

No. 630,344.

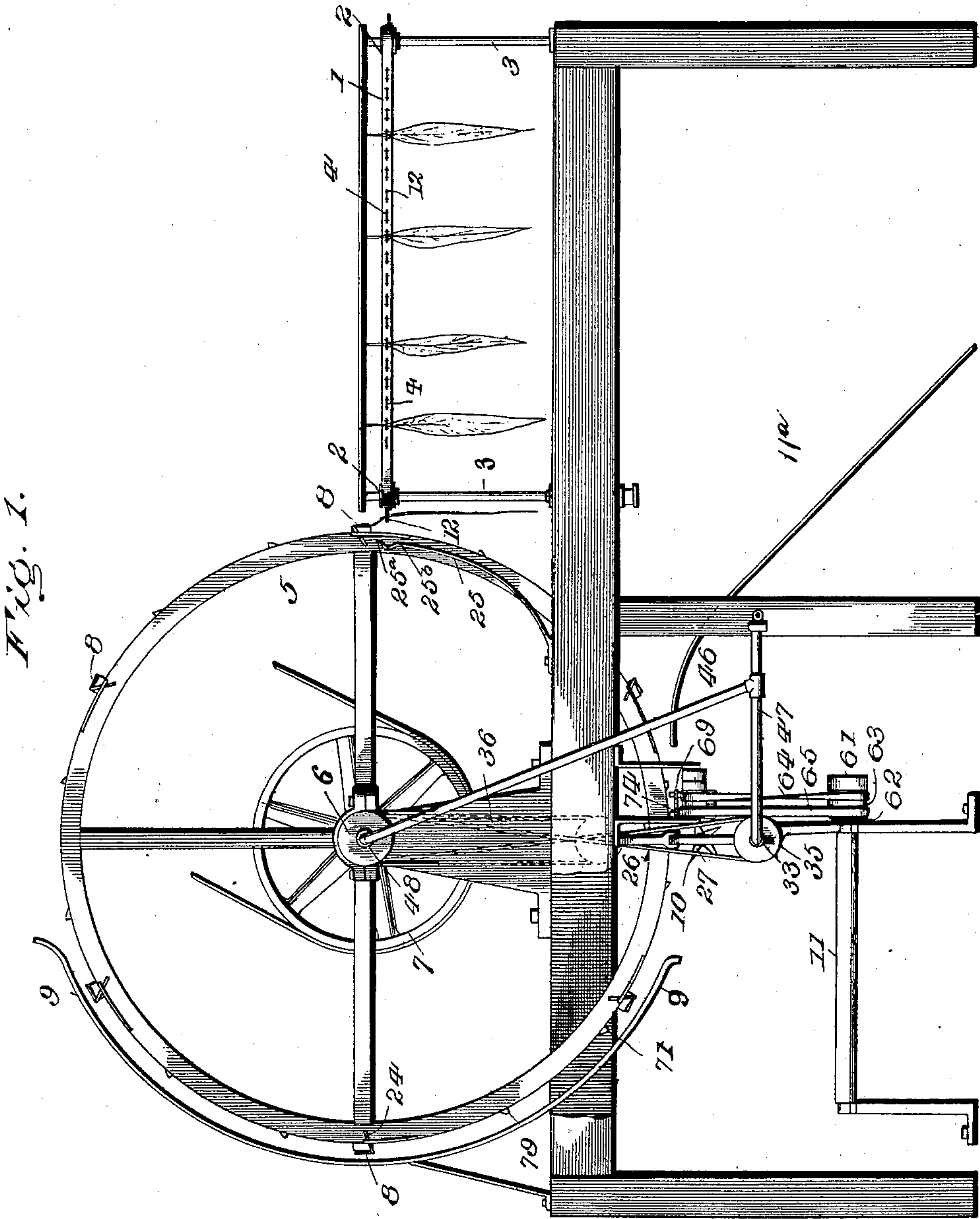
Patented Aug. 8, 1899.

G. M. GUERRANT.
TOBACCO STEMMING MACHINE.

(Application filed Oct. 14, 1897.)

No Model.)

4 Sheets—Sheet 1



Inventor

George M. Guerrant

by *Knight Bros*

Attorneys

Witnesses

J. H. Allen
Edw. H. Allen,

No. 630,344.

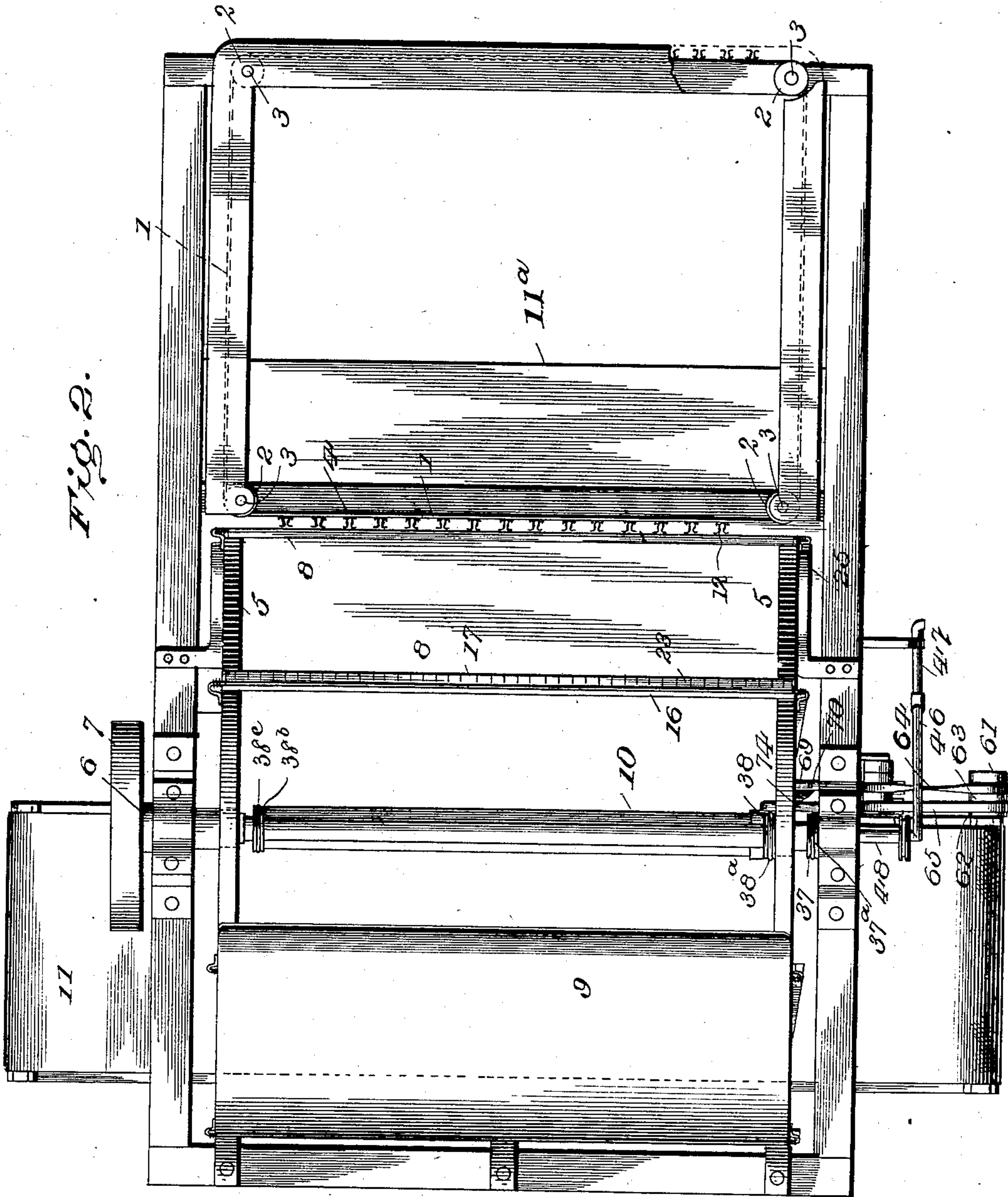
Patented Aug. 8, 1899.

G. M. GUERRANT.
TOBACCO STEMMING MACHINE.

(Application filed Oct. 14, 1897.)

(No Model.)

4 Sheets—Sheet 2.



Witnesses

John Miller
Edw. H. Allen

Inventor

George M. Guerrant

by *Knight Bros*
Attorneys

No. 630,344.

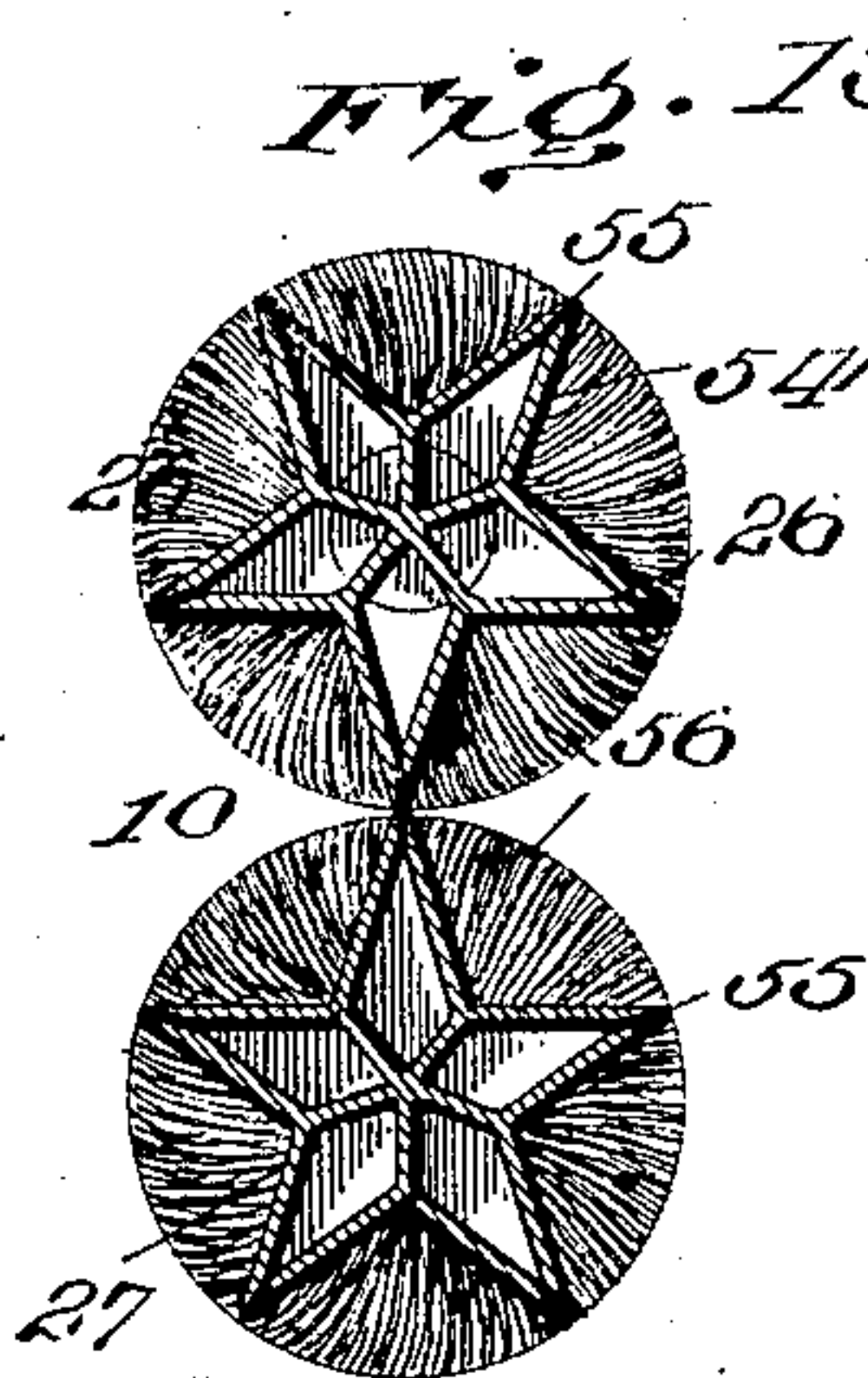
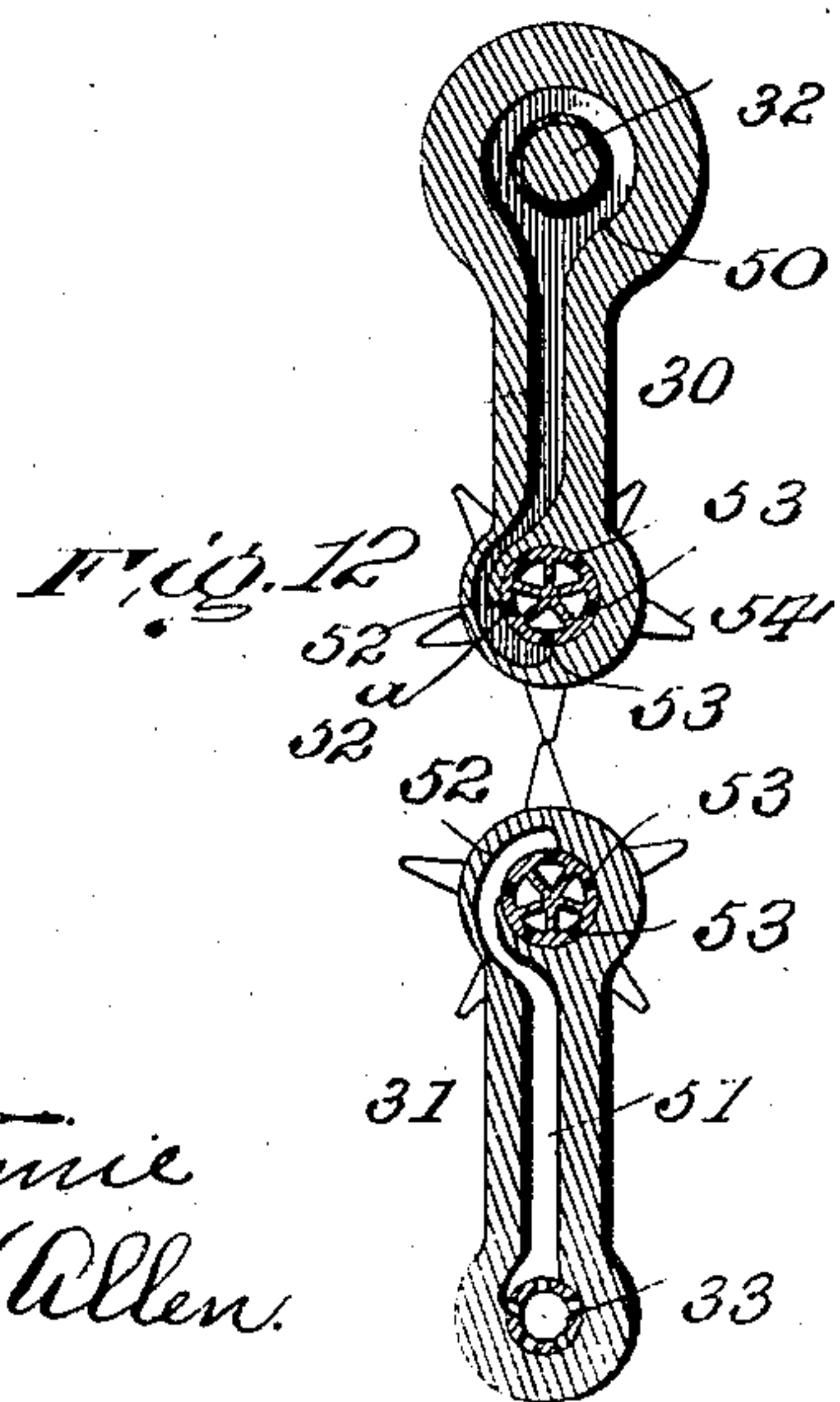
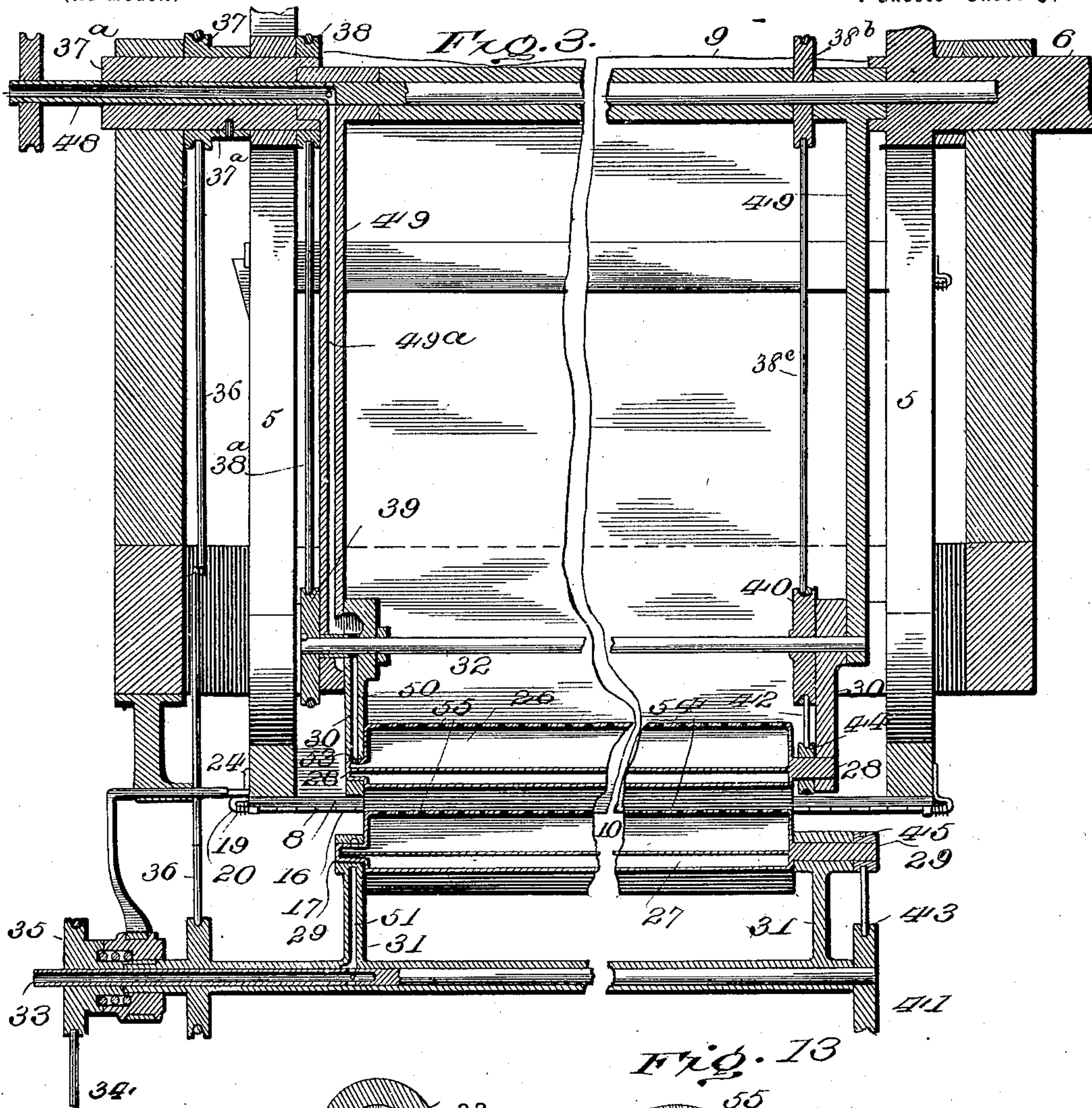
Patented Aug. 8, 1899.

G. M. GUERRANT.
TOBACCO STEMMING MACHINE.

(Application filed Oct. 14, 1897.)

(No Model.)

4 Sheets—Sheet 3.



Witnesses
J. M. Allen
Edw. K. Allen.

Inventor
George M. Guerrant
by *Amos H. H. H.*
for Attorney.

No. 630,344.

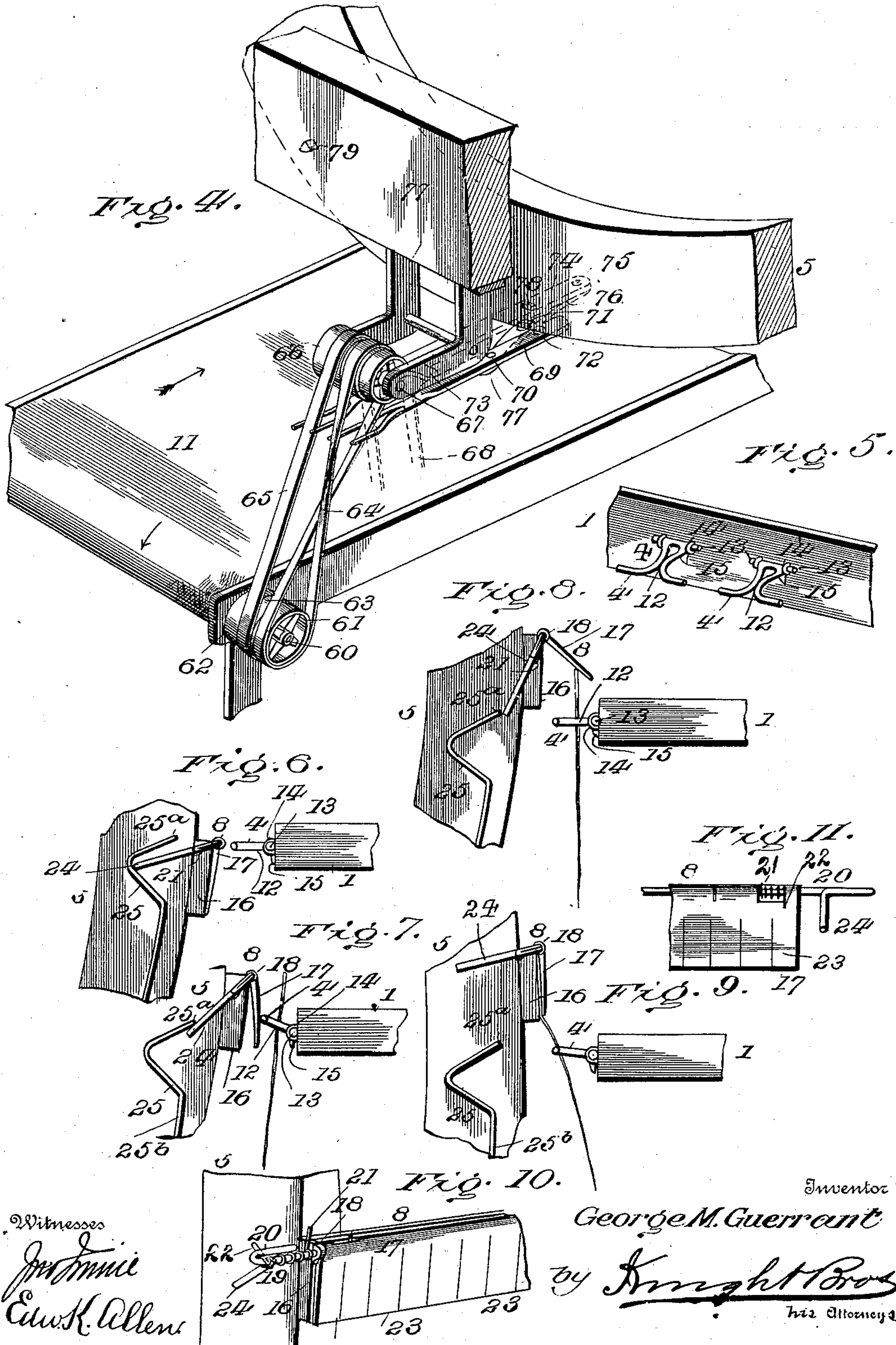
Patented Aug. 8, 1899.

G. M. GUERRANT.
TOBACCO STEMMING MACHINE.

(Application filed Oct. 14, 1897.)

(No Model.)

4 Sheets—Sheet 4.



Witnesses
James M. Allen
Edw. K. Allen

Inventor
George M. Guerrant
by *Knight Bros*
his Attorneys

UNITED STATES PATENT OFFICE.

GEORGE M. GUERRANT, OF RICHMOND, VIRGINIA.

TOBACCO-STEMMING MACHINE.

SPECIFICATION forming part of Letters Patent No. 630,344, dated August 8, 1899.

Application filed October 14, 1897. Serial No. 655,193. (No model.)

To all whom it may concern:

Be it known that I, GEORGE M. GUERRANT, a citizen of the United States, and a resident of Richmond, in the county of Henrico and State of Virginia, have invented a certain new and useful Improvement in Tobacco-Stemming Machines, of which the following is a specification.

My invention relates to a machine to which leaf-tobacco may be delivered and which will tear off and separate the blades of the leaves from their stems.

The objects of my invention are to provide a feeder or carrier to which the tobacco may be conveniently and rapidly delivered by hand and which will present the leaves in series or groups in an orderly condition to a conveyer, to provide a conveyer which will effectively and surely take the leaves in groups or series as they are presented by the feeder or carrier and pass them through a stripper, to provide a stripper which will quickly and thoroughly remove the blades from the stems, and to provide a discharger which will separate the fully-stemmed blades from those partly stemmed and deliver them at different points. Further objects are to provide certain details of construction whereby the various parts of the machine are brought together in a unitary mechanism operating effectively to accomplish the several objects recited.

The feeder or carrier is arranged horizontally, and consists of a traveling belt or band provided on its outer face with laterally-projecting leaf-holders of such construction that leaves may be made to adhere to the belt or band in pendent position and will be carried sidewise in series or groups in orderly condition and presented stems first to the conveyer.

One of the essentials of a satisfactory conveyer is that it shall not be restricted to a single point at which it may grip the stems, but as the stems pass along they should remain within reach of the conveyer-grip for sufficient time to insure their being taken up.

Another essential of a satisfactory conveyer is that it shall be adapted to take up a group or series of leaves at each gripping action, thereby greatly increasing the capacity of the machine. To insure both these advantages in the conveyer, it is provided with grips arranged transversely to the horizontal line of

travel of the belt or apron and having continuous gripping-jaws extending in such transverse direction, while the feeder or carrier is guided around a pair of vertical rollers so located as to present a section of the endless belt or band constituting the feeder equal at least to the length of the grips of the conveyer in parallel relation to said grips, so that the leaves carried by that section of the belt or band may be simultaneously gripped and so that there will be at all times within reach of the grips as they reach gripping position a full group or series of leaves to be taken. The conveyer travels constantly past the presented portion of the feeder and has a series of grips which successively embrace the stems of the series of leaves presented and pass them on to the stripper. As the feeder is constantly traveling and is timed so as to present a newly-charged section to each grip of the conveyer as it passes, it follows that each grip is fully charged without difficulty.

The stripper is so constructed that it will effectively treat each group or series of leaves as presented by the grip of the conveyer. It comprises a pair of peculiarly-clothed stripping rolls or brushes having air-blast cleaning or discharging connections which release the leaf from the brushes or rollers and keep the latter clean and avoid injury to the leaf.

As incomplete stripping results from breaking of the stems before the blades are removed, the incompletely-stripped blades are separated from the completely-stripped blades by employing a discharger which is timed to deliver in one direction during the first part of the stripping action on each group or series of leaves and to then deliver in the opposite direction during the remainder of time of each stripping action. The handling and treatment of the leaves in groups or series are especially adapted for such separation of the product. Obviously the incompletely-stripped leaves need only be again delivered to the feeder, when they will be again sent through the machine for treatment.

My invention will be fully understood upon reference to the accompanying drawings, in which—

Figure 1 is a side elevation of the complete machine. Fig. 2 is a plan of the same. Fig. 3 is a partial view showing in axial section,

on an enlarged scale, the construction of the conveyer and of the stripping device. Fig. 4 is an enlarged perspective showing the delivery-belt and the means for imparting intermittent movement thereto in opposite directions. Fig. 5 is a detail view of the leaf-holders on the belt or band of the feeder or carrier. Figs. 6, 7, 8, 9, 10, and 11 represent by detail views the construction of the grips of the conveyer and the various steps in their action. Figs. 12 and 13 are sectional views illustrating the construction of the stripping device and its brushes.

1 represents the horizontal endless belt or band of the feeder, which is caused to travel about pulleys 2 on standards 3 and is provided on its outer face with leaf-holders 4, into which leaves may be introduced by hand as the belt or band travels and by which they will be carried sidewise in pendent position. Two of the pulleys 2 are located in such position as to present a certain stretch or portion of the feeder or carrier in a tangential relation to a reel 5, which constitutes the conveyer and which is rotated on a horizontal shaft 6 through pulley 7. This reel has suitably located upon its periphery grips 8, which extend transversely to the line of feed and pass in such relation to the feeder or carrier as to close upon a series of stems coextensive with the length of the grip and withdraw them from the holders 4 and pass them in a group for simultaneous treatment by the strippers. The travel of the feeder or carrier is such that a new line of leaves will be brought into position in the interim between the passing of the respective grips, so that each grip carries a full line of leaves sidewise, the stems being presented in series.

9 is a shield which causes the leaves to lie flat upon the periphery of the conveyer until they are delivered to the stripping device 10, stems first, by which the stems are stripped, the blades being deposited upon a delivery-apron 11 of the discharger, which discharges them in one direction or another, according to whether they are fully stemmed or not, as will presently appear, after which the stems are released from the grip and pass over a chute 11^a.

The leaf-holders on the belt or band 1 may be of any suitable construction—such, for instance, as the spring-clips 12, (shown in Fig. 5,) which have trunnions 13 engaging in bearings 14, carried by the belt, and downwardly-projecting stops 15, which hold the clips in proper position to receive the leaf, but permit them to yield upwardly as the leaf is withdrawn by the grips on the reel.

The grips on the reel comprise fixed jaws 16, mounted longitudinally and coextensive with the length of the reel, spring-pressed movable jaws 17, hinged at 18 to the fixed jaws, and springs 19, coiled upon the extensions 20 of the pintles of the movable jaws and bearing at 21 against fixed points and at

22 against the movable jaws, so as to press the latter firmly against the fixed jaws 16 and hold the stems which may be introduced between the jaws.

23 represents flexible gripping-teeth formed on the jaw 17 and of such construction that each will yield slightly to the gripping action, and thereby avoid holding the jaw open by the introduction of a thick stem and taking gripping pressure off thin stems.

24 is an extension on the pintle 20 which is adapted to engage a cam 25 on some fixed point and so shaped at 25^b that it will open the jaw 17 as the grip approaches the belt 1 to drop the stripped stems and having the salient point 25^a, which insures the full opening of the jaw 17, as illustrated in Figs. 7 and 8, when said jaw has sprung past the projecting ends of the stems and then permits said jaw to close upon said stems and draw the leaves from the leaf-holders 4.

The stripping device consists of a pair of peculiarly-constructed brushes 26 27, Figs. 1, 3, 12, and 13, rotating upon journals 28 29, supported in upper and lower hangers 30 31, which are in turn mounted to swing about the shafts 32 33. The shaft 33 receives rotation from a belt 34, working over a pulley 35 upon said shaft, and this movement is transmitted through a crossed belt 36 to a pulley 37 on a short shaft 37^a, from which rotary movement is in turn imparted through pulley 38 and belt 38^a to a pulley 39 on the shaft 32. The effect of these connections is to impart simultaneous and equal rotary movement to the shafts 32 33, so that the brushes 26 27 carried thereby will slowly and continuously in one direction swing about said shafts, separating to permit passage of grips 8 between them and intermittently coming together upon the leaves immediately behind the grips at the periphery of the reel, where stripping is to take place. The movements are timed so that the brushes 26 27 come together immediately after the passing of each of the grips 8, so that they do not interfere with the passing of said grips, but will close upon the leaves and effect the stripping as soon as the grips have passed through, and their travel about their shafts is slow enough to permit them to remain ample time together to effect stripping. To impart rapid rotary movement to the brushes on their journals, the shafts 32 33 are provided with large pulleys 40 41, which are respectively connected by belts 42 43 to small pulleys 44 45 on the journals 28 29, and 38^b is a pulley connected with the large pulley 40 by means of a belt 38^c. By these means a rapid rotary movement is imparted to the brushes 26 sufficient to strip the blades from the stems in the short period during which the brushes are together.

In order to supply a clearing air-blast to the brushes 26 27 for the purpose of disengaging the leaves from them and keeping them

clean, a pipe 46 communicates through a hollow shaft 48, passage 49^a in one of the hangers 49, and passage 50 in one of the hangers 30 to the tubular brush-journal 28 of the upper brush, and a pipe 47 communicates through tubular shaft 33 and passage 51 in one of the hangers 31 to the tubular journal 29 of the lower brush. By maintaining air-pressure in the pipes 46 47 from any suitable source an air-blast may be induced in the brushes. Each of the passages 50 51 in the hangers 30 31 is provided with a segmental extension 52, (see Fig. 12,) and the journals of the brushes have independent ports 53, which are brought successively into communication with the extensions 52 during rotation of the brushes on their individual axes and communicate with the respective rows of radial hollow spurs 54. The locations of the segmental extensions 52 and ports 53 are such that the air-blast only passes through the spurs as they recede from the blades of the leaf and after they have performed their duty, so that adhesion of the blades to the bristles any longer than is required for each successive portion of the brushes to perform their function is avoided. The hollow spurs are represented at 54 in Fig. 13 and their ports at 55. They are preferably of rubber or some other flexible or yielding substance. It will be seen that the ports are on the forward faces of the spurs adjacent to their points. This feature of the air-blast is particularly desirable if bristles or card-clothing be employed in addition to the spurs, as represented at 56 in Fig. 13. The air-blast then becomes a positive means for disengaging the blades from the bristles or card-clothing and renders tearing or puncturing impossible.

I desire it to be understood that while I have shown and described these details of construction in an air-blast apparatus my invention is by no means limited in scope to the employment of the particular means described.

The means for operating the delivery-apron 11 alternately in opposite directions will be best understood from Fig. 4, wherein 60 represents one of the shafts over which the delivery-apron 11 travels. 61 62 are idle pulleys mounted on said shaft, and 63 is a fast pulley between the idlers. 64 65 represent belts which may be alternately shifted from the respective idlers to the fast pulley 63, which belts are driven by a pulley 66, which is in turn rotated by a belt 68, driven from any suitable source of power. The belt 64 is crossed, so that it will impart rotation to the pulley 63, and consequently movement to the apron 11, in a direction opposite to that imparted by the belt 65. 69 is a belt-shifter fulcrumed at 70, and 71 is a lug on the reel 5 in position to engage a projection 72 on the belt-shifter 69 and throw the same in a direction which will shift the crossed belt 64 upon the pulley 63. At the same time said belt-

shifter 69 engages a projection 73 on the belt-shifter 74 and runs the straight belt 65 off the pulley 63 and onto the idler 62. With the belts in these positions the apron 11 will run in the direction of the featherless arrow. The belt-shifter 74 is fulcrumed at 75 at its outer end upon an extension 76 of the bracket 77 and has a projection 78 in the path of a lug 79 on the reel 5, so that after the apron 11 has run a short time in the direction of the featherless arrow the belts are again shifted, so that belt 65 will be running on the fast pulley 63 and the crossed belt 64 will be shifted to the idler 61, and the apron will then travel in the direction of the feathered arrow. The lugs 71 79 are so located and spaced apart that the former engages the belt-shifter 69 at about the same time when the stripping action commences and causes the apron 11 to run in such a direction as to deliver out of the machine any leaves which break off and fall before they have become completely stemmed, while lug 79 follows at the proper time to shift the belts in the opposite direction as soon as the leaves have become properly stemmed, so as to run the apron 11 in the direction of the feathered arrow and deliver all blades that fall after that time in the opposite direction. It will be understood that the one pair of lugs 71 79 is located in the proper relation to each grip on the reel to repeat the action of the delivery-apron each time a line of leaves passes through the stripping device.

While I have described in detail the means for setting up the periodic reverse movements of the apron 11, I desire it understood that my invention is not limited to the particular means described, but consists, broadly, in separating unstemmed from stemmed leaves by means of an apron driven alternately in opposite directions during the stripping action.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. A tobacco-stemming machine comprising a stripper, a conveyer provided with a series of grips, each grip consisting of a pair of jaws, extending transversely to the line of feed, and adapted to grip from above and hold by their stems, a group, or series, of leaves beneath them, a feeder, or carrier, having an endless belt arranged horizontally, edge up, and provided with laterally-extending leaf-holders, and vertical guide-rollers, on which the belt is mounted, so as to carry the belt, with the leaves sidewise, stems up, and present a portion of the length of the belt to the jaws; substantially as described.

2. A tobacco-stemming machine comprising a stripper, a conveyer, for presenting the leaves to the stripper, having a series of grips, each grip consisting of a pair of jaws, extending transversely to the line of feed, a feeder, or carrier, having an endless belt, arranged

horizontally, edge up, and provided with laterally-extending leaf-holders, vertical pulleys, around which the said belt passes, so as to carry the belt with the leaves sidewise, stems up, and present a portion of the length of the belt with a group or series of leaves to the jaws, and additional vertical pulleys for extending the other portion of the belt in position to receive the leaves; substantially as described.

3. A tobacco-stemming machine comprising a stripper, a conveyer, consisting of a horizontal reel for presenting the tobacco-leaves to the stripper, grips, each grip consisting of a pair of jaws, and mounted on the said reel, a feeder, or carrier, having an endless belt arranged horizontally, edge up, and laterally-extending leaf-holders, and vertical pulleys around which the belt is carried to present a portion of the length of the belt with a pendent group, or series, of leaves, to the jaws in tangential relation to the periphery of the conveyer; substantially as described.

4. A tobacco-stemming machine comprising a suitable stripper, a reel for presenting the tobacco-leaves to the stripper, and grips, having fixed and movable jaws, extending longitudinally upon the periphery of the reel at suitable distances apart, and adapted to grip a series, or group of leaves; substantially as described.

5. A tobacco-stemming machine comprising a suitable stripping device, a reel for presenting the tobacco-leaves to the stripping device, grips mounted longitudinally upon the periphery of the reel at suitable distances apart and consisting of fixed jaws and movable jaws, and a cam on a fixed part of the machine for operating the movable jaws; substantially as described.

6. A tobacco-stemming machine comprising a suitable stripping device, a horizontal reel for presenting the tobacco-leaves to the stripping device, grips, each grip consisting of a pair of jaws mounted longitudinally upon the periphery of the reel and extending in a direction transverse to the line of feed, so as to embrace a series of leaves simultaneously, a feeder, or carrier, having an endless belt arranged horizontally, edge up, vertical pulleys which present a portion of the length of the belt coextensive with the length of the grips, in tangential relation to said grips, and leaf-holders located on the belt into which leaves may be inserted, and carried sidewise, stems up, and from which said leaves are taken in a group, or series, by the grips; substantially as described.

7. A tobacco-stemming machine comprising a rotary conveyer, having grips, each grip consisting of a pair of jaws, adapted to take up a group, or series, of leaves, simultaneously, and a feed-belt arranged horizontally, edge up, and having means for holding the leaves, and carrying them sidewise, stems up, in a pendent position and having a portion of

its line of travel approximately tangential to the conveyer for the length of the grip on said conveyer; substantially as described.

8. A tobacco-stemming machine comprising a conveyer, having grips, each grip consisting of a pair of jaws, extending transversely to the line of feed, and constructed to grip, simultaneously, a group, or series, of leaves, and an endless feeder, having a belt arranged horizontally, edge up, provided with leaf-holders, mounted to travel repeatedly, past the conveyer, and carry the leaves sidewise, stems up, in a direction parallel to its grips at the point of meeting; substantially as described.

9. A tobacco-stemming machine comprising a suitable stripper, a rotary conveyer, having grips, each grip consisting of a pair of jaws extending transversely to the line of feed, and constructed to engage simultaneously, a series, or group, of leaves, an endless feeder having a belt arranged horizontally, edge up, provided with leaf-holders supporting the leaves in pendent position, and having a portion of its length presented to the conveyer opposite its horizontal diameter, and carrying the leaves sidewise, stems up, in a direction parallel with its grips, whereby said grips embrace the stems of a group of leaves and take them endwise from the feeder, and a shield over a portion of the conveyer beneath which the leaves are carried for holding them in position and presenting them longitudinally to the stripper; substantially as described.

10. A tobacco-stemming machine comprising a stripper, a conveyer for presenting the leaves to the stripper, a grip mounted on the conveyer and consisting of a fixed jaw and a spring-pressed movable jaw, a cam mounted on a fixed part, and engaging the movable jaw to open it, and means for presenting tobacco-leaves in position to be taken up by the grips when the movable jaw closes; substantially as described.

11. A tobacco-stemming machine comprising a suitable stripper, a conveyer for presenting the tobacco-leaves to the stripper, and grips mounted on the conveyer and consisting of fixed jaws and spring-pressed movable jaws; the spring-pressed movable jaws being formed with a number of yielding teeth to compensate for difference in the thickness of the leaf-stems; substantially as described.

12. A tobacco-stemming machine comprising a stripper, a conveyer for presenting tobacco-leaves to the stripper, a grip mounted on the conveyer, consisting of a fixed jaw and a spring-pressed movable jaw, means for presenting the tobacco-leaves to the grip, and a cam located beyond the stripper, which opens the movable jaw to discharge the stripped stems; substantially as described.

13. A tobacco-stemming machine comprising a stripper, a conveyer for carrying the leaves to the stripper, a grip mounted on the

conveyer, consisting of fixed and movable jaws, and a cam located beyond the stripper, engaging the movable jaw and formed to open the same after the stems have passed through the stripper so as to discharge said stems and to permit them to close the same upon the stems of succeeding leaves as they are presented to it; substantially as described.

14. A tobacco-stemming machine comprising a stripper, consisting of a pair of cooperating brushes, a conveyer for presenting tobacco-leaves to the stripper, a grip mounted on the conveyer for holding the leaves, mountings for the brushes which permit them to move apart, and means for separating the brushes to permit the passage of the grips between them and closing said brushes upon the leaves behind said grips to perform said stripping function; substantially as described.

15. A tobacco-stemming machine comprising a conveyer having a grip for holding the stems of the tobacco-leaves and a stripper to which the leaves are presented by said grips and which consists of a pair of cooperating brushes between which the grips pass, hangers in which said brushes are mounted, and shafts about which the hangers are swung to separate the brushes for the passage of the grips and bring them together upon the leaves behind the grips; substantially as described.

16. A tobacco-stemming machine comprising a conveyer having grips, a pair of stripper-brushes, and an air-blast discharging through said brushes for disengaging the leaves therefrom; substantially as described.

17. A tobacco-stemming machine comprising a conveyer having grips, a pair of rotary stripping-brushes and means for discharging an air-blast through the brushes; substantially as described.

18. A tobacco-stemming machine comprising a conveyer having grips, rotary stripping members, each member constructed with an air-chamber and with peripheral air-ports, and a mounting for said stripping member having an air-passage communicating with the said chamber; substantially as described.

19. A tobacco-stemming machine comprising a conveyer having grips, rotary stripping-brushes, each brush having hollow projecting spurs formed with air-ports therein, and constructed for connection with means for discharging air through said spurs; substantially as described.

20. A tobacco-stemming machine comprising a conveyer having grips, rotary brushes, each brush having bristles, or card-clothing and means for discharging an air-blast in the direction away from the brushes; substantially as described.

21. A tobacco-stemming machine comprising a conveyer having grips, stripping-brushes, each brush provided with suitable bristles, or card-clothing, and hollow flexible or yielding spurs with air-ports therein; substantially as described.

22. A tobacco-stemming machine comprising a rotary brush, means for discharging an air-blast through the brush, rotary ports introduced in the air-passage timed relatively to rotation of the brush, and means for limiting the air-blast to that part of the brush which is receding from the stripping-point; substantially as described.

23. A tobacco-stemming machine comprising a rotary brush constructed with peripheral discharge-ports, an inner air-chamber divided into radial sections communicating with the respective ports, a hollow journal communicating with said chamber, and a mounting for the journal of said brush, formed with an air-passage through which air-pressure is communicated; said passage in the mounting being extended partly around the journal, said journal being provided with ports communicating with the respective radial sections of the air-chamber in the brush to successively receive air-pressure as the brush rotates, whereby the blast is confined to certain parts of the brush; substantially as described.

24. A tobacco-stemming machine comprising a conveyer having grips, brushes, each brush having a tubular shaft upon which the brush is mounted, ports in the brush communicating with said shaft, and a mounting for the brush having an air-passage in it and adapted to receive an air-supply from a suitable source; substantially as described.

25. A tobacco-stemming machine comprising a suitable stripper, a delivery-apron upon which stemmed leaves are dropped, and means for imparting movement to the apron alternately in different directions during the stripping movement; substantially as described.

26. A tobacco-stemming machine comprising a suitable stripper, a conveyer for presenting the leaves to the stripper, a delivery-apron which receives the blades or leaves removed by the stripping device, and means for imparting movement to the delivery-apron alternately in different directions, which means is timed relatively to the conveyer so as to discharge the leaves falling prematurely, in one direction and then changing its movement to discharge the fully-treated leaves in the other direction; substantially as described.

27. A tobacco-stemming machine comprising a stripper, a conveyer for presenting the tobacco to the said stripper device, a delivery-apron for receiving leaves or blades from said stripping device, reversely-running belts for driving said delivery-apron, belt-shifters for bringing said belts alternately into action, and projections on a moving part of the machine for operating said belt-shifters successively; substantially as described.

28. A tobacco-stemming machine comprising a stripper, and an alternating discharger for delivering to different points during the first and latter portions of the stripping action; substantially as described.

29. A tobacco-stemming machine comprising a stripper treating a group or series of leaves simultaneously and an alternating dis-
5 charger for separating partially from fully-stemmed leaves; substantially as described.

30. A tobacco-stemming machine comprising a stripper, a conveyer presenting leaves to said stripper periodically and in groups

and a discharger delivering alternately at different points during stripping action; substantially as described. 10

GEO. M. GUERRANT.

Witnesses:

E. A. CATLIN,
C. C. CHAPIN.