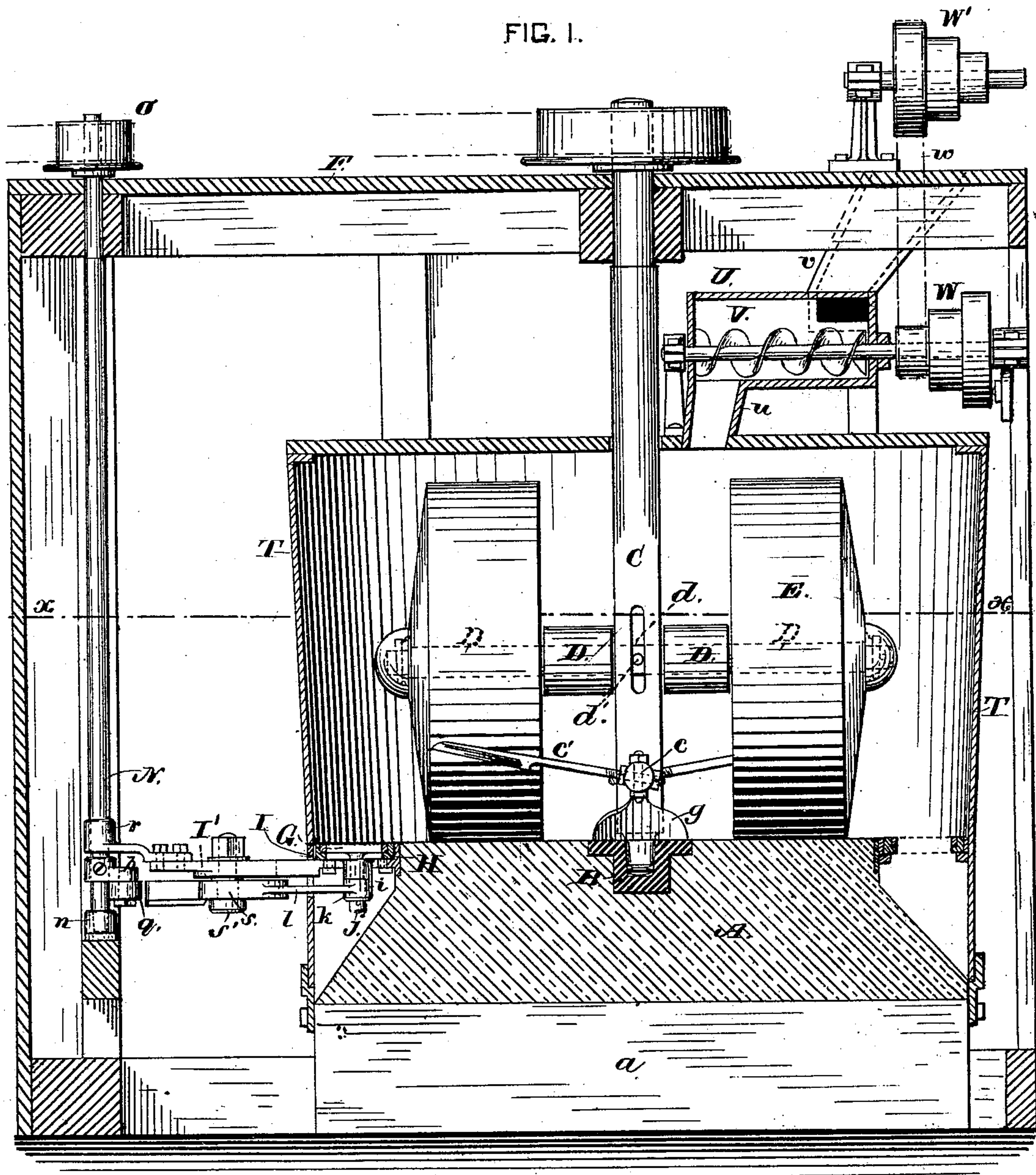


S. V. APPLEBY.
 Apparatus for Grinding Tobacco.
 No. 226,953. Patented April 27, 1880.

FIG. 1.



WITNESSES:
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J. A. Rutherford,

INVENTOR:
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 by *James L. Norris,*
Att'y.

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FIG. II.

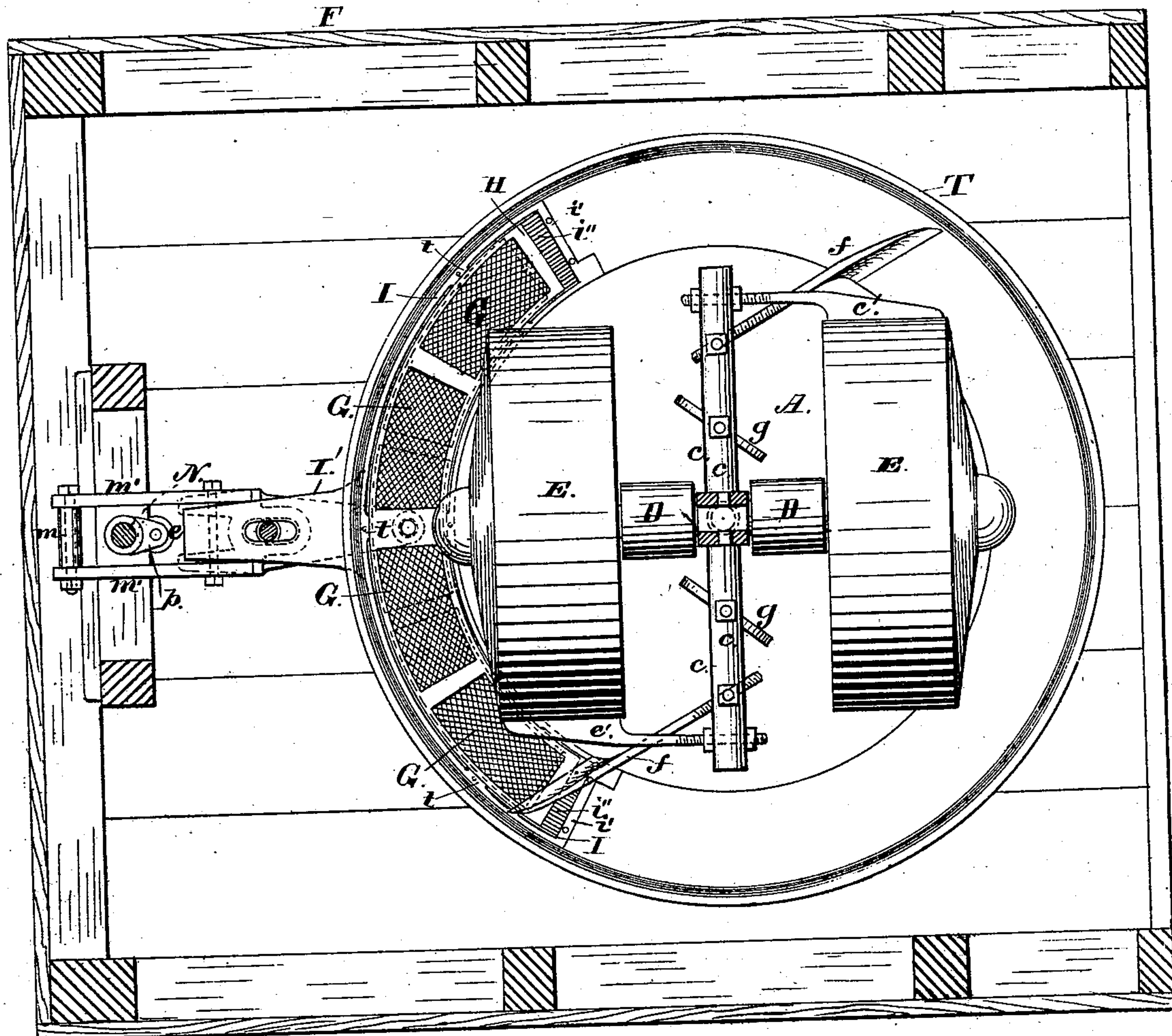
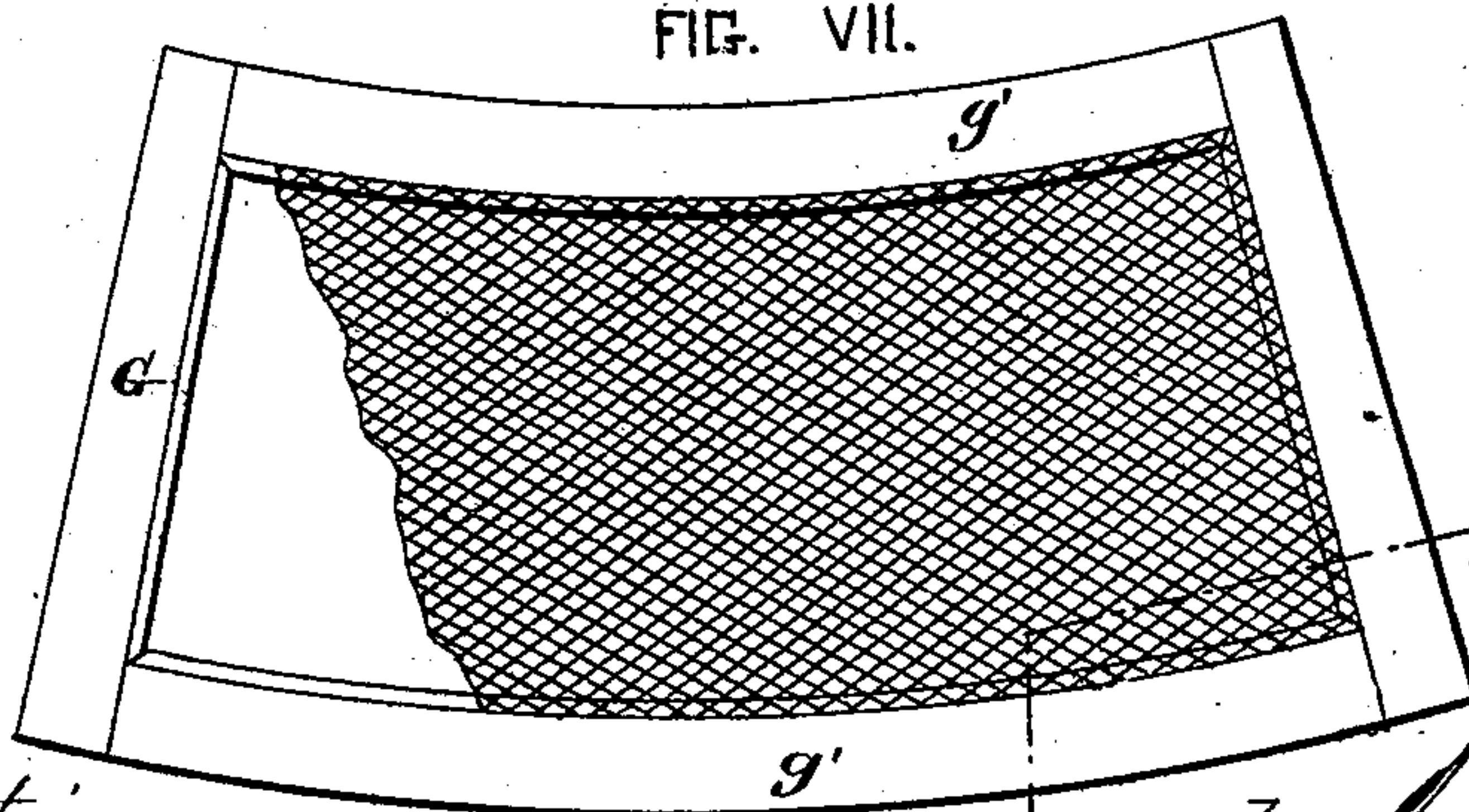


FIG. VII.



WITNESSES:

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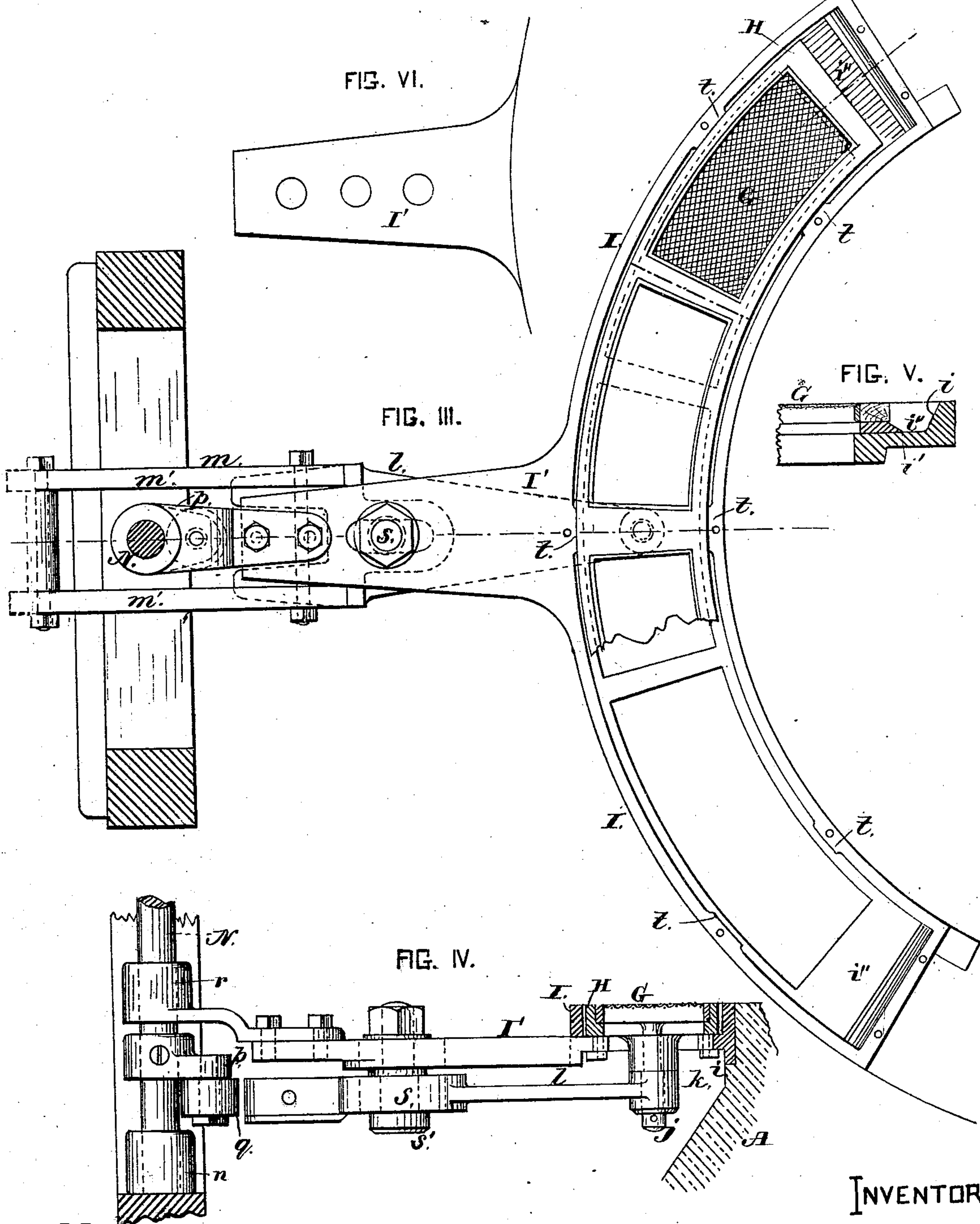
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UNITED STATES PATENT OFFICE.

STEPHEN V. APPLEBY, OF SPOTSWOOD, NEW JERSEY.

APPARATUS FOR GRINDING TOBACCO.

SPECIFICATION forming part of Letters Patent No. 226,953, dated April 27, 1880.

Application filed December 31, 1879.

To all whom it may concern:

Be it known that I, STEPHEN V. APPLEBY, of Spotswood, in the county of Middlesex and State of New Jersey, have invented certain new and useful Improvements in Apparatus for Grinding Tobacco and other Materials, of which the following is a specification.

This invention relates to an improved apparatus for grinding tobacco for the manufacture of snuff and for reducing various other articles, such as grain and spices, its object being the production of a single machine which will simultaneously grind and sift either wet or dry tobacco, or the other materials referred to, and thereby obviate the necessity of separate machines for the respective operations of grinding and sifting, and which shall be self-feeding, thereby dispensing with the attention of a feeder and insuring a constant and proper supply of material to the grinding and sifting devices.

Though suitable for other purposes, the machine is intended especially for the manufacture of snuff, and will be described with reference to such use.

To this end my invention consists, first, in the combination, with a bed-stone, forming the bottom, or a portion of the bottom, of an inclosing-casing, of one or more rotating cylinders traveling upon said bed-stone in a path around the center thereof, and one or more reciprocating sieves or sifters arranged about and adjacent to the periphery of said stone and on a level therewith. The tobacco to be ground being fed upon the bed-stone, the traveling cylinder or cylinders comminute the same, and generally force it outward upon the sieves or sifters, through which that portion which is properly reduced falls into a proper receptacle, from which it may be removed as required. The portion of the tobacco which is not sufficiently reduced to pass through the sifters is, by devices hereinafter referred to, brushed back in the path of the grinding cylinder or cylinders for further reduction.

The invention consists, secondly, in the combination, with the grinding and sifting devices above referred to, of an automatic feeding device, operating, in combination with said grinding and sifting devices, to deliver tobacco to be ground upon the bed-stone in regulated

quantity, corresponding to the discharge of the sifters.

It consists, thirdly, in the combination, with the bed-stone, traveling cylinder or cylinders, sifters, and automatic feeding device, of an inclosing-case surrounding and covering the said bed-stone, traveling cylinder or cylinders, and sifters, and connected by a suitable passage-way with the feeding device, all as hereinafter more particularly described.

It consists, fourthly, in the combination, with the bed-stone, traveling cylinders, and sifters, of one or more scrapers traveling over and upon the sifters in a direction to remove the coarse tobacco therefrom to the bed-stone and in the path of the traveling grinding-cylinder, whereby the apparatus is rendered able to reduce to proper condition the entire quantity of tobacco fed thereto.

In the accompanying drawings, Figure I, Sheet 1, is a vertical central section of the inclosing-case, bed-stone, and other essential stationary parts of the apparatus, with the movable parts arranged in proper relation thereto. Fig. II is a horizontal section on line *xx* of Fig. I. Fig. III is a detached plan view of the sifters and their operating devices. Fig. IV is a detail elevation of the sifter-moving devices, the sifter-supports being shown in vertical section. Fig. V is a detail longitudinal section, showing the arrangement of the sifters and their supports. Fig. VI is a plan view of the arm projecting from the sieve-guide. Fig. VII shows a plan and longitudinal section of one of the sieves.

The letter A indicates the stationary bed-stone, which may be arranged upon any suitable foundation, as *a*. This stone, at its center, is provided with a step, B, in which is stepped the foot of a vertical shaft, C. Said shaft carries a loosely-secured vertically-movable cross-shaft, D, upon the opposite ends of which are journaled the grinding-cylinders E, which travel in a circle upon the horizontal face and around the center of the bed-stone A. The upper end of the vertical shaft C is journaled in the top of a frame-work, F, surrounding, or partially surrounding, the entire apparatus, and the vertical movement of the cross-shaft D with respect to said vertical shaft is obtained by having a flattened middle portion,

d, of said cross-shaft to pass through a vertical slot through said vertical shaft, while pins *d'* project from said flattened middle portions through vertical slots cut through the shaft C at right angles to that through which passes the flattened portion of shaft D.

Upon a level with the horizontal face of the bed-stone A, and adjacent to and in coincidence with the periphery thereof, are arranged arc-shaped sieves or sifters G. These sieves or sifters are each composed of an arc-shaped open frame, *g*, as shown in Fig. VII, covered with wire-gauze, and said sieves or sifters rest upon and are carried by an arc-shaped reciprocating carrier, H, which may be formed of brass or other suitable metal, and is supported by and reciprocates longitudinally upon a guideway, I, preferably cast of Babbitt metal or a similar composition, and embracing snugly the periphery of the bed-stone, the top surfaces of the guideway, the sieve-carriers, and the sieves being flush with each other and with the horizontal face of the bed-stone A.

The inner edge of the guideway I is supported by a shoulder, *i*, formed around the periphery of the bed-stone A, and the outer edge of said guide may rest upon suitable standards. From a middle cross-bar of the sieve-carrier a stud, *j*, projects downward, and has formed upon its end a journal, embraced by a collar, *k*, from which radially with respect to the bed-stone extends an arm, *l*, terminating in an open frame, *m*. Through this open frame passes a vertical shaft, N, the lower end of which is stepped in a suitable bearing, *n*, and the upper end projects beyond and has a bearing in the frame F, the projecting portion of said shaft carrying a belt-pulley, *o*. Immediately above the open frame *m* an arm, *p*, projects from the shaft N, and has a downward-projecting stud, upon which is journaled a roller, *q*, hanging within said open frame *m*, for a purpose which will presently appear.

From the center of the outer edge of the guideway I a rigid arm, I', projects outward above the arm *l*, and terminates in a sleeve-bearing, *r*, which embraces the shaft N. From this arm I' a pin, *s*, projects downward, passing through a longitudinal slot in the arm *l*, and a head, *s'*, on the lower head of said pin supports said arm. If, now, the shaft N should be rotated, the roller *q* will strike the side bars, *m'*, of the open frame *m* alternately, forcing said frame alternately in opposite directions, and giving the arm *l* an oscillating movement upon the pin *s* as a fulcrum, thus causing the sieve-carrier I to reciprocate upon its arc-shaped guideway and receive the shaking movement necessary to the efficient action of the sieves. In the present instance I have shown the guideway and sieve-carrier as let into an arc-shaped recess in the periphery of the bed-stone, the guideway, of course, being a little longer than the carrier to permit reciprocation of the latter; but the guideway may entirely encircle the stone and support an an-

nular sieve-carrier. As now shown, the end walls, *i'*, of the guideway are beveled or inclined outward from bottom plates, *i''*, (see Fig. V,) upon which the ends of the sieve-carrier play, and this sieve-carrier has its end bars beveled to form chisel-shaped lower edges, this form of the said wall and end bar causing any tobacco which may fall into the recesses of the guideway at the ends of the sieve-carrier to be removed at each reciprocation of the latter.

In order to reduce the friction between the sieve-carrier and its guideway, I form inwardly-projecting bearings *t* for the carrier on the walls of said guideway.

From the vertical shaft C arms *c* project in opposite directions at right angles to the shaft D, beyond the peripheries of the cylinders E, and from the ends of these arms *c* extend scrapers *c'*, the edges of which rest against the peripheries of the cylinders and prevent the adherence of tobacco thereto. Obliquely from the shaft *c* also project scrapers *f*, the edges of which play over the sieves or sifters G, and sweep coarse tobacco therefrom back into the path of the grinding-cylinders, the tendency of these cylinders being to work the tobacco outward, the finer and properly-reduced portions passing through the sieves, while the coarser portions are swept back for further reduction, as stated. The arms *c* also carry scrapers *g*, which sweep the central portion of the bed-stone and are set obliquely to force the tobacco outward toward the cylinders.

Closely surrounding the bed-stone A and the guideway is a cylindrical casing, T, extending above the grinding-cylinders and provided with a cover to prevent the escape of light finely-ground tobacco when the same is ground dry. The vertical wall of the casing is provided with an opening for the arms I' and *l* to work through. Upon the top of this cylindrical casing is arranged a horizontal box or housing, U, connected with the casing by a spout, *u*. Longitudinally within this box or housing is mounted a feeding or conveying screw, V, the shaft of which passes through the end walls of said box and is journaled in suitable bearings. Upon a portion of said shaft, outside of the housing U, is mounted a cone-pulley, W, above which, upon the frame F, is suitably mounted a corresponding cone-pulley, W', these pulleys being connected by a belt, *w*, and their function being to regulate the speed of the screw V, and consequently to control the quantity of tobacco fed by said screw into the casing. A chute, *v*, connects the housing or box U with an elevated hopper or bin. (Not shown in the drawings.)

The tendency of the cylinders while rotating and grinding the tobacco upon the bed-stone being to constantly crowd the tobacco outward and upon the sieves, a constant discharge of properly-ground product takes place through these sieves, and it is obvious that the speed of the feed-screw may be so regulated as to feed to the bed-stone a quantity of tobacco sufficient

to balance this discharge and keep the grinding devices constantly fed in a manner most conducive to their efficient operation—that is, so that there may be neither too little nor too much stock upon the bed-stone.

In the drawings, Fig. I, I have shown the stone as beveled outward and downward from the ledge upon which the guideway I rests, the beveled wall serving to shed off the snuff to a convenient position for being collected. This, however, is not essential, and the stone may have the same diameter at the bottom as at the top.

The sieves are removable, so that any grade or fineness of mesh may be used, according to the grade of snuff desired to be produced.

In practice I arrange the positions of the shafts C and N in such relative position that the belt which connects the belt-wheel of a motor with the belt-wheel at top of shaft C may have a bearing upon the belt-pulley at top of shaft N, and thus serve to communicate motion to the sieves or sifters.

I have not shown any particular means of connecting the cone-pulleys which drive the feed-screw with any other rotary shaft of the apparatus, as this is a matter within the skill of an ordinary mechanic without special instruction.

What I claim is—

1. The combination, in a grinding and sifting machine, with a bed-stone forming the bottom of an inclosing-casing, of one or more rotating cylinders traveling upon said bed-stone in a path around the center thereof, and one or more reciprocating sieves or sifters arranged about and adjacent to the periphery of

said bed-stone and on a level therewith, substantially as and for the purpose set forth.

2. The combination, with a bed-stone and one or more reciprocating sieves or sifters arranged adjacent thereto and upon a level therewith, of one or more grinding-cylinders traveling upon said stone, and an automatic feeding device arranged to deliver material to be ground upon said bed-stone, substantially as described.

3. The combination, with the bed-stone, traveling cylinder or cylinders, sifting and automatic feeding devices, of an inclosing-case surrounding and covering said bed-stone, cylinder or cylinders, and sifters, and connected by a suitable passage-way with said feeding device, substantially as described.

4. The combination, in a grinding and sifting machine, of a stationary bed-stone forming the bottom of an inclosing-casing, one or more rotating cylinders traveling upon said bed-stone, one or more reciprocating sieves or sifters arranged about and adjacent to the periphery of the bed-stone on a level with the surface of the same, and one or more scrapers extending obliquely across and traveling upon the sieve or sieves and acting to sweep the loose unsifted material from the surface of the sieve or sieves onto the bed-stone, substantially as herein shown and described.

In testimony whereof I have hereunto set my hand in the presence of two witnesses.

STEPHEN V. APPLEBY.

Witnesses:

W. B. WELSH,
GEO. W. HELME.