

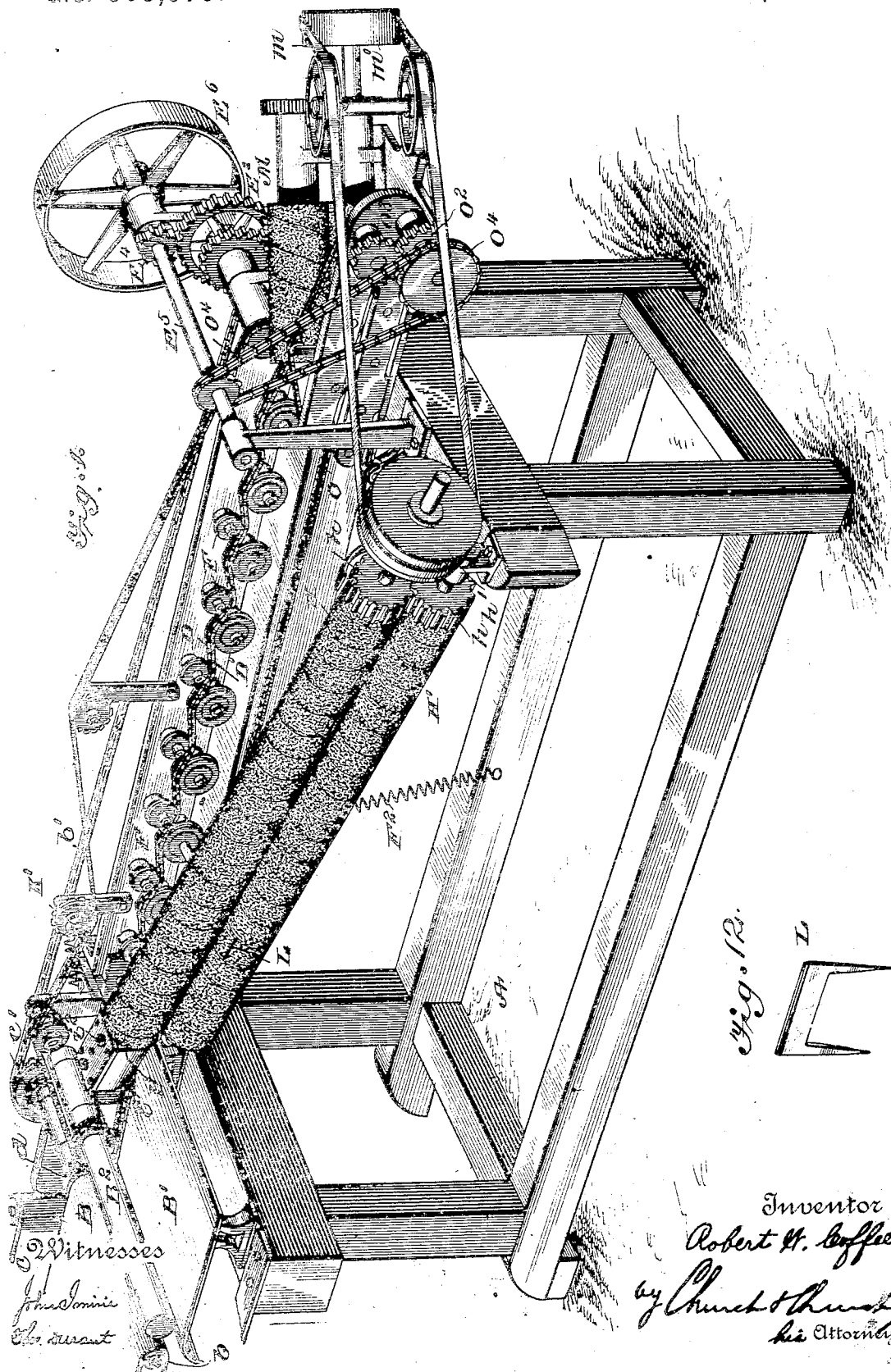
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3 Sheets—Sheet 1.

R. W. COFFEE.
TOBACCO LEAF STEMMING MACHINE.

No. 569,575.

Patented Oct. 13, 1896.



Witnesses
J. Church & Son
Attorneys

Inventor
Robert W. Coffee
by J. Church & Son
Attorneys

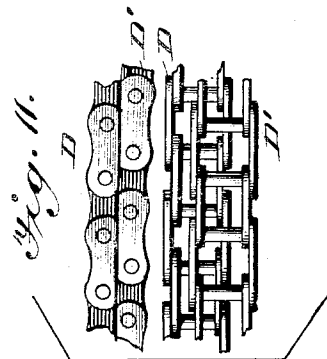
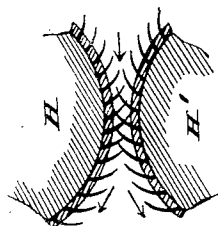
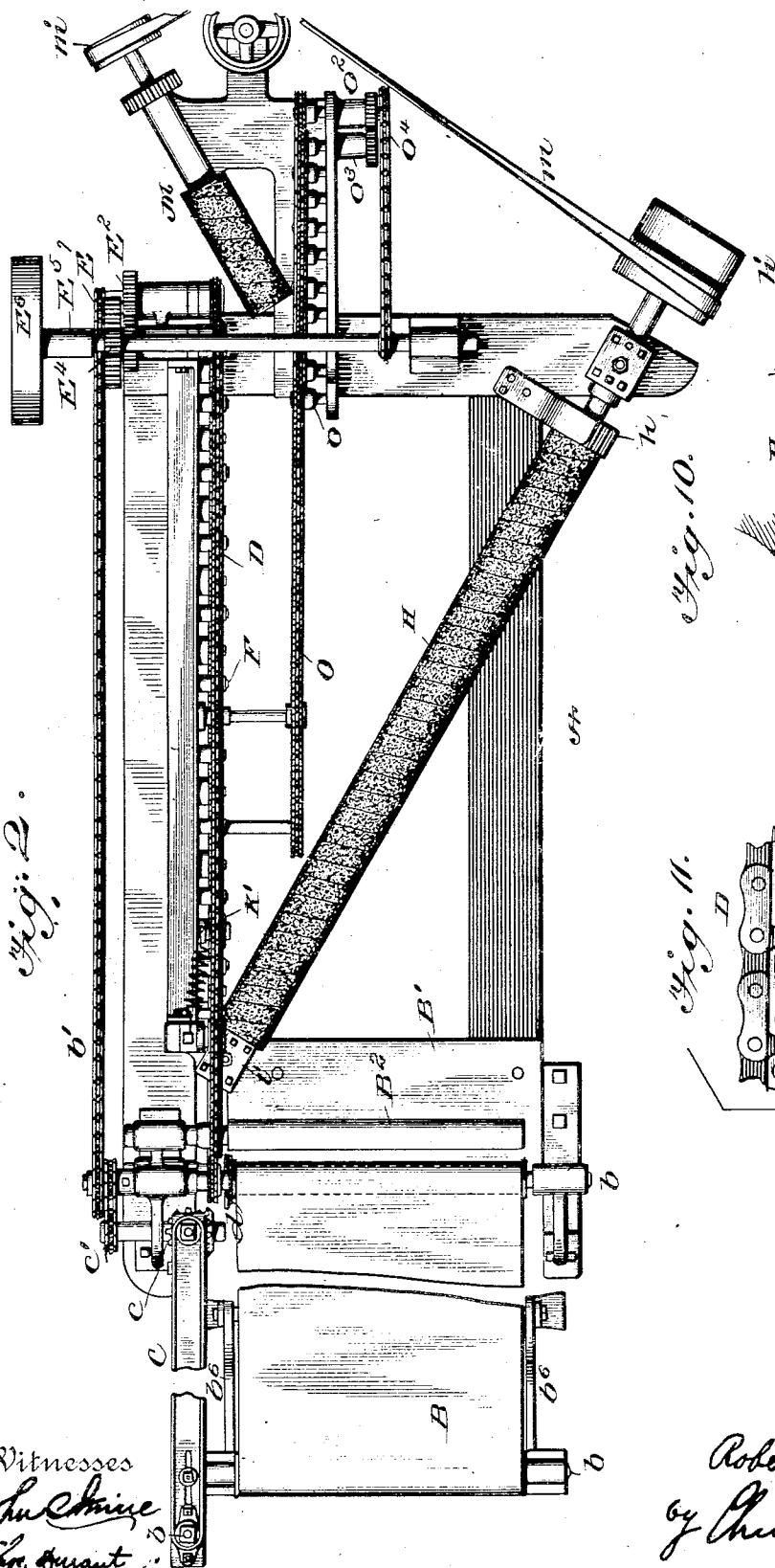
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8 Sheets—Sheet 2.

R. W. COFFEE.
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No. 569,575.

Patented Oct. 13, 1896.



Witnesses
John C. Smith
Thos. Durant

Inventor
Robert W. Coffee
by *Chas. & Chas. S.*
his Attorneys

(No Model.)

8 Sheets—Sheet 3.

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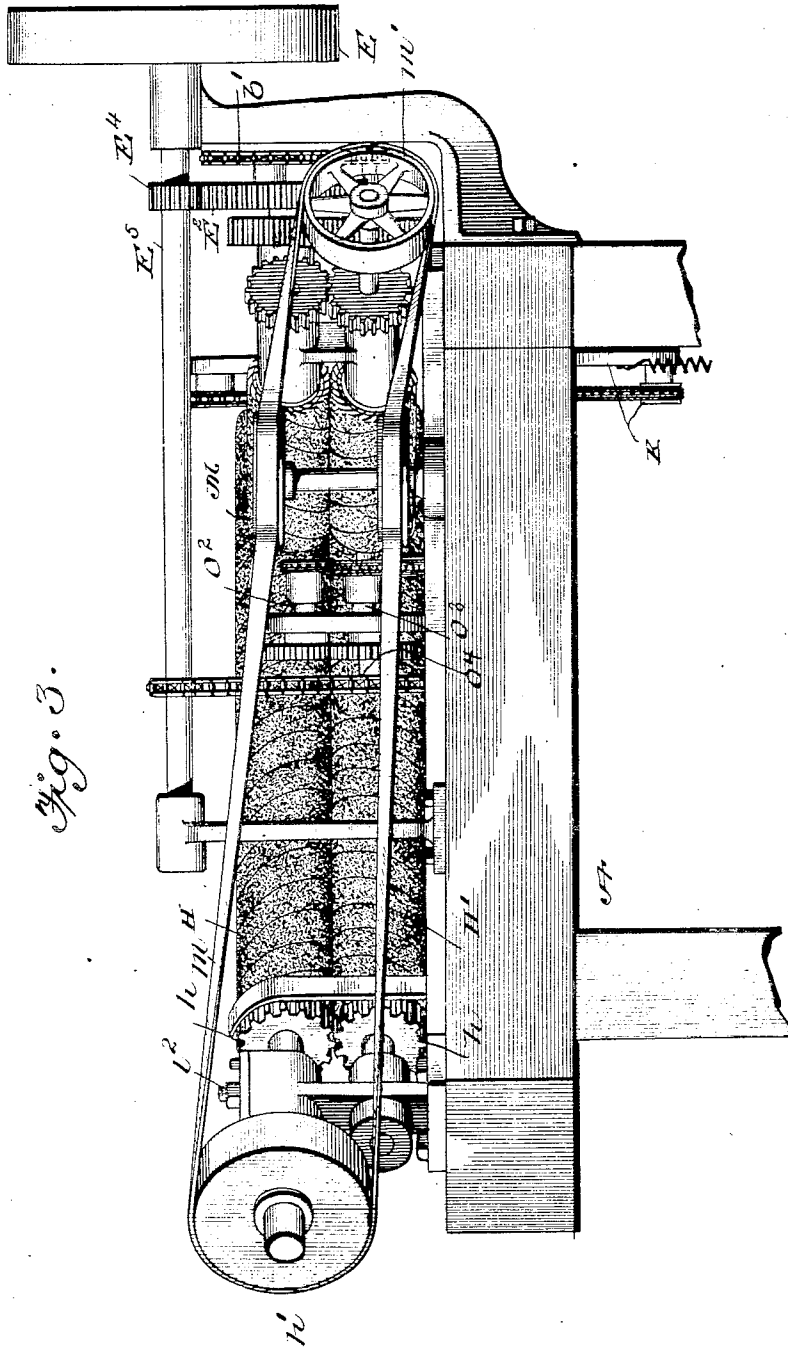


Fig. 3.

Witnesses

John Comrie
Thomas Durant

Inventor

Robert W. Coffee
by *Church & Church*
his Attorneys

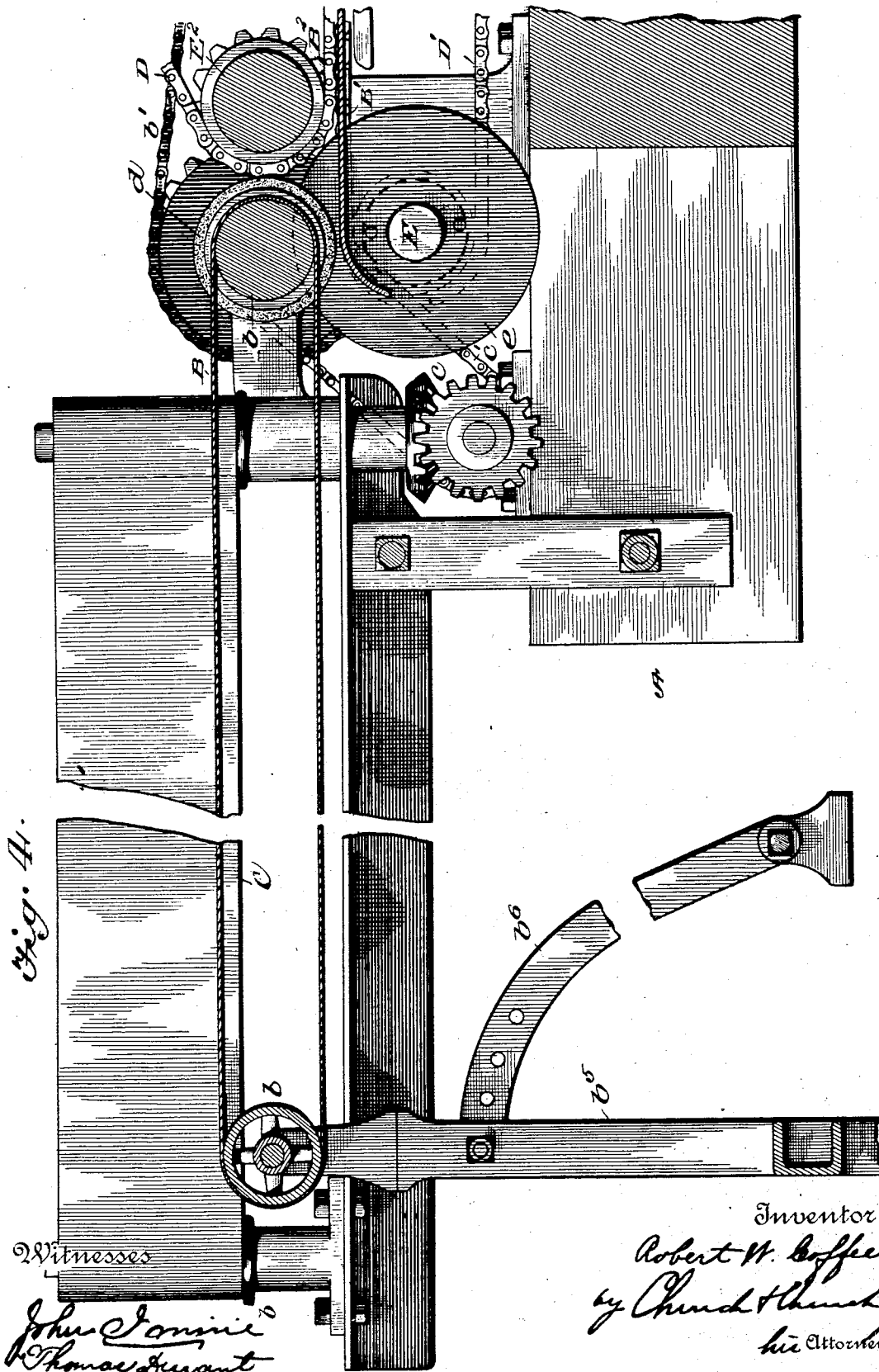
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8 Sheets—Sheet 4.

R. W. COFFEE.
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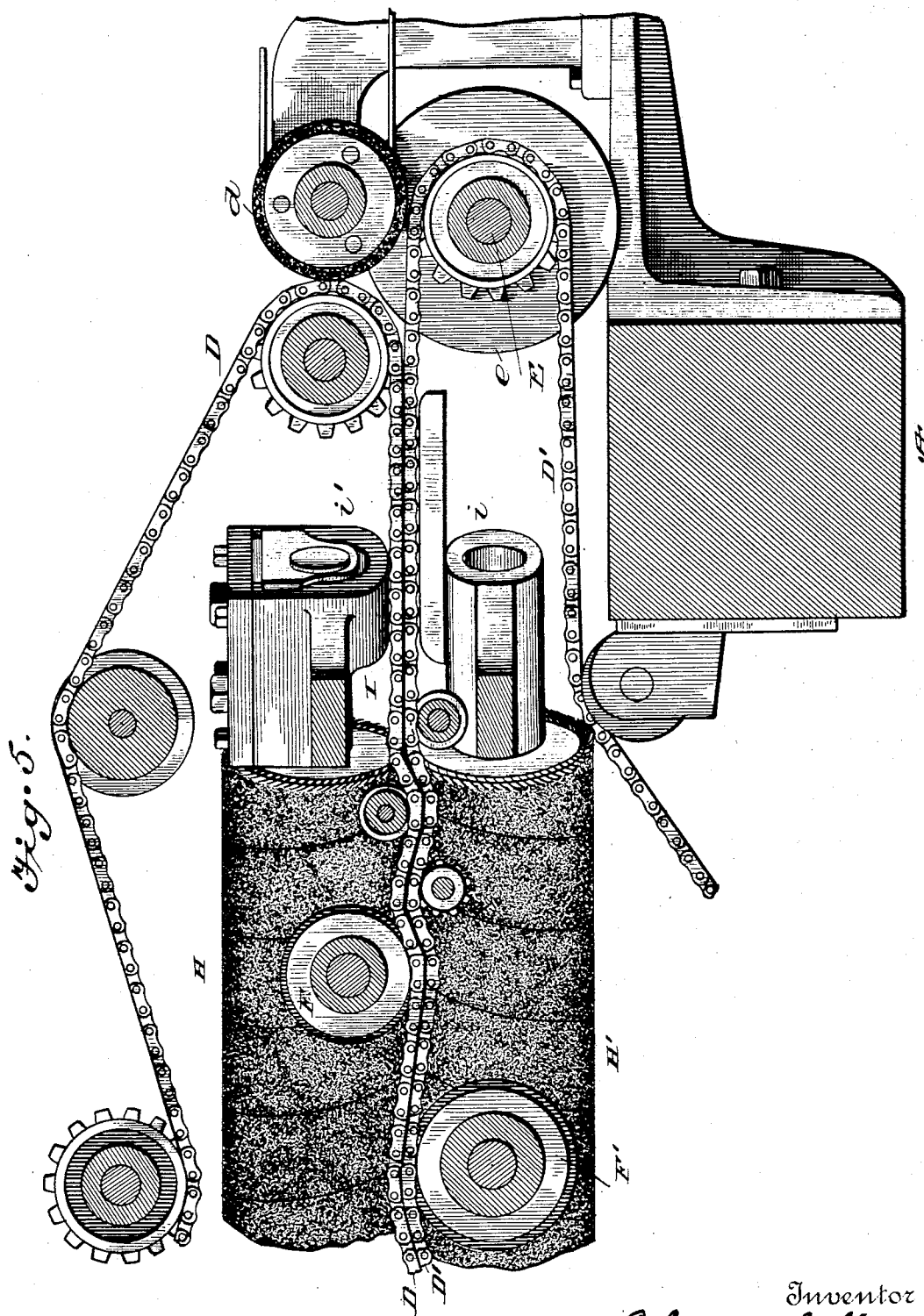
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8 Sheets—Sheet 5.

R. W. COFFEE.
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No. 569,575.

Patented Oct. 13, 1896.



Witnesses

John D. Smith
Thomas Durant

Inventor

Robert W. Coffee,
by Church & Church
his Attorneys

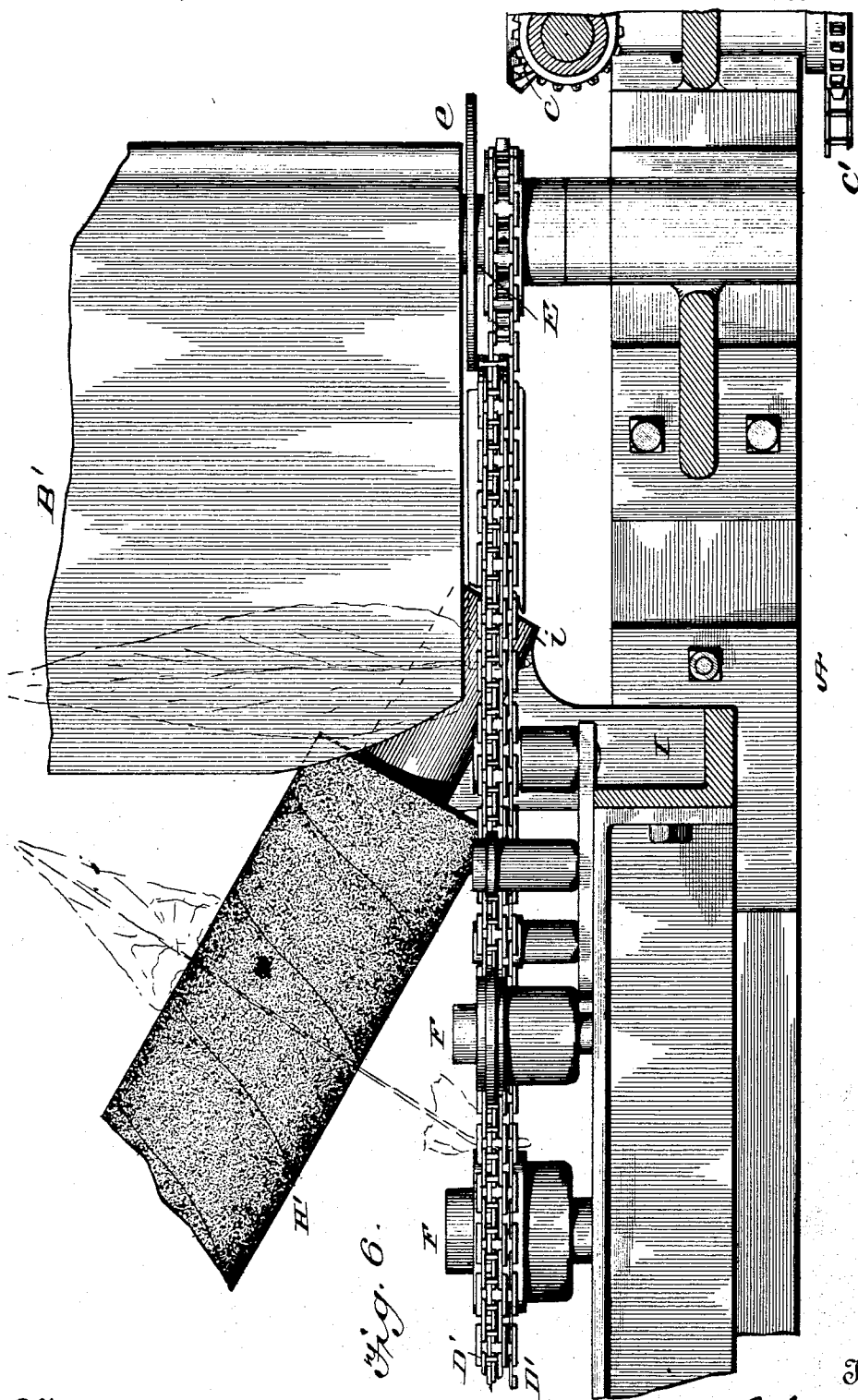
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8 Sheets—Sheet 6.

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Witnesses

Witnesses
John Comrie
Thomas Durant

Inventor

Robert W. Coffee,
by Chas. H. Church
his Attorneys

(No Model.)

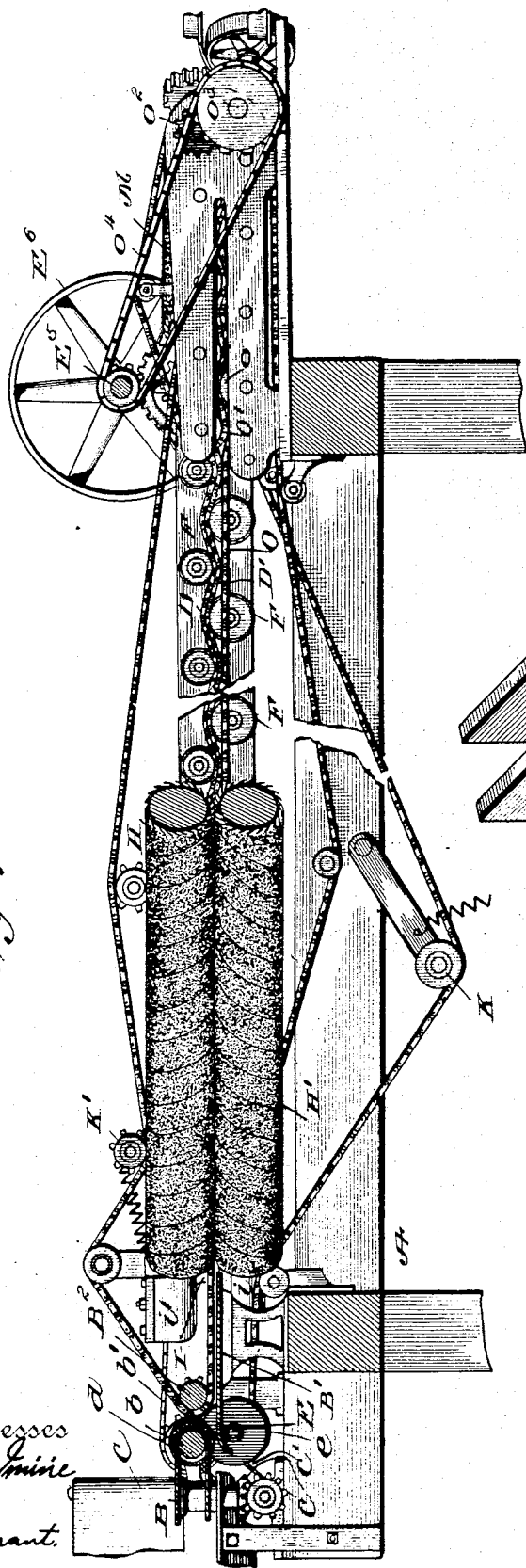
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R. W. COFFEE.
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Fig. 7.



Witnesses
John Smith
Thos. Durant.

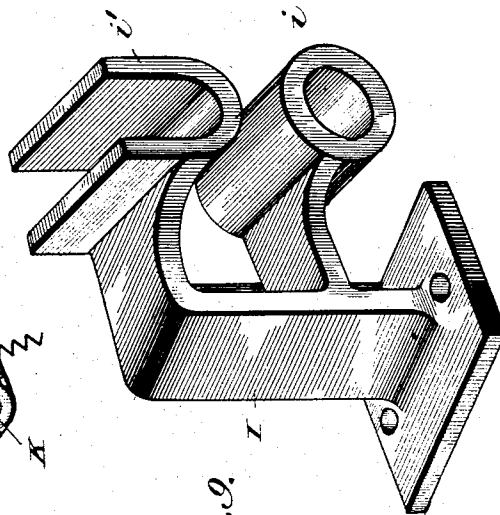


Fig. 9.

Inventor
Robert W. Coffee
by *Chas. H. Smith*
his Attorneys

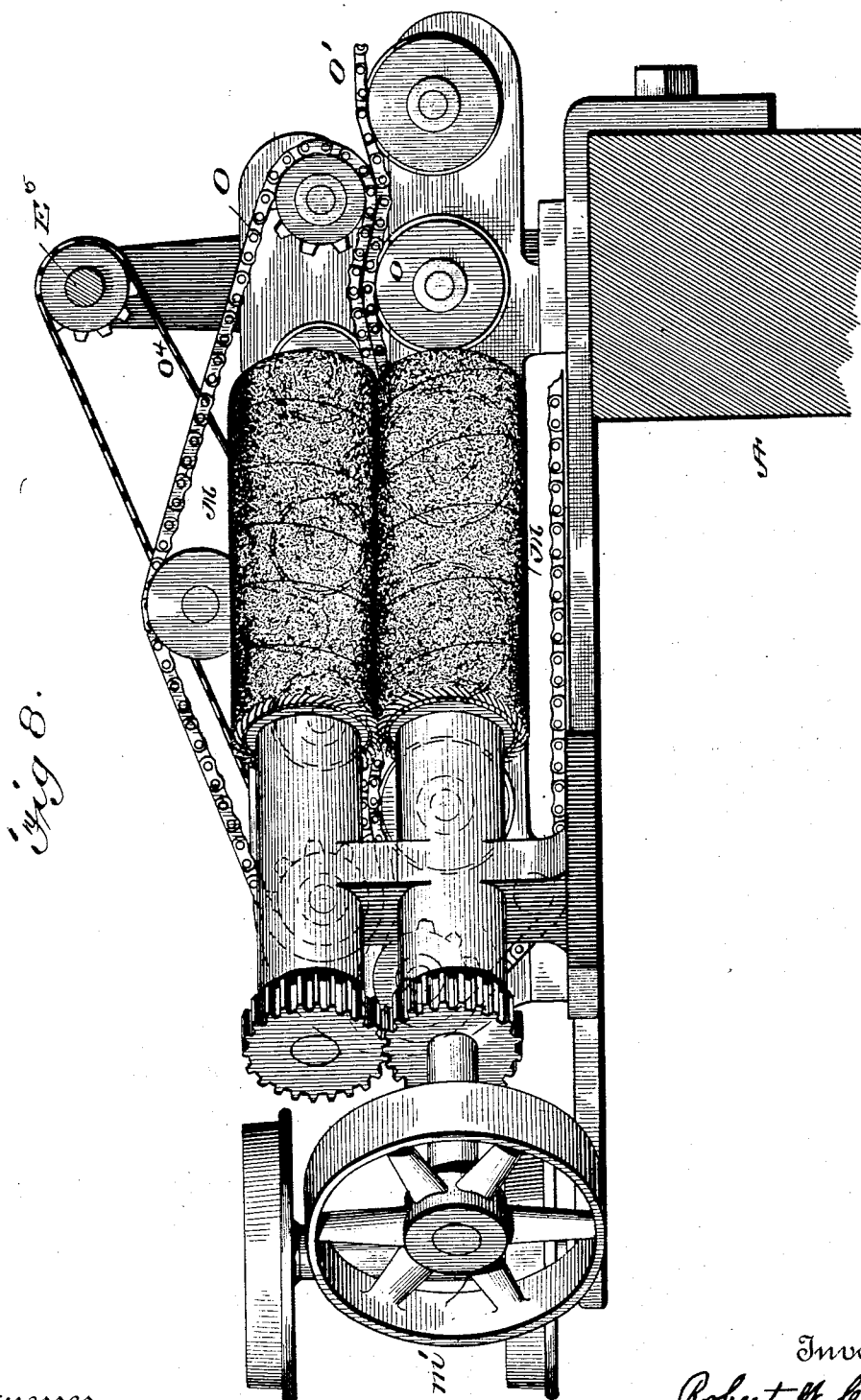
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8 Sheets—Sheet 8.

R. W. COFFEE.
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Patented Oct. 13, 1896.



Witnesses

John Comrie
Thomas Duant

Inventor

Robert W. Coffee
by *Charles & Charles*
his Attorneys

UNITED STATES PATENT OFFICE.

ROBERT W. COFFEE, OF RICHMOND, VIRGINIA, ASSIGNOR TO THE COFFEE
STEMMING MACHINE COMPANY, OF SAME PLACE.

TOBACCO-LEAF-STEMMING MACHINE.

SPECIFICATION forming part of Letters Patent No. 569,575, dated October 13, 1896.

Application filed January 22, 1896. Serial No. 576,444. (No model.)

To all whom it may concern:

Be it known that I, ROBERT W. COFFEE, of Richmond, in the county of Henrico, State of Virginia, have invented certain new and useful Improvements in Tobacco-Leaf-Stemming Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the letters of reference marked thereon.

This invention relates generally to a class of tobacco-stemming appliances or machines wherein the separation and removal of the leaf from the stem is effected by subjecting the leaf as a whole to the action of a series of flexible wires, pins, or teeth so applied as to travel on opposite sides and in close proximity to the stem, said wires, pins, or teeth operating lengthwise of the stem to sever, tear, or break the leaf and laterals close to the stem, and thus by a wiping motion longitudinally of the stem separate it from the leaf without injury to the latter. A machine containing a wiping mechanism of this type is illustrated in Patent No. 346,843, wherein card-clothing is employed, granted to A. H. Cochrane September 24, 1895.

The object of my present invention is to provide a machine or apparatus by means of which the stemming operation can be performed expeditiously, automatically, and thoroughly, to which end it consists, primarily and broadly, in the employment, in connection with a wiping or stemming mechanism, of an automatic feeding device or mechanism competent to engage the stems of the leaves and to carry or feed the latter sidewise, so that the leaves will be conveyed to and conducted through the stemming or wiping mechanism.

The invention also consists in so constructing and arranging the stemming or wiping mechanism and the feeding mechanism that in addition to the sidewise movement imparted to the leaf by the feeding mechanism there shall also be produced, as between the stem of the leaf and the stemming or wiping mechanism, a drawing movement in the direction of the length of the leaf, whereby the stemming or wiping action is inaugurated at or near one end of the leaf and is progress-

ively applied throughout the whole or a determinate portion of the length of the stem.

In a more limited and concrete form my said invention also consists in the combination, with a stemming or wiping mechanism comprising a pair of rolls armed with pins, teeth, or wires and rotating in contact, of a feeding mechanism engaging the stems and carrying the leaves sidewise to the rolls, when said feeding mechanism and wiping-rolls are so arranged that the line of feed movement will be at an angle to the axes of the rolls, the two lines diverging, whereby the portion of the leaf nearest the feed mechanism will first be presented to the action of the rolls, and as the leaf is carried lengthwise of the rolls the stem will be gradually drawn from between the rolls, thus causing the latter to operate lengthwise of the stem and effect the separation of the leaf from the stem.

The invention also comprehends the employment of two independent wiping mechanisms, each provided with a proper feeding mechanism, one of said wiping mechanisms operating to remove the major portion of the leaf from the stem, and the other supplementing said action by removing the smaller adherent particles or portions of leaf left by the first wiping mechanism.

The invention further includes certain other subordinate features hereinafter fully described, and set forth in the claims.

Referring to the accompanying drawings, Figure 1 is a perspective view of the body of a machine constructed in accordance with my present invention, the feeding-table and butter being shown broken away. Fig. 2 is a top plan view of the same. Fig. 3 is a rear elevation. Fig. 4 is a side elevation of the feeding-table and butter; Fig. 5, a sectional elevation of one end of the wiping-cylinders, showing the feeding mechanism for grasping and holding the stem. Fig. 6 is a sectional top plan view of the same. Fig. 7 is a longitudinal section through the machine. Fig. 8 is an elevation of the supplemental cleaner shown at the right in Fig. 1. Fig. 9 is a detail perspective of the bearings for the inner ends of the wiping-cylinders. Fig. 10 is a detail section of the wiping-cylinders on an enlarged scale. Fig. 11 is a detail of the feed-

ing chain or chains of said elevation and top plan. Fig. 12 is a detail of the stem-severing knife.

Like letters of reference in the several figures indicate the same parts.

The letter A indicates the framing of the machine, of any suitable or desired size and material found most convenient for the particular machine to be made. At one end of this frame a receiving-table is provided, which in the preferred construction consists, first, of a feeding-belt B, running over suitable rollers or shafts *b*, one of which is driven by a sprocket-chain *b'* or other suitable means, and, secondly, of a stationary platform B', onto which the leaves are delivered by the belt after passing between the belt and roller B², and from which the leaves are removed and presented to the wiping-cylinders by the main feeding mechanism to be presently described.

At one side of the belt B a vertically-arranged belt C is provided, driven through the bevel-gears *c* and chain *c'* from the chain *b'*. This belt C forms a butter or stop against which the large ends of the stems may be placed when the leaves are deposited on the belt B, thus insuring their being presented in proper alinement for the main feeding mechanism.

The belts B and C are preferably driven at substantially the same speed and are provided with any ordinary means for taking up slack, such, for instance, as by having their outer rollers *b* mounted in adjustable bearings, as shown clearly in Figs. 2 and 4, the latter figure showing the bearings for the roller of the belt B on the upper end of arms *b³*, held in adjusted position by the diagonal arms or braces *b⁴*, to which the arms *b⁵* are adjustably connected.

The leaves are delivered to the stationary platform B' singly, which result is accomplished by mounting on the shaft of the roll *b* a resilient ring *d*, which coöperates with one of the feed-chains D, Fig. 4, to grasp the stem of the leaf as it is presented between them and give the same a somewhat more rapid feed down onto the table or platform B', from which point the leaf is removed by being grasped between the upper feed-chain D and the lower feed-chain D', which latter runs around a pulley on the shaft E, to which shaft E there is preferably attached a relatively large disk *e*, which coöperates with the ring *d* and upper feed-chain D to advance the leaf over the stationary table and insures the proper entry of the butt-end of the stem between the two surfaces of the feed-chains D and D'. From this point the stems are controlled by the feed-chains being pressed between the same and held until the body of the leaf is stripped therefrom by the wiping-cylinders. I preferably run the feed-chains so as to feed the leaf or stem straight forward at substantially right angles to the length of the leaf, and in order to insure a proper ac-

tion of the chains at every point they are arranged as shown in Fig. 11, that is to say, the sides of the links of the chains are arranged out of vertical alinement with each other, and hence the tobacco-leaf stem will be forced in between the sides of the links on one chain by the corresponding link on the other chain.

The chains are kept taut and tightly pressed together by passing over and under a series of idlers or bearing-rollers F, which gives the chain a somewhat sinuous or deflective course in a vertical plane, but does not interfere with the substantially straight feed of the stem.

The separation of the leaf portion from the stem is effected by a wiping mechanism, which, in this instance, comprises two rollers or cylinders H H', each armed with a series of pins, teeth, or wires, hereinafter designated as "teeth," the latter being preferably bent or inclined backward with relation to the direction of rotation, (see Fig. 10,) so that the points of the teeth will not penetrate or pick up the leaf portion as the cylinders revolve.

The two cylinders or rolls H H' are mounted with their axes substantially parallel and at such distance apart as to cause the projecting teeth of the two rolls to contact or intermesh, that is to say, the ends of the teeth on one roll project inward to or slightly beyond the outer ends of the teeth of the opposite roll, so that there is no open or free space between the contiguous surfaces of the two rolls. On the contrary, the surfaces of the two rolls may be said to be merged at this point by the intermeshing of the teeth comprising said surfaces.

The teeth of each roll or cylinder H H' are arranged on lines running diagonally to its axis; the helices thus formed on one roll running in the reverse or opposite direction from those on the opposite roll, presenting in effect reversed screws with intermeshing threads, the latter composed of a succession of flexible teeth projecting radially from a cylindrical base or axis.

Upon reference to Figs. 1, 2, and 6 it will be seen that the stemming mechanism, comprising wiping-rolls H H', is disposed at an angle to the plane of the feeding mechanism, the latter comprising the holding and carrying chains D D', the front or entering end of the stemming or wiping devices lying in close proximity to the feeding mechanism and extending rearwardly from this point at an angle to the feeding mechanism, thus causing the two mechanisms to operate on diverging lines. It results from this arrangement that the leaves carried by the feeding mechanism will be presented to the stemming or wiping mechanism at an angle to the axes of the rollers, and will be entered between the rolls H H' at one end thereof, said rolls engaging the leaf at a point in proximity to the portion of the stem held by the feeding devices. As the leaf is advanced under the influence of

the feeding mechanism it is caused to traverse longitudinally of the wiping-rolls at the same time the stem is drawn longitudinally from between the rolls, thus causing the latter to operate progressively upon the stem from the point of first contact or engagement at the entrant ends of the rolls. In other words, the leaves are carried bodily sidewise and caused to traverse longitudinally of the rolls, but owing to the diagonal arrangement of the wiping and feeding mechanisms the stems held at one end by the feeding mechanism are drawn gradually in a longitudinal direction from between the proximate faces of the wiping-surfaces. The traverse of the stems lengthwise of the rolls is materially assisted by the helical arrangement of the teeth on the rolls, the latter operating after the manner of screw-threads to propel the leaves by engaging the stems thereof.

As the leaf is advanced by the feeding mechanism and presented sidewise between the ends of the wiping-rolls its stem will be received between the flexible teeth, the latter projecting from opposite directions and traveling in close proximity to the sides of the stem, so that as the leaf is advanced laterally and the stem is drawn longitudinally between the rolls the succession of teeth will engage the leaf portion at its junction with the stem, on opposite sides of the latter, cutting, breaking, or tearing the leaf portion free from the stem and delivering the leaf portion on one side of the rolls, while the stem is discharged on the opposite side.

Owing to the inclination given the teeth on the wiping-rolls and the fact that the ends of said teeth contact or are intermeshed the leaf portion is brushed back and held away from the stem, the stem being partially or wholly embedded in the surface or surfaces of the rolls, the separation of the leaf portion from the stem at the sides of the latter being effected at about the point where the said teeth sweep past the sides of the stem as they travel in opposite directions or move apart on the rear side of the rolls.

With the exception of a small section, which may be engaged at the time the leaf first enters between the rolls $II\ II'$, the leaf portion does not enter between the rolls and is not acted upon thereby in a manner to break or tear it. On the contrary, the stem alone enters between the rolls and is embedded in the surface thereof, while the leaf portion rests lightly against the surface of the rolls on the rear side, and is carried along by its attachment to the stem beyond the point at which the teeth are operating to sever the connection close to the stem, and as soon as the stem is fully separated and withdrawn the leaf portion drops from the face of the rolls and the stem is carried forward for subsequent treatment to remove adhering fragments, as will presently appear.

The wiping-cylinders are preferably geared together by gear-wheels h at the outer end

and are driven from a counter-shaft through a pulley h' , Fig. 2, while at their inner ends they are mounted in bearings, so as to permit of a certain degree of adjustment to insure the proper entry of the leaf. A simple form of such bearing is shown in Fig. 9, in which figure it will be seen that the bearings are separated, the lower one, i , being of the ordinary cylindrical type, while the upper one, i' , is of the open type and will permit of a bearing-block being mounted therein and held from a top plate by any of the usual adjusting mechanism, such, for instance, as bolts i'' , Fig. 1, both said bearings i and i' being for convenience formed in a single casting with a standard I , which may be secured to the body of the frame by bolts or otherwise.

The teeth, pins, or wires constituting the wiping-surface of the rolls $H\ H'$ are preferably mounted upon a narrow flexible strip or backing, after the manner of ordinary card-cloth, which latter is preferably employed as a covering for the cylinders by being wound helically thereon, so that the teeth will occupy a spiral or helical relation to the axis of the roller, the helices running in the proper direction to cause the lateral traverse of the stem and maintain it at substantially right angles to the axes of the rollers, as shown by dotted lines, Fig. 6, the teeth of the wiping mechanism thus supplementing the action of the feeding devices in advancing the stem laterally, and at the same time assisting in preserving the proper relation of the stem to the wiping mechanism as the former is drawn longitudinally between the two rolls or cylinders.

The feed-chains themselves are preferably driven by passing over sprocket-wheels arranged at the outer end of the machine and driven through gear-wheels in mesh with the wheel E^4 on a shaft E^5 , driven from a counter-shaft through a pulley E^6 , the tension of said chains being maintained by the spring-pressed idlers K and K' , arranged above and below the frame, although it will be obvious to those skilled in the art that these chains may be driven in any suitable manner and their tension maintained by any ordinary mechanism, and, in fact, it is obvious that other forms of feeding mechanism may be employed to engage the butt-ends of the stems and advance the same while the body of the leaf is being acted on by the wiping-cylinders, it only being essential that the wiping-cylinders and line of feed should diverge as the leaf is advanced in order to cause a separation of the body of the leaf and stem, and hence I do not wish to be limited to any particular feeding mechanism for accomplishing this result.

The chain b' for driving the feeding-apron and butter derives its motion from the shaft E^5 and gear-wheels E^2 by passing over a sprocket-wheel E^7 , Figs. 2 and 6, as will be readily understood.

In the operation of the portion of the ma-

chine thus far described the bodies of the leaves are separated from the stems and dropped down on the outer sides of the wiping-cylinders, and if it is desired to sever the stem or stems when they have been removed for a particular length it is only necessary to incorporate in one of the wiping-cylinders a severing-knife, such as L, Figs. 1 and 12, which will sever the stem when it has been drawn out to this point, but inasmuch as the body of the leaf never enters between the cylinders it does not operate upon the body of the leaf to injure the same in any way. Such knife may be located at any point in the length of the cylinder, or if it is not desired to leave a short length of the stem at the top of the leaf it may be entirely omitted. Should one of the stems be broken or escape from the feed mechanism, the leaf will be at once discharged from the wiping-cylinders and will not be carried along to the point where the completely-stemmed leaves are delivered. Consequently the machine, it is found in operation, forms a separator for automatically separating the perfectly-stemmed leaves from those imperfectly stemmed, thereby greatly simplifying the handling of the product, as the imperfectly-stemmed leaves may be stemmed by hand or again run through the machine, as may be found most convenient.

To remove the smaller particles or portions of leaf remaining attached to the stem, more especially that portion lying nearest the butt, and which has not been brought within the range of action of the primary stemming mechanism, I provide a supplemental or auxiliary wiping mechanism, preferably arranged to operate in a reverse direction to the primary or principal wiping mechanism, so as to engage the stems held by the feeding mechanism and operate toward the butt-end of the stem instead of toward the tip.

Referring again to Fig. 1, it will be seen that at the right-hand end of the machine there is provided a somewhat smaller or supplemental pair of wiping-cylinders M, geared together and driven from the main cylinders through a belt and pulleys *m m'*. As just explained, these supplemental wiping-cylinders are fed to operate in a reverse direction on the stems passing through the machine, and in order to accomplish this result the stems as they advance along with the main feeding mechanism are carried over and rest upon a chain O, Fig. 2, which forms the lower chain of a supplemental feeding mechanism or a feeding mechanism for carrying the stems to the supplemental wiping mechanism. The stems resting on this chain O advance with the feeding mechanism until released therefrom, at which time, or before they are released from the main feeding mechanism, they are pressed between the chain O and a second supplemental feeding-chain O', Fig. 8, these two chains engaging the stem at a point near its smaller end and carrying it between the supplemental wiping-cylinders, which

wiping-cylinders are arranged at an angle to the supplemental feeding mechanism, so as to secure a wiping action in a reverse direction over all of that portion of the stem nearer the butt-end.

The card-clothing on the supplemental wiping-cylinders is arranged spirally, so as to cause an advance feed of the stem, as has been described with relation to the main cylinders, and the supplemental feed-chains are maintained in their proper relative position while holding the stems by the bearing-pulleys *o*, which occupy the same relation to the supplemental feeding-chains as do the pulleys F to the main feed-chains. The supplemental feeding-chains have their shafts *o² o³* geared together, as shown in Fig. 1, and are driven by a sprocket chain and wheels *o⁴* from the drive-shaft E³.

The working parts of the machine it will be noted are extremely simple, there being no delicate or complicated mechanisms liable to become broken or disarranged, so as to interrupt the operation of the machine, and in practice it is found that by giving the wiping-cylinders a very rapid rotation the body of the leaf is not injured to the slightest extent, the stem being drawn therefrom for its entire length, if so desired, and by arranging the cylinders and feeding mechanism as described leaves of any length may be operated upon in the same machine, although it is desirable to set the stem-severing knife for operation upon stems of a given length, but this is a simple matter and does not require any readjustment or rearrangement of the machine, which latter may as a consequence be manufactured of a standard size for use in handling any of the many grades of tobacco now grown.

The wiping-cylinders being arranged at an acute angle to the line of feed permits of the leaves being fed to the cylinders in rapid succession, that is to say, a number of leaves may be passing through the machine and be simultaneously stripped, the advance leaves being farther advanced in the operation than those just entering between the wiping-cylinders. This of itself is a most important advantage incident to the diagonal arrangement of the cylinders, for we are thus enabled to handle a very much larger quantity of tobacco than would be possible in any construction where the leaves must be acted on successively and the stripping operation on one leaf completed before the next leaf is submitted to the action of the wiping-cylinder.

The apparatus herein described illustrates what I regard as the best mode thus far devised of applying the principle, which latter involves, primarily, the lateral or sidewise movement of feeding of the leaves and the separation and removal of the leaf portion while in transit by the action of a wiping mechanism acting longitudinally of the stem. It also includes as a secondary, but quite im-

portant, feature the progressive application of the wiping media to the leaf as the latter is carried sidewise, illustrated by the diagonal arrangement of the feeding and wiping mechanisms. It further embraces, as an additional feature, such a construction and arrangement of the wiping mechanism as will supplement the action of the feeding mechanism in effecting the sidewise traverse of the leaves and stems in the same general direction, as illustrated by the helical arrangement of the wiping media.

Having thus described my invention, what I claim as new is—

1. In a tobacco-leaf-stemming machine, the combination with wipers for removing the body of the leaf from the stem, of a feed mechanism for advancing the stem with the body of the leaf sidewise during the stemming operation; substantially as described.

2. In a tobacco-leaf-stemming machine, the combination with the rotary wiping mechanism for removing the body of the leaf from the stem, of a feed mechanism for advancing the stems with the body of the leaf sidewise as the latter is being separated or detached; substantially as described.

3. In a tobacco-leaf-stemming machine, the combination with the rotary wiping mechanism for removing the body of the leaf from the stem, of a feed mechanism for advancing the stems with the body of the leaf and simultaneously drawing the stem away from the wiping mechanism; substantially as described.

4. In a tobacco-leaf-stemming machine, the combination of the rotary wiping mechanism for removing the body of the leaf from the stem and the feeding mechanism for holding the stems, said wiping mechanism and feeding mechanism being arranged in gradually-diverging lines; substantially as described.

5. In a tobacco-leaf-stemming machine, the combination of the rotary wiping mechanism for removing the body of the leaf from the stem and the feeding mechanism for holding the stems, said wiping mechanism and feeding mechanism being arranged in gradually-diverging lines, and the feeding mechanism extending beyond the entrant portion of the wiping mechanism, whereby the leaves are carried to the wiping mechanism; substantially as described.

6. In a tobacco-stemming machine, the combination with the feeding mechanism for cooperating with the stem of the leaf, of the rotary cylinders for separating the body of the leaf from the stem arranged with their axes at an acute angle to the line of feed; substantially as described.

7. In a tobacco-leaf-stemming machine, the combination with the feeding mechanism for cooperating with the stem of the leaf, of the rotary cylinders for separating the body of the leaf from the stem arranged with their axes at an acute angle to the line of feed and

with their entrant ends in proximity to the feeding mechanism at an intermediate point, whereby the leaves are fed to the cylinders; substantially as described.

8. In a tobacco-leaf-stemming machine, the combination with the feeding mechanism for cooperating with the stem of the leaf, of the rotary cylinder for separating the body of the leaf from the stem having its operative surface formed in a spiral to advance the body of the leaf in unison with the feeding mechanism; substantially as described.

9. In a tobacco-leaf-stemming machine, the combination with the feeding mechanism for cooperating with the stem of the leaf, of the cylinders for separating the body of the leaf and stem rotating in opposite directions and having their operative surfaces formed into oppositely-arranged spirals for advancing the body of the leaf in unison with the feeding mechanism; substantially as described.

10. In a tobacco-leaf-stemming machine, the combination with the feeding mechanism, for cooperating with the stem of the leaf, of the cylinders covered with card-cloth and arranged with the axes at an acute angle to the line of feed; substantially as described.

11. In a tobacco-leaf-stemming machine, the combination with the feeding mechanism for cooperating with the stem of the leaf, of the cylinder covered with card-cloth wound spirally thereon and arranged with its axis at an acute angle to the line of feed; substantially as described.

12. In a tobacco-leaf-stemming machine, the combination with the feeding mechanism for cooperating with the stem of the leaf, of the cylinders covered with card-cloth the clothing on each cylinder wound spirally and in an opposite direction to the clothing on the other cylinder, said cylinders being arranged with their axes at an acute angle to the line of feed; substantially as described.

13. In a tobacco-leaf-stemming machine, the combination with the main stem holding and feeding mechanism and mechanism for stripping the body of the leaf from the stem of a supplemental or secondary stem holding and feeding mechanism and mechanism for stripping the remaining leaf particles from the stem; substantially as described.

14. In a tobacco-leaf-stemming machine, the combination with the main stem holding and feeding mechanism, and mechanism for stripping the body of the leaf from the stem, of a supplemental or secondary reversely-arranged stem holding and feeding mechanism and mechanism for stripping the remaining leaf particles from the stem, whereby both ends of the stem are subjected to the stripping action; substantially as described.

15. In a tobacco-leaf-stemming machine, the combination with the main stem holding and feeding mechanism and a secondary stem holding and feeding mechanism lying parallel thereto and extending beyond the main holding and feeding mechanism, of wiping-

cylinders arranged at an acute angle to the main stem holding and feeding mechanism and secondary wiping-cylinders arranged at an opposite acute angle to the secondary stem holding and feeding mechanism; substantially as described.

16. In a tobacco-leaf-stemming machine, the combination with the stem holding and feeding mechanism and wiping-cylinders arranged at an acute angle to the line of feed of a supporting conveyer or chain for the stems located between the holding and feeding mechanism and cylinders; substantially as described.

17. In a tobacco-leaf-stemming machine, the combination with the stem holding and feeding mechanism and wiping-cylinders arranged at an acute angle to the line of feed, of a supporting conveyer or chain located between the holding and feeding mechanism in line with said conveyer and a secondary set of wiping-cylinders arranged on the side of said secondary holding and feeding mechanism opposite to the main wiping-cylinders; substantially as described.

18. In a stemming-machine, the combination with mechanism for stripping the body of the leaf from the stem, of a stem holding and carrying device, the same comprising two endless chains, driving and supporting rollers for the same, and two series of rollers, the one series engaging the inner face of one chain opposite the working section thereof and the other series engaging the inner face of the opposite chain along the line of the working section thereof, said opposing series of rollers serving to hold the two chains together in working position; substantially as described.

19. In a stemming-machine, the combination with the stripping mechanism of a leaf carrying or feeding mechanism for engaging the stem to advance the latter, said feeding mechanism comprising a pair of endless feeding-chains arranged to run in parallel planes, a series of rolls engaging the rear face of one chain and a second series of rolls engaging the rear face of the opposite chain, the rolls of said two series being arranged in alternate succession, to produce reverse curves in the chain and increase the bite on the stem; substantially as described.

20. In a tobacco-leaf-stemming machine, the combination with the mechanism for stripping the body of the leaf from the stem, of a pair of stem holding and feeding chains, and guides for directing said chains in a sinuous course during the time the stem is held thereby; substantially as described.

21. In a tobacco-leaf-stemming machine, the combination with a pair of stem holding and feeding chains of a pair of wiping-rollers provided with a covering of spirally-wound card-cloth and having their axes arranged at an acute angle to the line of travel of the chains; substantially as described.

22. In a tobacco-leaf-stemming machine, the combination with a pair of stem holding

and feeding chains and guides for holding said chains in contact during the time the stem is held thereby of a pair of wiping-cylinders covered with spirally-wound card-cloth arranged with their axes at an acute angle to the line of travel of the chain and with their meeting portions in substantially horizontal alignment with those portions of the chain coming in contact and adapted to hold the stems between them; substantially as described.

23. In a tobacco-leaf-stemming machine, the combination with the stem holding and feeding mechanism of the stripping-cylinders arranged to feed the body of the leaf in the same direction as the feeding mechanism and a knife on one of the cylinders for severing the stem when a predetermined length has been separated from the leaf; substantially as described.

24. A wiping-cylinder for tobacco-leaf-stemming machines covered with card-cloth and having a knife fixed thereto for severing the stem when a predetermined length has been stripped from the body of the leaf; substantially as described.

25. A wiping-cylinder for tobacco-leaf-stemming machines having card-cloth spirally wound thereon and provided with a peripheral knife for severing the stem when a predetermined length has been stripped from the body of the leaf; substantially as described.

26. In a tobacco-leaf-stemming machine the combination with the receiving-table and butter against which the stems are alined, of a stem holding and feeding mechanism arranged in line with the butter and the wiping-cylinders arranged diagonally to said lines; substantially as described.

27. In a tobacco-leaf-stemming machine, the combination with the receiving-table having the belt thereon for advancing the leaves, the movable butter against which the stems are positioned, a stem holding and feeding mechanism arranged in line with the butter and diagonally-arranged wiping-cylinders for stripping the body of the leaf from the stem; substantially as described.

28. In a tobacco-leaf-stemming machine, the combination with the stem holding and feeding mechanism and mechanism for stripping the body of the leaf from the stem of the receiving-table having the apron or belt thereon for advancing the leaves in succession and a rotary flexible disk for receiving the stems as they are delivered from the belt and delivering them to the holding and feeding mechanism; substantially as described.

29. In a tobacco-leaf-stemming machine, the combination with the stem holding and feeding mechanism and stripping mechanism for removing the body of the leaf from the stem of the receiving-table having the belt for advancing the leaves, the roll under which the leaves pass as they leave the belt and the flexible disk and chain for cooperating with the stems of the leaves to deliver the same

to the holding and feeding mechanism; substantially as described.

30. In a stemming-machine, the combination of the following elements, to wit: a leaf-feeding mechanism engaging the stem and carrying the leaf sidewise; and a stemming mechanism or device to which the leaf is submitted by the feeding mechanism; substantially as described.

31. In a stemming-machine, the combination of the following elements, to wit: a feeding mechanism for advancing or carrying leaves sidewise; and a stemming mechanism sustaining a diagonal relation to the feeding mechanism; substantially as described.

32. In a stemming mechanism, the combination of the following elements, to wit, a stemming mechanism provided with a wiping surface or surfaces; and a feeding mechanism for advancing the leaf sidewise, said feeding mechanism being arranged to travel in a path at an angle to the movable wiping surface or surfaces of the stemming mechanism.

33. In a stemming-machine, the combination of the following elements, to wit: a leaf carrier or feeding mechanism engaging the stems and advancing the leaves laterally of the stems; and a wiping mechanism comprising opposing working surfaces moving in same direction in planes diagonal to the line of feed movement; substantially as described.

34. In a stemming-machine, the combination of the following elements, to wit: a leaf carrying or feeding mechanism for receiving the stems and carrying them laterally; and a stemming or wiping mechanism diagonally disposed with respect to the line of feed movement and provided with helical wiping-surfaces, substantially as described.

35. In a stemming mechanism, the combination of the following elements, to wit: a

feeding or carrying mechanism adapted to engage the stems of leaves and advance the latter sidewise; and a stemming mechanism diagonally disposed with reference to the direction of feed movement of the leaves, said mechanism comprising movable surfaces provided with a series of flexible teeth arranged in lines diagonal to the direction of motion of said movable surfaces.

36. In a stemming mechanism, such as described, the combination of the following elements, to wit: a stemming or wiping mechanism comprising opposing wiping-surfaces moving in the same direction, each composed of a multiplicity of separate teeth arranged in lines at an angle to the direction of the motion of said surfaces and having their outer ends bent or inclined rearwardly; and a feeding mechanism having its line of travel at an angle to the plane of motion of the movable surfaces of the stemming or wiping mechanism and in proximity to one end thereof.

37. In a stemming mechanism, the combination of the following elements, to wit: a stemming or wiping mechanism adapted to operate longitudinally of the stem and remove the leaf portion therefrom; and a feeding mechanism traversing in front of the stemming mechanism and beyond the entrant end thereof in a plane diagonal to the direction in which the stemming mechanism operates upon the leaf, that is sidewise of the stem, whereby the leaf is carried sidewise through the stemming mechanism while the latter operates longitudinally of the stem to remove the leaf portion therefrom; substantially as described.

ROBERT W. COFFEE.

Witnesses:

ALEX. S. STEUART,
THOMAS DURANT.