

No. 840,845.

PATENTED JAN. 8, 1907.

G. S. HEATH.
FEEDER FOR COMMINUTED MATERIAL.

APPLICATION FILED JAN. 29, 1906.

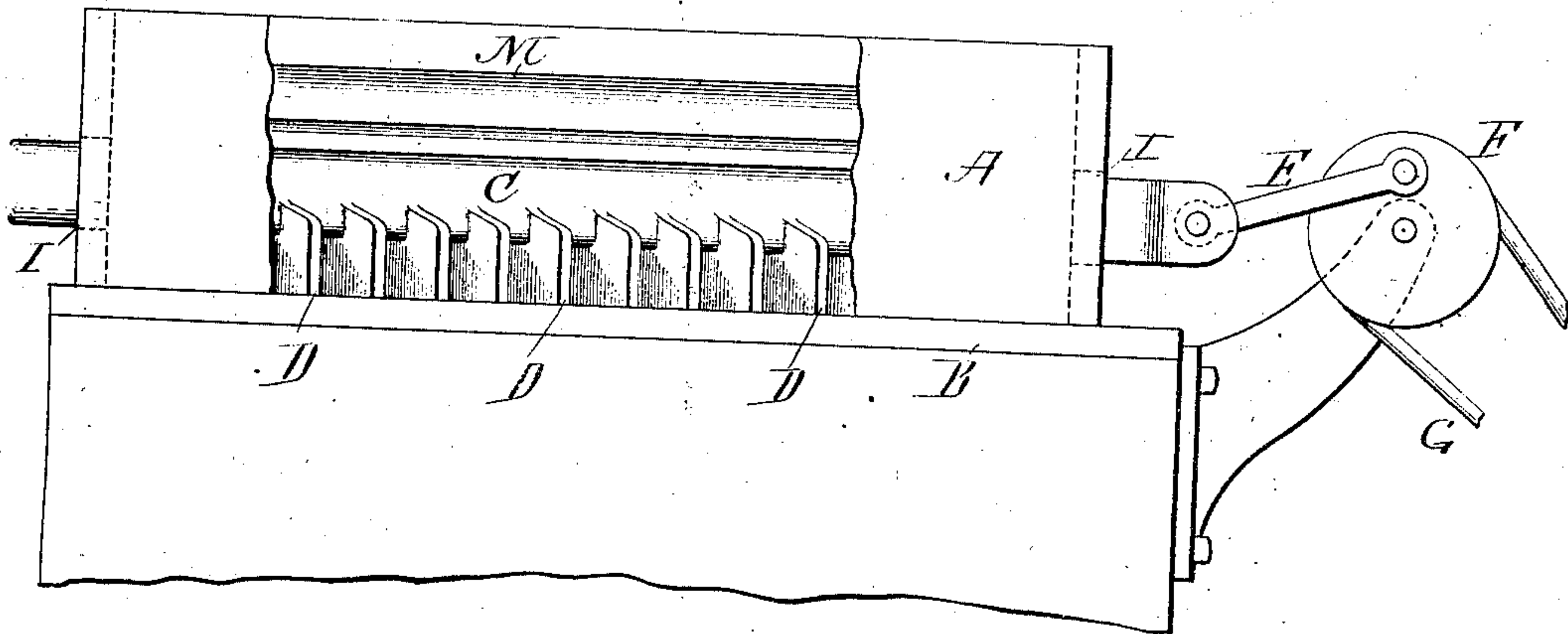


Fig. 1.

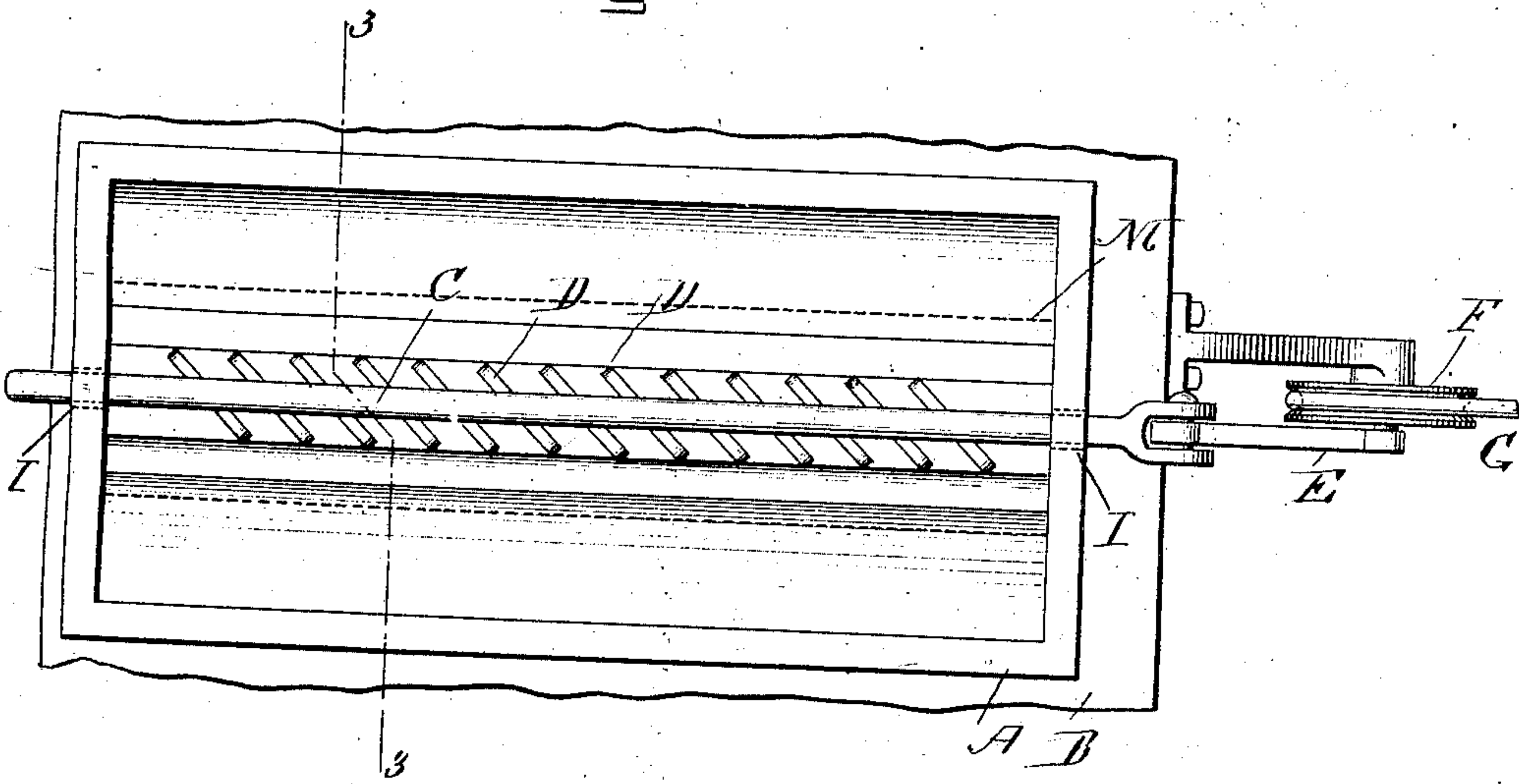


Fig. 2.

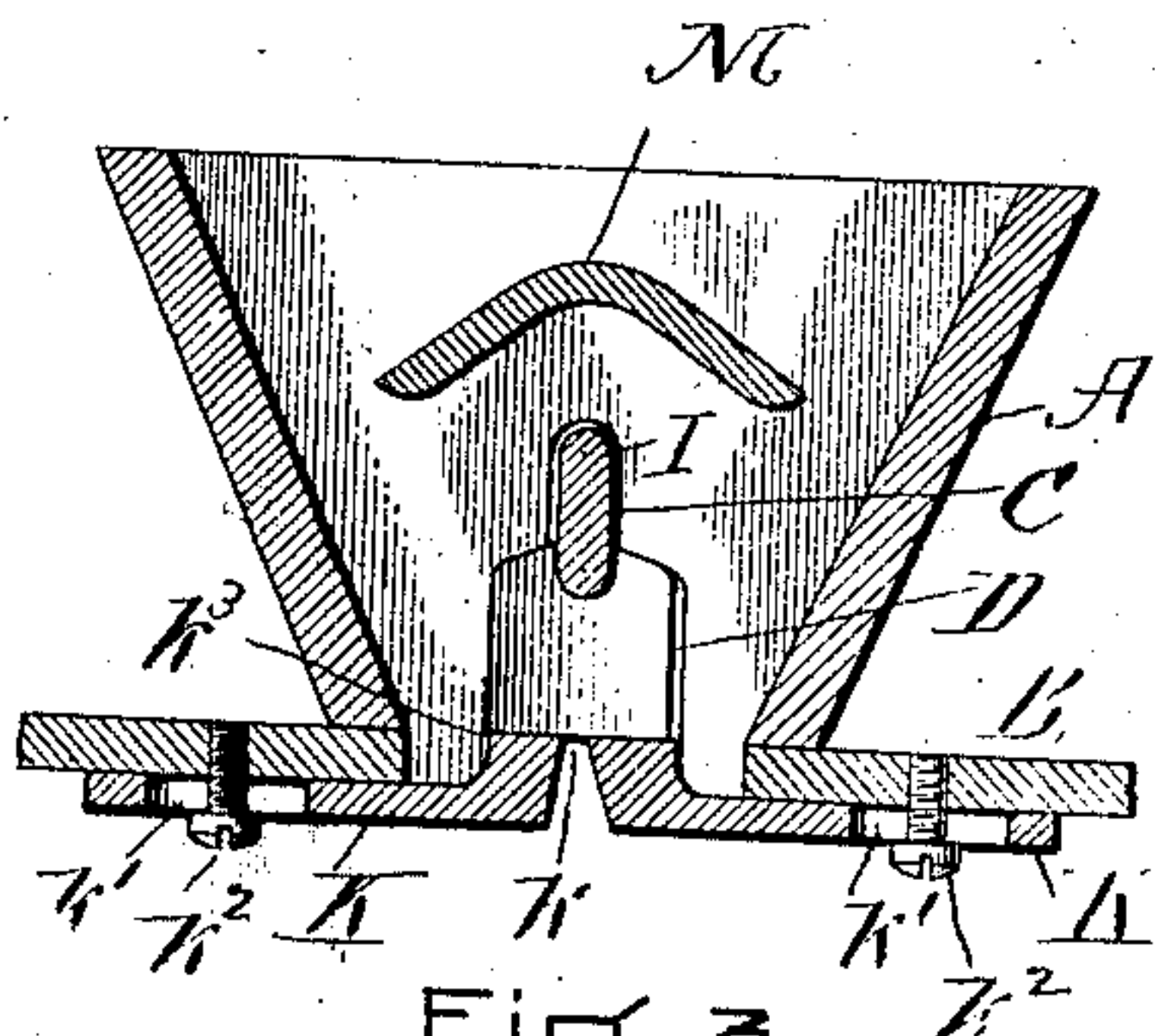


Fig. 3.

WITNESSES

Joseph T. Brennan.
Ernest C. Gibson.

INVENTOR

George Sidney Heath
Robert Hutchell
Attorneys

UNITED STATES PATENT OFFICE.

GEORGE SIDNEY HEATH, OF REVERE, MASSACHUSETTS, ASSIGNOR TO
HUFF ELECTROSTATIC SEPARATOR COMPANY, OF BOSTON, MASSA-
CHUSETTS, A CORPORATION OF MAINE.

FEEDER FOR COMMINUTED MATERIAL.

No. 840,845.

Specification of Letters Patent.

Patented Jan. 8, 1907.

Application filed January 29, 1906. Serial No. 298,406.

To all whom it may concern:

Be it known that I, GEORGE SIDNEY HEATH, a citizen of the United States, and a resident of Revere, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Feeders for Comminuted Material, of which the following is a specification.

My invention relates to apparatus and mechanisms for feeding and distributing comminuted material; and it consists in the improvements hereinbelow described.

In the drawings hereto annexed, which illustrate an embodiment of my invention and improvement, Figure 1 is a longitudinal elevation, partly broken away, of the feeding apparatus. Fig. 2 is a top plan view of the same; and Fig. 3 is a cross-section of Fig. 2, taken at the line 3 3.

Considerable difficulty has heretofore been encountered in the operation of feeding comminuted material, especially when the said material consists of particles which differ from each other in size, in specific gravity, in superficial character or texture, in hardness, hygroscopic capacity, and in other physical characteristics. Even a mixture of homogeneous comminuted particles tends to clog and form lumps, and in the case of mixtures of heterogeneous particles there are super-added the difficulties due to the automatic segregation of differentiated components when all are subjected to a uniform application of force.

There is illustrated in the drawings an embodiment of my invention and improvement which has in practice proved effective to feed continuously and evenly a thin stream of material whether composed of heterogeneous or homogeneous particles. I provide a containing-hopper, as A, into which the mass of comminuted material is fed in any desired quantity. The hopper A rests upon a base B, to which are secured adjustable plates K, these plates being formed, as shown in Fig. 3, with transverse slots k' , through which pass adjusting set-screws k^2 , whereby the adjacent edges of the plates may be adjusted to form any desired width of opening within the range of adjustment provided by the construction. These plates at their adjacent edges are beveled, so as to form a slot or opening k , which is narrowest at the

top. Preferably I make the plates K thicker at their adjacent edges, as at k^3 , and these plates and the slots formed by their approximation to each other extend substantially the entire length of the hopper A at the bottom thereof.

In the ends of the hopper A apertures I are provided which admit the passage of the agitator-bar C. The bar C has secured to it, or if it be of metal cast integral with it, a number of floats D, these floats, as shown in Fig. 2, being preferably set at an acute angle to the bar C. The angle which I have found in practice to serve best the purposes to which the feeder is applied is about forty-five degrees. At one end of the feeder-bar C the same is articulately jointed to a connecting-rod E, the other end of this connecting-rod being secured, as by a crank-pin, to an agitating disk or wheel F, which is driven by a belt G or by any other desired instrument for the transmission of power. The apertures I are preferably somewhat larger in cross-section than the agitator-bar C, so that there is room for play of the latter laterally as well as provision for it to move longitudinally.

The lower edges of the floats D rest upon the adjacent inner edges of the plates K, and where, as shown in the specific illustration exhibited in the drawings, the plates K are thickened at their inner adjacent edges I prefer to make the floats D sufficiently wide to extend entirely across the upper surfaces of the enlargements k^3 . By this means the formation by abrasion of a channel in which the floats will move only longitudinally is avoided and the combined longitudinal and lateral movement thereof permanently assured.

The operation of the apparatus is as follows: When the wheel F or such other agitating device as may be employed is actuated, the feeder-bar C and its attached floats is reciprocated longitudinally. As the hopper is filled with comminuted material the effect when the floats are set at an acute angle with the feeder-bar is to shift the feeder-bar and its floats laterally as it is moved longitudinally. The inclination of the floats to the line of longitudinal movement and the bearing thereof upon the plates at either side of the slot k will, even if the feeder-bar be agitated in an empty hopper, cause the bar as a

whole to shift laterally as it is moved longitudinally to the extent permitted by the clearance between the sides of the slots I and the bar C. This movement of the feeder-bar and floats operates to preserve the smoothness of the surfaces of the adjustable plates K and to maintain a well-defined sharp edge on each of these plates, so that the upper slide of the slot *k* shall always be transversely the smallest portion of the said slot, and thus the danger of particles of material wedging in the slot is successfully obviated. When also, as I prefer, the feeder-bar and its floats are given a lateral as well as a longitudinal movement, the lower edges of the floats are also worn evenly, and the formation of protuberances on the lower edges of the floats immediately over the slot *k* is prevented. I consider it advisable to prevent the formation of such protuberances, because if they are so formed their effect will be to wear laterally upon the edges of the plates K and form a narrowing taper from the top downward, which would tend to be clogged with particles of the material under treatment. Moreover, the preferred form of agitator-bar, with floats set at an acute angle thereto, stirs the comminuted material effectively, giving it a side throw in either direction, as well as agitating it longitudinally.

When, as may be the case, the hopper A is of considerable capacity and vertical height and the materials contained therein are finely comminuted and of considerable weight, the resistance to the movement of the feeder-bar and its floats may increase so as to tax unduly the driving mechanism. In order to relieve the feeder-bar from undue load, I provide the shed M, which is secured in the hopper immediately above the feeder-bar. This shed preferably slopes in either direction toward the sides of the hopper and sustains the major part of the weight of the superincumbent mass of material, allowing only enough to flow downward between the edges of the shed and the sides of the hopper to keep the feeder in full effective operation.

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

1. In a feeding apparatus, the combination of a hopper and feeder-bar, means to reciprocate the feeder-bar longitudinally in the hopper, bottom plates with adjacent edges to form a longitudinal slot under the feeder-

bar, and floats on the feeder-bar sliding upon the bottom plates.

2. In a feeding apparatus, the combination of a hopper and feeder-bar, means to reciprocate the feeder-bar longitudinally in the hopper, bottom plates with adjacent edges to form a slot under the feeder-bar, and floats on the feeder-bar at an acute angle thereto and sliding upon the bottom plates.

3. In a feeding apparatus, the combination of a hopper, a feeder-bar, means to reciprocate the feeder-bar longitudinally and laterally in the hopper, and bottom plates with adjacent edges to form a slot under the feeder-bar.

4. In a feeding apparatus, the combination of a hopper, a feeder-bar, means to reciprocate the feeder-bar longitudinally in the hopper, bottom plates with adjacent edges to form a slot under the feeder-bar, and floats on the feeder-bar at an acute angle thereto and sliding upon the bottom plates.

5. In a feeding apparatus, the combination of a hopper, a feeder-bar, means to reciprocate the feeder-bar longitudinally, bearings for the feeder-bar to slide in, having lateral clearance therefor, bottom plates in the hopper with adjacent edges to form a slot, and floats on the feeder-bar at an acute angle thereto, sliding upon the bottom plates.

6. In a feeding apparatus, the combination of a hopper, bottom plates therein, laterally adjustable and thickened at their adjacent edges, on the top thereof, and beveled to form a slot widening downward, a feeder-bar, means to reciprocate the same longitudinally of the hopper, end bearings for the feeder-bar providing lateral play therefor, and floats on the feeder-bar at an acute angle thereto, resting on and spanning the thickened portions of the bottom plates.

7. In a feeding apparatus, the combination of a hopper, a feeder-bar, means to reciprocate the feeder-bar longitudinally in the hopper, bottom plates with adjacent edges to form a slot under the feeder-bar, floats on the feeder-bar and a protective shed located in the hopper above the feeder-bar.

Signed by me at Boston, Massachusetts, this 20th day of January, 1906.

GEORGE SIDNEY HEATH.

Witnesses:

JOSEPH T. BRENNAN,
GRACE E. GIBBONS.