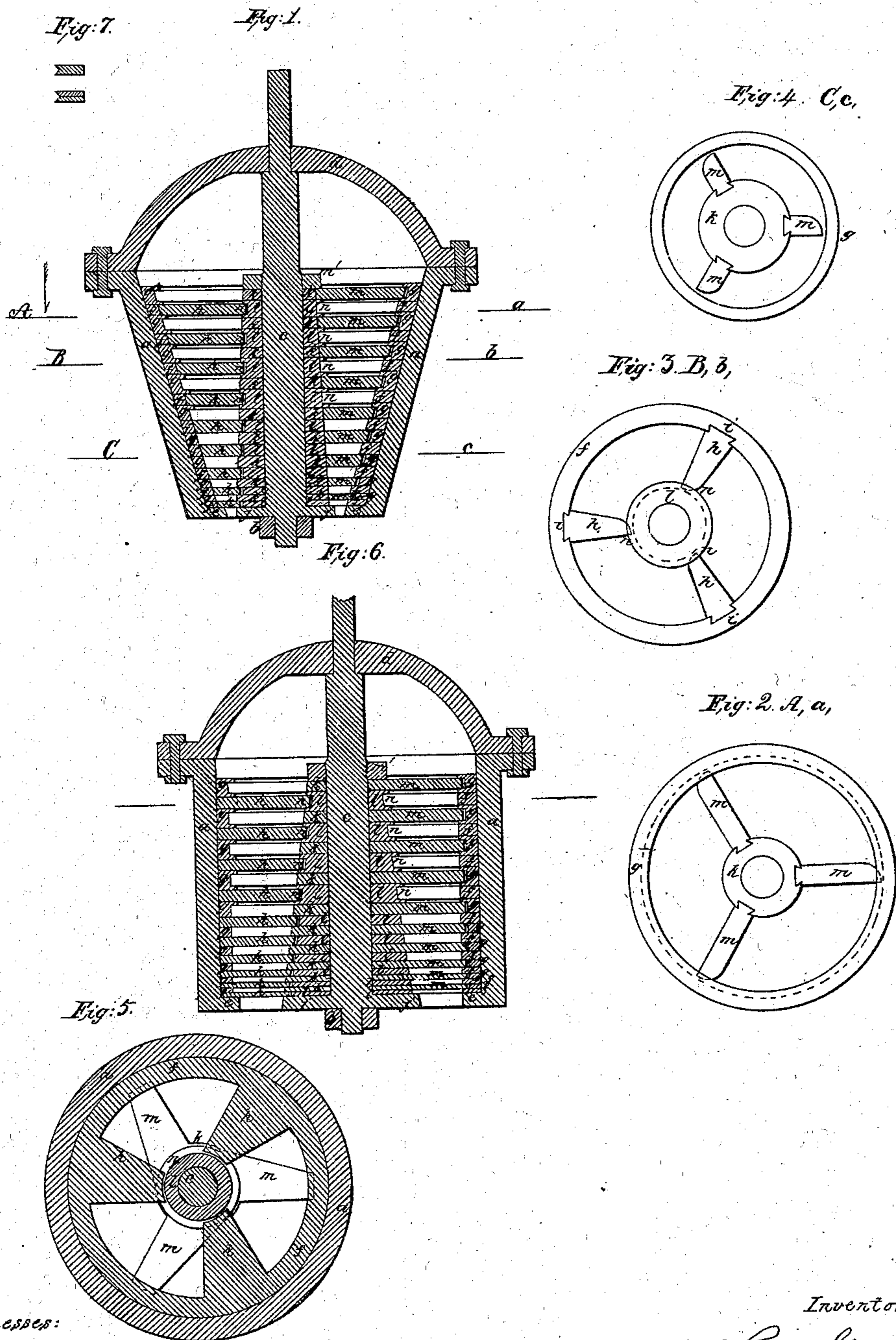


T. J. SLOAN.
MACHINE FOR CUTTING AND REDUCING VEGETABLES.
No. 48,316, Patented June 20, 1865.



Witnesses:

J. M. Bishop
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UNITED STATES PATENT OFFICE.

THOMAS J. SLOAN, OF NEW YORK, N. Y.

IMPROVED MACHINE FOR CUTTING AND REDUCING VEGETABLES.

Specification forming part of Letters Patent No. 48,316, dated June 20, 1865.

To all whom it may concern:

Be it known that I, THOMAS J. SLOAN, of the city, county, and State of New York, have invented certain new and useful Improvements in Machinery for Cutting Up and Reducing Vegetable Substances; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a vertical section; Figs. 2, 3, and 4, horizontal sections taken at the lines A *a*, B *b*, and C *c* of Fig. 1. Fig. 5 is a horizontal, and Fig. 6 a vertical, section of a modification of a machine on my improved plan.

The same letters indicate like parts in all the figures.

The object of my said invention is to cut up and reduce vegetable substances by a shearing or cutting operation, and thereby to reduce to a granular state substances which consist of an aggregation of thin and hard laminae, which by the process heretofore practiced of breaking or crushing are only separated from each other without being separately reduced, and whereby, also, I am enabled to reduce to a more uniform granular state and with less power other substances which by the processes of breaking or crushing heretofore practiced are reduced to unequal sizes and at an undue expenditure of power.

In Figs. 1, 2, 3, and 4 of the accompanying drawings, *a* represents the outer shell or case, which is in the form of an inverted frustum of a cone, with a cross-bar, *b*, or bridge extending across the lower open end to receive the journal or pivot at the lower end of a vertical shaft, *c*, the upper end of which is sustained by a cross-bar, *d*. To leave the upper end of the case free for feeding in the material, the cross-bar *d* is curved upward, as represented. This, however, is a matter of mere preference. The lower end of the case has a flange, *e*, extending inward for a short distance, to form a seat for a series of rings which are fitted to the inner periphery of the said case. There are two sets of these rings, indicated by *f* and *g*. The rings *f* have cutters *h* secured to them by dovetail joints, as at *i*. I prefer to have three such cutters on each of the rings *f*, and to have their front or square cutting-edges inclined a

little from a radial line. The rings *g*, constituting the other series, are interposed between the rings which carry the cutters to leave alternate spaces for the passage of cutters on the shaft.

The shaft *c* is formed with a projecting flange, *j*, at the lower end, to form a base for two series of rings, *k* and *l*, which rings are slipped onto the shaft and secured by a nut, *m*', tapped onto the shaft, or by other and equivalent means.

The series of rings *k* carry radiating cutters *m*, secured to their outer periphery by dovetail or other equivalent joints, and the other rings of the series *l* are interposed between the rings that carry the cutters, so that beginning at the lower end of the shaft there shall be one blank ring *l* and then one ring *k*, with its cutters, and then another ring *l*, and so on to the top, the rings *f*, with the cutters *h*, secured to the case, being opposite the rings without cutters on the shaft, and vice versa.

The inner ends of the cutters *h* on the rings *f* of the case, from the upper end to a little below the middle, extend into grooves formed in the outer peripheries of the rings *l* on the shaft, as at *n*, and the inner end of the cutters on the remaining rings *f* extend between the rings *k* on the shaft, the rings *l* being made narrower for that purpose; and the rings secured to the case are formed in like manner to receive the ends of the cutters on the rings secured to the shaft. In this way the cutters are guided and controlled so as not to be forced out of position by the material on which they are required to act.

I prefer to make the cutters flat and with square cutting-edges, the object being to have them act as shears in cutting the material. They may, however, be formed, as represented in the sectional Fig. 7, by grooving the front face, or by making them of two thicknesses in contact, and beveled so that the outer edges shall act as shears.

The rings *k* are feathered, or otherwise so secured to the shaft as to turn therewith, and the rings *f* are to be in like manner secured to the case so as not to turn therein.

The shaft, with its cutters, is to be driven by a belt or other equivalent means, and the upper end of the case may be provided with a

suitable hopper to facilitate the feeding in of the material to be reduced. As the material enters at the top in the coarse state, whatever may be its size, it is first acted upon by the upper revolving cutters and carried against the upper stationary cutters, and by the two series sheared or sliced into pieces, which in their further progress downward are further reduced. The spaces between the revolving and stationary cutters along the upper part facilitate the reduction from the natural or coarse state to a medium size; but when so reduced it reaches the lower cutters, which run close to the stationary cutters, both the stationary and fixed cutters at the lower end being made thinner, and by them the pieces are still more and gradually reduced by the like cutting or shearing action to the required small or granular state, and in that state discharged at bottom; and although I prefer the method herein described of connecting the cutters with the rings on the shaft and in the case, and deem that a material part of my said invention, for the reason that the cutters can be readily taken out for grinding and readily replaced or new ones substituted, nevertheless it will be obvious that this portion of my said invention may be dispensed with and the other portions be retained and used to advantage by substituting some other mode of construction.

Another mode of construction for the application of the leading part of my said invention is represented in Figs. 5 and 6 of the accompanying drawings. In the two last-named figures the cutters *h* and *m*, both revolving and stationary, are cut out of a series of plates, *f* and *k*, inserted in and upon and secured to the case and shaft, as before described, with interposed rings *g* and *l*. The inner periphery of the rings of the case may present the form of a cylinder, and those on the shaft the frustum of a cone, instead of the form represented in Fig. 1, the form represented in Fig. 6 being preferred, for the reason that it presents a greater extent of reducing-surface than when made of the reverse form.

The annular space between the rings in the case and on the shaft is made gradually less toward the lower end, because the cutters at

and near the lower end are required to be made thin when the material is required to be reduced to a fine state, and if made comparatively long they would be liable to be bent and strike one against another.

Instead of making the spaces between the cutters on the shaft and also in the case at and near the upper end wider apart, by leaving spaces between the cutters on the shaft and those in the case, they may be all made to run close, as at the lower end, the cutters, both on the shaft and in the case, being made thicker at the upper than at the lower end; and if the material to be reduced is of a small size—such as grain—the machine may be made with the cutters of equal or nearly equal thickness from the upper to the lower end, and for some materials it may be advisable to make all the cutters of equal thickness and at equal distances apart.

For the reduction of some materials it may be desirable to use two machines—one coarse for the first reduction, and the second fine to still further reduce the product of the first; but I prefer to have the different grades of cutters in the one machine.

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

1. The combination of the series of square or shear-edge cutters on the shaft with the series of square or shear-edge cutters in the case, arranged and operating substantially as herein described.

2. Sustaining the outer ends of the cutters on the shaft by the rings of the case, in combination with the sustaining of the inner ends of the cutters of the case by the rings on the shaft, substantially as and for the purpose described.

3. Connecting the cutters with the shaft and with the case by having the cutters attached each separately, by a dovetail or equivalent joint, to a ring, and the rings to the shaft and case, substantially as described, to facilitate sharpening and other repairs.

THOS. J. SLOAN.

Witnesses:

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