

(No Model.)

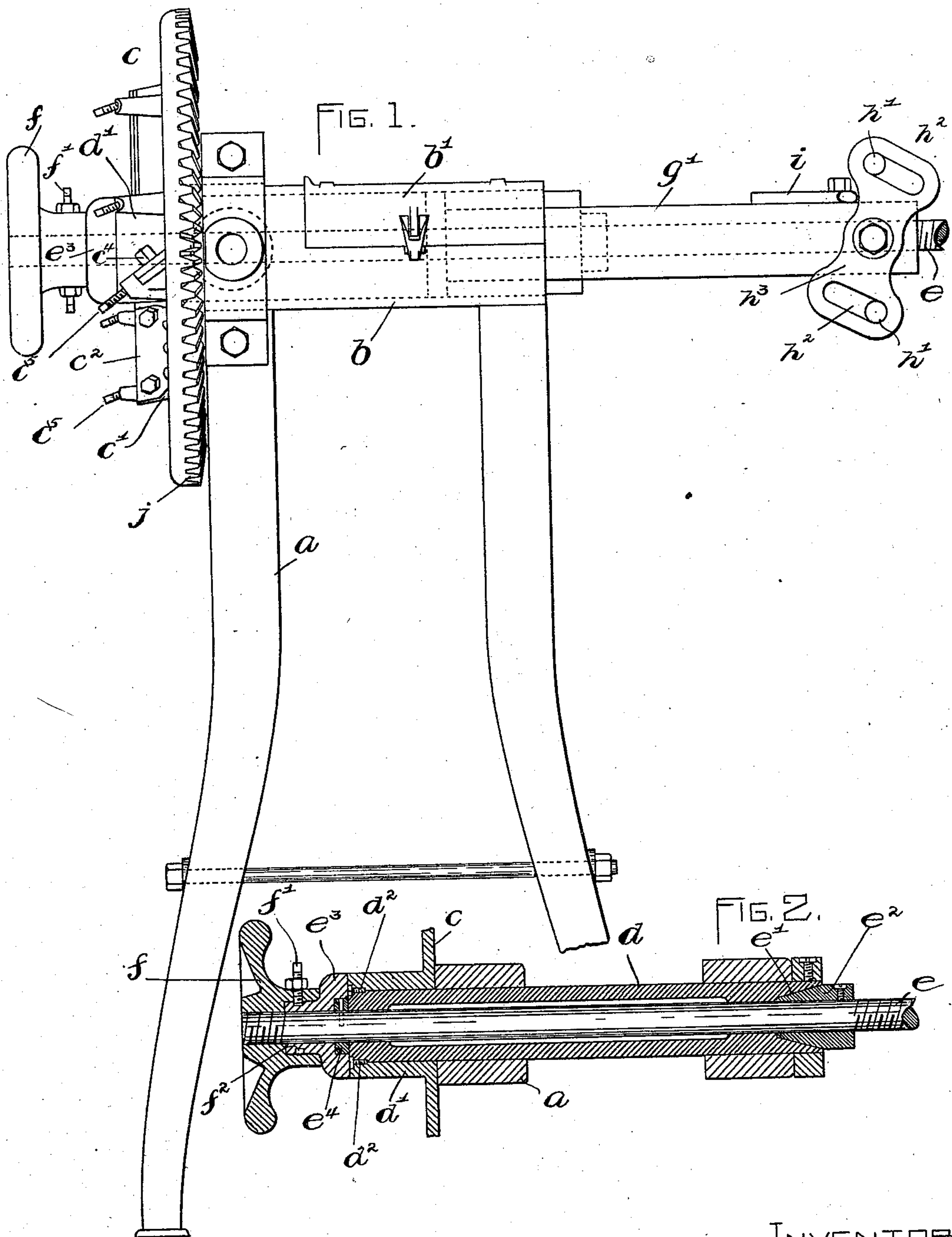
3 Sheets—Sheet 1.

E. J. ROCHE.

MACHINE FOR COMMINUTING BONE AND VEGETABLE MATTER.

No. 531,426.

Patented Dec. 25, 1894.



WITNESSES:
A. D. Harrison
J. P. Davis.

INVENTOR:
E. J. Roche
by Wright Brown Krossley
Atty.

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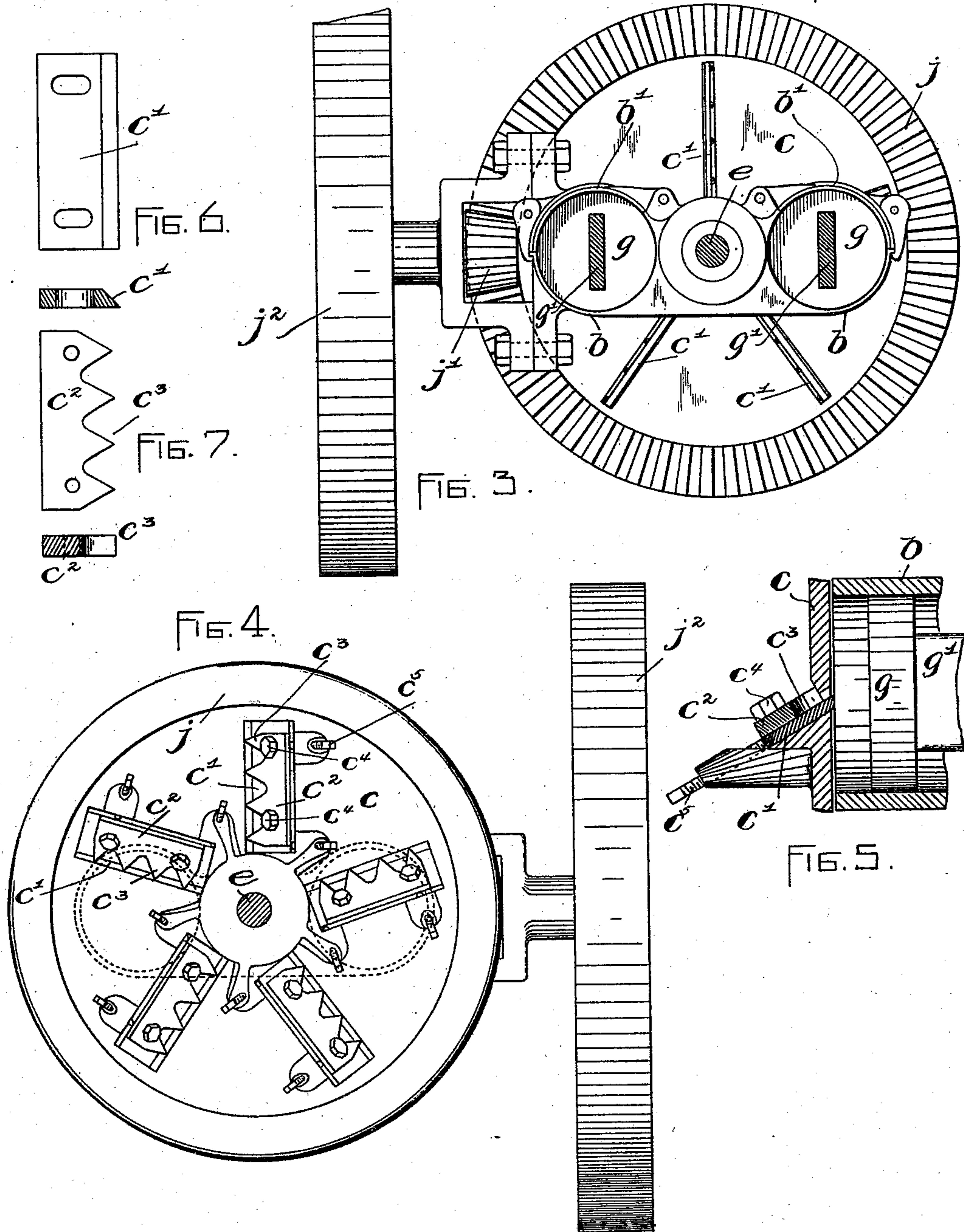
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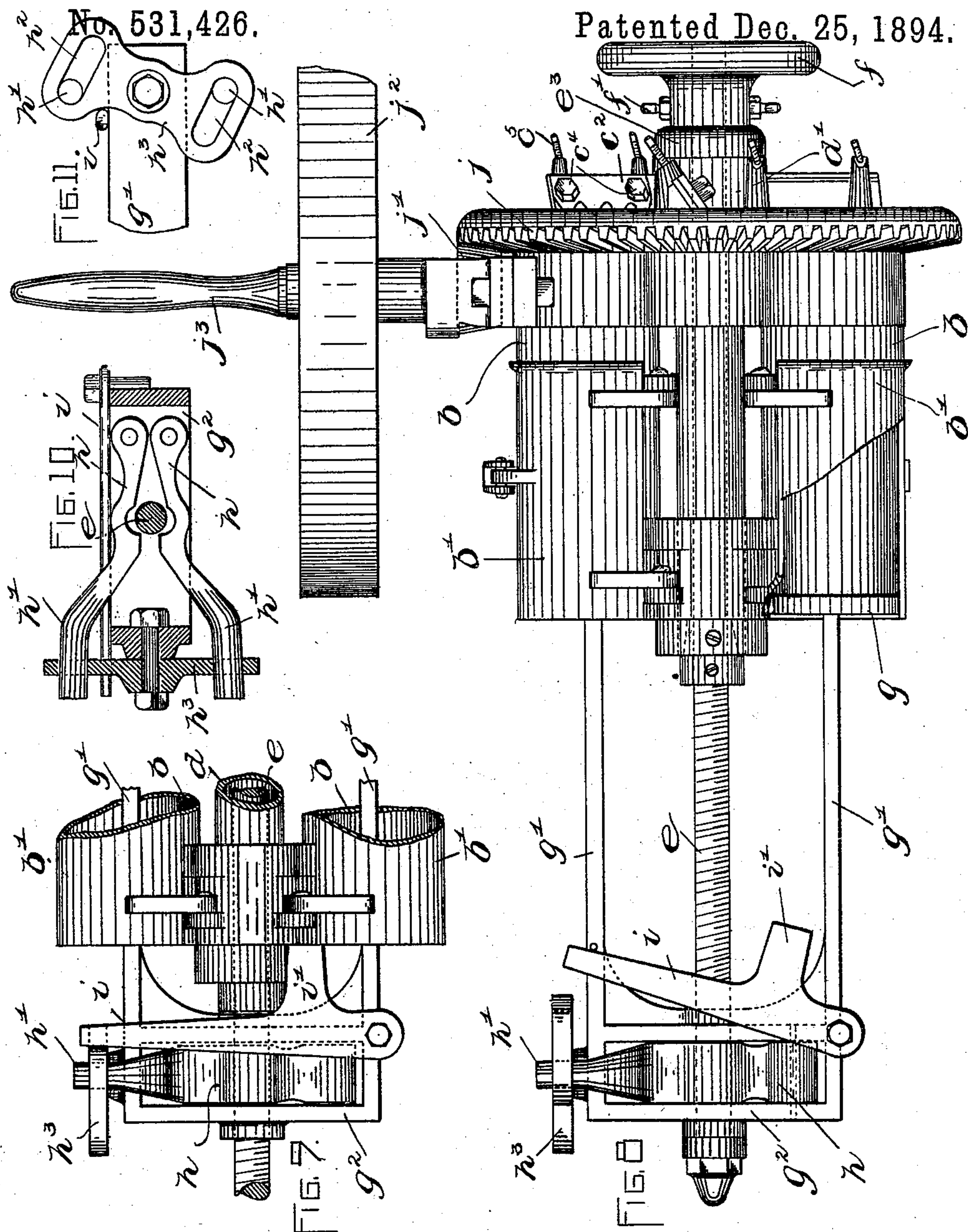
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UNITED STATES PATENT OFFICE.

EDWARD J. ROCHE, OF MILFORD, MASSACHUSETTS.

MACHINE FOR COMMINUTING BONE AND VEGETABLE MATTER.

SPECIFICATION forming part of Letters Patent No. 531,426, dated December 25, 1894.

Application filed February 8, 1894. Serial No. 499,497. (No model.)

To all whom it may concern:

Be it known that I, EDWARD J. ROCHE, of Milford, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Machines for Comminuting Bone and Vegetable Matter, of which the following is a specification.

This invention relates to an improvement in machines for comminuting bone and vegetable matter for live-stock feed.

The invention has in view the provision of a machine of this character which will do more effective work than any heretofore devised, and in which the feed will be automatic, and adapted to be checked when it becomes excessive, and also adapted to be discontinued altogether at a predetermined point.

To the above ends the invention may be said to consist in the novel features of construction and combinations of parts which are fully described hereinafter and recited in the claims.

The accompanying drawings illustrate a machine embodying the invention.

Figure 1 shows a side elevation of the machine. Fig. 2 shows a longitudinal section of means for frictionally connecting the feed-screw and cutter. Fig. 3 shows a rear elevation of the rotary cutter and of the cylinders which hold the material. Fig. 4 shows a front elevation of the rotary cutter, the means for frictionally connecting the feed-screw and cutter being omitted. Fig. 5 shows a sectional detail of the front end of one of the cylinders and a portion of the rotary cutter. Figs. 6 and 7 show details of one of the cutting knives. Fig. 8 shows a top plan view of the machine. Fig. 9 shows a plan view of parts appearing at the left of Fig. 8, under a different adjustment than they appear in said Fig. 8. Fig. 10 shows a sectional detail illustrative of a separable nut for engaging the feed-screw. Fig. 11 shows a detail side view of the cam controlling the separable nut.

The same letters of reference indicate the same parts in all the figures.

The letter *a* designates the supporting frame of the machine on which are mounted, side-by-side, a pair of horizontal cylinders, *b*, for containing the material to be treated, the said cylinders having hinged covers, *b'*, for admitting the material. A circular disk, *c*, is sup-

ported in bearings on the frame, *a*, between the two cylinders, and the said disk extends over the front ends of the cylinders and carries a number of radial knives for acting on the material in the cylinders, the said knives being supported on the outer side of the disk and their cutting edges projecting through radial slots in the disk. Each knife is composed of two blades, one of which, *c'*, has a plain cutting edge projecting from the inner surface of the disk, and the other, *c''*, being fastened over the blade, *c'*, having a toothed or serrated cutting section, *c'''*. The object of this peculiar construction of the cutting knives is to prevent the machine from delivering the material in slices. The blade, *c'*, is calculated to slice or shave the material, and the teeth of the blade, *c''*, to divide these slices or shavings so that the material will be delivered in small particles, as desired. Bolts, *c''''*, fasten the blades together and to the disk, and screws, *c''''''*, provide means for adjusting them.

The disk, *c*, is provided with an elongated hub which is here shown as a separate sleeve, *d*, fitting through a boss, *d'*, formed at the center of the disk, and prevented from turning therein by screws, *d''*. A feed-screw, *e*, extends through the sleeve, *d*, and projects from the front end thereof, and the said screw is designed to be frictionally connected with the rotary disk, *c*, through the following means.

The sleeve, *d*, has a conical socket, *e'*, formed in its inner end and a conical block, *e''*, affixed to the screw, *e*, engages said socket. A circular block, *e'''*, is fitted over the front end of the screw, *e*, and is formed to squarely abut the boss, *d'*, and a friction ring, *e''''*, is fitted in the block, *e'''*, so as to bear against the end of the sleeve, *d*. The block, *e'''*, may be moved longitudinally of the feed-screw. A hand-wheel, *f*, engages screw-threads of the feed-screw, and is formed with a collar which embraces a reduced portion of the block, *e'''* and carries a pin or screw, *f'*, engaging an annular groove, *f''* in said block. By turning the hand-wheel, *f*, in one direction, the feed-screw will be moved longitudinally and the conical block, *e''*, drawn into the sleeve, *d*, while the friction ring, *e''''* is pressed against the front end of said sleeve. In this manner

a frictional connection is established between the disk, *c*, and the feed-screw will be rotated with the disk. It is to be observed that this connection is not a positive one, and should the feed become excessive, the connection will be broken and undue strain on the machine parts thus avoided. The feed can be disconnected whenever desired by operating the hand-wheel *f*.

Followers, *g*, fit the bores of the cylinders, *b*, and are designed to feed the material therein to the rotary cutter, and bars, *g'*, connected with said followers are themselves connected together by a cross-head or frame, *g²*, which carries a nut for engaging the feed-screw, the latter extending loosely through the frame, *g²*. The said nut is made in two parts, *h*, which are pivoted to the cross-head, *g²*, so that the nut can be opened and closed to disengage it from and engage it with the feed-screw. The members, *h*, of the nut are formed with rounded arms, *h'*, which extend through slots, *h²* of a plate, *h³*, pivoted to the cross-head, *g²*, said slots being located on opposite sides of the pivot. This plate, *h³*, constitutes a cam which when turned in one direction closes the nut, and when turned in the opposite direction opens the same by the action of the sides of the slots, *h²*, on the arms, *h'*. This cam is adapted to be turned by hand, when desired, and is also adapted to be automatically actuated to open the nut when the followers have advanced to the limit of their movement. This is accomplished by means of a lever, *i*, pivoted at one end to the cross-head, *g²*, and extending in front of the cam, *h³*, and when the nut is closed on the feed-screw, the upper end of the cam is in its forward position. The lever, *i*, has a foot, *i'*, which when the followers reach the limit of their forward movement abuts one of the cylinders, *d*, or any other suitable fixed portion of the machine, and the lever is moved back, and coming against the cam, *h³*, causes the same to throw the nut open, and thus disengage it from the feed-screw and stop the feed.

The means here shown for driving the machine consists in a gear, *j*, formed on the disk, *c*, a pinion, *j'*, meshing with said gear, and supported in a fixed bearing on the machine frame and a fly-wheel, *j²*, on the journal of said pinion and provided with a handle, *j³*. After the separable nut has been opened the followers can be quickly drawn back by hand to position for starting, they being disconnected from the feed-screw.

While the machine here shown has been designed for cutting up green bones and vegetable matter, it may be employed for other purposes.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a holder for the material, a rotary cutter working across said holder, a follower to feed the material in the

holder, a feed-screw for advancing said follower, and means for frictionally connecting the feed-screw with the rotary cutter.

2. The combination of a holder for the material, a rotary cutter working across said holder, a follower to feed the material in the holder, a feed-screw for advancing said follower, means for frictionally connecting the said screw and the rotary cutter by a longitudinal movement of the screw, and means for moving the screw into such engagement with the disk.

3. The combination of a holder for the material, a rotary cutter working across said holder, a follower to feed the material in the holder, a feed-screw for advancing the follower, a friction cone clutch for operatively connecting the rotary cutter and the feed-screw by longitudinal movement of the latter, and means for producing such movement of the screw.

4. The combination of a holder for the material, a rotary cutter working across said holder and having an elongated hub, a follower to feed the material in the holder, a feed-screw for advancing said follower, said screw extending through the hub of the cutter and provided with friction devices adapted to engage the said hub at opposite ends, one being fixed on the shaft and the other longitudinally movable thereon, and a handle screwing on said shaft and engaging the longitudinally movable friction device so as to move it longitudinally but free to turn independently thereof.

5. The combination of a holder for the material, a rotary cutter working across said holder, a feed-screw adapted to be rotatively connected with said cutter, a follower for feeding the material in the holder, a separable nut carried by said follower and engaging the feed-screw, and a cam for opening the same and adapted to be actuated at a predetermined point in the follower's advance.

6. The combination of a holder for the material, a rotary cutter working across said holder, a feed-screw adapted to be rotatively connected with said cutter, a follower for feeding the material in the holder, a separable nut carried by said follower and engaging the feed-screw, a cam for opening the same, and a lever for operating the cam and adapted to abut a fixed part of the machine whereby it is actuated.

7. In a machine of the character described, a cutter adapted to work across the end of the holder for the material and comprising a blade having a plain cutting edge, a blade lying upon the same and having a toothed or serrated cutting edge back of the plain edge of the first-named blade, and fastenings common to both blades and securing them to a suitable support.

8. A machine of the character described comprising in its construction a pair of horizontal cylinders arranged side-by-side, and

having movable covers on the upper side, a rotary disk extending over the cylinders, followers in the cylinders, and a feed-screw for advancing said followers and adapted to be
5 operatively connected with the rotary disk.

9. In a machine of the character described, the combination of a pair of horizontal parallel cylinders for containing the material to be acted upon, and a wheel or disk supported
10 between the said cylinders and extending over the ends of the same and having knives

on opposite sides of its center, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of 15 two subscribing witnesses, this 3d day of February, A. D. 1894.

EDWARD J. ROCHE.

Witnesses:

A. D. HARRISON,

F. P. DAVIS.