(No Model.)

C. BALL.

ROTARY CUTTING MACHINE FOR REDUCING VARIOUS MATTERS TO FRAGMENTS.

No. 549,264. Patented Nov. 5, 1895.

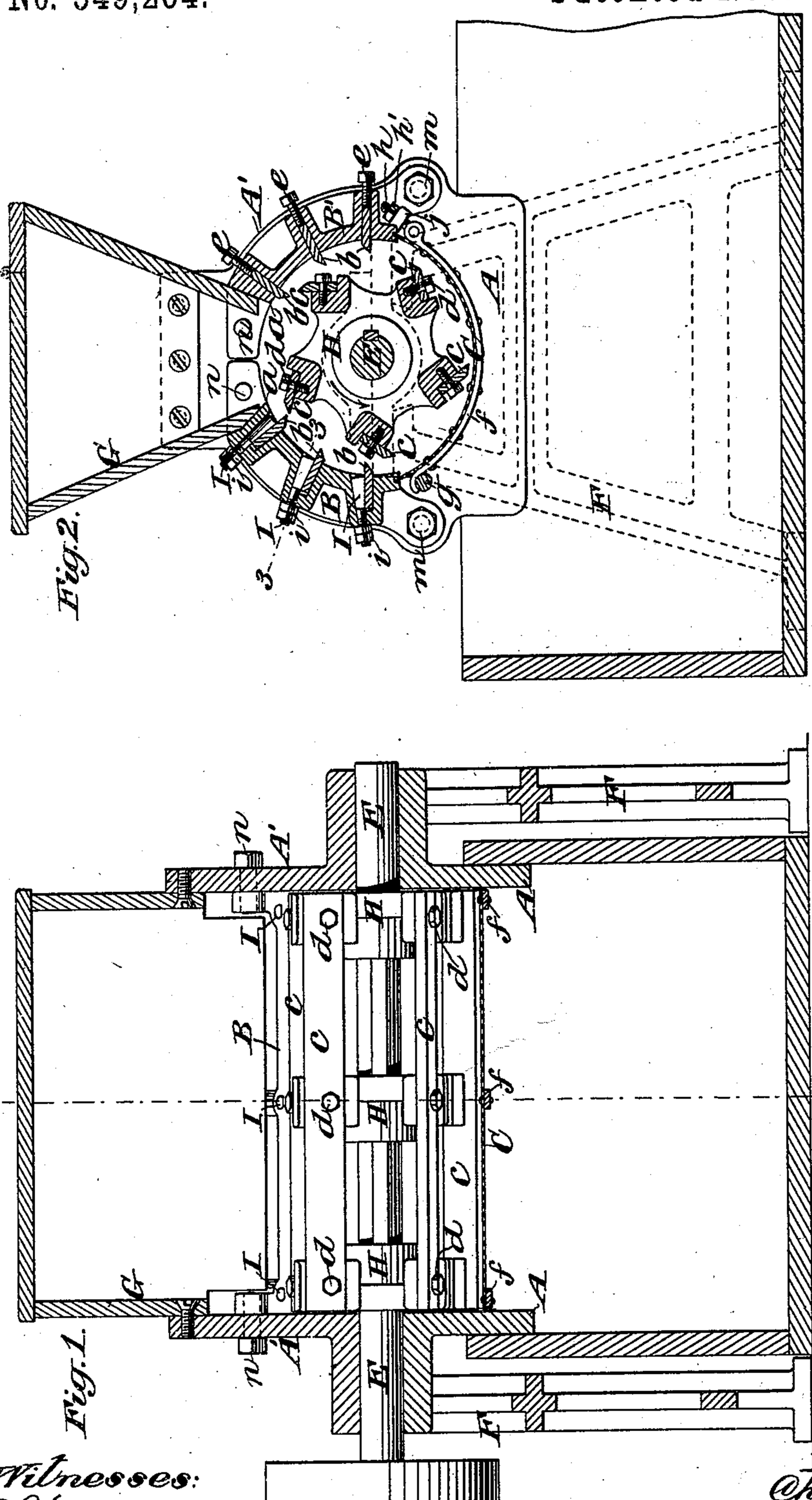

Fig. 2.

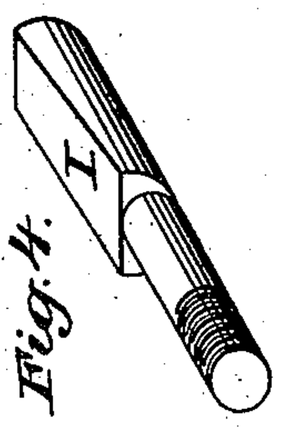

Fig. 4.

Fig. 1.

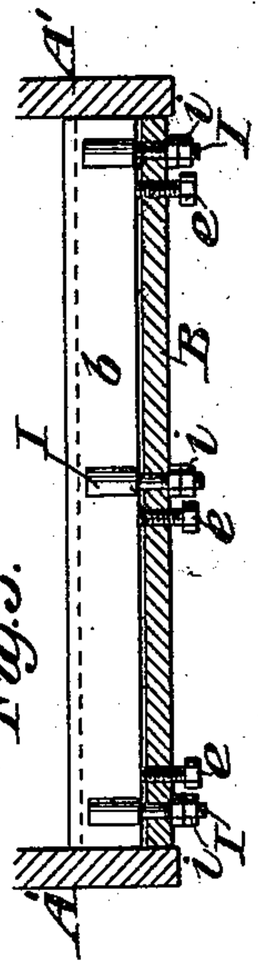

Fig. 3.

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ROTARY CUTTING-MACHINE FOR REDUCING VARIOUS MATTERS TO FRAGMENTS.

SPECIFICATION forming part of Letters Patent No. 549,264, dated November 5, 1895.

Application filed May 16, 1894. Serial No. 511,417. (No model.)

To all whom it may concern:

Be it known that I, CHARLES BALL, of the city of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Rotary Cutting-Machines for Reducing Various Matters to Fragments, of which the following is a specification.

My improvement relates to machines in which a series of cutters carried by a rotating shaft revolve within a stationary casing, into which there project fixed cutters, with which the first mentioned cutters co-operate with a shear-like action, such machines being applicable to the reduction into fine fragments of various matters—such, for example, as medicinal roots or cork scraps.

Figure 1 in the accompanying drawings represents a vertical sectional view, taken parallel with the cutter-shaft of a machine embodying my invention, the stationary parts of the machine being shown in section and the rotary shaft and its cutter-heads and cutters being shown entire. Fig. 2 represents a transverse vertical section at right angles to Fig. 1 in the line 2 2 of that figure. Fig. 3 represents a vertical section taken in the line 3 3 of Fig. 2. Fig. 4 is a perspective view of one of the bolts which is used for clamping and securing the stationary cutters.

Similar letters of reference designate corresponding parts in all the figures.

A A′ B B′ C designate the stationary casing of the machine. This casing is of approximately cylindrical form and is represented as consisting of two heads A A′ A A′, two internally concave side plates B B′, inserted between the said heads and constituting the sides and upper parts of the cylindrical contour of the casing, and a screen C, which constitutes the lower part and bottom of the said casing between the two concave plates B B′.

E is the rotary cutter-shaft running through the center of the casing and having its bearings in the two heads A A′ A A′ thereof, the said heads for that purpose being each divided horizontally into two parts, between which are formed the bearings for the shaft. The lower parts A A of the said heads are supported on and fastened to upright standards F F, and the upper parts A′ A′ are fastened to the lower parts A. There is an opening at *a a* between the two concave side plates B B′, and to this opening is fitted a hopper G. In each of the said concave side plates B B′ there is a series of radial or approximately radial grooves for the reception of the fixed cutters *b b*, which are simply straight knives and which are fitted to the said grooves, the said grooves running lengthwise of the casing.

The rotary shaft E is furnished with any suitable number of cutter-heads H, three being represented, to which the rotary cutters *c*, consisting simply of straight knives, are secured by screw-bolts *d*, the said cutters being tangential to circles described around the shaft. These cutters *c* are represented as having their edges parallel with the shaft. The bevel of the said cutters, by which their sharp edges are produced, is on the sides presented in the opposite direction to that in which the cutters revolve, which direction is indicated by the arrow on one of the cutter-heads in Fig. 2. The bevel of the stationary cutters is the reverse of that of the rotary cutters—that is to say, it is on the sides opposite to those toward which the rotary cutters move.

The cutters *b*, though stationary when in operation, are adjustable inward or outward relatively to the casing to bring their edges in proper relation to the edges of the rotary cutters by means of adjusting-screws *e*, (see Figs. 2 and 3,) of which there may be any suitable number for each cutter arranged directly behind it and screwing through their respective concave side plates at the backs of their respective grooves. By screwing up these screws the cutters are adjusted into their proper relation to the rotary cutters. The said cutters *b* when thus adjusted are secured by taper-headed clamping-bolts I, of which one is shown separately in the perspective view, Fig. 4, and the taper-heads of the said bolts, working in recesses provided in the concave plates B B′ on one side of each cutter-groove, are made to act as wedges to clamp the cutters against the opposite side of the groove by screwing up the nuts *i*, provided on the screwed ends of the said bolts, which project outwardly from the plates B B′.

The screen C is of such concave form internally that the cutters *c* will nearly touch it at the bottom, but will work farther away from it at other parts, as may be understood by reference to Fig. 2. The meshes, perforations, or interstices may be varied according to the fineness to which it is desired to reduce the material to be cut, and in order to provide for changing the screen it is attached to bars *f*, Figs. 1 and 2, which are hooked at one end to a bar *g* running across the machine between the heads A A, the other ends of the said bars having pivoted to them screw-bolts *h*, Fig. 2, which pass through lugs *j* on one of the plates B B′, and are secured by nuts *h*′ outside of the said lugs *j*.

The cutters as they pass the screen have the effect of turning over the cut-up material and to force the finer portions thereof through it and to turn over the coarser portions in such way as to present them anew to the action of the cutters.

In order to afford access to the cutter-heads H and cutters *b* and *c* and to provide for the taking out of any or all of the cutters for grinding and replacing them after grinding, the concave side plates B B′, which contain the stationary cutters, are pivoted at their bottoms to the two head-plates A A by means of pivot-bolts *m*, and are secured at their upper ends to the head-plates A′ A″ by removable screw-bolts *n*. By taking out these latter bolts *n* the concave plates are left free to be swung aside separately in opposite directions from the stationary hopper, so that access can be readily had to all the cutters in either or each of said concave plates and to those on the rotary cutter-heads.

What I claim as my invention is—

The combination of a central rotary shaft and attached cutters, a casing inclosing said shaft and cutters and comprising two stationary heads and two concave side plates and a concave screen between the lower parts of the said side plates, adjustable cutters in said side plates, and a hopper between the said side plates, the said side plates being separately pivoted at their lower parts to the said heads on opposite sides of said screen and capable of being swung outward in opposite directions from the hopper to give access to the cutters, substantially as herein described.

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