

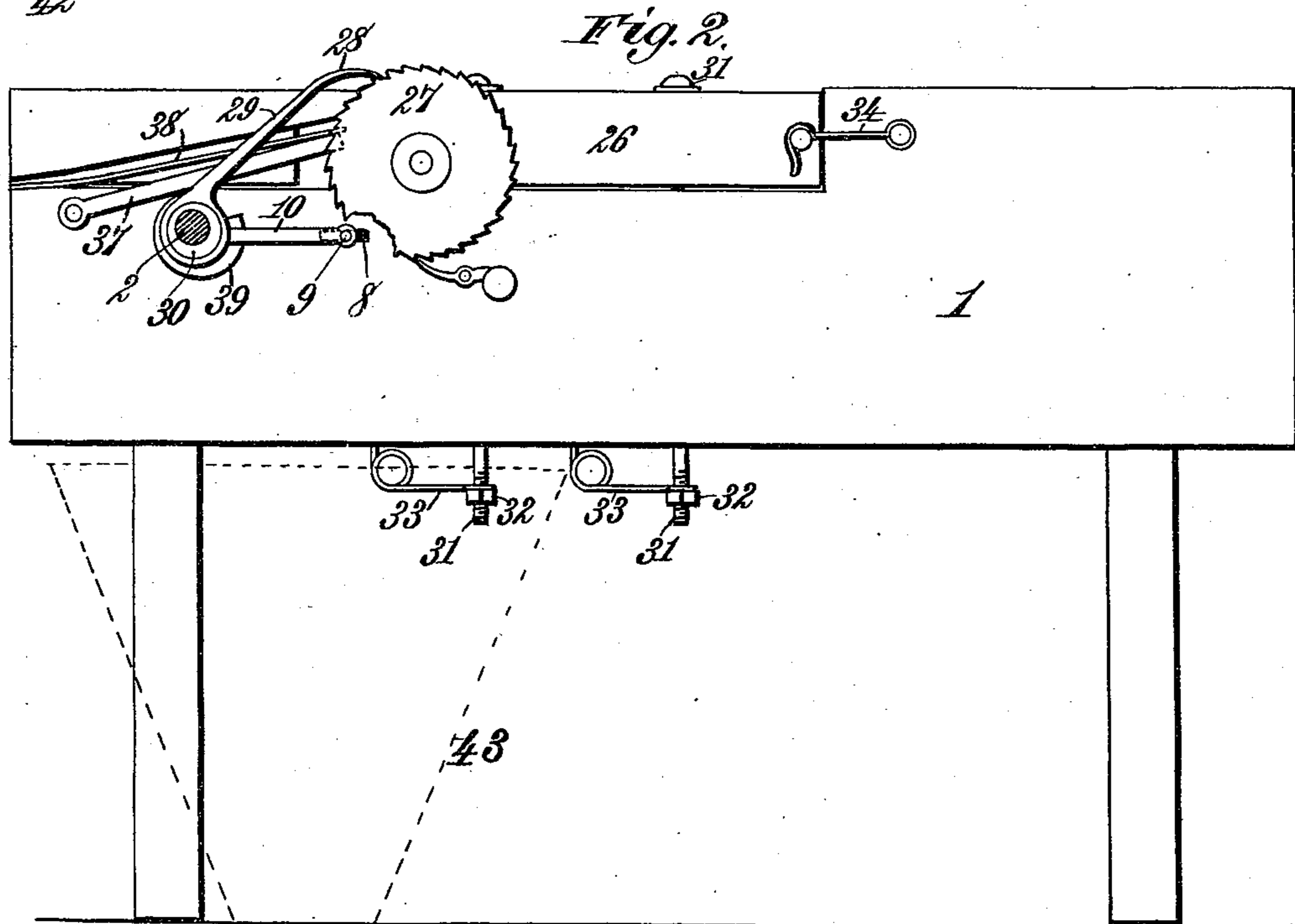
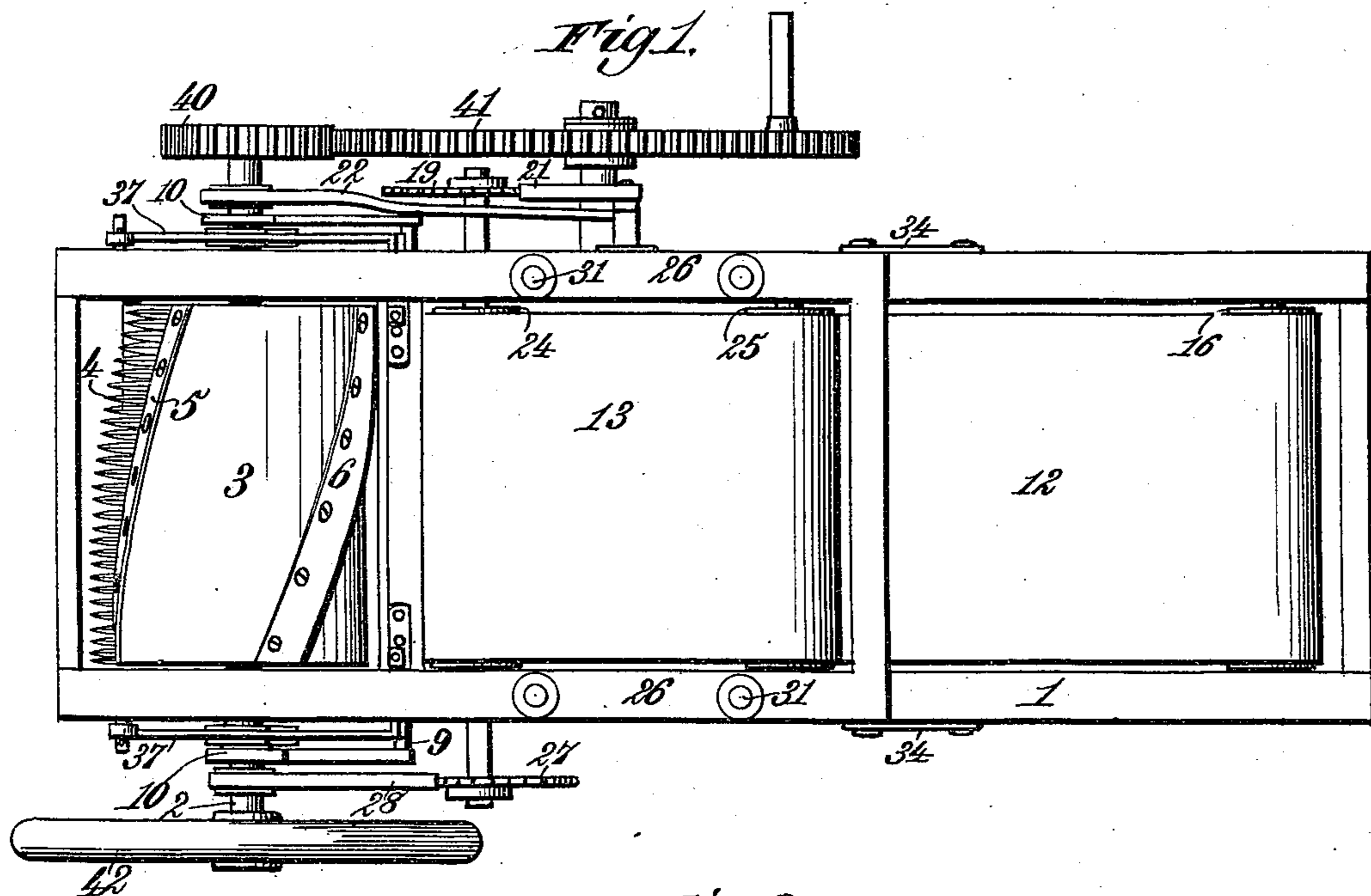
(No Model.)

3 Sheets—Sheet 1.

G. A. TURNER.  
TOBACCO GRANULATING MACHINE.

No. 546,565.

Patented Sept. 17, 1895.



Witnesses:  
Robert Everett,  
Thos. A. Green

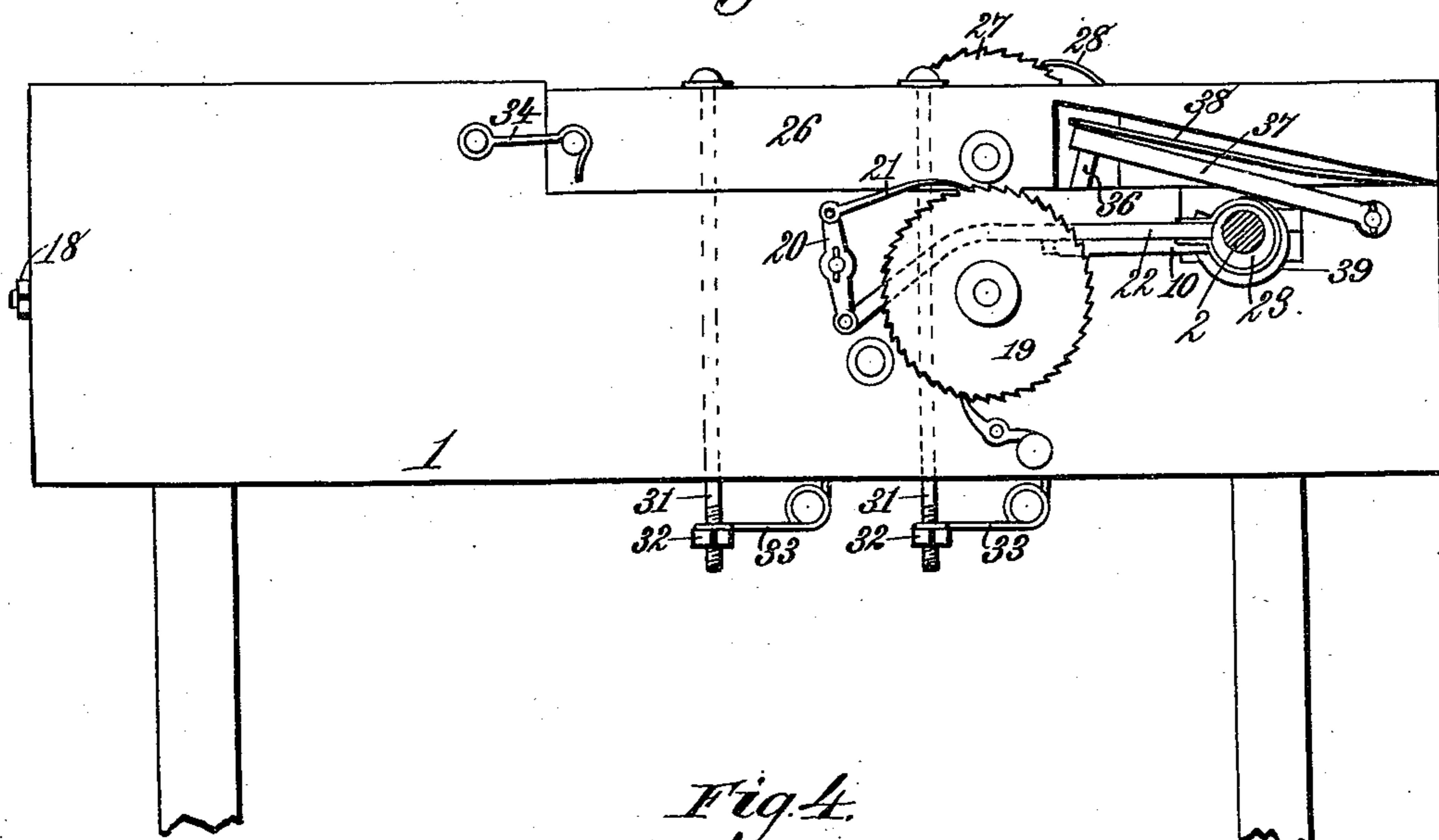
Inventor  
George A. Turner:  
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G. A. TURNER.  
TOBACCO GRANULATING MACHINE.

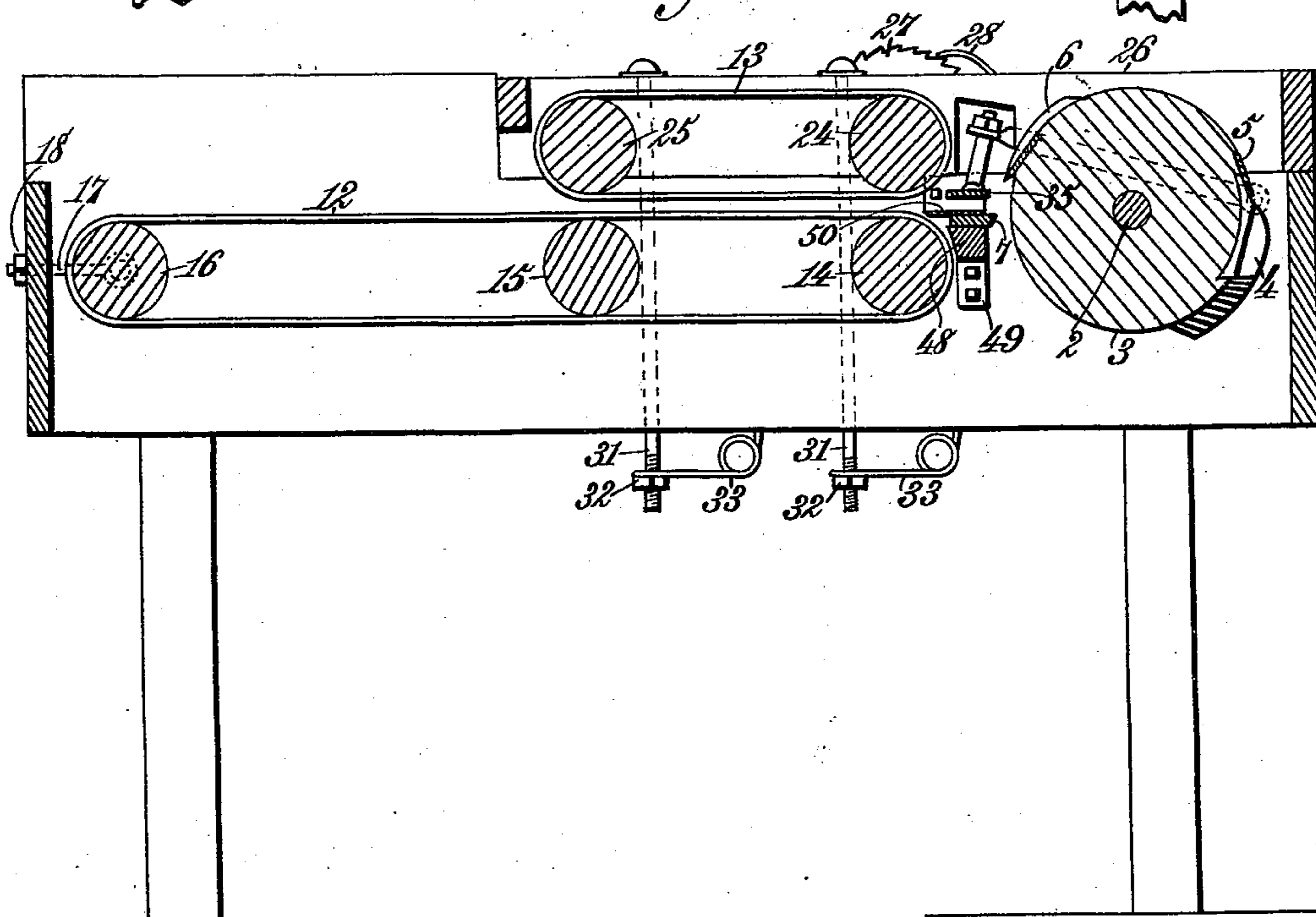
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*Fig. 3.*



*Fig. 4.*



Witnesses:  
*Robert Everett,*  
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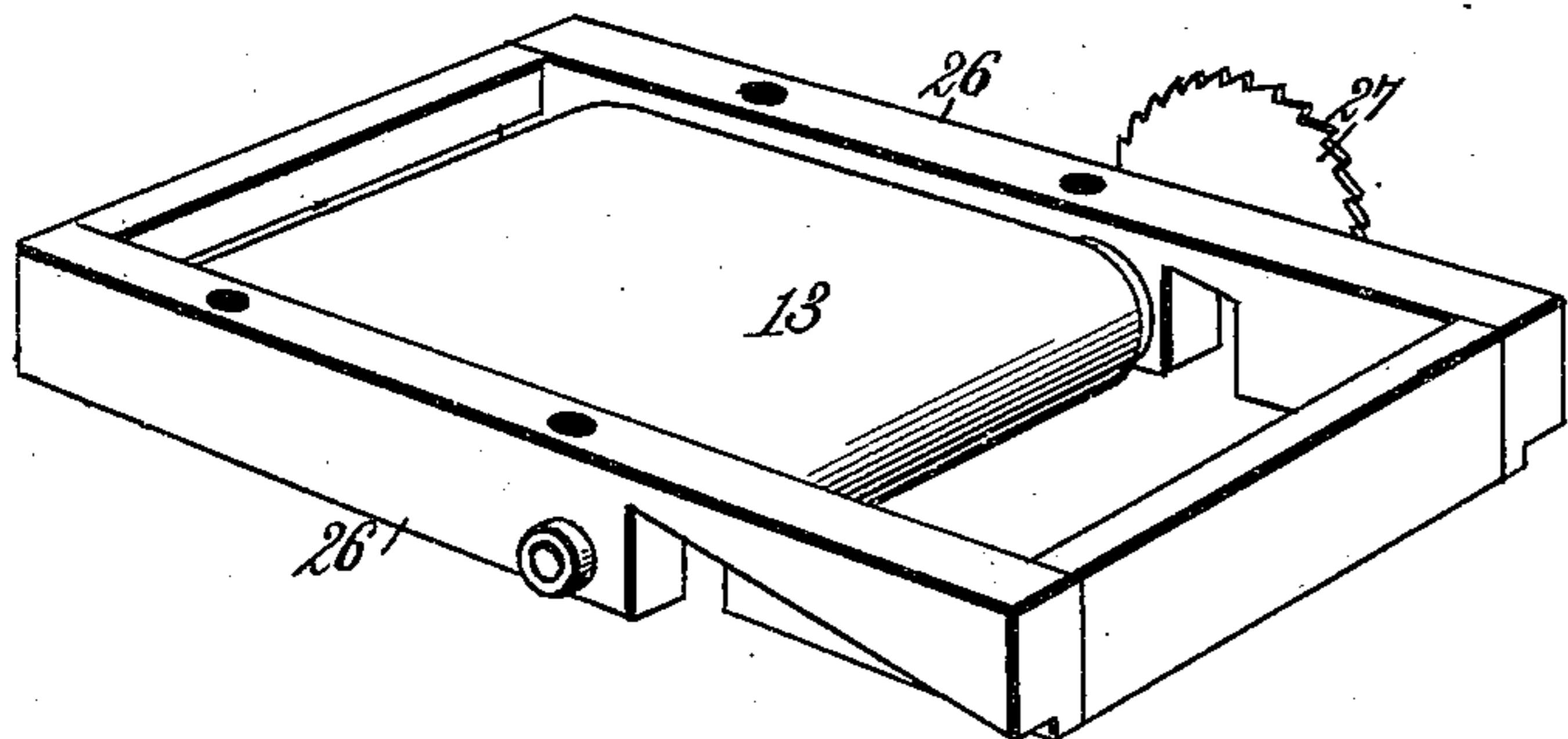
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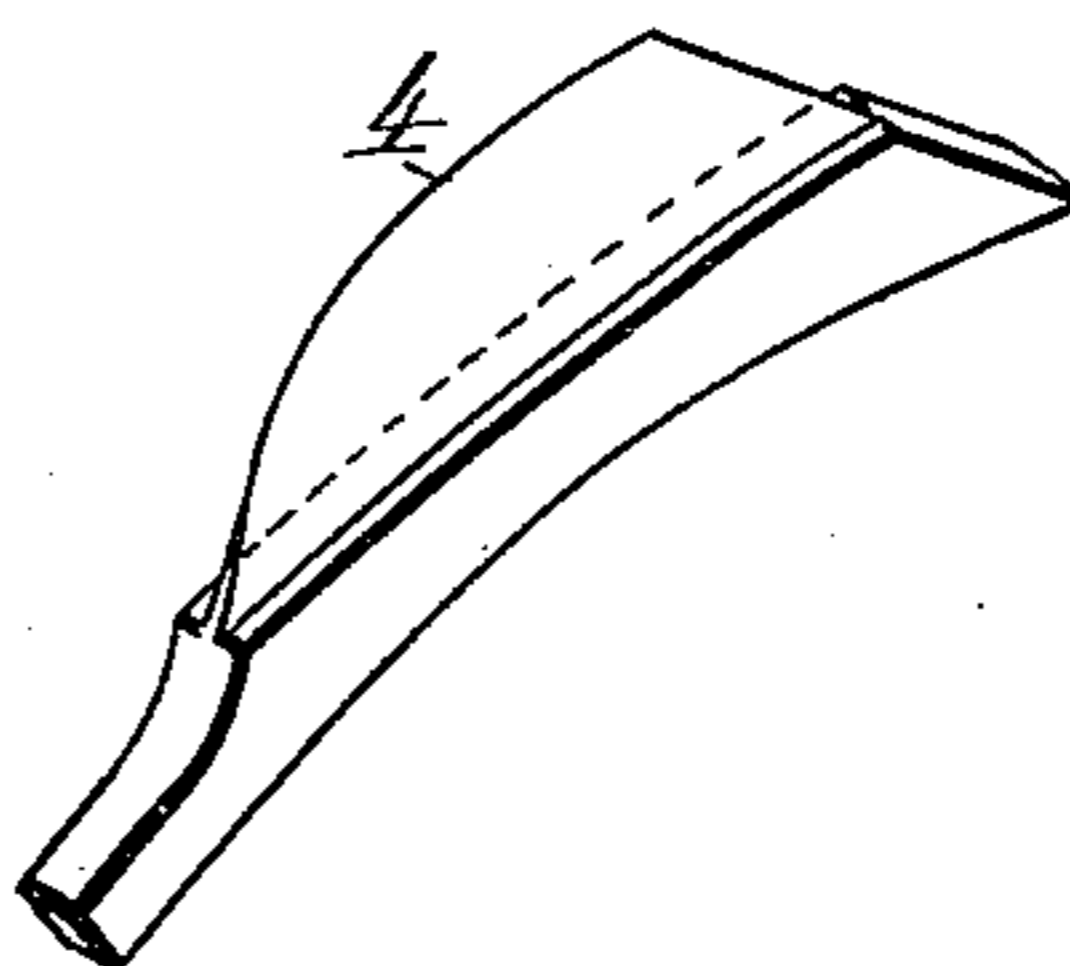
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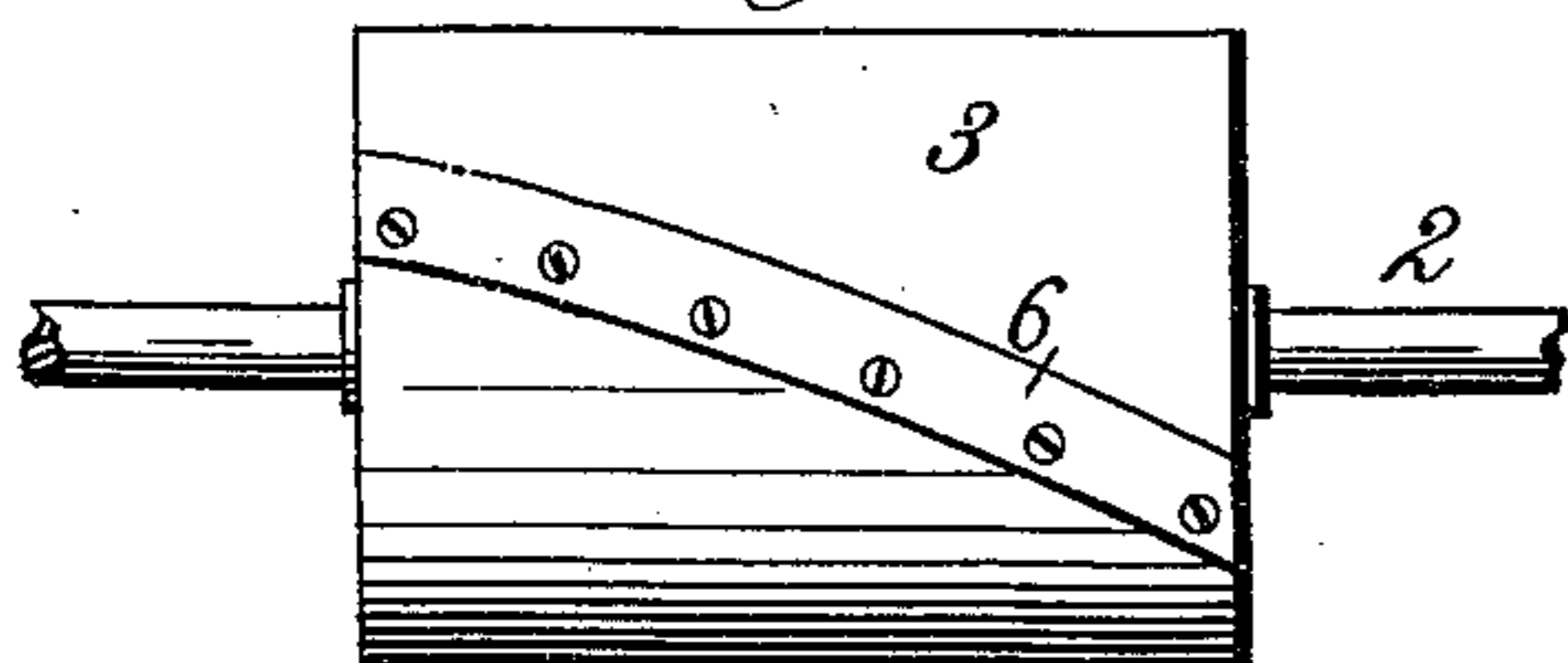
*Fig. 5.*



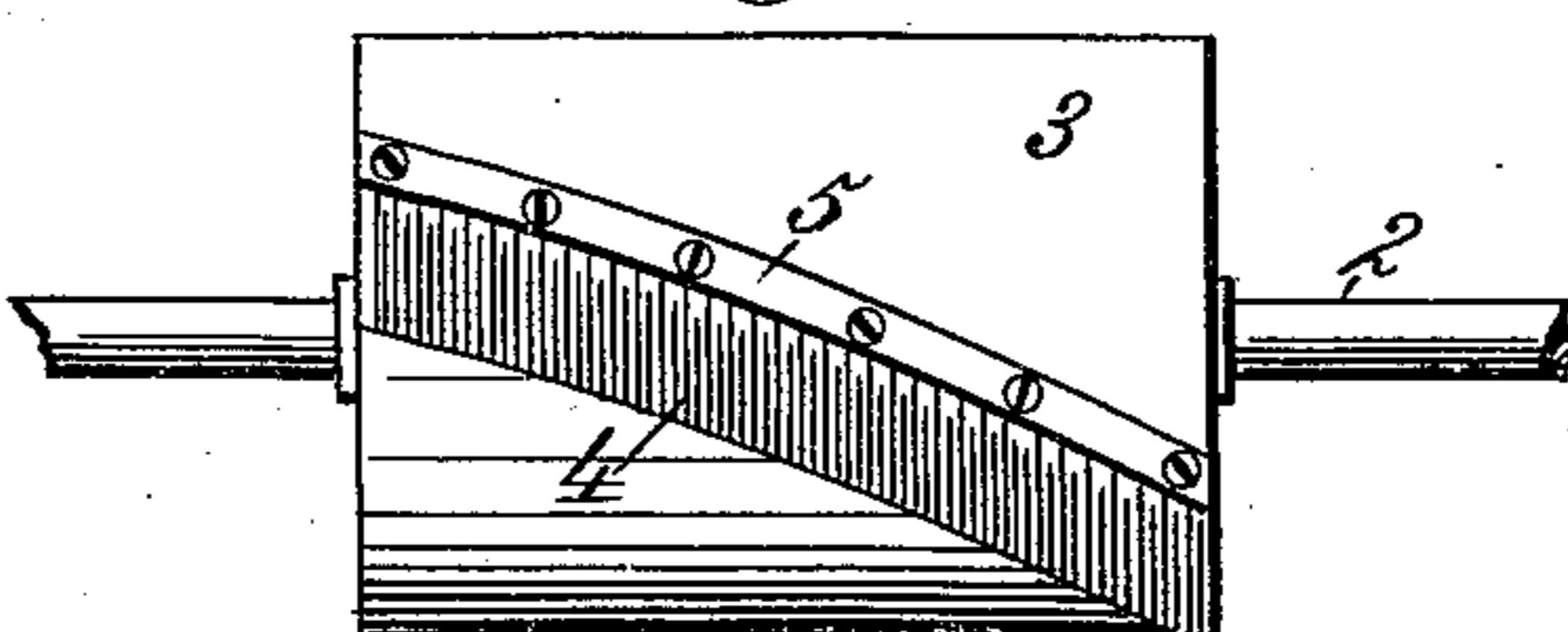
*Fig. 8.*



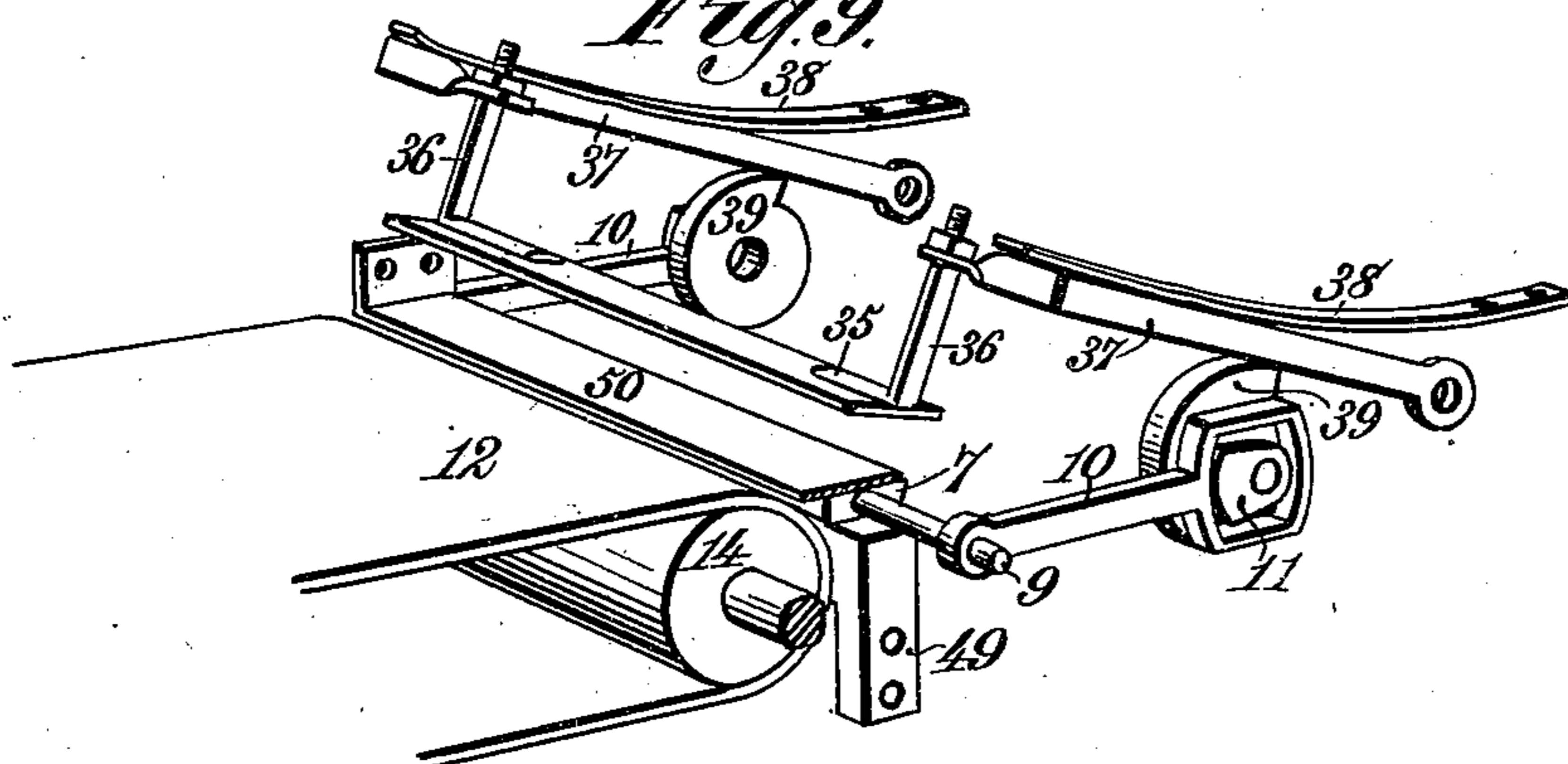
*Fig. 6.*



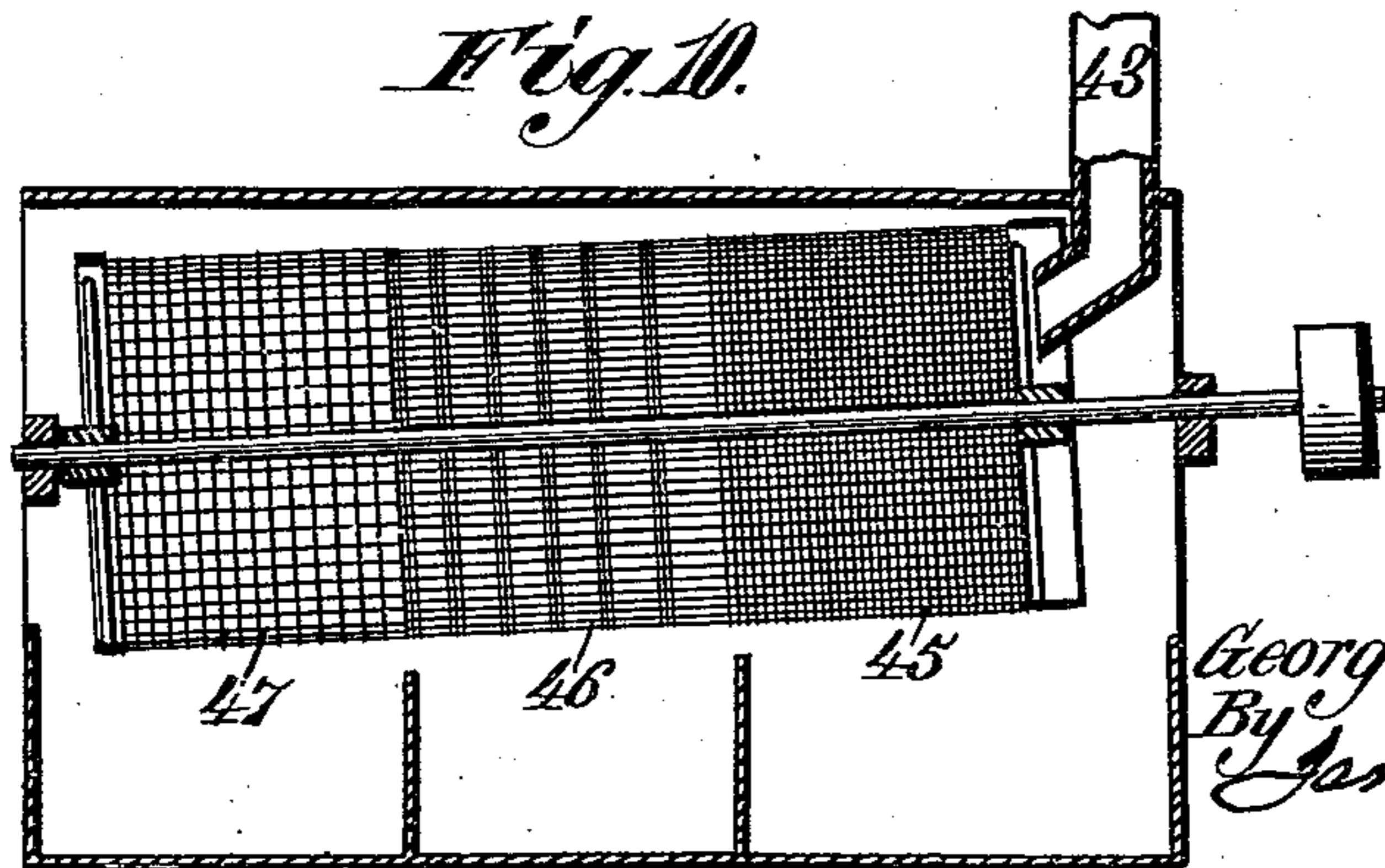
*Fig. 7.*



*Fig. 9.*



*Fig. 10.*



Witnesses,  
*Robert E. Smith,*  
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Inventor:  
*George A. Turner,*  
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*Att'y.*

# UNITED STATES PATENT OFFICE.

GEORGE A. TURNER, OF ROANOKE, VIRGINIA.

## TOBACCO-GRANULATING MACHINE.

SPECIFICATION forming part of Letters Patent No. 546,565, dated September 17, 1895.

Application filed May 18, 1895. Serial No. 549,801. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE A. TURNER, a citizen of the United States, residing at Roanoke, in the county of Roanoke and State of Virginia, have invented new and useful Improvements in Tobacco-Granulating Machines, of which the following is a specification.

My invention relates to tobacco-granulating machines, and has for its objects to improve the construction and capacity of such machines, avoid waste and loss of tobacco by enabling it to be worked more economically and with less making of dust, and to largely increase the product within a given time by reason of the greater speed with which the tobacco may be handled.

The invention consists in features of construction and novel combinations of parts in a tobacco cutting and granulating machine, as hereinafter more particularly described and claimed.

In the annexed drawings, illustrating the invention, Figure 1 is a plan of my improved tobacco-granulating machine. Figs. 2 and 3 are elevations from opposite sides. Fig. 4 is a vertical longitudinal section of the machine. Fig. 5 is a view of the detachable top frame-section. Figs. 6 and 7 are views of the cutting-cylinder and its knives. Fig. 8 is a view of one of the splitting-knives detached. Fig. 9 is a detail view of the feed and presser mechanism. Fig. 10 is a view of the rotary screen.

Referring to the drawings, the numeral 1 designates the machine-frame, in one end of which is journaled a transversely-arranged horizontal shaft 2, on which the cutting-cylinder 3 is carried. In a partly-spiral groove extended diagonally about one-fourth around this cylinder 3 and from end to end thereof is set a series of tobacco-splitters or splitting-knives 4, that are each about one inch and a half in length, say, one-eighth of an inch thick at the base or attaching portion, and for the remainder of their width they are each hollow-ground to an edge, as shown. The knives 4 are arranged parallel with each other in the partly-spiral groove or seat formed for them in the cylinder 3, and they may be detachably secured therein by any suitable means, as by a metal strip 5—screwed to the

cylinder and bearing on the ends of the knife-shanks in such manner as to hold the knives in place. The purpose of the series of splitters or knives 4 is to split into longitudinal strips the tobacco fed to the cylinder 3, as hereinafter explained. At a point about or very nearly opposite the diagonally-arranged series of splitters 4 there is secured to the cylinder 3 a diagonally-placed cutting-blade 6 for cutting the strips of tobacco transversely. The cutting-blade 6 is extended diagonally about one-fourth around the cylinder and from end to end. The cutting-edge of the blade 6 is beveled underneath, and may project beyond the face or periphery of the cylinder about one-eighth of an inch. Each splitting-knife 4 may project fully one-fourth of an inch beyond the cylinder-face.

There is arranged on the frame of the machine, in rear of and adjacent to the cylinder 3, a straight-edged cutter-bar 7 to co-act with the cutting-blade 6, that is carried by the cylinder. As the splitting-knives 4 project beyond the cylinder farther than the cutting-blade 6, it is necessary to provide for the cutter-bar 7 an automatic adjustment to and from the cylinder 3, so that at the proper intervals the said cutter-bar 7 will occupy a suitable position for joint operation with the cutting-blade 6 and at other times be moved back to permit free passage of the splitting-knives 4, that rotate with the cylinder. For this purpose the cutter-bar 7 is arranged to have a forward and back movement in guide-slots 8, provided in the sides of the machine-frame. On the ends of the cutter-bar 7 are studs 9 for connection with eccentric rods 10, actuated from eccentrics 11 on the cylinder-shaft 2 in such manner as to automatically adjust the cutter-bar 7 in proper time movements with relation to the position of the cutting mechanism carried by the rotary cylinder.

The tobacco to be split and cut or granulated is fed to the cutting mechanism by means of endless belts or aprons 12 and 13, one above and one below, between which the tobacco is caused to pass to the cutting-cylinder.

The lower feed-belt or endless apron 12 is carried on transversely-arranged rollers 14, 15, and 16, journaled in the frame 1 of the machine. One of these rollers, as 14, may be

located in rear of and slightly below the automatically-adjustable cutter-bar 7, and the said lower belt or apron 12 may be extended rearward nearly or quite the entire length of the machine. The rear roller 16 may be provided with means for adjusting the tension of the belt or apron 12, such as rods 17, attached at one end to the journal-bearings of the roller-shaft and their other ends resting in sockets formed lengthwise in the frame 1, the said rods being each threaded a sufficient distance intermediate their ends and their threaded portions engaged in screw-taps or nuts 18, loosely supported by the frame 1 in such manner that by turning said nuts the rods engaged therewith will be moved longitudinally to adjust the connected roller 16 forward or back and thereby give any required tension to the endless belt or apron. The lower belt or apron 12 is actuated from the roller 14, the shaft of which has secured to one end a ratchet-wheel 19, with its teeth disposed in such direction as to permit the application of power from the rear for causing the upper face of the lower belt 12 to be moved intermittently toward the cutting-cylinder. For this purpose there is fulcrumed to one side of the frame 1 a pawl-lever 20, carrying on its upper end a pawl 21, engaged with the upper rear portion of the ratchet-wheel 19, and the lower end of the lever 20 is connected by a rod or eccentric strap 22 with an eccentric 23 on the shaft 2 of the cutting-cylinder.

The upper endless belt or apron 13 is carried on rollers 24 and 25, journaled transversely in a removable frame-section 26, mounted on the upper portion of the main frame. When the upper frame-section 26 is in position, the forward roller 24 of the upper belt 13 will occupy position above the forward roller 14 of the lower belt 12 and the rear upper roller 25 may occupy position above the intermediate lower roller 15, with which the lower endless belt or apron 12 is preferably provided. The shaft of the front upper roller 24 has secured to one end a ratchet-wheel 27, having its teeth disposed in such direction as to be engaged by a pawl 28, carried by a lever 29, mounted on and actuated from an eccentric 30 on the shaft 2 of the cutting-cylinder in such manner as to cause an intermittent movement of the lower face of the upper endless belt or apron 13 toward said cylinder. The top frame-section 26 is detachably secured to the main frame 1 by means of four bolts 31, extended vertically through both sections of the frame, there being two bolts on each side. The upper ends of the bolts 31 are headed, and their lower ends have nuts 32 engaged therewith and arranged as bearings for strong spiral springs 33, through which the top frame-section 26 and belt 13, mounted therein, will be caused to press the tobacco down as it is fed toward the cutting mechanism. If desired, hooks or catches 34 may be arranged to engage the ends of the top section 26 with the main frame.

Above the automatically-adjustable cutter-bar 7 is arranged a presser-bar or presser-foot 35, having its ends supported by and secured to angle-bars 36, that are adjustably connected to the rearward ends of a pair of levers 37, arranged on opposite sides of the frame 1 and having their forward ends pivoted thereto. Springs 38 are mounted on the frame 1 and arranged to force the presser-bar 35 down onto the tobacco resting above the cutter-bar 7 when the latter is in its forward position. The levers 37 extend above and bear upon cams 39, carried on the shaft 2 of the cutting-cylinder 3 and arranged to act on the levers 37, so as to cause them to lift the presser-bar 35 at proper intervals.

The leaf-tobacco to be granulated is untied and spread out upon the exposed surface of the lower traveling band or apron 12 and is carried by and between the two feed-bands 12 and 13 to the cutter-bar 7 and beneath the raised presser-bar 35, which works above the top of the cutter-bar 7 and holds the tobacco down after it has been fed forward until the splitters 4 pass down through the tobacco, splitting it longitudinally one-eighth of an inch deep and, say, at intervals one-eighth of an inch apart. The cutter-bar 7 then moves forward, and the tobacco is held down thereon by the presser-bar 35 until after the cutting-blade 6 comes around and cuts off smoothly and cleanly the ends of the split tobacco in lengths of, say, one-eighth of an inch, and the tobacco being thus cut into uniform squares drops down between the cylinder 3 and cutter-bar 7 and into any suitable receptacle. The ratchet-wheels 19 and 27 may each have eighty teeth or notches one-half inch apart, and each revolution of the cylinder 3 moves the ratchet-wheels one notch. The rollers to which the ratchet-wheels are connected will be about ten inches in circumference, so that eighty cuts of one-eighth inch each will be made during each revolution of these ratchet-wheels.

Power may be applied to the cylinder-shaft 2 in any convenient or suitable manner, as by a spur-gear 40, mounted thereon and having, say, twenty teeth or cogs meshing with a larger spur-gear 41, having, say, one hundred teeth, and mounted on a spindle secured to the main frame of the machine. The gear 41 may be provided with a crank for applying hand-power, or instead of this gearing any other means may be provided for giving motion to the machine. A balance or fly-wheel 42 may be placed on one end of the cylinder-shaft.

For a large machine, adapted to granulate about ten thousand pounds of tobacco per day, the geared wheels may be replaced by a pulley placed on the cylinder-shaft 2 and belted to the band-wheel of an engine. The tobacco can with this machine be readily granulated or cut into squares of one-eighth inch while in good tough handling order and in such manner as to avoid the loss and expense of drying, with consequent conversion of a large part of

the tobacco into dust, it being possible to save at least ten per cent. of the stock, and the cutting of the tobacco into uniform squares in the manner described can be accomplished more rapidly than is usual in any similar processes for the granulation of tobacco, and no fiber or stems will be left in the granulated stock longer than one-eighth of an inch.

The diagonally-arranged series of splitting-knives 4 should project about one-fourth of an inch from the periphery of the cutting-cylinder, so as to properly split the tobacco, and in order that the cutter-bar 7 may be placed close to the cylinder 3 in position for properly holding the tobacco to the action of the diagonally-arranged transversely cutting-blade 6, and yet avoid contact with the splitting-knives 4 that travel in a larger circle than the blade 6, it is necessary to give the said cutter-bar 7 an automatic adjustment, as before explained. Just before the splitting-knives come around the feed of the tobacco takes place between the two endless traveling bands or aprons 12 and 13; then the presser-bar 35 drops onto the tobacco over the cutter-bar 7 and the latter slides backward under the action of its connected eccentric mechanism, thereby enabling the splitting-knives 4 to pass down through the tobacco without touching the cutter-bar, the presser-bar 35 meantime being still on the tobacco, holding it in its place, until the eccentric movement again brings the cutter-bar 7 to the front under the tobacco and within about one-eighth inch of the split-tobacco ends. The diagonally-arranged cutting-blade 6, carried by the cylinder 3, now comes into proper position and shaves off the projecting ends of the tobacco strips with a shear cut along the entire length of the cutter-bar 7, from which the tobacco drops, cut into square pieces one-eighth of an inch each way. The presser-bar 35 now rises to receive the feed again, and the operations described are repeated.

The cut or granulated tobacco may be received in a chute 43, leading to one of the open ends of a rotary screen-cylinder 44 placed on a lower floor of the building. The rotary screen 44 is to be open at both ends and consists of a suitable framework having its periphery composed of wire-cloth in different divisions of varying mesh. One division or section 45 of the rotary screen 44 should consist of wire in meshes of twenty-five or thirty to the square inch for separation of any fine dust mingled with the tobacco. The next section 46 should be woven with small wire three strands close together and then a space of half an inch, and so on alternately throughout the length of the section, which is filled in longitudinally with wire strands one-twentieth of an inch apart. The third and last section 47 of the rotary screen may consist of six meshes to the inch each way. In the second section 46 of the rotary wire screen the meshing is such that the granulated leaf-tobacco will pass through edgewise, while the

stems, being more bulky, are carried farther along and may escape through the last section of the screen.

In some instances it may be desirable to arrange beneath the automatically-adjustable cutter-bar 7 a solid and rigidly-supported bed-plate 48, secured by bracket-arms 49 to the inner sides of the machine-frame. There may also be secured to the machine-frame a stationary plate 50, of thin metal, arranged above the top of the movable cutter-bar 7 to prevent the tobacco from getting behind and choking the space between the lower feed-belt and said automatically-adjustable cutter-bar. A sufficient space is provided between the upper plate 50 and bed-plate 48 for the cutter-bar 7 to move automatically and with ease. The plates 48 and 50 are just outside the circuit of the splitting-knives 4, and when the splitting takes place the tobacco is resting on the top plate 50 with the cutter-bar 7 under it and on a line with the front edges of both the top plate and bed-plate. Before the cutting-blade 6 comes around the cutter-bar 7 moves forward about one-eighth of an inch, and as the said blade passes the cutter-bar the tobacco is cut off.

What I claim as my invention is—

1. In a tobacco-cutting or granulating machine, the combination with a rotary cylinder provided with a cutting blade and with a series of splitting knives moving in a larger circle than said cutting blade and projecting beyond the same, of an automatically adjustable cutter-bar supported adjacent to said cylinder for joint operation with the said cutting blade and knives, substantially as described.

2. In a tobacco-cutting or granulating machine, the combination with a rotary cylinder provided with a cutting-blade and with a series of splitting knives moving in a larger circle than said cutting-blade and projecting beyond the same, of a movable cutter-bar supported adjacent to said cylinder for joint operation with the cutting blade carried thereon, and eccentric mechanism connecting said cutter-bar with the shaft of the said cylinder to automatically move said bar to and from the cylinder and out of the path of the splitting knives, substantially as described.

3. In a tobacco-cutting or granulating machine, the combination with a rotary cylinder provided with a cutting-blade and with a series of splitting knives, of an automatically movable cutter-bar supported adjacent to the said cylinder, eccentric mechanism connecting said cutter-bar with the cylinder-shaft to automatically move the said bar out of the path of the splitting knives, a presser-bar supported above the cutter-bar, springs for holding the presser-bar down onto the tobacco on the cutter-bar, cams mounted on the cylinder shaft, and levers actuated by said cams to lift the presser-bar, substantially as described.

4. In a tobacco-cutting or granulating machine, the combination with a cylinder pro-

vided with a cutting-blade and with a series of splitting knives, an automatically adjustable cutter-bar actuated from the cylinder-shaft, and a yielding presser-bar provided with cam-actuated lifting mechanism, of two endless feed bands arranged one above the other and mounted on the rollers, ratchet-wheels secured to rollers of said feed bands, and pawl mechanism engaged with said ratchet wheels and actuated from the cylinder-shaft, substantially as described.

5. In a tobacco-cutting or granulating machine, the combination of a frame having a cutting-cylinder mounted in one end, a cutter-bar supported on said frame and automatically adjustable from the cylinder shaft, a presser-bar arranged above the cutter-bar, means for actuating said presser-bar, a lower endless feed band mounted in the main frame and actuated from the cylinder-shaft, an upper detachable frame section having an upper endless feed band mounted therein and actuated from the cylinder shaft, and spring pressed rods or bolts extended vertically through the main frame and upper frame section and adapted to cause the upper feed band to press down on the tobacco, substantially as described.

6. In a tobacco-cutting or granulating machine, the combination of a rotary cylinder provided with a cutting-blade and with a series of splitting knives moving in a larger circle than said cutting blade and projecting beyond the same, an automatically adjustable cutter-bar supported adjacent to said cylinder for joint operation with the cutting-blade and knives carried thereon, means for auto-

atically adjusting the said cutter-bar, and a stationary plate supported above said cutter-bar and outside the circuit of the splitting knives carried by the cylinder, substantially as described.

7. In a tobacco-cutting or granulating machine, the combination of a rotary cylinder provided with a cutting-blade and with a series of splitting knives, an automatically adjustable cutter-bar arranged for joint operation with the cutting-blade and knives carried on the rotary cylinder, a stationary bed-plate below said movable cutter-bar, a stationary top plate above the movable cutter-bar, said bed plate and top plate being outside the circuit of the splitting knives carried by the cylinder, and means for automatically moving the adjustable cutter-bar to and from the cylinder and out of the path of the splitting knives, substantially as described.

8. In a tobacco-cutting or granulating machine, the combination of a rotary cylinder provided with a cutting-blade and a series of splitting knives, an automatically adjustable cutter-bar for joint operation with the cutting-blade and knives, means for automatically adjusting said cutter-bar, a stationary plate above said cutter-bar, a yielding presser-bar above said plate, and the endless feed bands, substantially as described.

In testimony whereof I have hereunto set my hand and affixed my seal in presence of two subscribing witnesses.

GEORGE A. TURNER. [L. S.]

Witnesses:

JNO. H. WRIGHT,  
B. LACY HOGE.