

No. 610,531.

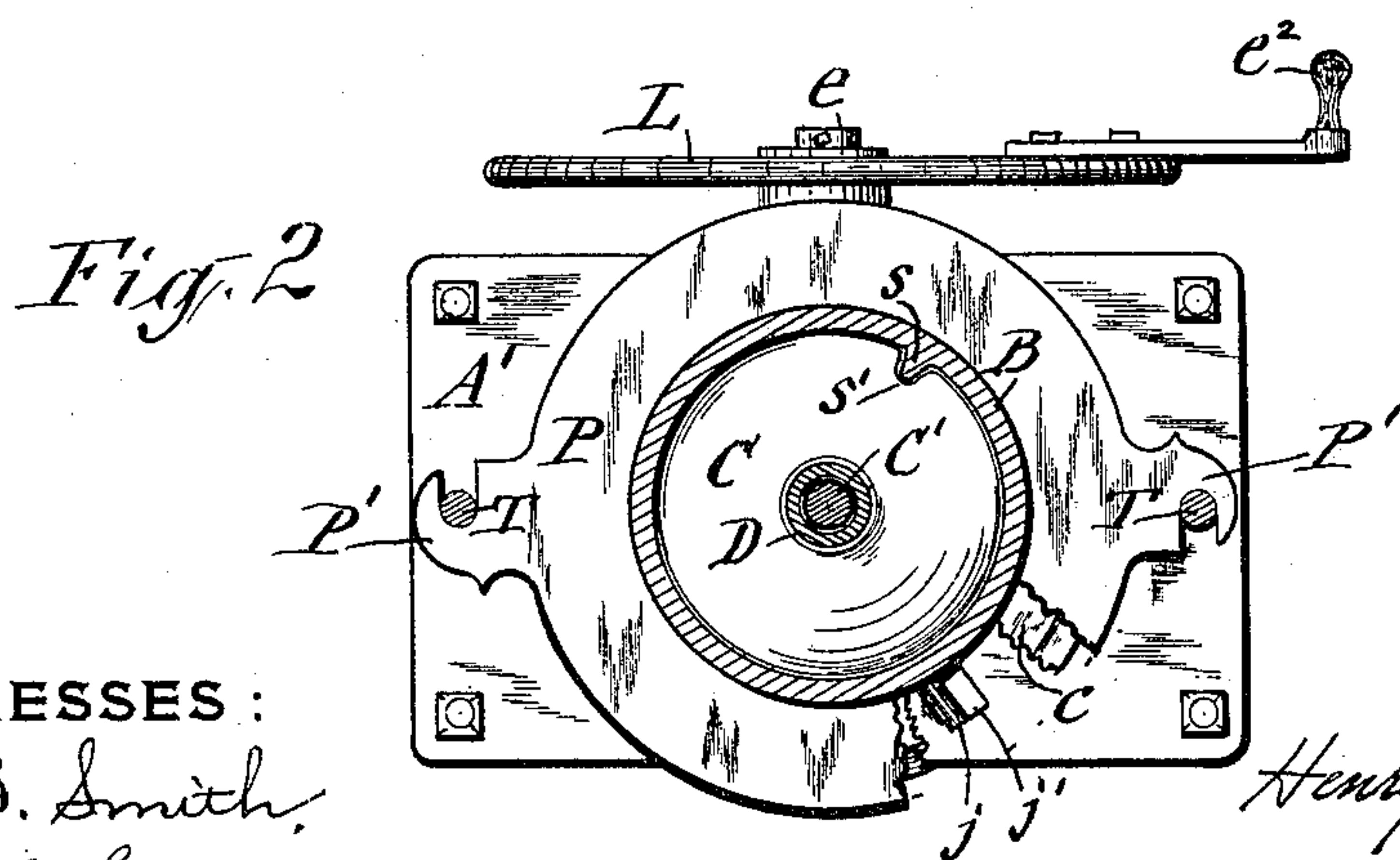
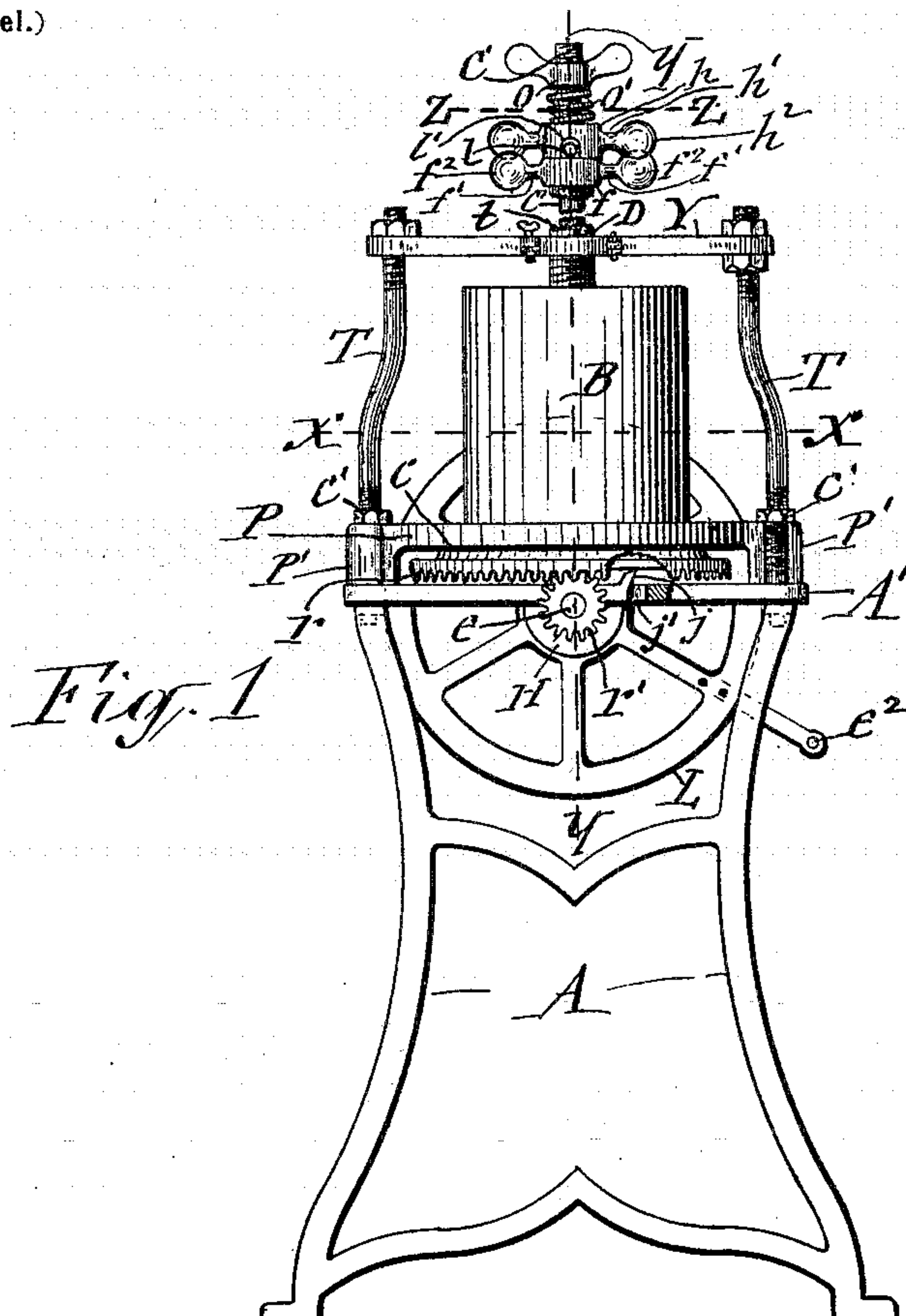
Patented Sept. 13, 1898.

H. A. HANNUM.
GREEN BONE CUTTER.

(Application filed Sept. 9, 1897.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

H. B. Smith,
M. A. Leyden.

INVENTOR:

Henry A. Hannum
By E. Laass
his ATTORNEY

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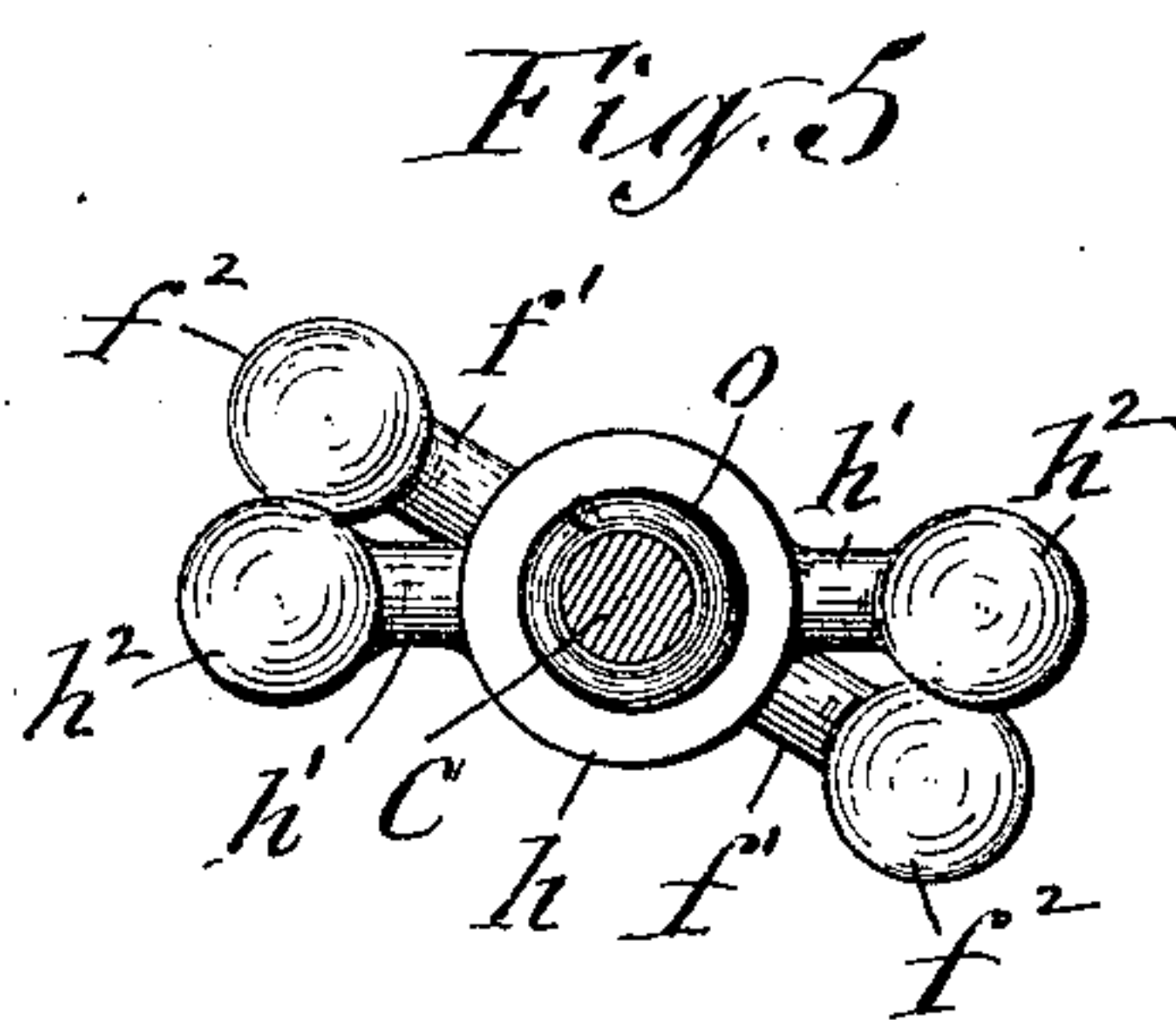
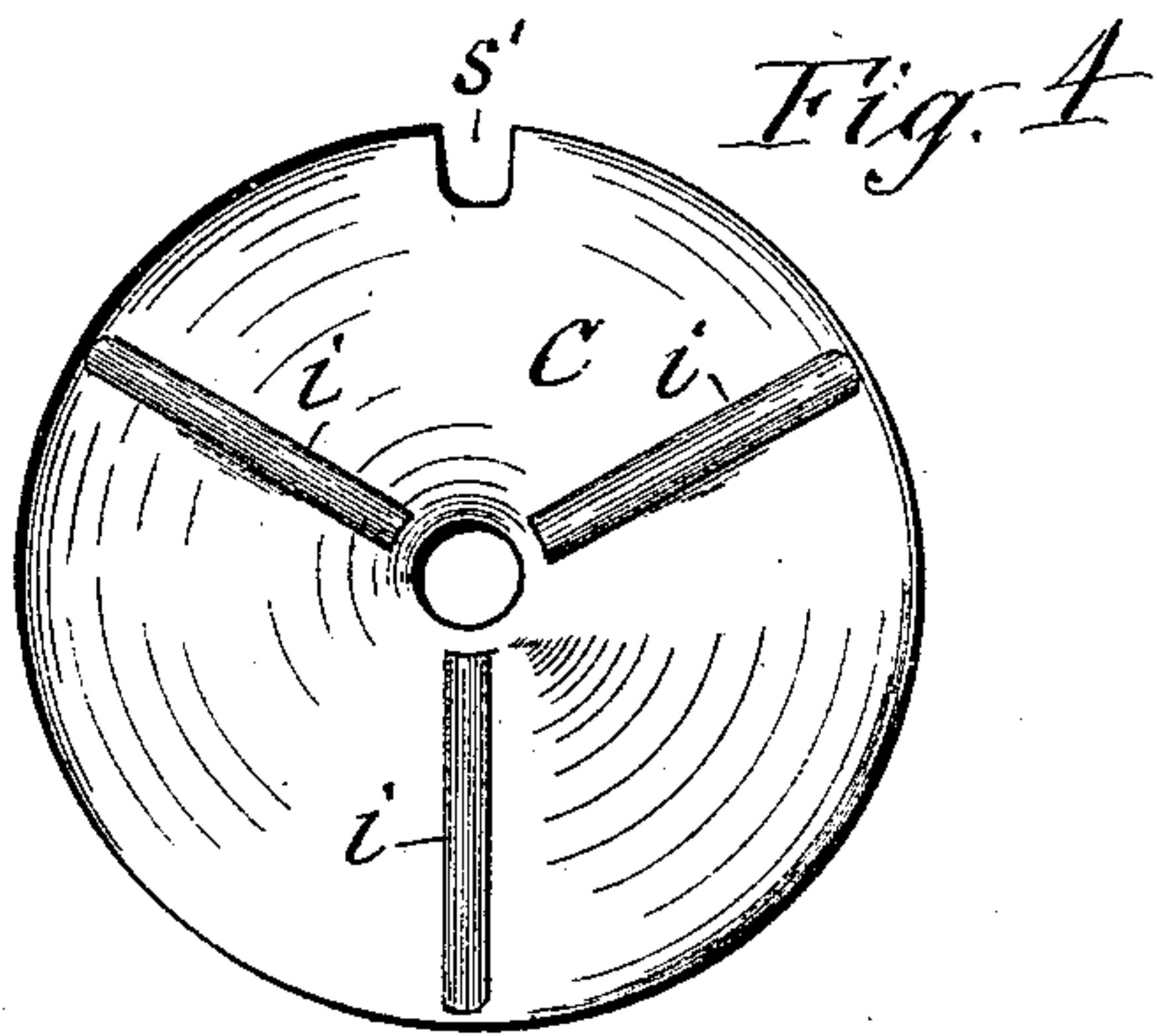
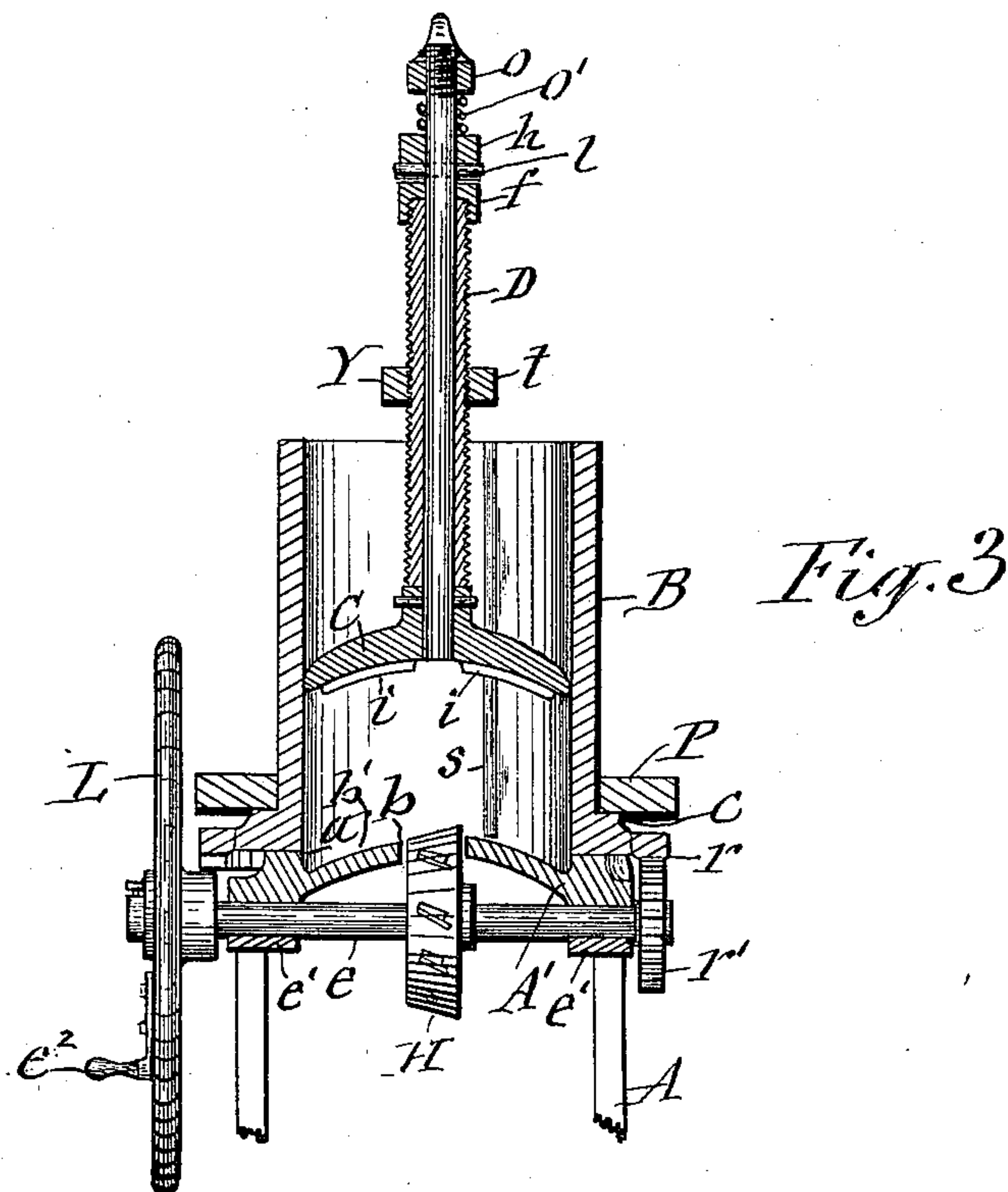
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UNITED STATES PATENT OFFICE.

HENRY A. HANNUM, OF CAZENOVIA, NEW YORK.

GREEN-BONE CUTTER.

SPECIFICATION forming part of Letters Patent No. 610,531, dated September 13, 1898.

Application filed September 9, 1897. Serial No. 651,026. (No model.)

To all whom it may concern:

Be it known that I, HENRY A. HANNUM, of Cazenovia, in the county of Madison, in the State of New York, have invented new and useful Improvements in Green-Bone Cutters, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to the species of comminuting-machines shown in my reissued Letters Patent No. 11,298, dated January 3, 1893.

The chief object of my present invention is to provide said machine with efficient and reliable means for automatically controlling the action of the feed or press screw during the operation of the machine, so as to guard against excessive pressure of the follower on the substance subjected to the action of the comminuting-cutter without stopping the motion of the machine.

The object is also to render the hopper of the machine capable of being readily removed for obtaining access to the base of the hopper when required; and the object is, furthermore, to otherwise improve the machine, so as to render it more convenient and efficient in its operation; and to that end the invention consists in the improved construction and combination of parts hereinafter described, and set forth in the claims.

In the annexed drawings, Figure 1 is a rear elevation of a comminuting-machine embodying my present improvements. Fig. 2 is a horizontal transverse section on line X X in Fig. 1. Fig. 3 is a vertical transverse section on line Y Y in Fig. 1. Fig. 4 is an enlarged inverted plan view of the follower, and Fig. 5 is an enlarged transverse section on line Z Z in Fig. 1.

A represents a standard upon which my improved comminuting-machine is mounted. The top plate A' of said standard constitutes the base of the hopper B, which is seated revolvably upon an annular horizontal rim a, formed on said base. Said hopper is secured to the base by means of a ring P, which embraces the hopper and is seated upon a circumferential shoulder or offset c, formed on the exterior of the hopper. Said ring is formed with hooks P', projecting from the edges of the ring at points diametrically opposite each other and disposed reverse from each other. Said hooks receive through them the rods T T, which are attached to the base

A' and are screw-threaded and provided with nuts c' c', bearing on the tops of the hooks P'. By loosening said nuts the hopper and ring can be carried laterally from the base A' when desired.

The upper ends of the rods T T are screw-threaded and pass through ears on the ends of the cross-bar Y, which is sustained on said rods by means of nuts applied to the rods at the bottom and top of the cross-bar in the same manner as shown and described in my Letters Patent hereinbefore mentioned. One of said ears is formed hook-shaped or with a lateral opening to allow the cross-bar to be swung laterally out of engagement with the rod and thus removed from over the hopper when desired to remove the hopper for cleaning the same or for other purposes.

The top of the portion of the base A' which is inside of the hopper is shaped convex and is inclined from the radial slot b to one side of the hopper, as shown at b', to carry the substance under treatment more effectually to the face of the cutter H, which protrudes through the slot b and is beveled toward the said inclined side of the base A'. The lower end of the hopper is formed with an annular rack r, with which engages a pinion r', fastened to the shaft e of the cutter H. Said shaft extends across the under side of the base A' and is journaled in suitable bearings e' on said base. A balance-wheel L is attached to the end of the shaft and has adjustably secured to it a crank e² by which to turn the shaft, and thus operate the cutter and rotate the hopper.

C denotes the follower, which is made concave on its under side to correspond to the convex base A' and is provided with ribs or projections i to obtain a better hold on the substance beneath it. The follower is caused to rotate with the hopper by a vertical rib s on the interior of the hopper, which rib passes through a notch s' in the edge of the follower.

The more essential feature of my present invention is the automatic control of the travel and pressure of the follower on the substance under treatment without arresting the movement of the cutter. For this purpose I employ a tubular screw D, which presses on the follower and is revoluble independent thereof. Said screw works in a nut l, which is sustained on the cross-bar Y and preferably formed of separable parts, as shown in

my aforesaid Letters Patent, to facilitate the removal of the screw when desired. To the upper end of said screw is fastened a collar f , formed with laterally-projecting arms f' , which terminate ball-shaped, as shown at f^2 , or in any other suitable shape which will wedge upward similar-shaped devices forced against them.

To the follower C is firmly secured a vertical shaft C', which extends longitudinally through the tubular screw D and has on its upper protruding portion a vertically-movable hub h , from which project laterally arms h' , formed at their free ends with balls h^2 or with other suitably-shaped heads, which by excessively-forced contact with the balls or head f' are caused to be wedged upward and to slip over said heads f' for the purpose hereinafter explained.

The hub h is made to rotate with the shaft C' by means of a pin l , passing transversely through the shaft and through vertical slots l' in the hub, which slots allow the hub to be crowded or wedged upward, as aforesaid, without depriving the pin l of its hold on the hub.

The upper end of the screw C' is screw-threaded and provided with a nut o , and between this nut and the hub h is interposed a spiral spring o' , which serves to resist to a certain degree the upward movement of the collar due to the forcible contact of the balls h^2 with the balls f^2 . The nut o permits adjustment of the tension of the spring o' .

It will be observed that the hub h , with its described arms h' and heads h^2 on said arms, constitutes a driver for turning the screw D and will perform said function so long as the screw is under ordinary strain; but when said strain becomes excessive the heads h^2 of the hub h will mount upon and slip over the heads f^2 of the collar f , and thus leave the screw C' stationary until sufficient substance has been ground away to relieve the screw from excessive strain, when it will again be rotated by the contact of the aforesaid heads.

In the operation of the machine, especially when grinding so-called "green" bones containing marrow and having more or less meat adhering to them, it is found that some of the greasy and soft substances are liable to ooze through the joint between the hopper and its base, and to prevent this from accumulating on the base at the exterior of the hopper and from clogging the rack r and pinion r' I affix to the base A' a suitable scraper j , which is in contact with the under side of the projecting portion of the lower end of the hopper. An aperture j' in the base in front of the scraper allows the scrapings to drop from the machine.

What I claim as my invention is—

1. The combination with the hopper, cutter and the follower movable to and from said cutter, of a tubular feed-screw bearing on said follower, a shaft passing through said screw and rotating with the cutter, a driver

mounted longitudinally movable on said shaft and provided with means for engaging and releasing the screw, a nut, on the end of said shaft, and a spring interposed between said nut and driver to force the cutter to yieldingly interlock with the screw as set forth.

2. The combination with a rotary hopper and a follower rotating with said hopper, and a stationary nut, of a tubular screw working in said nut and pressing on the follower, lugs projecting from the screw, a shaft fastened to the follower and extending longitudinally through the screw, a driver mounted longitudinally movable on said shaft and rotating therewith and provided with lugs yieldingly interlocking with the lugs of the screw, and a spring holding said driver in engagement with the lugs on the screw and yielding to a predetermined degree of resistance of the follower, as set forth.

3. In combination with a rotary hopper, the follower rotating with said hopper, and a stationary feed-nut, a tubular screw working in said nut and pressing on the follower with a revoluble bearing between them, a shaft fastened to the follower and extending longitudinally through the screw and screw-threaded on its upper end, arms fixed to and projecting radially from the screw, a hub embracing the aforesaid shaft and movable longitudinally thereon, means transmitting rotary motion from the shaft to said hub, rigid arms projecting from the hub and engaging the arms of the screw by vertically wedging bearings permitting said hub-arms to slip over the screw-arms, a nut on the screw-threaded end of the shaft, and a spring interposed between said nut and hub to hold the arms of the hub in engagement with the arms of the screw, as set forth.

4. In combination with the rotary follower and stationary feed-nut, a tubular screw working in said nut and pressing upon the follower and revoluble independently thereof, a collar fastened to the upper end of the screw and formed with radially-projecting arms terminating with ball-shaped ends, a shaft fastened to the follower and extending longitudinally through the screw and provided with screw-threads on its upper end, a hub mounted movably longitudinally on said shaft and provided with vertical slots and with fixed arms terminating ball-shaped to engage the balls of the subjacent collar, a pin passing transversely through the shaft and through the slots of the aforesaid hub, a nut on the upper end of the shaft, and a spring interposed between said nut and vertically-movable hub, substantially as described and shown.

In testimony whereof I have hereunto signed my name this 4th day of September, 1897.

HENRY A. HANNUM.

Witnesses:

J. J. LAASS,
H. B. SMITH.