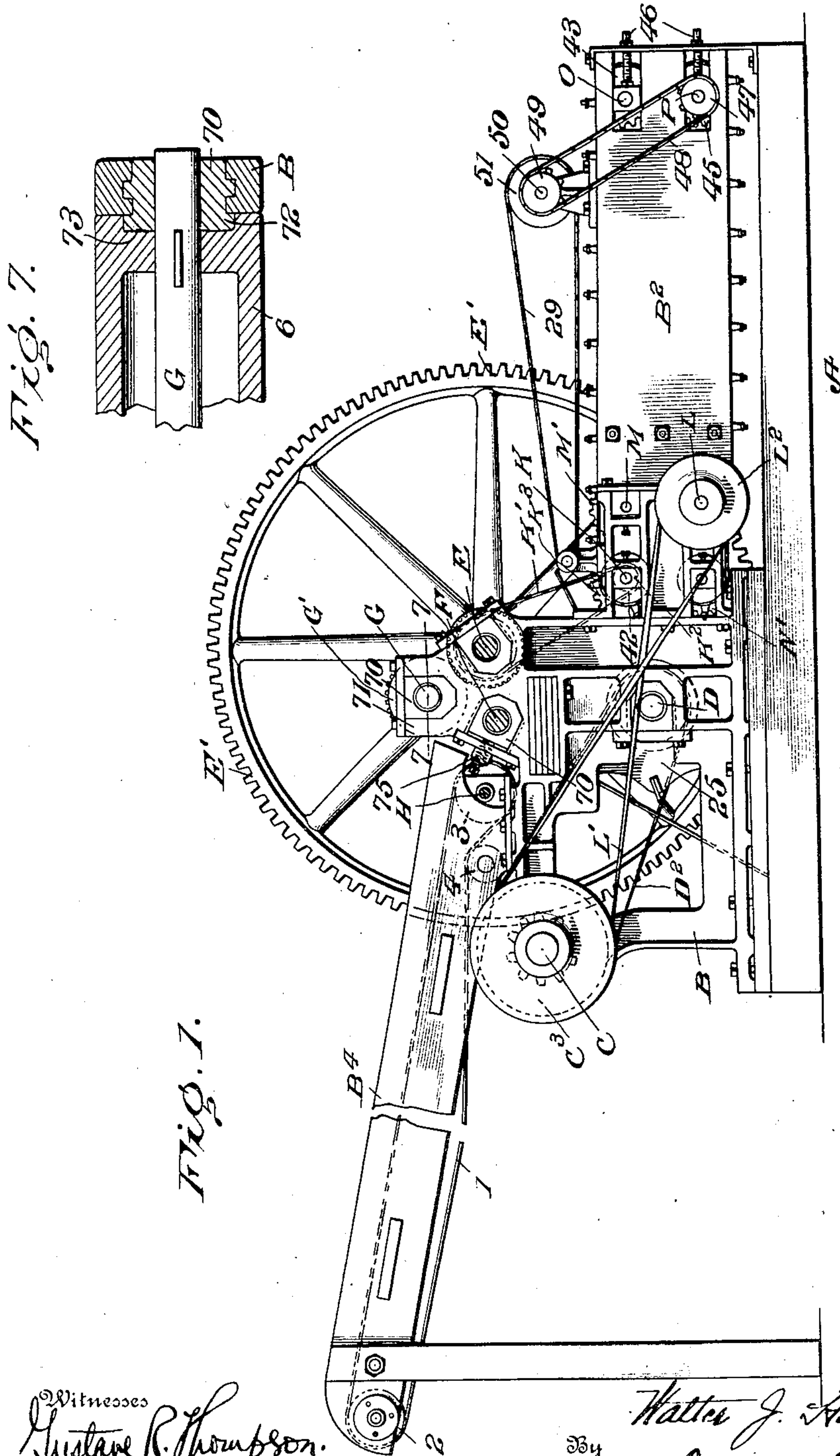


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PATENTED JUNE 26, 1906.

W. J. HOLLIER.
DECORTICATING MACHINE.
APPLICATION FILED JUNE 15, 1905.

4 SHEETS—SHEET 1.



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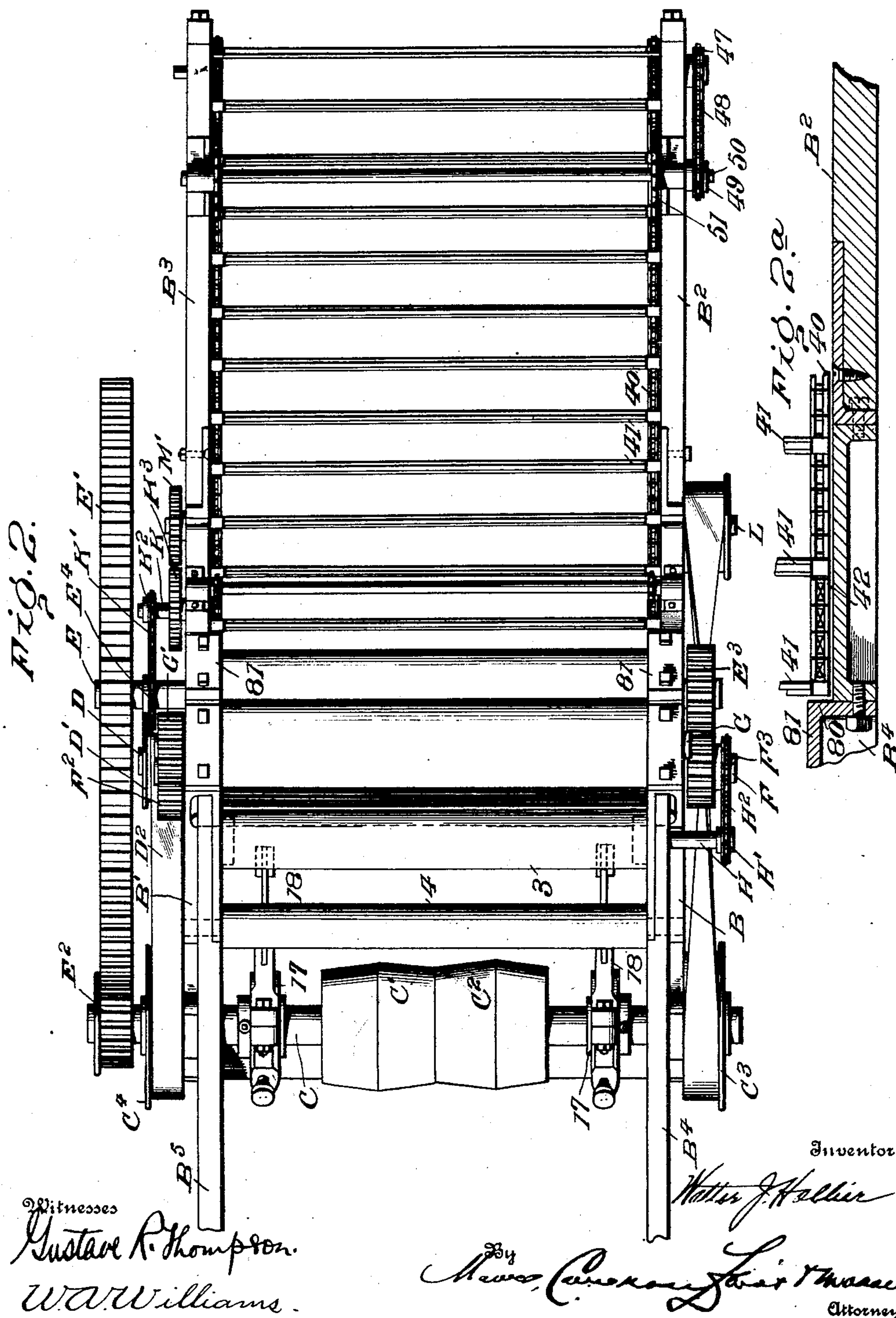
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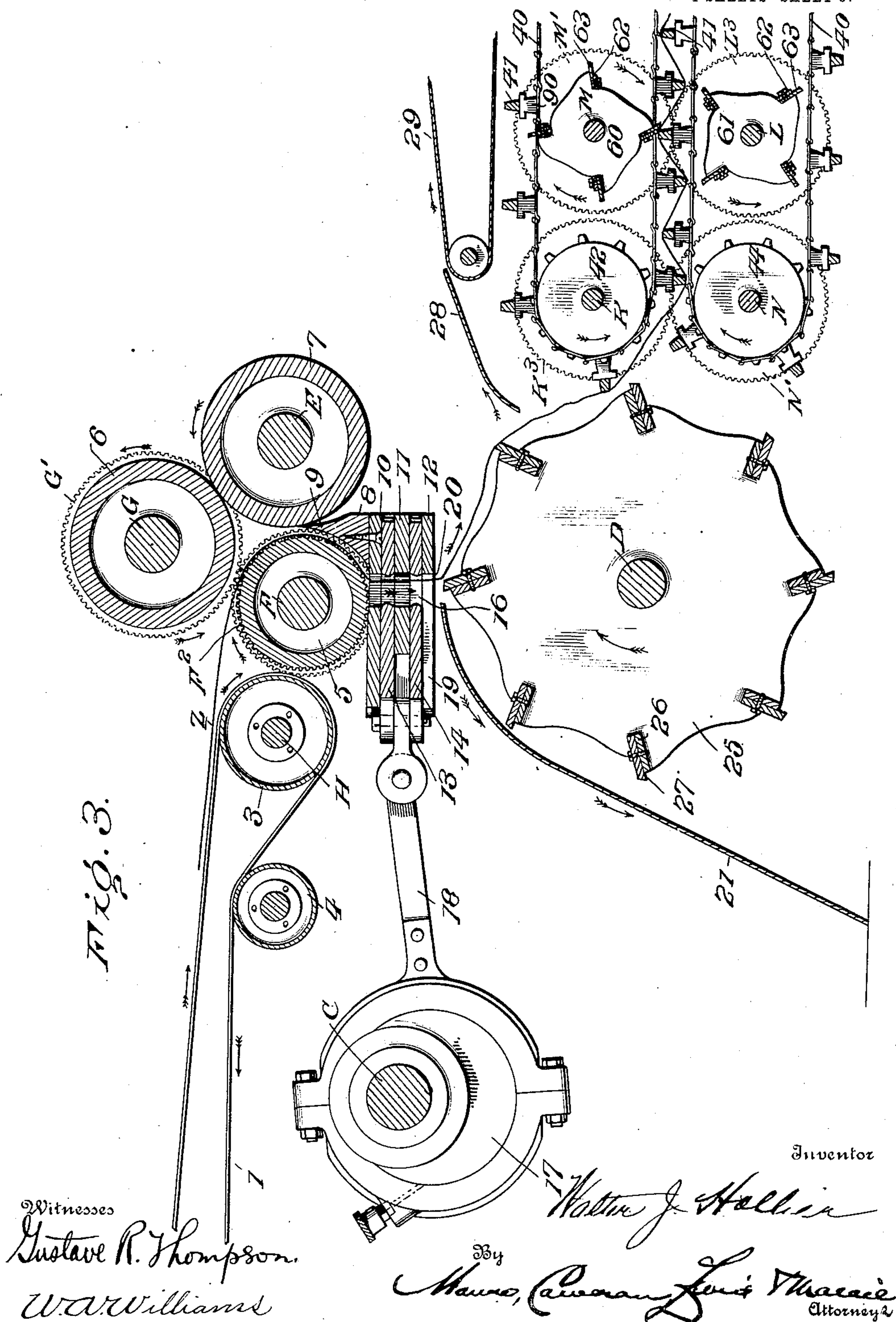


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4 SHEETS—SHEET 4.

Fig. 4.

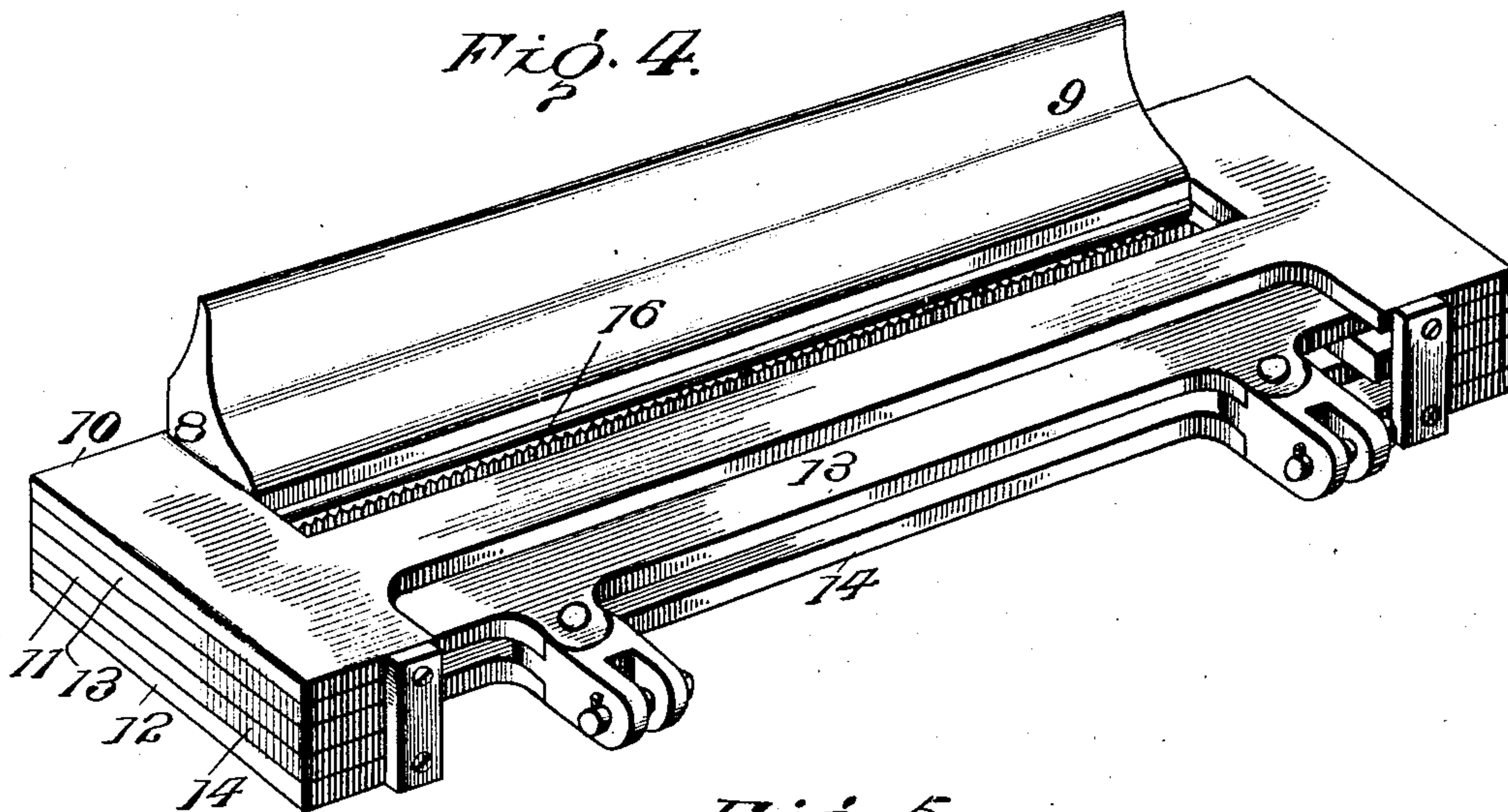


Fig. 5.

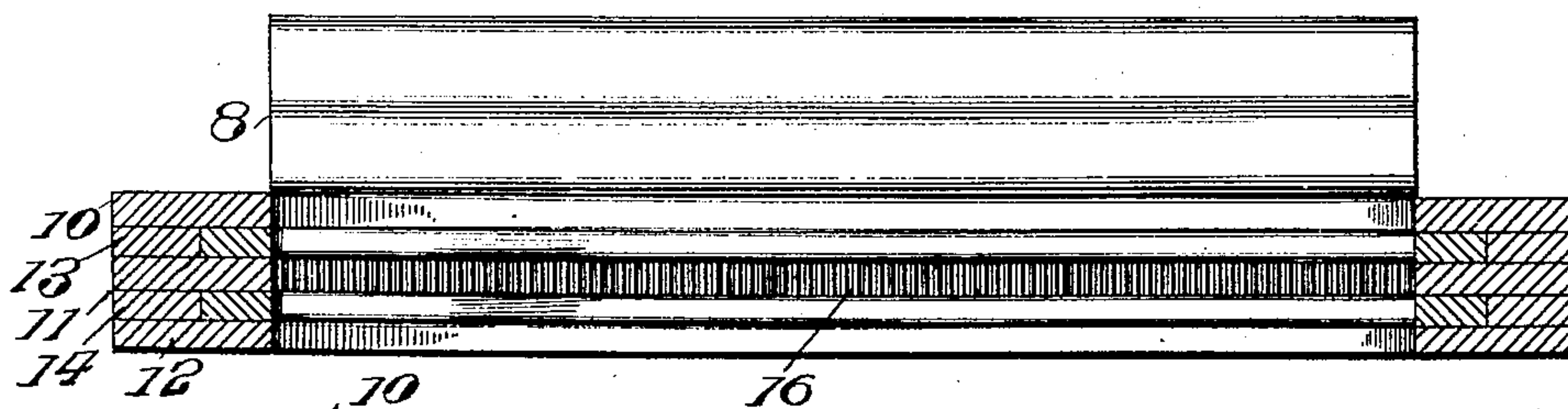
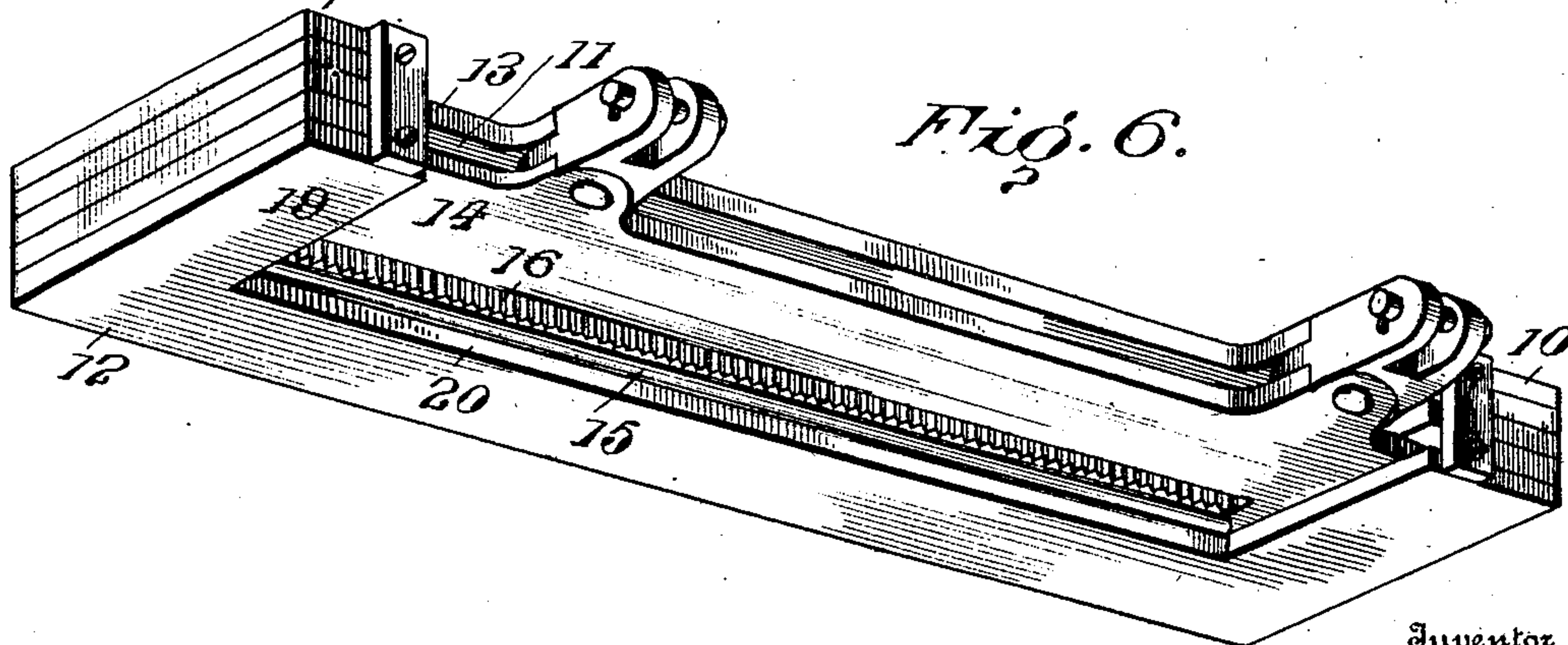


Fig. 6.



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UNITED STATES PATENT OFFICE.

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DECORTICATING-MACHINE.

No. 824,244.

Specification of Letters Patent.

Patented June 26, 1906.

Application filed June 15, 1905. Serial No. 265,450. Substituted for abandoned application filed May 21, 1902. Serial No. 108,335.

To all whom it may concern:

Be it known that I, WALTER J. HOLLIER, a resident of New Orleans, Louisiana, have invented new and useful Improvements in Decortivating-Machines, which invention is fully set forth in the following specification.

The object of my invention is to provide a machine capable of effectively and completely separating the fibers of fibrous stalks—such as hemp, ramie, and jute—from the woody and other parts of the stalks.

The invention consists in certain improvements in the construction and combination of parts, all of which will be best understood by reference to the accompanying drawings, illustrating the preferred embodiment thereof in practical form.

Figure 1 is an elevation. Fig. 2 is a plan view. Fig. 2^a is a transverse sectional view through part of the framework; Fig. 3, a sectional view showing the coöperative arrangement of the principal parts of the machine. Fig. 4 is a top perspective, Fig. 5 a longitudinal section, and Fig. 6 a bottom perspective, of the brake; and Fig. 7 is a detail sectional view through one of the rollers and its bearings.

Referring to Figs. 1 and 2, A is a base upon which is mounted the framework supporting the various journals and operating parts of the machine. Said framework comprises castings B B' at opposite sides of the machine, plates B² B³, preferably of wood, bolted to said castings, respectively, and extending to the right, and plates B⁴ B⁵, bolted to the castings, respectively, and extending to the left.

I will first explain the shafting and gearing for driving the principal parts of the machine.

C is the main driving-shaft, carrying at its middle fast pulley C' and loose pulley C², Fig. 2, and at its ends outside of the framework pulleys C³ C⁴, respectively.

D is a shaft carrying pulley D', through which it is driven from pulley C⁴ by belt D².

E is a shaft carrying a large gear-wheel E', meshing with a small gear-wheel E² on shaft C. A gear-wheel E³ on the other end of shaft E meshes with a gear-wheel F' on the end of shaft F to drive the latter, and a gear-wheel F² at the other end of shaft F meshes with a gear-wheel G' on shaft G to drive the same. A sprocket-wheel F³ on shaft F is connected

with a sprocket-wheel H' on shaft H by a sprocket-chain H², and a sprocket-wheel E⁴ on shaft E is connected by a sprocket-chain K' with a sprocket-wheel K² on a shaft K. The gear-wheels E³ F', sprocket-wheels F³ and H', and the sprocket-chain H² are omitted from Fig. 1 in order to show the journal-boxes for the shafts E and F. A gear-wheel K³ on shaft K meshes with a gear-wheel N' on shaft N to drive the latter. (See Fig. 3.)

L is a shaft driven from shaft C in a reverse direction by a crossed belt L', passing from pulley C³ over a pulley L². A gear-wheel L³ on the other end of shaft L meshes with a gear-wheel M' on shaft M, Fig. 3, thereby driving the latter.

The hemp, jute, ramie, or other fibrous stalks to be decorticated are carried into the machine by a feed-apron 1, Figs. 1 and 3, (not shown in Fig. 2,) which works between the plates B⁴ and B⁵, passing at its outer end around roller 2 and at its inner end around a roller 3 on shaft H and over a tension-roller 4.

5, 6, and 7 are rollers on the shafts F, G, and E, respectively, to which the stalks are delivered from apron 1. Roller 5 has longitudinal teeth or corrugations on its surface, which act to crush and break the woody part of the stalks into short lengths or pieces. Rollers 6 and 7 have smooth surfaces and act to hold and press the stalks tightly against and carry them around the roller 5 in the path indicated by line z in Fig. 3. A deflector 8, Fig. 3, serves to direct the stalks around under roller 5 to the feed-opening of the brake located beneath said roller. The concave surface 9 of deflector 8 furthermore acts, in conjunction with the roller 5, to grip the stalks and hold and feed them to the brake, so that the latter may operate on the endmost part of the same with the same efficiency as it has acted on the part which is first introduced into the brake. Heretofore there has been a material waste of fiber, due to the fact that a certain length of the butt-end of the stalk drops through the brake without being operated upon and from which it is therefore impossible to remove the fiber. This is due to the fact that in the machines now commonly used the crushing-rollers release the ends of the stalks while a material length thereof still projects above the brake, and as soon as the parts of the brake arrive

at such position as to momentarily release the stalk which has already been released by the rollers the end of the stalk drops through the brake without being acted upon. In the arrangement herein described, however, this is avoided, as the stalk remains gripped between rollers 5 and the surface 9 until only a fraction of an inch of its end remains above the brake.

My improved brake, which is shown in Figs. 3, 4, 5, and 6, consists of three stationary plates 10, 11, and 12, secured together at their ends, and two movable plates 13 and 14, adapted to be oscillated between the stationary parts. Each of the plates 10, 13, 11, and 14 has an elongated slot 15 therethrough, through which the stalks pass. When the movable plates are in the position shown in Fig. 3, these slots register; but when the movable plates 13 and 14 are reciprocated the slots therein are moved more or less out of register with the slots in the other plates, first in one direction and then in the other, in a well-known manner, thereby crushing and breaking the woody and other part of the stalks without injury to the fiber. At the same time in order to split the woody part of the stalks longitudinally I provide teeth 16, extending transversely across the side walls of the slot 15 of the stationary plate 11. The deflector 8 is mounted upon the top plate 10. The movable plates 13 and 14 are reciprocated by eccentrics 17 17 on shaft C through pitmen 18 18, Fig. 2. The lower stationary plate 12 instead of being slotted, as are the other plates, is cut away at 19, Figs. 3 and 6. Therefore while this plate has a vertical wall 20, against which the stalks are crowded and crushed when the blades 13 and 14 are moved to the right, Fig. 3, it has no opposing vertical wall against which the stalks are crowded and crushed when the blades 13 and 14 are moved in the opposite direction. On the contrary, when plate 14 moves to the left, Fig. 3, that part of the stalk immediately below said plate is left free and is violently shaken toward the left, thereby throwing a material part of the broken and loosened woody part of the stalk over onto the shield 21, Fig. 3. By thus removing a material portion of the woody part of the stalk at this stage of the operation I greatly facilitate the action of the other parts of the machine.

25 is a beater-drum or cylinder composed of two end plates or heads secured to shaft D and connected by bars 26, to which are secured blades 27, which travel in close proximity to the under surface of the upper end of shield 21 as the drum rotates in the direction indicated by the arrow in Fig. 3. As the stalk leaves the brake the blades 27 strike the same in rapid succession, loosening and throwing over onto the plate 28 and the

traveling discharge-apron 29 a material portion of the remaining woody portion of the stalk. The discharge of the woody matter at this stage of the operation is assisted by a strong current of air set up by the rapid rotation of drum 25 and discharged over plate 28 in the direction indicated by arrows, Fig. 3. The fibrous part of the stalk not being broken or secured by the action of the brake travels around the drum 25 in the path indicated by the broken line, Fig. 3. The fiber is removed from the drum 25 and further acted upon by horizontally-moving carriers, which will now be explained.

Each of the carriers is composed of two continuous sprocket-chains 40, one at each side of the machine, connected by a series of equidistant projecting ribs or slats 41, secured at opposite ends to blocks 90 on chains 40. The chains of the upper carrier pass, respectively, around sprocket-wheels 42 42 on shaft K and sprocket-wheels 43 43 on a shaft O, Fig. 1, while the chains of the lower carriers pass, respectively, around sprocket-wheels 44 44 on shaft N and sprocket-wheels 45 45 on a shaft P, Fig. 1. The bearings of shafts O and P are adjustable, by means of bolts 46, to tighten the carriers. The discharge-apron 29, heretofore referred to, is driven from shaft P by means of a sprocket-wheel 47 on said shaft, a sprocket-chain 48, and a sprocket-wheel 49 on shaft 50, which carries roller 51, around which the apron passes at one end.

As clearly shown in Fig. 3, the ribs 41 on the upper part of the lower carrier project into the space between the ribs on the lower part of the upper carrier, thereby bending the fiber back and forth in a zigzag line and gripping and holding the same as it is carried forward. By acting in close proximity to the path of the blades of drum 25 the ribs on the carriers remove the fiber from the drum.

The gearing for the carriers is arranged to drive the same at a greater speed than the feed of the machine—as represented, for example, by the speed of rotation of the rollers 5, 6, and 7. The result is that the fibers are held taut in a zigzag line, so that every part thereof may be operated upon.

60 and 61, Fig. 3, are rotary scrapers or cleaners mounted on shafts M and L, respectively, and each composed of two heads or end plates connected by metallic bars 62. To the bars 62 and projecting radially beyond the same are blades 63, of leather, rubber, or other suitable material. Scrapers 60 and 61 are rotated in a reverse direction to the movement of the carriers and in such manner that each of the flexible blades on the upper drum 60 passes between two successive ribs 41 of the upper carrier and presses the fiber against one of the ribs 41 of the lower

carrier, while the flexible blades of the lower drum 61 act in a corresponding manner with reference to the ribs 41 of the upper carrier. In this manner the flexible blades on the drums 60 and 61 act in conjunction with the ribs 41 to scrape and remove from the fiber every particle of woody and other foreign material that has not been removed by the other mechanism.

10 In decorticating-machines much trouble and numerous stoppages and delays are experienced by the stalks or parts thereof finding their way into the bearings of the rollers which act thereon, thus clogging the machine and frequently resulting in injury there-
15 to. I effectually avoid this difficulty by mounting the rollers 5, 6, and 7 in bearings such as shown in Fig. 7 with reference to one end of rollers 6. 70 is a bearing-block
20 which has a tongue-and-groove engagement with and is held in a recess in the casting B by a plate 71, Fig. 1. The end of roller 6 rotates in close contact with the adjacent surface of plate B, and a circular boss 72 on block
25 70 projects into and closely fits a corresponding opening 73 in the end of the roller. The shaft G passes through the center of boss 73 and block 70. Should any portion of a stalk find its way between the contiguous surfaces
30 of the cylinder and casting, it would be prevented from going farther by the boss 72. Rollers 5 and 7 and drum 25 are provided with similar bearings.

To permit roller 5 to yield slightly, and thus prevent injury to the machine when the stalks are accidentally fed to the rollers in larger quantities or bunches than the space between the rollers is intended to accommodate, the bearing-blocks 70 of said
40 roller 5 are held to their normal position by springs 75, Fig. 1, which yield to permit movement of said roller away from the other rollers.

To avoid entanglement of the material operated upon with the sprocket-chains 40 of the carrier and with their sprocket-wheels, I locate the sprocket-wheels 42 and 44, only one sprocket-wheel 42 showing in Fig. 2^a behind shoulders 80, so that as the fibers pass
50 from between the inner surfaces 81 81, Figs. 2 and 2^a, they will be engaged by ribs of the carriers at points between (and not over) said sprocket wheels and chains.

What is claimed is—

55 1. In a decorticating-machine, a brake comprising a plurality of superposed slotted plates arranged in two relatively movable groups the plates of one group alternating with those of the other, the lowermost plate
60 being cut away at one side of the slot to permit escape of part of the stalks acted upon, and means for imparting relative movement to the plates of the brake to open and close

the continuous passage formed by the slots therein.

2. In a decorticating-machine, the combination with a brake composed of a plurality of superposed slotted plates relatively movable to open and close the continuous passage formed by the slots, the lowermost plate being cut away at one side of its slot, of means for actuating the plates, and a shield projecting upwardly beneath the space formed by cutting away the lower plate and acting to deflect to one side parts of the material removed from the fiber at this point.

3. In a decorticating-machine, the combination with a brake composed of a plurality of superposed slotted plates relatively movable to open and close the continuous passages formed by the slots, the lowermost plate being cut away at one side of its slot, of means for actuating the plates, a rotary beater-drum having blades thereon and located beneath the brake, and a shield extending upwardly about one side of the drum and beneath the space formed by cutting away the lower plate and acting to deflect to one side parts of the material removed from the fiber at this point.

4. In a decorticating-machine, two endless movable carriers having transverse projecting ribs thereon, the ribs on one side of one carrier projecting into the space between the ribs on the opposing side of the other carrier and stretching the fibrous material in a zigzag line, a scraper acting upon the fibrous material while it is stretched over the ribs on the carrier, and means for feeding the fibrous material between the carriers.

5. In a decorticating-machine, two endless movable carriers having transverse projecting ribs thereon, the ribs on one side of one carrier projecting into the space between the ribs on the opposing side of the other carrier and stretching the fibrous material in a zigzag line, a rotary scraper acting upon the fibrous material while it is stretched over the ribs on the carriers, and means for feeding the fibrous material between the carriers.

6. In a decorticating-machine, two endless movable carriers having transverse projecting ribs thereon, the ribs on one side of one carrier projecting into the space between the ribs on the opposing side of the other carrier and stretching the fibrous material in a zigzag line, two rotary scrapers one acting in conjunction with the ribs on each carrier, and means for feeding the fibrous material to the carriers.

7. In a decorticating-machine, crushing feed-rollers, a brake to which the material passes from said rollers, a beater-drum acting on the fibrous material after it leaves the brake, two endless movable carriers to which the fibrous material is delivered from the

drum said carriers having transverse projecting ribs thereon the ribs on one side of one carrier projecting into the space between the ribs on the opposing side of the other carrier
5 and stretching the fibrous material in a zigzag line, and two rotary scrapers one acting in conjunction with the ribs on each carrier.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

WALTER J. HOLLIER.

Witnesses:

S. VALENTINE SAXBY,
C. R. SAVAGE.