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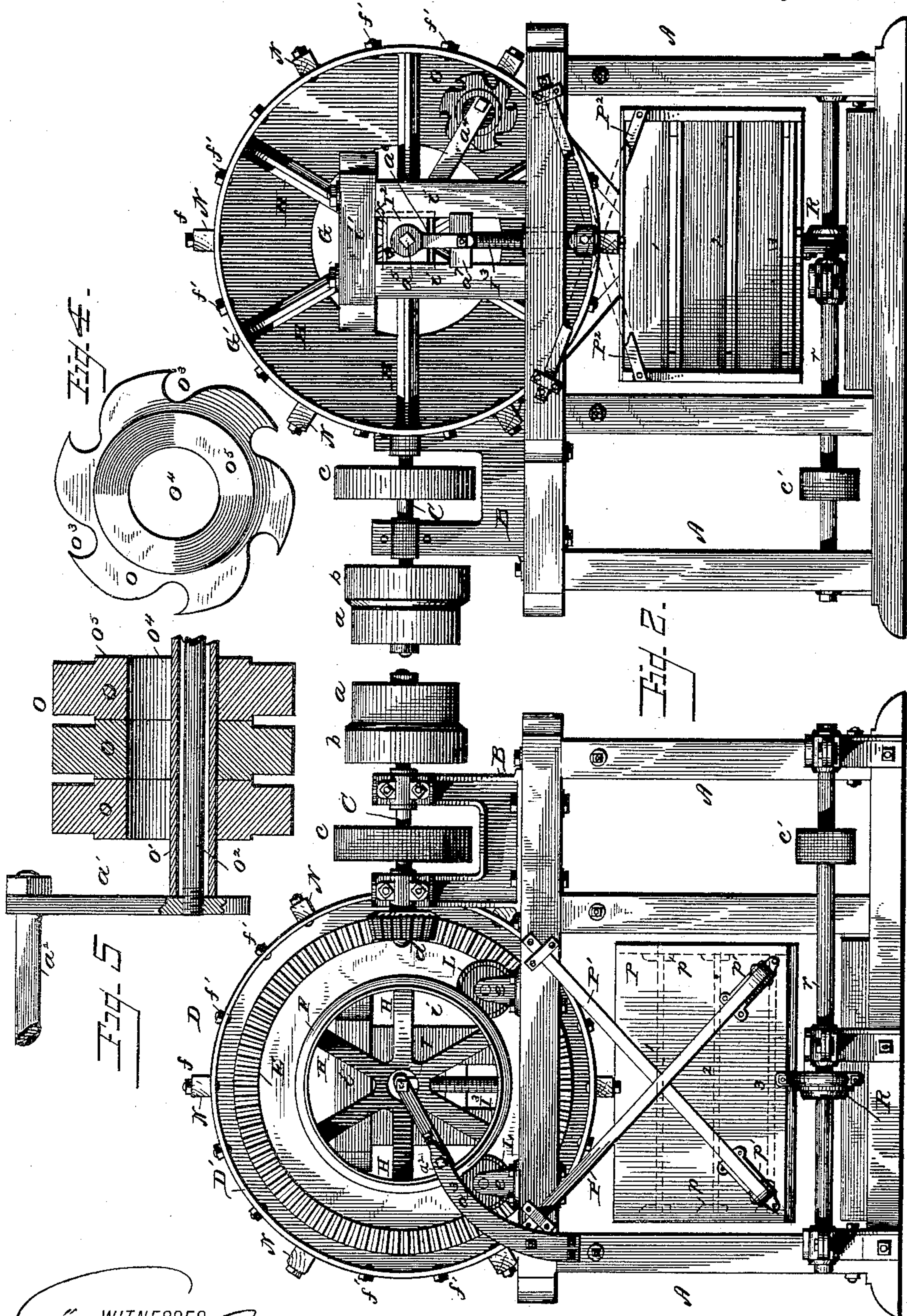
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L. BURDICK & W. F. COLEMAN.

TOBACCO GRANULATING MACHINE.

No. 318,542.

Patented May 26, 1885.



WITNESSES  
*Franklin H. Hough*  
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INVENTORS  
*Leander Burdick and*  
*Wm. F. Coleman*  
*by J. W. Craig*  
Attorney..



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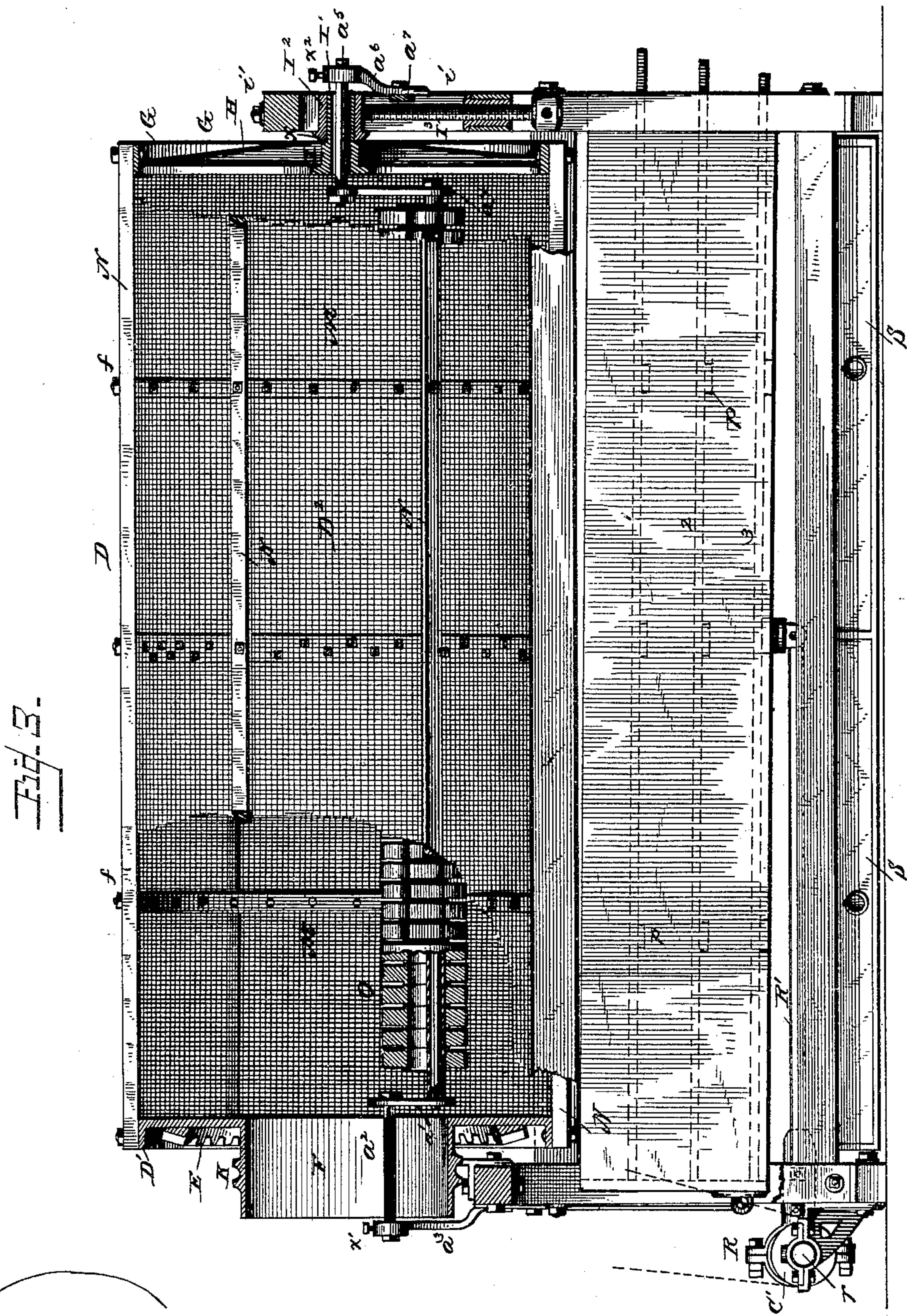
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WITNESSES

Wm. L. Steider  
Franklin H. Douglass

INVENTORS.

Lander Burdick and  
Wm F. Coleman.  
per H. Cragin.  
Attorney



# UNITED STATES PATENT OFFICE.

LEANDER BURDICK AND WILLIAM F. COLEMAN, OF TOLEDO, OHIO, AS-  
SIGNORS TO CHASE, ISHERWOOD & CO., OF SAME PLACE.

## TOBACCO-GRANULATING MACHINE.

SPECIFICATION forming part of Letters Patent No. 318,542, dated May 26, 1885.

Application filed September 24, 1884. (No model.)

*To all whom it may concern:*

Be it known that we, LEANDER BURDICK and WILLIAM F. COLEMAN, citizens of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented certain new and useful Improvements in Tobacco-Granulating Machines; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

The object of our invention is to provide a simple, durable, and efficient tobacco-granulating machine.

To this end our invention consists, chiefly, in combining with a wire-cloth cylinder a cylindrical breaker revolved by the friction of the cylinder in the same direction, but more rapidly, said breaker being composed of a number of independently-rotating blocks, each provided with a number of cups or pockets in their periphery, whereby the tobacco is both carried over and broken, or caused to pass and repass under the breaker, each of said blocks also being provided with a central hub for keeping their faces apart and allowing independent movement.

Our invention further consists of a novel combination of parts, all of which will be described below, and pointed out in the claims.

In the drawings, Figure 1 is a front view. Fig. 2 is a rear view. Fig. 3 is a side elevation, partly in section. Fig. 4 is a detail view of one of the breaker-blocks. Fig. 5 is a detail view of a portion of the breaker removed from the cylinder.

Like letters refer to like parts.

A A represent the frame supporting the machine. To a side extension of said frame a double journal, B, is bolted. Through this journal extends a short shaft, C, carrying pulleys *a*, *b*, and *c*, and a conical cog-wheel, *d*, the latter turning the cogged rim, E, which is a part of the cylinder-head, as will be described below. The pulley *a* is a loose one for shifting the belt. Motion given to the pul-

ley *b* by any suitable prime motor will therefore cause the cylinder D to revolve.

As regards the cylinder, the head of it is composed of the hoop or flange D', the cogged rim E, and the short open drum F, all cast in one piece. (See Figs. 1 and 3.) The open drum permits the tobacco to be conveniently inserted into the cylinder, and the rim E acts to turn it in connection with the cog-wheel *d*, above mentioned. Upon the circumference of the drum is a raised portion, having a groove, *k*, in which two opposite pulleys or sheaves, L L, revolve by the friction of the parts. These pulleys are journaled in raised standards *e e*, bolted to the frame. The drum and pulleys therefore both support the front of the cylinder and hold it in place during its revolution. The main portion of cylinder D is composed of wire-cloth D<sup>2</sup>, which should be of a suitable mesh for allowing the granulated tobacco to pass through after being sufficiently acted upon by the breaker, hereinafter described. The wire cylinder is held in position by three inside band-iron ribs, M M, and at the ends of the cylinder the ribs and the wire-cloth are held together by external wooden strips, N N, extending the whole length of the cylinder, all of said parts being united by a nut-and-bolt fastening, *f f*, and the ends of the cylinder being further fastened by a series of short bolts, *f'*, held by nuts. The rear end of the cylinder (see Fig. 2) consists of an open spider, G, composed of the circular flange or rim G', the radial arms H, and the hub I. The special purpose of this open construction is to allow the refuse to escape during the granulating process, at the same time giving ample strength to the rear end of the cylinder. The hub extends rearward in the form of a reduced shaft, I', which revolves in a metallic box, I<sup>2</sup>, supported between the uprights *i i*, cross-piece *i'*, and a screw, I<sup>3</sup>, between the said uprights. An end view of the box is seen in Fig. 2 and a section longitudinally in Fig. 3. The main portion of it is square, with a central opening which forms a journal for the shaft I'. The inner end of it has a raised square flange, *x*, which acts as a washer for the spider-hub, and serves as an additional support and guide for the reduced portion of the



box, which has free vertical play between the uprights. The lower side of the box rests on the screw  $I^3$ , the purpose of the latter being to raise and lower the box, and hence through the shaft and spider to give any desired incline to the cylinder when in operation.

The construction and arrangement of the breaker  $O$  will now be described. It is composed of a series of circular wooden blocks,  $o$ , strung on a tube,  $o'$ , the breaker as a whole being nearly as long as the cylinder. Within the tube is a tie-rod or shaft,  $o^2$ . The special construction of the individual blocks is seen in Fig. 4. In practice they have a diameter of about eight inches. In the periphery are the cups  $o^3$ , the backs of which terminate in a saw-tooth, the fronts being beveled. The purpose of these cups is to carry the tobacco over and over, or to cause it to pass and repass constantly under the breakers. The central opening,  $o^4$ , has a diameter of about three inches, and about this is a hub or raised flange,  $o^5$ . This integral hub holds the faces of the breakers apart, and, as the breakers are not joined, permits each one to revolve independently of the other. The tube  $o'$  should be of less diameter than the opening  $o^4$ , and the diameter of the rod  $o^2$  less than that of the tube, so as to give the parts ample freedom of movement.

The location of the breaker in the cylinder is seen in Figs. 2 and 3. It is revolved by the friction of the latter in the same direction and at a more rapid rate. Each block may not move at the same speed, as they are disconnected, and the tobacco may afford varying resistance.

The breaker is held in the cylinder as follows: At the front end of the tie-rod  $o^2$  is an arm,  $a'$ , which is fastened to a cross-tie,  $a^2$ , extending through the drum  $F$  and engaging by a set-screw,  $x'$ , with a depending curved arm,  $a^3$ , bolted to the frame. The other end of the tie-rod engages with an arm,  $a^4$ , fastened to the cross-tie  $a^5$ , which passes through the hub and shaft  $I, I'$ . The cross-tie  $a^5$  is of less diameter than the opening through these, so that the breaker can be rolled in the cylinder to varying positions. These cross-ties  $a^2, a^5$  are round, with squared ends where they pass through their respective arms. The said cross-tie  $a^5$  is fastened near its outer end by a set-screw,  $x^2$ , to a depending arm,  $a^6$ . The lower portion of the latter is attached by a bolt and nut to a transverse block,  $a^7$ . This block is not fastened. The outer face of it extends slightly over the uprights; but the rear portion is reduced to fit snugly between them, preventing lateral motion, but leaving the block free to move vertically or to be removed with the arm  $a^6$ . It will be seen that the inclination of the breaker changes with that of the cylinder. In order to change the location of the former, the cylinder being at rest, loosen the set-screws and remove or loosen the arms  $a^3, a^6$ . The breaker will then drop to the bot-

tom of the cylinder. Then put a block or rest behind the breaker to hold it against the cylinder, and turn the latter by hand until the breaker is raised to the desired position. The arms, being changed as to inclination as the case may require, may be fastened again, also the set-screws, and the breaker will be securely held. On account of the bolt-fastening of said arms they can be changed one-eighth or one-fourth, and meet all requirements. The block  $a^7$ , having no lateral play, will maintain the angle of arm  $a^6$ . It has been found by experience that the location of the breaker as shown in the drawings is the right one for practical working, and if placed there in the first place there will never, or rarely, be any change required. When the tobacco is granulated, it passes through the meshes of the wire cylinder, and is received by a series of vibrating wire sieves below. (See Figs. 1 and 3.) These are designated as 1, 2, and 3. They are held in a frame,  $P$ , by means of cleats  $p, p'$ . The frame is suspended by steel straps  $P'$ , which cross each other and are fastened to the front of the cylinder-frame by screws and cross-straps, and are also joined to the front of the sieve-frame by being passed around rollers  $x^3$  in the metal brackets  $p'$ . The rear end of the sieve-frame has short supporting-straps  $P^2$ ; but they do not extend below the top of said frame, in order not to interfere with the sliding sieves or any suitable device which may be used to remove the tobacco from them. The sieve-frame is vibrated by an eccentric,  $R$ , on a shaft,  $r$ , by means of a connecting-rod,  $R'$ , attached to the eccentric and the bottom of said frame, the shaft  $r$  being revolved by the pulleys  $c', c$  and a belt. The first sieve is sufficiently coarse to allow the properly-granulated tobacco to pass to the second, but carrying that too coarse into any suitable receptacle at the end of the machine, to be run through again. The second sieve, being of finer mesh, allows the dust and fine tobacco to pass to the third, which is of still finer mesh. The latter sifts this fine dust into drawers  $S, S$  beneath. The granulated goods may be removed from the second sieve by any desirable means.

In making our peculiar form of breaker we do not limit ourselves to wooden blocks, as any suitable material will answer. In practice our machine is covered by an outside case with an oval top, presenting a neat box-like appearance; but we do not deem this important to show.

Having fully described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a tobacco-granulator, the tobacco-breaker composed of a number of adjacent circular and independently-moving blocks with pockets arranged at intervals in their peripheries, and each having a central hub, combined with a shaft upon which they are supported, a wire-cloth cylinder, and means for rotating said cylinder, as set forth.



2. The tobacco-breaker composed of a number of adjacent circular and independently-moving blocks having a series of pockets in their peripheries, and each having a short hub, combined with a suitable shaft upon which they are supported, means for holding and adjusting the breaker in a wire-cloth cylinder, the said cylinder, and means for rotating it, as set forth.
3. The combination of the wire-cloth cylinder with the wooden breaker, constructed substantially as described, means for holding and adjusting said breaker, subjacent sieves of different fineness, and means for holding and vibrating said sieves, as set forth.
4. The tobacco-breaker composed of a series of wooden blocks,  $o$   $o$ , having pockets  $o^3$ , hub  $o^5$ , and circular opening  $o^4$ , combined with tube  $o'$ , tie-rod  $o^2$ , arm  $a'$ , cross-tie  $a^2$ , and arm  $a^3$ , having set-screw  $x'$ , arm  $a^4$ , cross-tie  $a^5$ , the open spider-shaft  $I'$ , box  $I^2$ , arm  $a^6$ , having set-screw  $x^2$ , block  $a^7$ , the uprights  $i$   $i$ , screw  $I^3$ , and the wire-cloth cylinder  $D$ , as set forth.
5. The cylinder  $D$ , supported at its front end by the drum  $F$ , having a raised portion provided with groove  $K$ , and having its rear end

composed of an open spider,  $G$ , consisting of a flanged rim,  $G'$ , radial arms  $H$ , hub  $I$ , and its shaft,  $I'$ , combined with the sheaves  $L$   $L$ , box  $I^2$ , screw  $I^3$ , and the uprights  $i$   $i$ , as set forth.

6. The cylinder  $D$ , having the flange  $D'$ , cogged rim  $E$ , and grooved drum  $F$  cast in one piece, combined with the sheaves  $L$   $L$ , cog-wheel  $d$ , shaft  $C$ , and the pulley  $b$  thereon, as set forth.

7. The cylinder  $D$ , composed of the flange  $D'$ , cogged rim  $E$ , and grooved drum  $F$ , the wire-cloth portions  $D^2$ , and the open spider  $G$ , the whole held together by the band-iron ribs  $M$ , the wooden strips  $N$ , and the bolts and nuts  $f$   $f'$ , combined with the breaker  $O$ , the box  $I^2$ , frame-work  $i$   $i$   $i'$ , screw  $I^3$ , pulleys  $L$   $L$ , cog-wheel  $d$ , shaft  $C$ , and the pulley  $b$  thereon, all as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

LEANDER BURDICK.

WILLIAM F. COLEMAN.

Witnesses:

EUGENE W. GAGE,

R. E. RICHARDS.