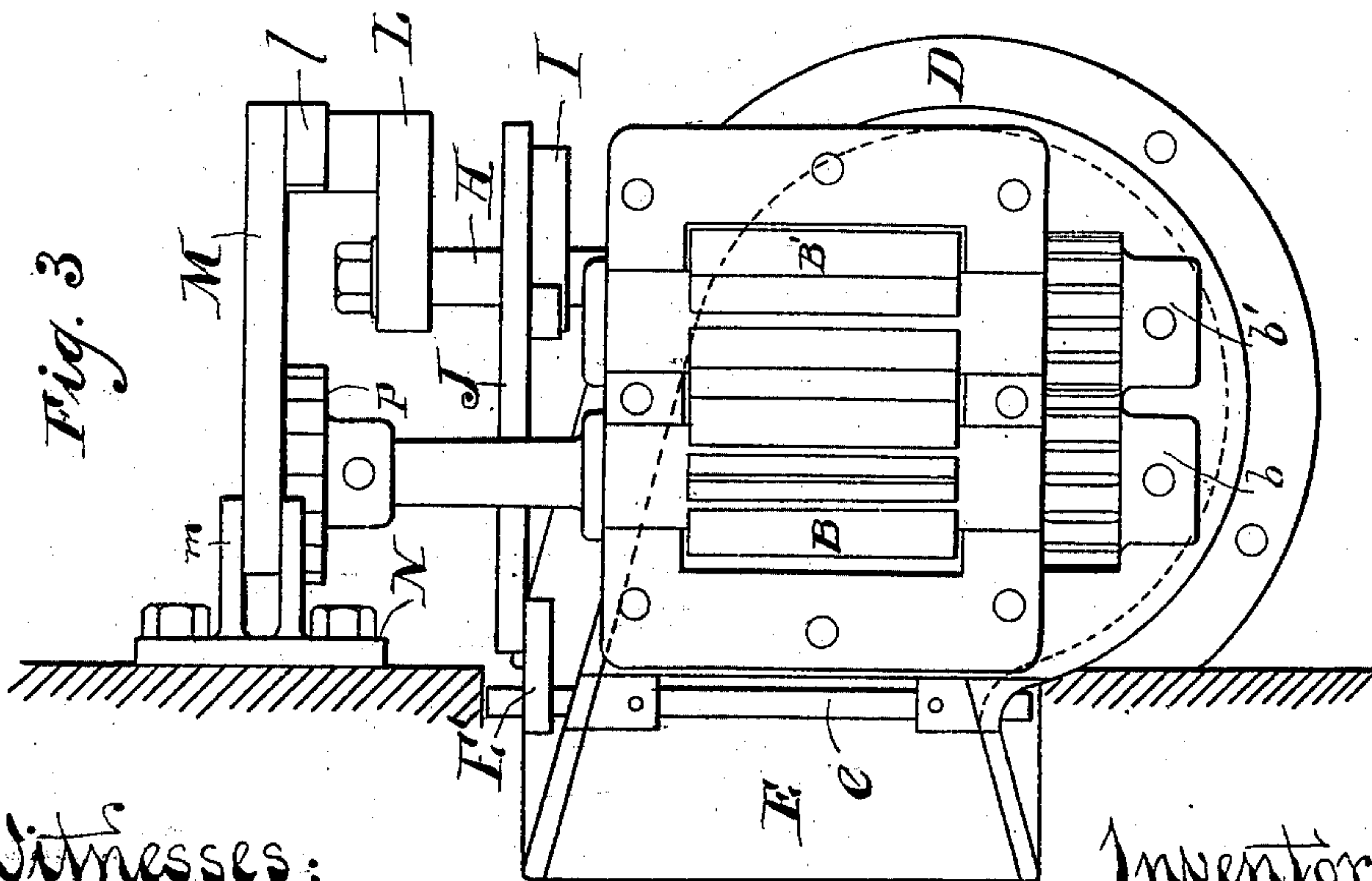
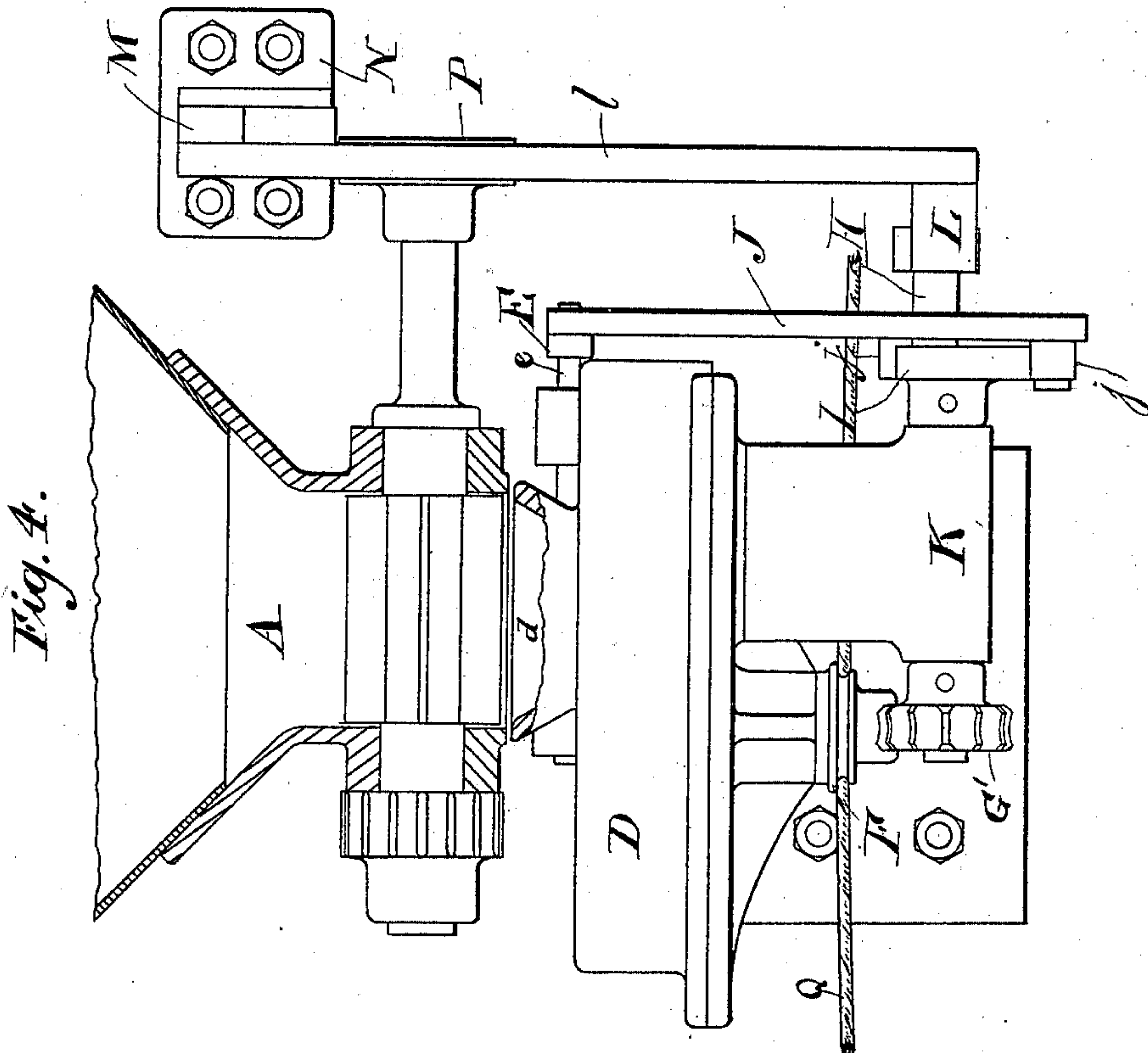
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UNITED STATES PATENT OFFICE.

WILLIAM H. SMYTH, OF BERKELEY, CALIFORNIA.

MECHANICAL STOKER.

SPECIFICATION forming part of Letters Patent No. 671,073, dated April 2, 1901.

Application filed June 22, 1899. Serial No. 721,476. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. SMYTH, a citizen of the United States, residing at Berkeley, in the county of Alameda and State of California, have invented certain new and useful Improvements in Mechanical Stokers; and I do hereby declare the following to be a full, clear, and exact description of the same.

This invention relates to mechanical stokers; and the object is to provide a device of this character simple in construction, efficient in operation, and which is adapted to be applied to any ordinary boiler-furnace and also to operate in a series with a multiplicity of boilers from the same source of power, suitably arranged that one or more can be thrown out of operation without affecting the remaining ones. This object is accomplished by means of the devices illustrated in the accompanying drawings, in which—

Figure 1 is a sectional elevation. Fig. 2 is a side view. Fig. 3 is a plan view. Fig. 4 is a front elevation, portions being in section to more clearly illustrate it.

Referring to the accompanying drawings, A is a hopper or receptacle for fuel. It is preferably provided with suitable devices to agitate the fuel at the bottom of the hopper to prevent choking, (shown in the drawings as rotatable rolls B B', journaled near the bottom of the hopper.) These rolls are preferably made toothed or corrugated, as shown, and arranged to mesh into each other.

A fan-wheel or runner C is provided, inclosed in a suitable box or casing D, preferably journaled with its axis vertical. A supply-opening *d* is provided, located radially from the center of the runner and beneath the feed-hopper. The casing D has a tangential discharge-opening *d'*, (shown best in Fig. 3, where the inner contour of the casing is shown by dotted lines.) Transverse to this opening is a deflecting-plate E, hinged at *e* to the casing D and adapted to be oscillated on its pivotal point by suitable mechanism hereinafter described. The lower part of casing D is preferably made in the form of a bracket to provide for its attachment to a boiler-front, and the fan or runner is journaled in this bracket. Below the journal and upon the shaft *c* of the runner is a rope-pulley F. Upon this same shaft is secured a

worm G. Meshing with G, to be driven thereby, is a pinion G', secured upon a shaft H, journaled at K in the casing D, Fig. 1.

Upon the shaft H is secured a cam I, of any suitable form. A rod J, having cam-rollers *j j*, adapted to engage with the cam and be operated thereby, is also provided, its other end being attached to a lever-arm E', secured upon the hinge-pin, to which the deflecting-plate E is also attached. Secured upon the shaft H also is a crank L, connected by a suitable rod *l* with a bell-crank rock-arm M, pivoted at *m* to a stationary bracket N.

Suitable pawls O and O' are loosely connected one on each arm of the bell-crank lever, arranged to engage with a ratchet-wheel P, secured upon the shaft of roll B.

Upon each of the shafts of the rolls B and B' and adapted to mesh into each other is secured a gear *b b'*.

To drive the fan C, a driving-rope Q is provided, connected with a suitable source of power and motion and suitably placed to engage in driving contact with the grooved pulley F. To insure driving contact between the rope Q and the pulley F, a grooved pulley R is provided, journaled on a pin S, hinged at *s* to frame or casing D. A strong spring T is provided, suitably arranged to force the pulley R against the rope and it in turn into the groove of pulley F. A spring-latch U is attached to a stationary portion of the structure and placed to engage with a lug V on the hinged pin S to hold when engaged therewith the pulley R and rope Q out of driving contact with the pulley F.

The whole device is arranged to be attached to a boiler-front in any suitable manner.

In operation the rope Q, traveling rapidly in driving connection with the pulley F, puts the fan and worm in rapid rotation, and through the engagement of the worm with the gear G' the shaft H is also given rotative motion at a much slower speed. The rotation of the shaft H slowly oscillates the deflecting-plate E by the operation of the cam I, rod J, and lever E'. The bell-crank M is simultaneously given a rocking motion by its connection with the crank L and rod *b*, and the pawls O and O' engage alternately with the ratchet-wheel P, giving it a slow continuous rotation, thus operating the rolls B and B'.

The device being thus in motion and coal placed in the hopper either in definite charges or in a continuous stream, it is fed in a thin flow by the rotation of the rolls B and B', which incidentally, owing to their toothed or corrugated form, break any lumps which may occur in the coal. The stream of coal flowing continuously upon the rapidly-rotating fan or runner is thereby thrown in a continuous stream into the furnace, and the slow oscillation of the plate E deflects the flying particles of coal, and thus produces an even distribution over the surface of the grate-bars.

The devices and method of driving herein shown permit of an indefinite series of these devices being connected to and driven by the same power device and at the same time permit of one or more of the series being thrown out of operation without affecting the working of the balance.

It is obvious that many modifications in the device herein described will readily suggest themselves to mechanics to adapt it to particular circumstances or conditions of operation without departing from the essential character of the invention. I therefore do not confine myself to the particular form or proportion of parts herein described; but

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

1. A mechanical stoker comprising a rotating horizontal device having radiating blades within a casing and a deflecting-plate in the

path of the fuel thrown by the blades, adapted by its oscillation to distribute the material to a greater or less distance.

2. A mechanical stoker comprising a rotating horizontal device within a casing and a deflecting-plate in the path of material thrown by the rotating device adapted by its oscillation to deflect said material at various angles, and a feed-hopper provided with breaking-rolls.

3. A mechanical stoker comprising a rope-driven rotating fuel-throwing horizontal device with means for holding the rope out of working contact therewith, a plate in the path of the material thrown adapted by its movement to distribute the material, a feed device provided with breaking-rolls, and driving connections engaging with the rotating device to effect the motion of the moving parts.

4. A mechanical stoker comprising a rotating fuel-throwing horizontal device having a grooved rope-pulley and a spring-actuated pressure-pulley adapted to bear upon a rope traveling in contact with the grooved rope-pulley and means adapted to engage with said pressure device to hold it out of working contact and a deflecting-plate in the path of the material thrown adapted to distribute the material.

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