

(No Model.)

H. N. WATROUS.
SPICE MILL.

No. 426,484.

Patented Apr. 29, 1890.

Fig. 1.

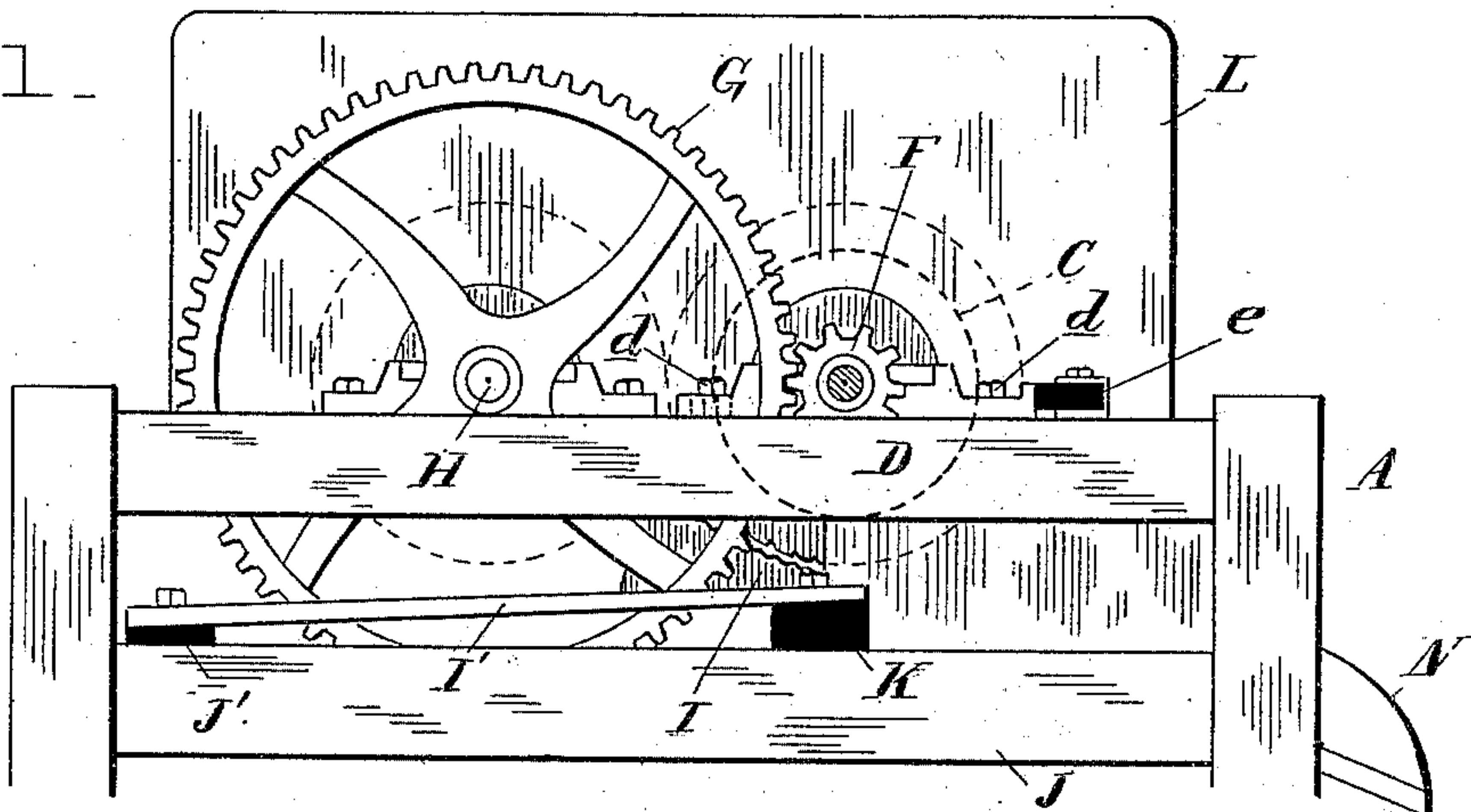


Fig. 2.

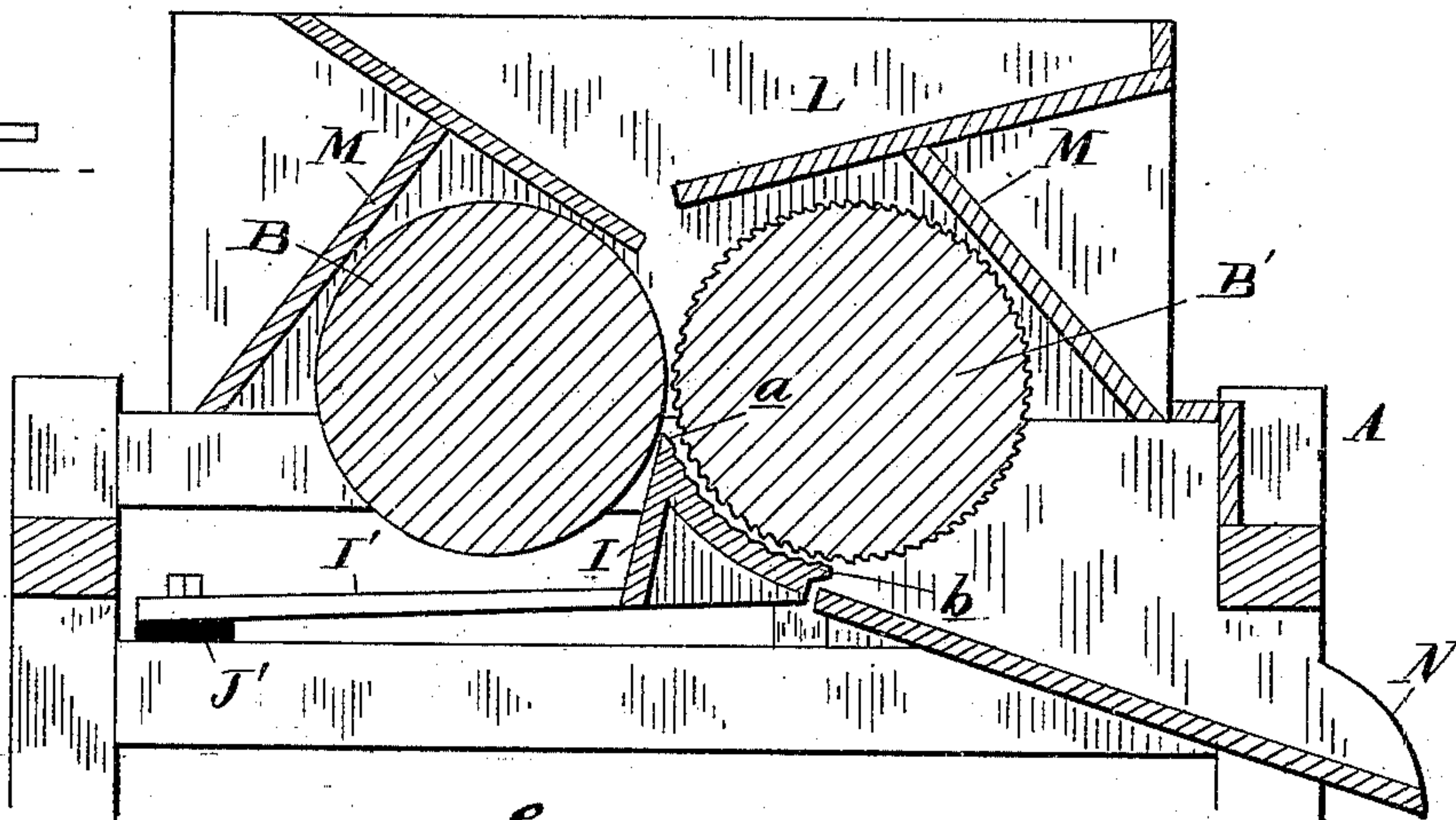
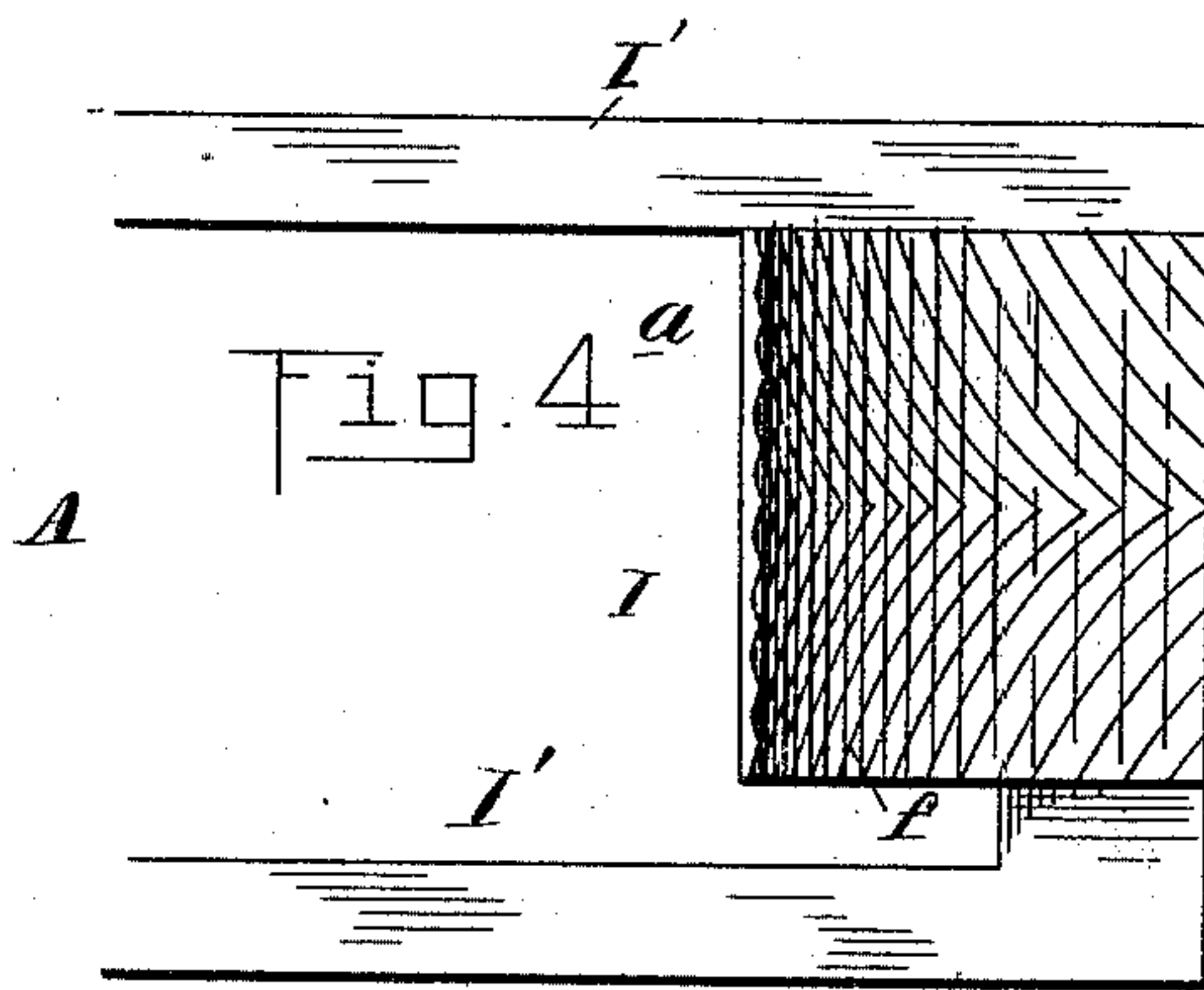
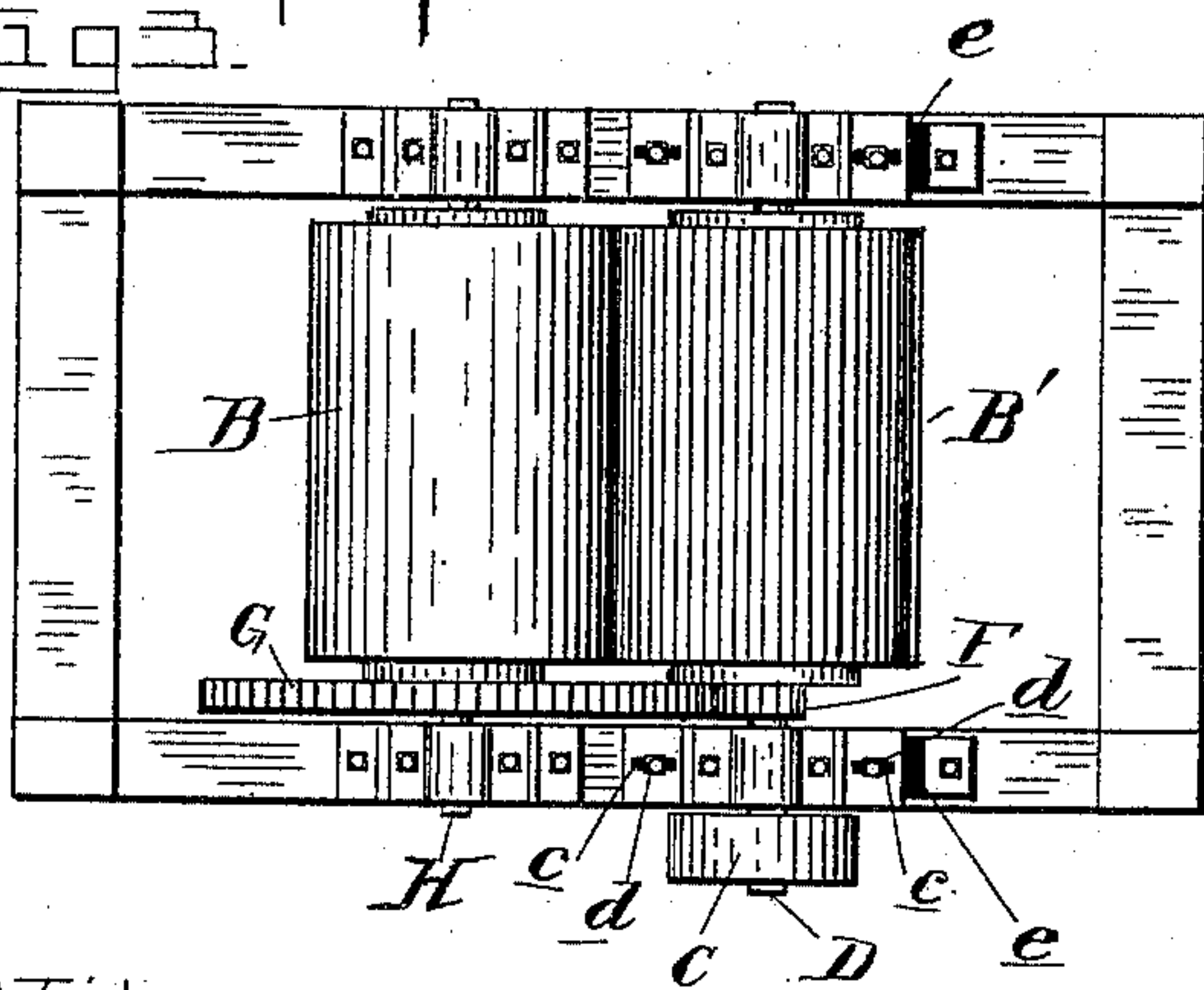


Fig. 3.



Witnesses:

Geo. A. Gregg.
A. B. Eaton

Inventor:
Henry N. Watrous,
By James Whittemore
Att'y.

UNITED STATES PATENT OFFICE.

HENRY N. WATROUS, OF BAY CITY, MICHIGAN, ASSIGNOR OF TWO-THIRDS
TO W. I. BROTHERTON AND CHANCY J. PICKETT, OF SAME PLACE.

SPICE-MILL.

SPECIFICATION forming part of Letters Patent No. 426,484, dated April 29, 1890.

Application filed February 18, 1890. Serial No. 340,953. (No model.)

To all whom it may concern:

Be it known that I, HENRY N. WATROUS, a citizen of the United States, residing at Bay City, in the county of Bay and State of Michigan, have invented certain new and useful Improvements in Spice-Mills, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to new and useful improvements in machines for breaking up spices, especially designed for cinnamon, ginger-root, and other spices which have heretofore been found difficult to crush and grind, owing to their size, shape, and fibrous structure; and the invention consists in the peculiar construction of crushing-rolls, in combination with a crushing-plate, and, further, in the peculiar construction, arrangement, and combination of the various parts, all as more fully hereinafter described.

In the drawings which accompany this specification, Figure 1 is a side elevation of my improved machine. Fig. 2 is a vertical central longitudinal section thereof. Fig. 3 is a top plan view with the hopper removed. Fig. 4 is a detached top plan view of the crushing-plate.

A is the frame of the machine, which may be of any suitable construction, and in this frame are journaled two crushing-rolls B B', both of which are positively driven. The roll B has preferably a plain surface, while the roll B' is provided with corrugations.

C is the driving-pulley, which is secured upon the shaft D of the roll B'. This shaft is provided within the frame with the gear-pinion F, which meshes with the gear-wheel G upon the shaft H of the roll B, so arranged that the roll B' is driven at a considerably greater speed than the roll B. In practice I drive the corrugated roll at about five times the speed of the smooth roll.

I is a corrugated segmental crusher-plate provided with rearwardly-extending arms I', which are secured to the cross-bar J of the frame, having a yielding bearing J' between.

K is a yielding cushion or bearing arranged beneath the crusher-plate—one on each side of the machine. This crusher-plate has a

point *a*, which extends up between the rolls almost to the point at which they meet, and preferably bears against the smooth roll B slightly to clean it of any particles that might have a tendency to cling to it. From this point to the forward point *b* the space between the crusher-plate and the roll B' gradually decreases, forming a V-shaped crushing-space between.

The roll B' is journaled in horizontally-yielding bearings. This I preferably accomplish by forming the slots *c* in the bearing-blocks, through which the bolts *d* secure the block to the frame.

e is a rubber cushion or spring bearing against the end of the block to allow it to have a limited lateral motion. The object of this is to prevent damage to the rolls in case a nail or other hard substance should get in with the spices between the rolls. To this end, also, the yielding bearings K are arranged beneath the crusher-plate. Above the rolls I secure a suitable hopper L, which is preferably provided with the guard-plates M, covering the rollers, so that dust or dirt cannot get in during the operation.

N is a spout, secured at its rear end to the crusher-plate and extended out from the frame to deliver the broken spices.

It will be seen that one side of the machine is entirely free from driving mechanism. This is done so that the operator may approach the machine from that side for feeding the spices, &c., without interfering with the driving mechanism.

By inclining the corrugations *f* upon the crushing-plate at an angle to the corrugations upon the roll B', I effect a more complete crushing of the spices.

What I claim as my invention is—

1. In a spice-mill, the combination, with a smooth and a corrugated crushing-roll, of a concaved crushing-plate yieldingly held between the rolls, its upper end contacting with the smooth roll, substantially as described.

2. In a spice-mill, the combination, with a smooth and corrugated crushing-roll arranged parallel with each other and on the same plane, of a yielding concave extending up be-

tween the rolls and below the corrugated roll and gradually approaching the corrugated roll toward its lower portion, its upper end being in close proximity to the smooth roll,
5 substantially as described.

3. In a machine of the kind described, the combination of the hopper L, the smooth and corrugated rollers B B', yielding bearings for the roller B', the concave crushing-plate I,
10 having an extension a , the elastic cushions J'

and K, and the spout N, substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses, this 10th day of January, 1890.

HENRY N. WATROUS.

Witnesses:

W. I. BROTHERTON,
H. W. JENNISON.