No. 652,008. Patented June 19, 1900.

J. E. SCHOOLFIELD & G. M. GUERRANT.

TOBACCO STEMMING MACHINE.

(Application filed Mar. 21, 1899.)

(No Model.) 2 Sheets—Sheet 1.

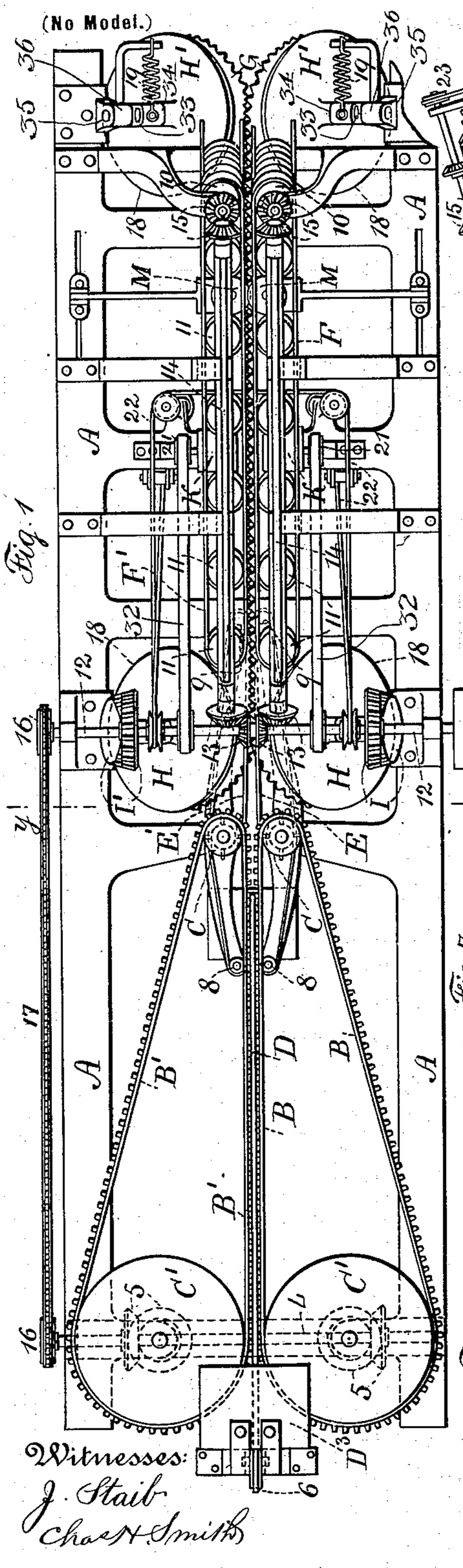

Fig. 1.

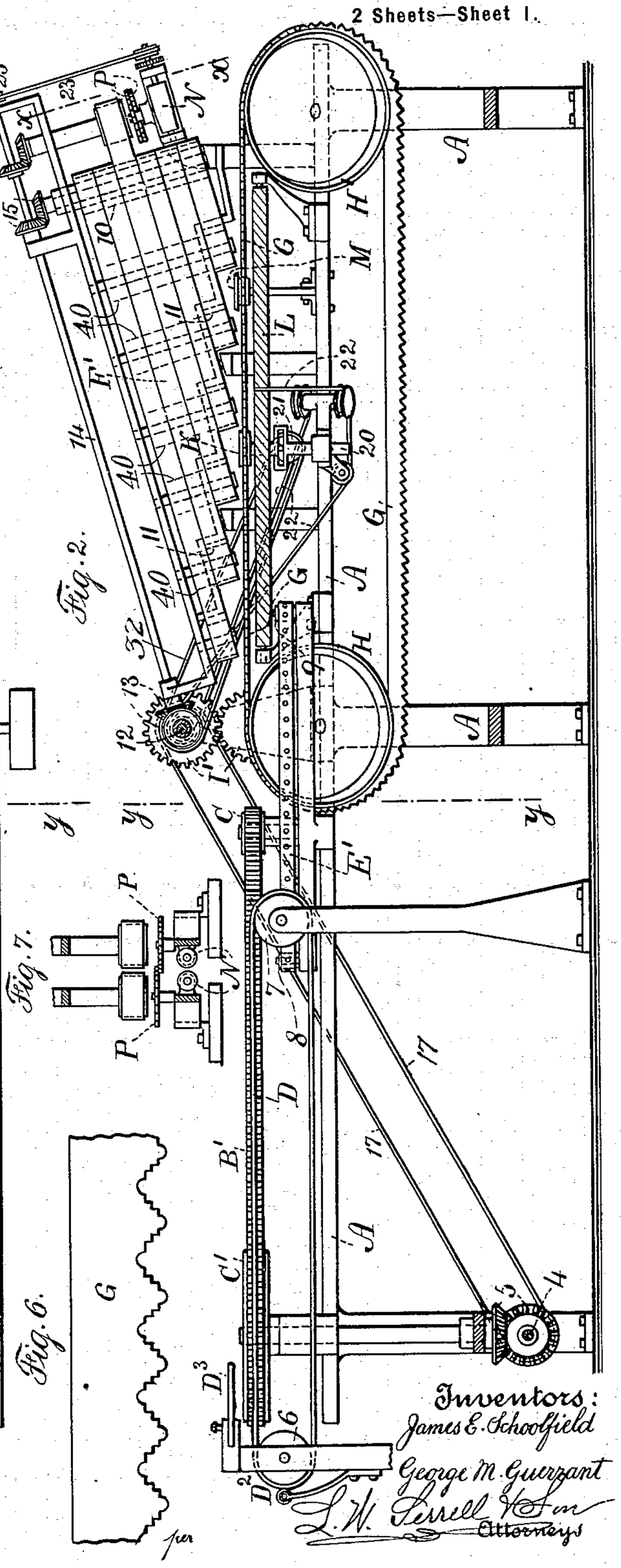

Fig. 2.

Fig. 7.

Fig. 6.

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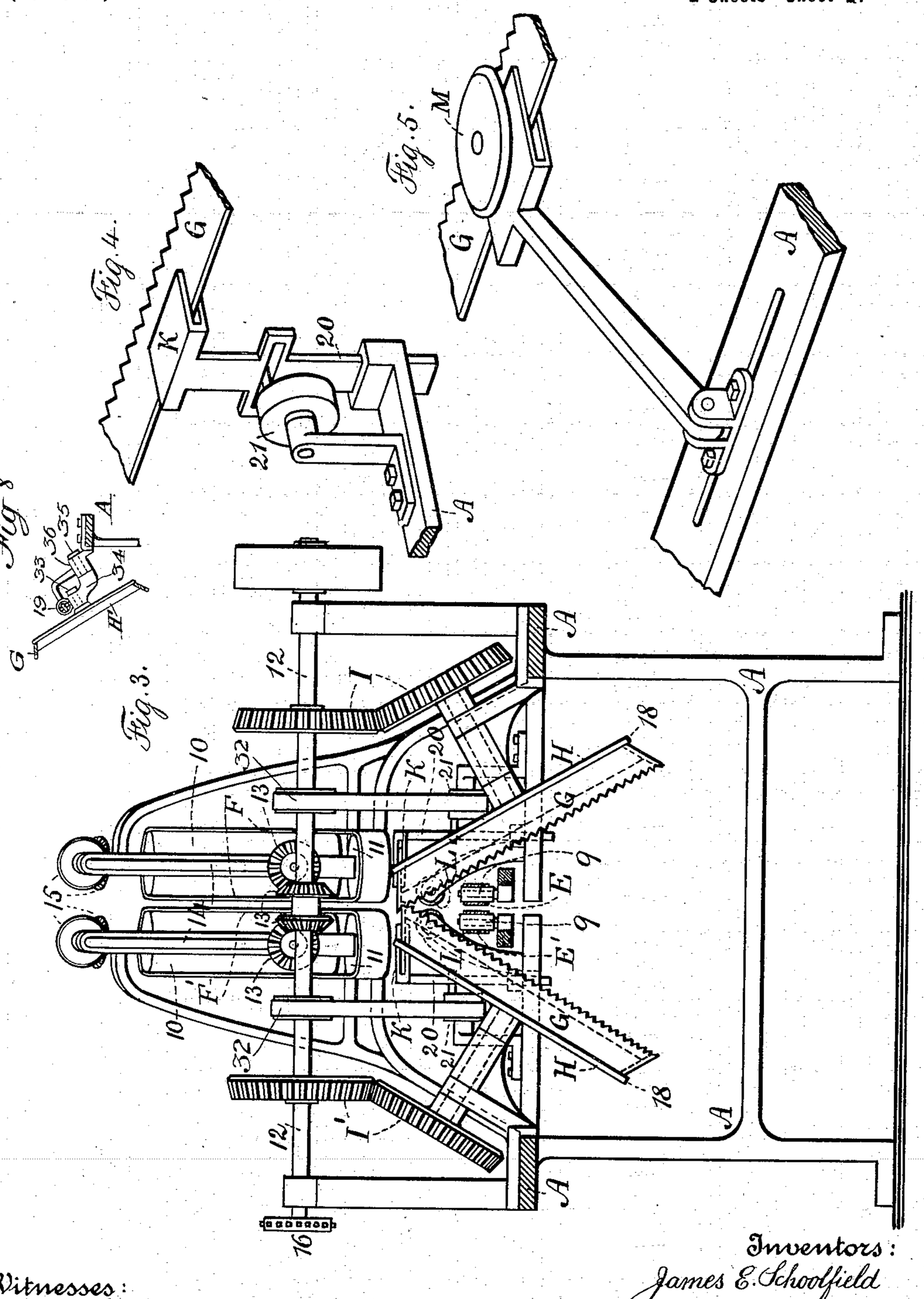

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UNITED STATES PATENT OFFICE.

JAMES E. SCHOOLFIELD AND GEORGE M. GUERRANT, OF DANVILLE, VIRGINIA.

TOBACCO-STEMMING MACHINE.

SPECIFICATION forming part of Letters Patent No. 652,008, dated June 19, 1900.

Application filed March 21, 1899. Serial No. 709,933. (No model.)

To all whom it may concern:

Be it known that we, JAMES E. SCHOOLFIELD and GEORGE M. GUERRANT, citizens of the United States, residing at Danville, in the county of Pittsylvania and State of Virginia, have invented an Improvement in Tobacco-Stemming Machines, of which the following is a specification.

In machinery for stemming tobacco the leaf has in some instances been taken with the butt or larger end of the stem at the end that advances, and the leaf has been drawn off the stem by the action of rollers or other devices, and in some instances the stem of the leaf has been grasped and carried through the machine by chains and the thinner portions of the leaf have been drawn off by the action of card-clothing or other devices. In these cases the stem, being grasped only at one point and being subject to a progressive pulling action, is liable to be injured and sometimes broken. The present improvement is made with reference to grasping the stem progressively and for allowing the leaf to hang vertically as the thinner portions of the leaf are removed; and to effect these objects the strippers or stemming devices do not penetrate the leaf or act to tear the same, and by the leaf hanging vertically the stem is grasped progressively and drawn off, allowing the leaf to be separated and fall away.

In the drawings, Figure 1 is a plan view. Fig. 2 is a longitudinal central section. Fig. 3 is a cross-section, in larger size, at *y y*, Figs. 1 and 2. Fig. 4 is a perspective view illustrating the action of the devices that vibrate the scraping-belt. Fig. 5 is a perspective view showing the cutter for separating the stem near the end of the leaf. Fig. 6 represents one of the stripping-belts, indicating the preferred form of notches in the edge thereof. Fig. 7 is a cross-section at *x x*, Fig. 2, showing the devices that act upon the stem as it is delivered from the machine. Fig. 8 is an elevation of one of the conical pulleys for the stripper-belts, showing the manner in which the same is mounted so that the pulley can yield under the vibration of the belt.

The framework of the machine is illustrated at A, and the feeding-belts B B′ pass around the respective pulleys C C′, the axes or shafts of which stand vertical, and these pulleys are to be driven by suitable power. We have represented a shaft 4 and bevel-gears at 5, by which the vertical shafts of the pulleys C′ may be revolved. Upon these belts are cleats or crossing projections at distances apart to give room for the stem of one leaf to pass in between one cleat and the next.

Between the feeding-belts B B′ is a belt D, preferably in the form of an inflated rubber tube, passing around the pulleys 6 and 7, and this belt is slightly detained by a roller at D^2, so that it may have a slower motion than the belts B B′ as it receives its motion from such belts.

While we have represented pulleys and belts for giving motions to the respective parts of this machine, we do not limit ourselves to the devices represented, but may vary the same as it may become necessary.

The objects of the devices thus far described are to separate and feed in the tobacco-leaves, and the leaves are to be supplied by hand between the respective belts B and B′ and the belt D, there being a guard in the form of a glass plate or other device D^3 above the belt, so that the attendant can press the upper ends of the stems against this guard as they are entered in between the belts, and as the leaves hang by the grasping action of these belts and the belts B B′ are traveling at a faster speed than the belt D each stem will receive a turning motion, which will help to separate one leaf from the next as the attendant passes the leaves in at opposite sides of the belt D, one stem being allowed to remain in each space between the cleats on the belts, and they are gripped progressively by the respective belts and moved along into the machine, there being sufficient space below the belts for the leaves to hang vertically and freely, and it is to be understood that the shanks or largest ends of the leaves are uppermost and between the respective belts. Hence if two stems are presented simultaneously they will be separated by the action of the belts in consequence of the action of the belts upon the stems, so that when the leaves reach the distant ends of the belts they are separated and in a vertical position, and the cleats are so placed upon the

belts that the leaves at one side of the belt D come in between the leaves from the other side of the belt, and they pass from between the belts B, B′, and D in between the pair of belts E E′, which are at a lower level than the belts B, B′, and D, so as to grasp the leaves at a sufficient distance from the large ends of the stems for such large ends of the stems to be taken by the belts hereinafter described. These feed-belts E E′ are upon pulleys 8 and 9, the shafts of which stand vertical, and they are revolved at the proper speed, so as to convey away the leaves and carry them into the stemming devices.

We make use of two closely-adjacent ranges of inclined belts F F′, which pass around the inclined rolls 10 11, so that the belts F F′ have an upward inclination, and the top belts are the longest, and the end rolls 10 can be made use of for giving motion to the belts, and the rolls 11 are separate—one for each belt—and occupy a substantially-horizontal range, although the axis of each roll is inclined. These ranges of belts are so placed that they receive between them the upper ends of the tobacco-stems and they are close enough together to grasp such stems, and in consequence of the upward inclination of the belts the stems are lifted bodily as they are moved along, the object being to draw up the stems as the leaf portions of the tobacco are scraped off or pressed down and stripped from the stems and delivered. Rollers 40 may be applied as shown by dotted lines in Fig. 2, so as to keep the adjacent faces of the belts F′ sufficiently close to each other to firmly clamp the butts of the stems between said belts as said stems are carried along by said belts. Said rollers 40 are shown upon the axes of the pulleys 11 and are of the same diameter as said rollers 11.

It is to be understood that the framework of the machine is constructed with reference to carrying the respective devices and that the belts receive their motion from any suitable power. We have, however, represented a driving-shaft 12, bevel-gearing 13, longitudinal shafts 14, and bevel-gearing 15 to the shafts of the rolls 10, and the shaft 12 is driven by any suitable device; but the sprocket-wheels 16 and chains 17 are shown as a convenient means for connecting the shaft 12 to the shaft 4.

We make use of strippers G, which occupy substantially-horizontal positions and act upon the leaves to separate the same from the stems as the stems are drawn up, and these strippers are advantageously of thin sheet metal notched upon the adjacent edges, so as to grasp the leaves with the stems in the notches, and the plates of these strippers advantageously lap at their edges sufficiently for the stems to occupy the bottoms of the notches, and hence the leaf portions are drawn off from the stems as the stems are carried upward by the actions of the inclined belts.

We find it advantageous to make use of strippers in the form of endless metal belts and to give to these belts a progressive movement corresponding, or nearly so, to the movement given to the stems by the ranges of inclined belts, and we also find it advantageous to vibrate these strippers, so that they may move up and down upon the stems, the object of the motion being to prevent the leaves becoming entangled or the stems broken by a continuous pull in one direction, because as the strippers move upward they tend to detach the leaf portions in one direction and moving downward to detach such leaf portions in the other direction, so that the stems are freed entirely from the leaf portions, except in some instances slight portions of the leaves which may remain near the butts or upper ends of the stems, and these may be removed as hereinafter indicated.

We have represented the endless-belt strippers G as passing around the conical pulleys H H′, which are provided with flanges 18, that serve to keep the stripper-belts in alinement, and the stripper-belts are brought closely together at their upper parts, so that the leaves pass in between them as they are moved along by the belts E E′ F F′, and the lower portions of the stripper-belts G are sufficiently distant one from the other not to come in contact with the leaves as they hang should the leaves be long. The conical pulleys H H′ receive motion by any suitable gearing or belts. We have represented the bevel-gears I I′ for communicating motion to the conical pulleys H H′ from the shaft 12. The stripper-belts G are also vibrated, as hereinafter indicated, and to allow for this movement the conical pulleys H′ are each provided with a stud or shaft 33, fitted to turn in a bearing 34, and said bearing has a pivot 35 in a plane below the shaft 33, passing into a bearing 36, secured to the frame A. A spring 19 is connected at one end to the bearing 34 and at the other end to an arm connected to the bearing 36. It will now be understood by reference to Figs. 1 and 8 that the pulleys H′ rotate upon the shafts 33 and can swing upon the pivots 35 as the stripper-belts are vibrated and that the springs 19 tend to move the pulleys H′ in a direction away from the pulleys H, thereby keeping the gripper-belts always under the proper tension. To vibrate such belts vertically, any suitable mechanism may be made use of. A device, however, is specially illustrated in Fig. 4, in which there is represented a jaw-plate K, through which the stripper-belt passes, and this jaw-plate is sustained upon a vertical standard 20, in which is the horizontal slot receiving a crank-pin upon a pulley 21, that is revolved by a belt 32, passing around a pulley on the shaft 12, and the crank-pin carries the standard and the jaw-plate up and down, and with it the stripper-belt, and a similar device is applied at each side, and hence these belts as they vibrate act progressively in scraping down the leaf portions as

the stems are drawn up, and the leaf portions are below the strippers G as the leaves hang down.

In order to prevent the leaf portions accumulating below the strippers G, we make use of a pair of rolls L, which pass along closely below the strippers G and are advantageously grooved helically in their surfaces, and they are revolved rapidly by any suitable mechanism—such, for instance, as the endless belts 22—and these rolls L draw down between them the loose portions of the leaves that have been scraped off the stems and finally deliver the same downwardly as soon as the stems have been cut by the circular cutters M, and said rolls also maintain a sufficient tension on the stems to prevent their being lifted as the strippers rise.

It is generally advantageous to cut the stems near their smallest ends by the cutters M, (shown specially in Fig. 5,) and the fine portions of the stems are not detrimental when they remain along with the leaf portions, and this also allows the two halves of the leaf portions to remain connected. The cutters M are shown as circular and supported on jaw-arms that allow the cutters to rise and fall with the strippers G.

Where the notches in the stripper-belts are made as shown in Fig. 6, they have a series of projecting points that aid in stemming the leaves, and the stripper-belts should lap one over the other, and the stems are received in the notches, and the belts should lap the most at the delivery end, so that the smaller parts of the stems will be properly acted upon by the notched strippers. After the leaves have been stemmed should there be any leaf portions adhering near the upper ends or butts of the stems such stems may be taken between a pair of rolls N, which are preferably of rubber, and drawn down and delivered, there being notched circular strippers P, that are immediately above the rollers, so as to be moved by the forward action of the stems, and these strippers P scrape off any portions of leaves that may remain upon the stems near their butt ends as the stems are drawn down by the rollers N. It is advantageous to have two of the belts in the inclined ranges of belts F F' longer than the others to pass out sufficiently far to carry the stems in between the rolls N, that draw said stems down and deliver them. These strippers P and rollers N are removed from Fig. 1 for greater clearness; but the parts are shown in Figs. 2 and 7. The rolls N may be revolved by any suitable means. We have represented pulleys and belts at 23 for giving motion to the same.

We claim as our invention—

1. Two feeding-belts and an intermediate belt, the feeding-belts having cross-cleats or projections upon them for the stems of the tobacco-leaves to pass in between one cleat and the next, and the intermediate belt causing the separation of the leaves where two or more may come opposite the notch between the cleats on the belts, substantially as set forth.

2. In a tobacco-stemming machine, the combination of a pair of feeding-belts for carrying in the leaves with the larger ends or butts upward, and the leaves hanging vertical, a second pair of belts at a lower level than the first pair of belts for receiving the leaves from said first pair of belts and grasping them lower down than the first pair of belts, and stemming devices adjacent to said second pair of belts and into which stemming devices the leaves are delivered by said pair of second belts with the butts projecting at the proper height, substantially as specified.

3. In a tobacco-stemming machine, the combination with the stripping devices, of ranges of inclined belts that act to draw out the stems from between the stripping devices, substantially as set forth.

4. The combination with the devices for moving the tobacco-leaves progressively through the machine, of a pair of stripping-belts with notches in their adjacent edges to grasp the stems of the leaves, and means for vibrating such belts as the stemming operation progresses, substantially as specified.

5. In a tobacco-stemming machine, two stripping-belts with notches in their adjacent edges to grasp the stems of the leaves, and means for withdrawing the stems as they are carried along by the stripping devices, substantially as set forth.

6. The combination in a tobacco-stemming machine, of ranges of inclined belts for holding the stems, a pair of stripping-belts with notches in their adjacent edges for removing the leaf portions from the stems, and mechanism for giving to the strippers a vibratory movement, substantially as set forth.

7. The combination in a tobacco-stemming machine, of a pair of stripper-belts with notches in their adjacent edges, means for vibrating the same, ranges of inclined belts for grasping the stems and a pair of revolving rolls acting below the strippers for drawing down between them the leaf portions as separated from the stems, substantially as set forth.

8. The combination in a tobacco-stemming machine, of a pair of stripper-belts with notches in their adjacent edges, means for vibrating the same, ranges of inclined belts for grasping the stems, a pair of revolving rollers below the strippers for drawing down between them the leaves as separated from the stems, and a pair of circular cutters for separating the stems near the ends of the leaves, substantially as set forth.

9. The combination in a tobacco-stemming machine, of two endless stripper-belts notched on their adjacent edges, pulleys for giving a progressive movement to such belts, jaws and a crank and shaft for giving motion to the jaws and vibrating the belts, substantially as set forth.

10. The combination in a tobacco-stemming machine, of two endless stripper-belts notched on their adjacent edges, pulleys for giving a progressive movement to such belts, jaws and a crank and shaft for giving motion to the jaws and vibrating the belts, and a pair of rollers below the strippers and means for revolving the same to draw down and deliver the leaf portions, substantially as set forth.

11. The combination in a machine for stemming tobacco, of inclined belts for withdrawing the stems, strippers for removing the leaf portions, a pair of rollers and means for revolving the same for drawing down the stems and rotary notched strippers above such rolls for removing any leaf that may adhere to the stems near the butt-ends thereof, substantially as set forth.

12. The combination in a machine for stemming tobacco, of two feeding-belts and an intermediate circular belt acting to spread the stems upon the feeding-belts, substantially as set forth.

13. In a tobacco-stemming machine, ranges of inclined belts for carrying the leaves in a hanging position, in combination with vibrating stripper-belts below said ranges of inclined belts that act progressively from the larger parts of the stems toward the ends of the leaves and strip the leaves while the stems are carried upward and along by said inclined belts, substantially as specified.

14. In a tobacco-stemming machine, the combination with the pair of notched stripping-belts and the two ranges of inclined belts, one belt of each range of belts extending beyond the other belts of the range, of a pair of rollers N to draw down the stems and a pair of circular notched strippers to strip any leaves remaining on the stems as said stems are drawn down by said rollers, substantially as specified.

15. In a tobacco-stemming machine, two strippers notched on their adjacent edges to grasp the stems, in combination with ranges of inclined belts that act to draw out the stems from between the stripping devices, substantially as set forth.

Signed by us this 15th day of March, 1899.

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