

**No. 617,735.**

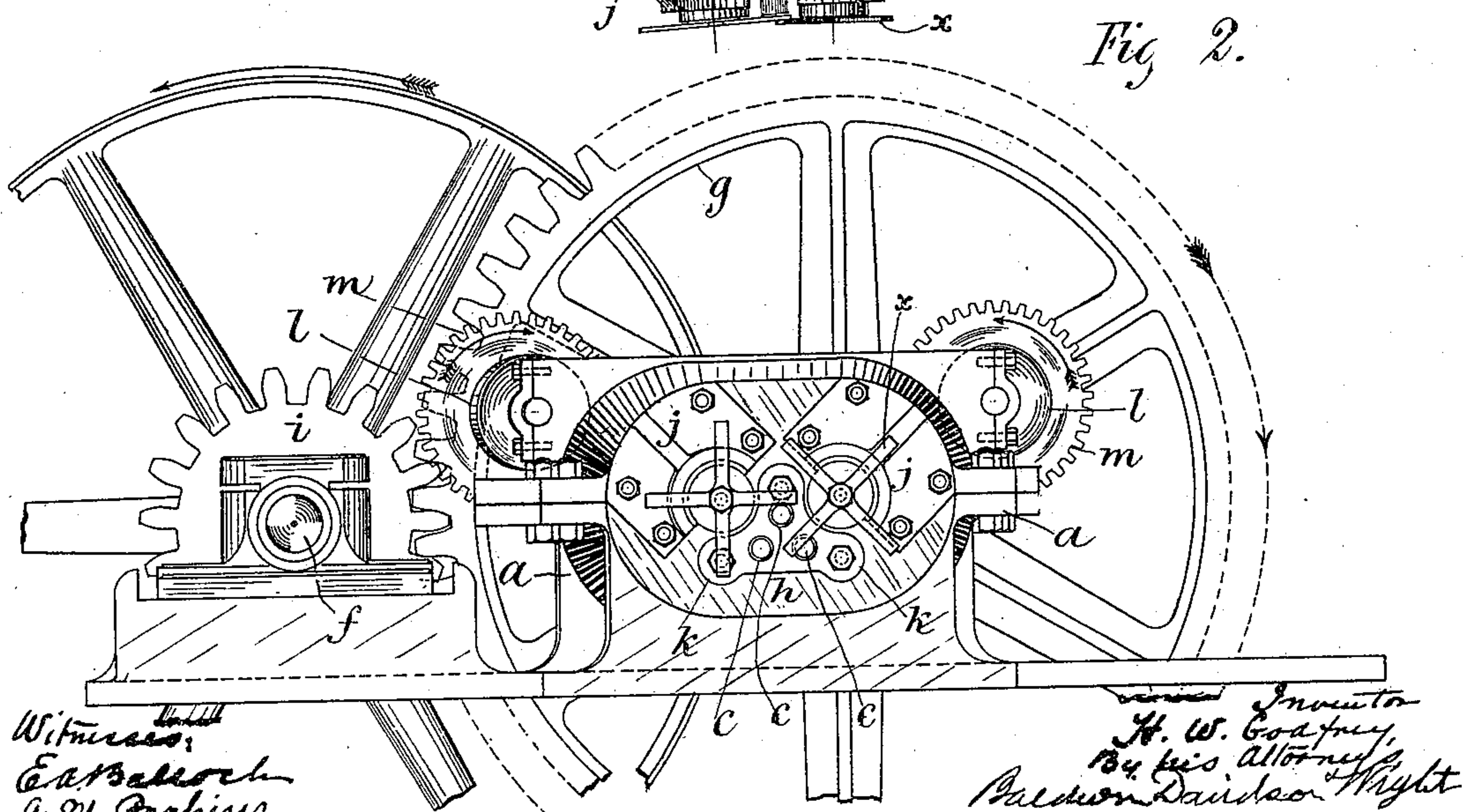
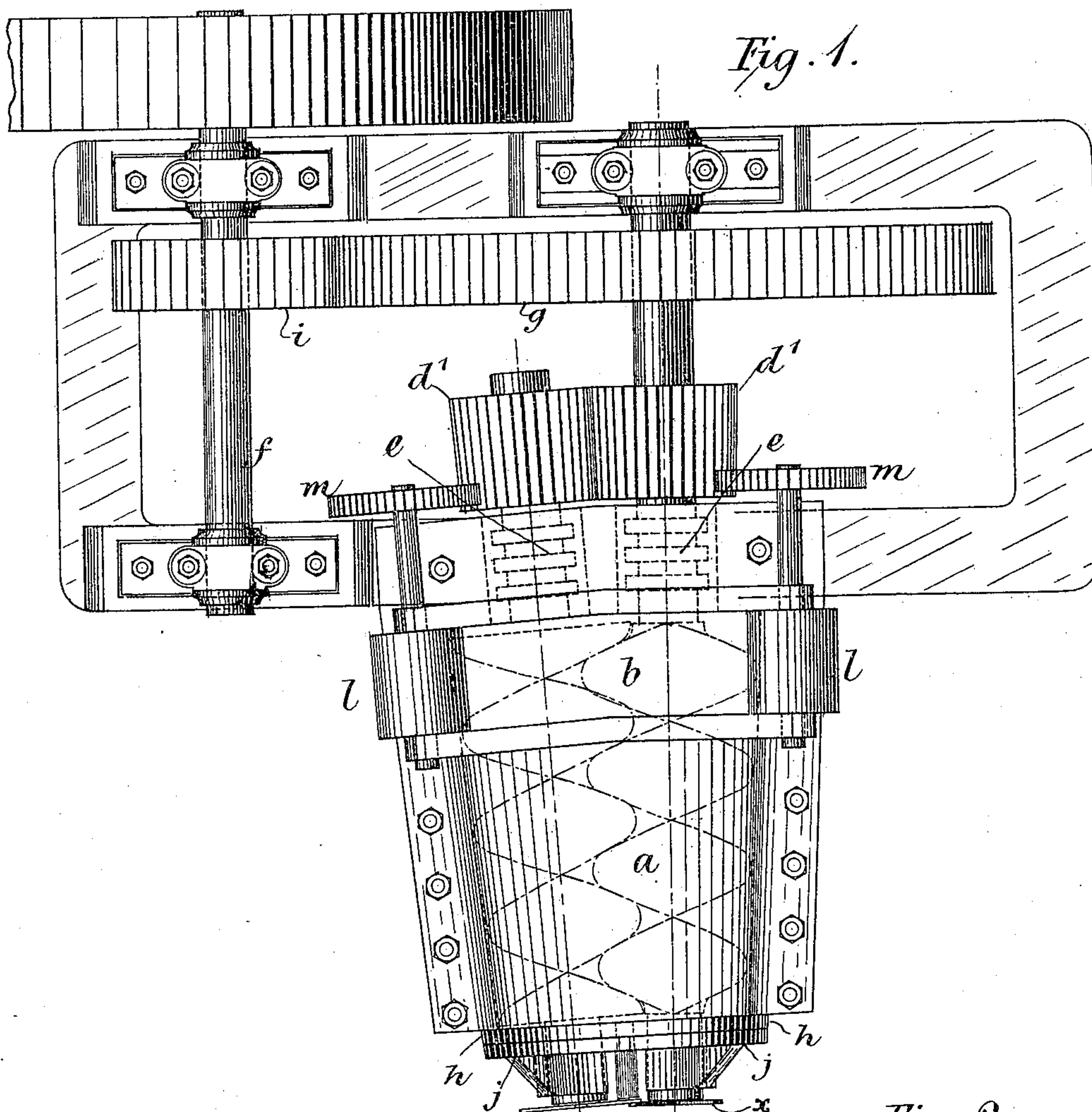
Patented Jan. 17, 1899.

**H. W. GODFREY.**  
**MASTICATOR.**

(Application filed Dec. 20, 1897.)

**3 Sheets—Sheet 1.**

(No Model.)



Witnesses:  
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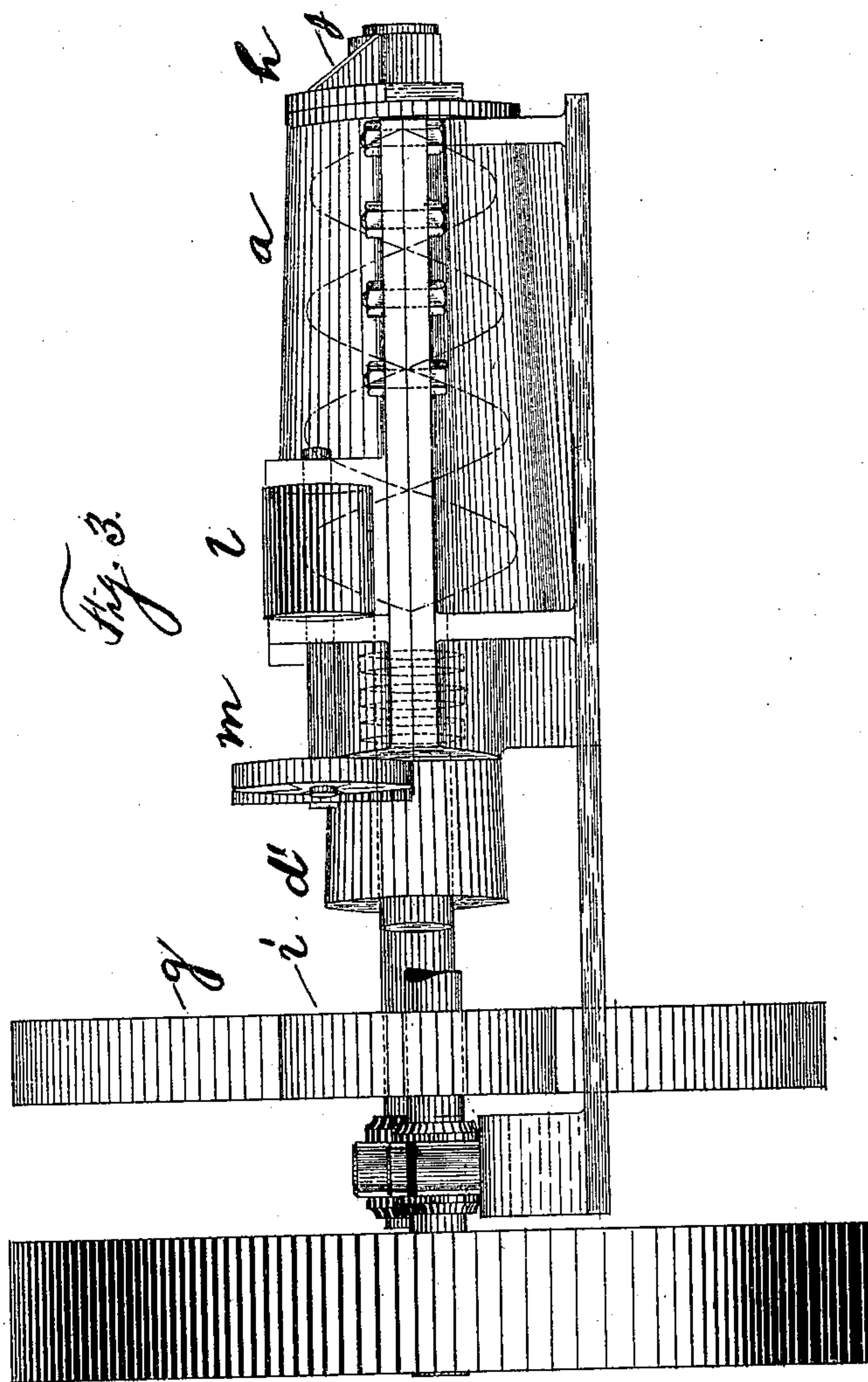
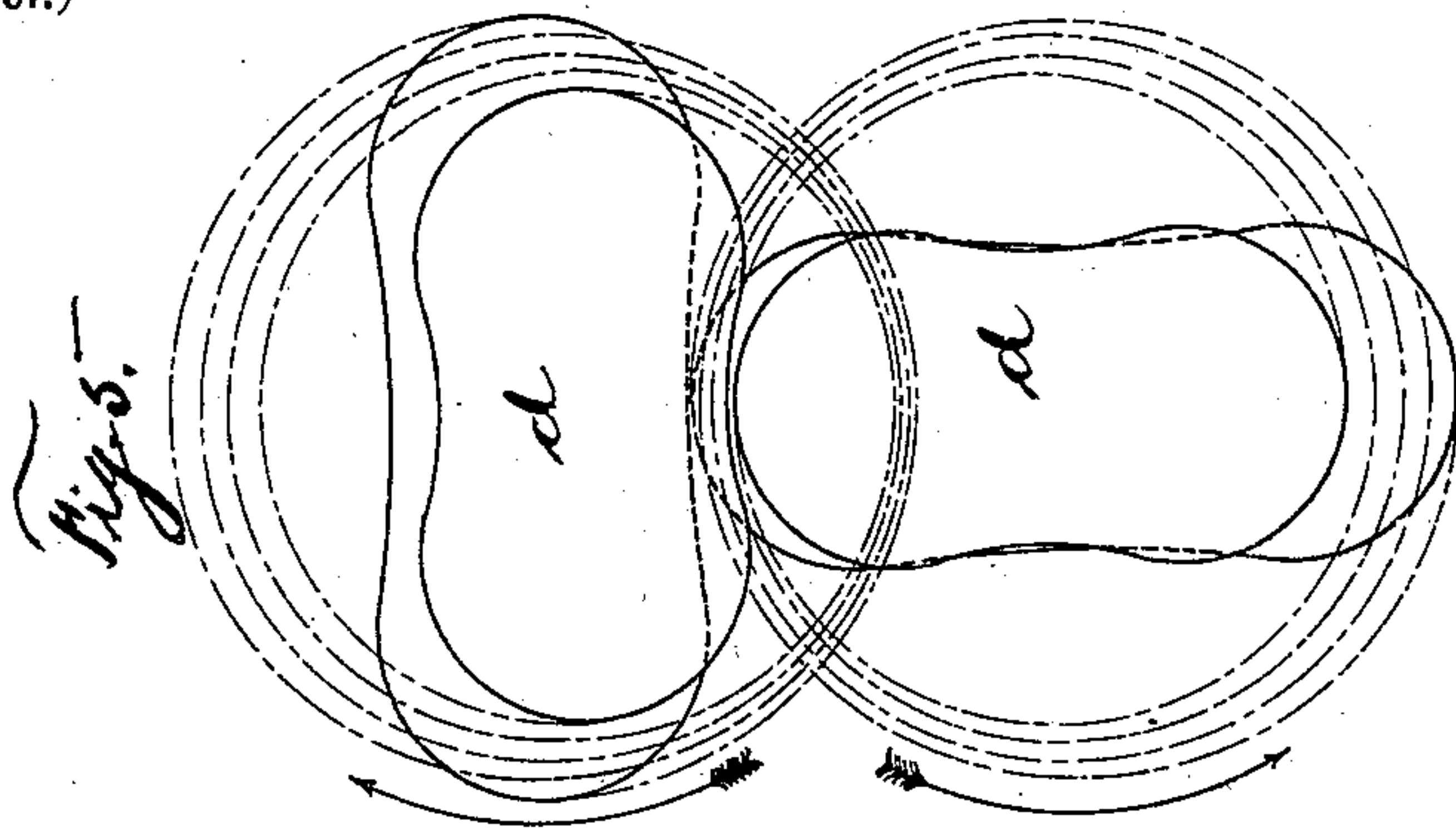
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MASTICATOR.

(Application filed Dec. 20, 1897.)

(No Model.)

3 Sheets—Sheet 2.



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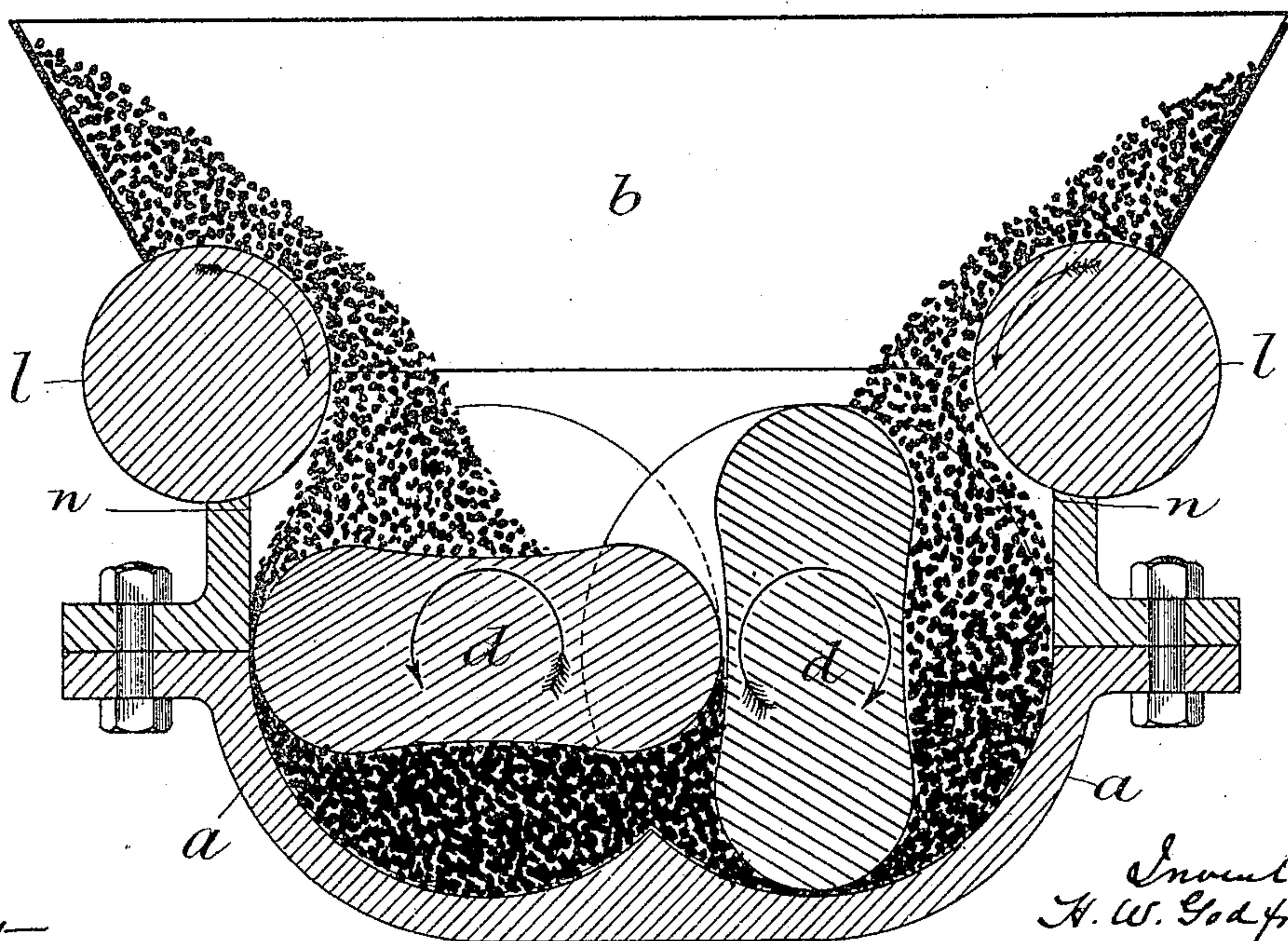
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(No Model.)

3 Sheets—Sheet 3.

Fig. 4.



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# UNITED STATES PATENT OFFICE.

HENRY WILLIAM GODFREY, OF LONDON, ENGLAND.

## MASTICATOR.

SPECIFICATION forming part of Letters Patent No. 617,735, dated January 17, 1899.

Application filed December 20, 1897. Serial No. 662,629. (No model.)

To all whom it may concern:

Be it known that I, HENRY WILLIAM GODFREY, engineer, a subject of the Queen of Great Britain, residing at Staines, London, in the county of Middlesex, England, have invented certain new and useful Improvements in Masticators or Mixers for the Preparation of Linoleum and other Plastic Materials, (for which I have received Letters Patent in Great Britain, No. 19,754, dated October 21, 1895, and in Germany, No. 95,700, dated August 16, 1896,) of which improvements the following is a specification.

The object of my invention is to provide for the thorough, efficient, and rapid mixture or mastication of the material acted upon, which end I attain by so organizing the apparatus that the material is masticated by the action of rotating blades, the surfaces of which act in close proximity to each other, the material being prevented from passing between them while being driven through the spaces between the blades and casing, thoroughly mixed, and delivered at one end of the casing.

In the accompanying drawings, Figure 1 shows a plan of a masticator made in accordance with my invention. Fig. 2 is a front elevation thereof. Fig. 3 is a side elevation; and Fig. 4, a vertical transverse section, on a larger scale, through the hopper or feed end of the machine. Fig. 5 is a diagrammatical end view of the masticator-blades.

The arrows in the drawings show the direction of rotation of the various moving parts of the mechanism to which they are applied.

The casing *a* is provided with a feed-hopper *b* at one end and delivery-orifices *c* at the opposite end. Within the casing *a* are arranged spiral twisted blades *d*. At the ends of the blades *d* there are necks or short shafts having collars *e*, held in suitable bearings in the casing.

*f* is a shaft which is driven in any desired manner, and on it is secured a pinion *i*, which gears with a toothed wheel *g* on a prolongation of one of the necks or short shafts of the blades *d*. On the necks are secured pinions *d'*, which gear together in such a manner that when one blade is driven the other turns in the opposite direction.

*h* is a plate which partially closes the cas-

ing *a* at the exit end, and *j* are bearings fixed on this plate, into which are received the necks at the delivery ends of the blades *d*.

*k* is a plate secured to the plate *h* and on which are arranged the nozzles within the exit-apertures *c*.

*l* are feed-rollers at the mouth of the hopper *b*, and by the gear-wheels *m* they are driven in the direction indicated by the arrows.

Scraping-blades (shown in the drawings) may be arranged at *n*, Fig. 4, to free the rollers *l* from the material when the rollers have carried it into the hopper. On the outer ends of the blades *d* knives or cutters *x* are secured, which cut the material as it issues from the orifices or delivery-openings *c*.

The blades *d* are spiral, twisted, blades of somewhat hour-glass shape in cross-section. Each blade tapers in width from the feed to the discharge end, and the outer ribs or edges of the blades each make two complete turns, or may be more. In short, the blades are spiral cones, each having two or more coarse deep threads, which are alike except that one cone has a right-hand thread and the other a left-hand one, the threads conforming closely to each other. The blades rotate in opposite directions, being preferably set as close together as is consistent with free rotation, and where they come more closely together the contours of their projecting edges coincide.

The operation of the apparatus is as follows: The material to be mixed passes from the hopper *b* into the casing, which passage is facilitated by the feed-rollers *l*, which force the material toward the center of the casing; but the material is caught by the edges or ribs of the mixing-blades, which, as will be seen by the arrows in Fig. 4, revolve in a direction opposite to that of the feed-rollers—that is to say, their adjacent or upper edges turn from the center toward the edges of the casing and force the material downward along the walls of the casing and toward the discharge end. The material is thus squeezed by the blades, but is not permitted to pass between them, as their surfaces are almost in contact. Hence the material can only escape by the delivery-orifices at the discharge end of the casing and can only pass along the casing below the blades and between them and the sides of the casing. Before the material



is discharged every portion of it is exposed to heavy pressure and is thoroughly mixed. As the blades taper in width toward the delivery end, their shafts are brought closer together at that end, and the shafts of the two blades consequently lie at an angle slightly inclined toward each other instead of being parallel. The gears are arranged to correspond with this mechanism.

10 I claim as my invention—

1. A masticator or mixer comprising a casing, a feed-hopper at one end, an exit-aperture at the opposite end, tapered twisted blades of hour-glass section arranged in the casing and revolving in close proximity to each other and in opposite directions to cause the material fed to them to be pressed between their outer surfaces, and the sides of the casing, and to be carried from one end of the casing to the other and delivered through an orifice at one end of the casing.

2. The combination, substantially as set forth, of a casing, tapering spiral blades arranged in the casing side by side in close proximity to each other, means for revolving the blades in opposite directions so that their edges which first act on the material turn from each other to force the material between the blades and the casing, and move it lon-

gitudinally toward and through the discharge-opening at the end of the casing. 30

3. The combination, substantially as set forth, of a casing, tapering spiral blades arranged longitudinally in the casing in close proximity to each other, a feed-hopper at one end of the casing, means for discharging the material at the opposite end of the casing, means for revolving the blades in opposite directions so that their upper edges move outwardly from each other toward the sides of the casing, feed-rollers working in the hopper above the planes of the blades, and means for revolving the feed-rollers. 40

4. The combination of a casing, spiral tapered blades arranged horizontally in the casing in close proximity to each other, means for revolving the blades in opposite directions so that their upper edges move outwardly away from each other toward the sides of the casing, a feed-hopper at one end of the casing, means for discharging the material at the opposite end of the casing, and blades at the discharge end of the casing for cutting the material. 50

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