

(No Model.)

4 Sheets—Sheet 1.

J. HEMPILL.

MACHINE FOR EXTRACTING FIBER.

No. 370,393.

Patented Sept. 27, 1887.

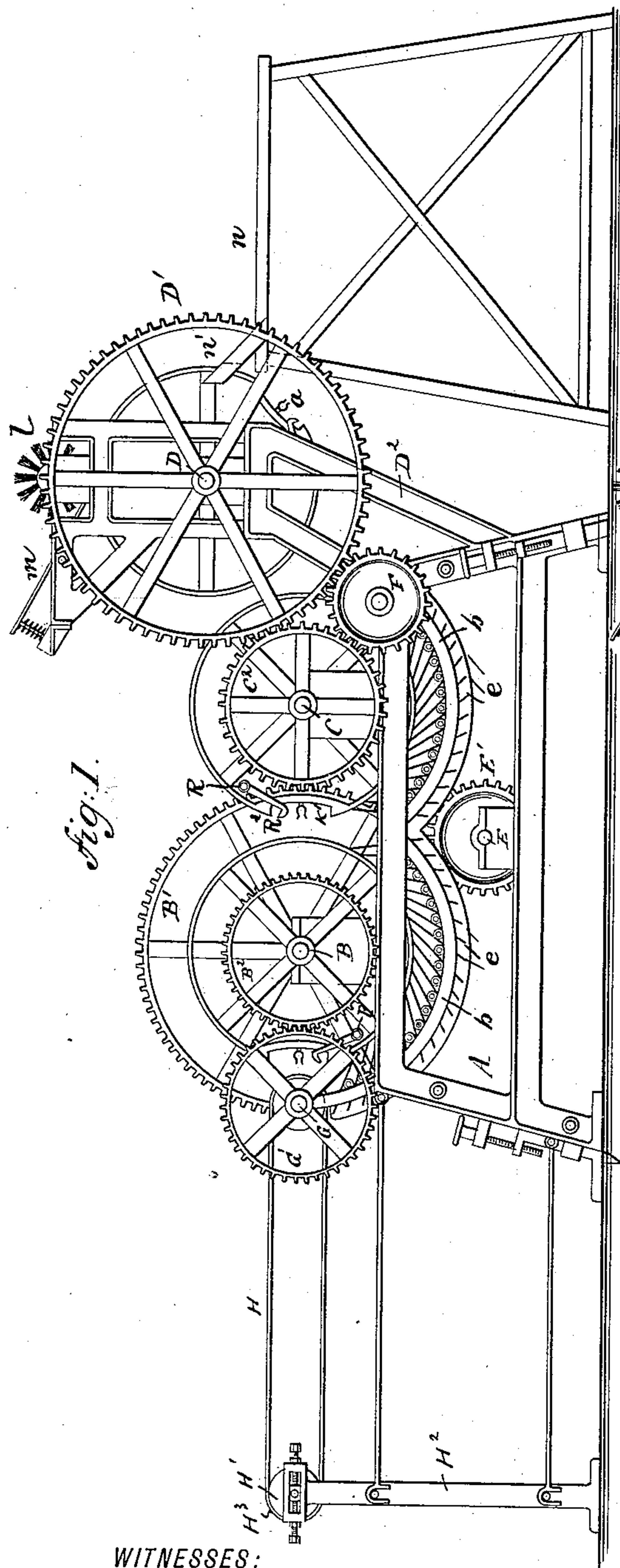


fig. 1.

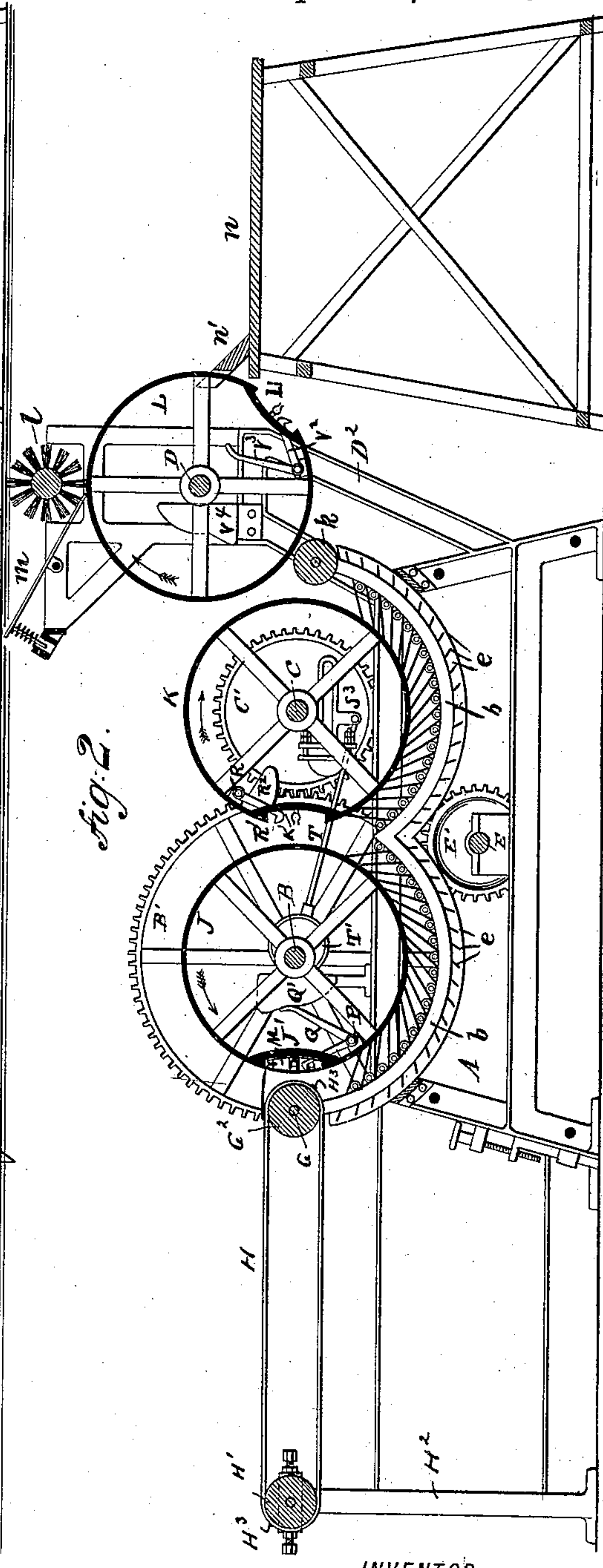


fig. 2.

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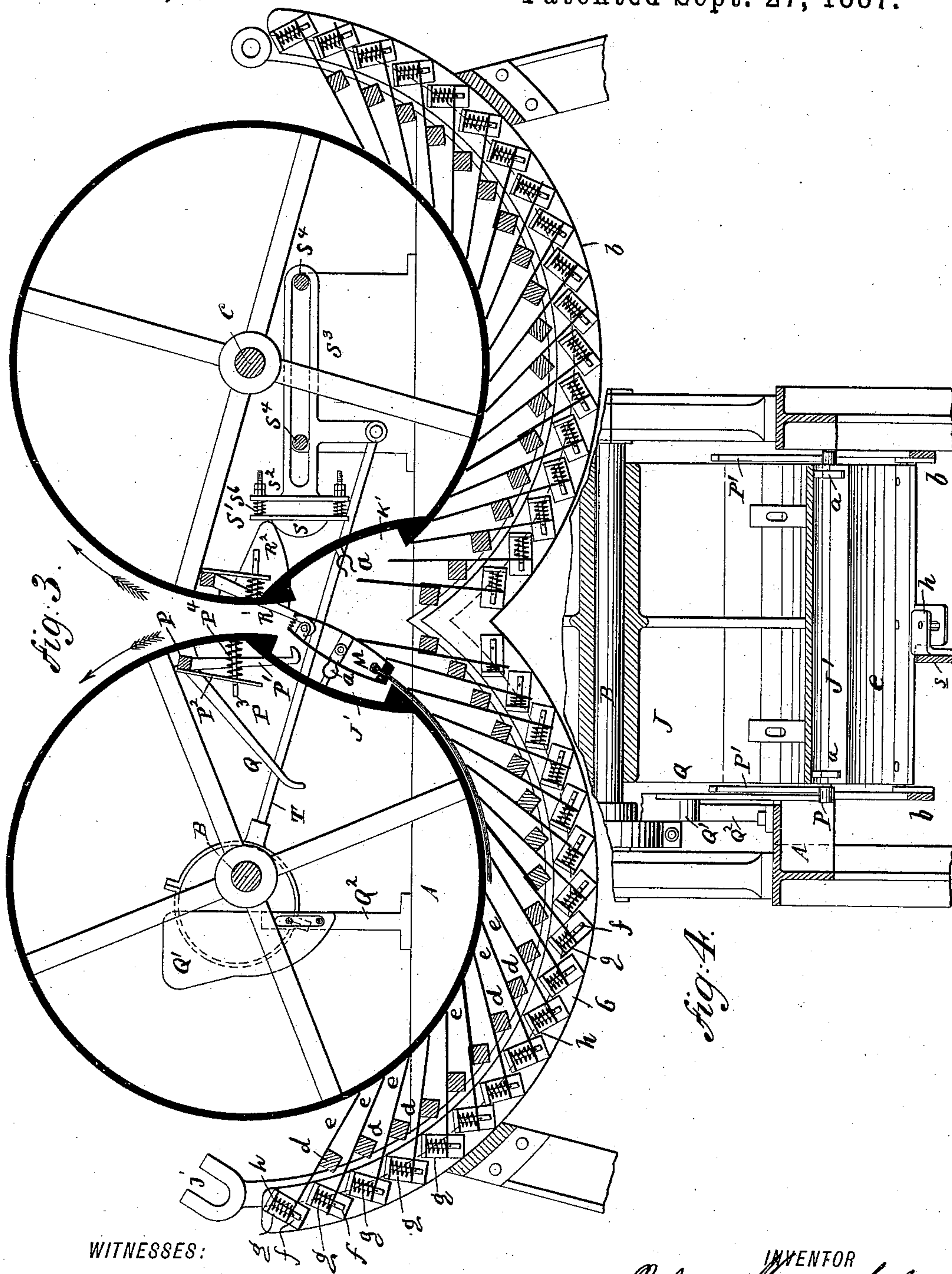
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4 Sheets—Sheet 3.

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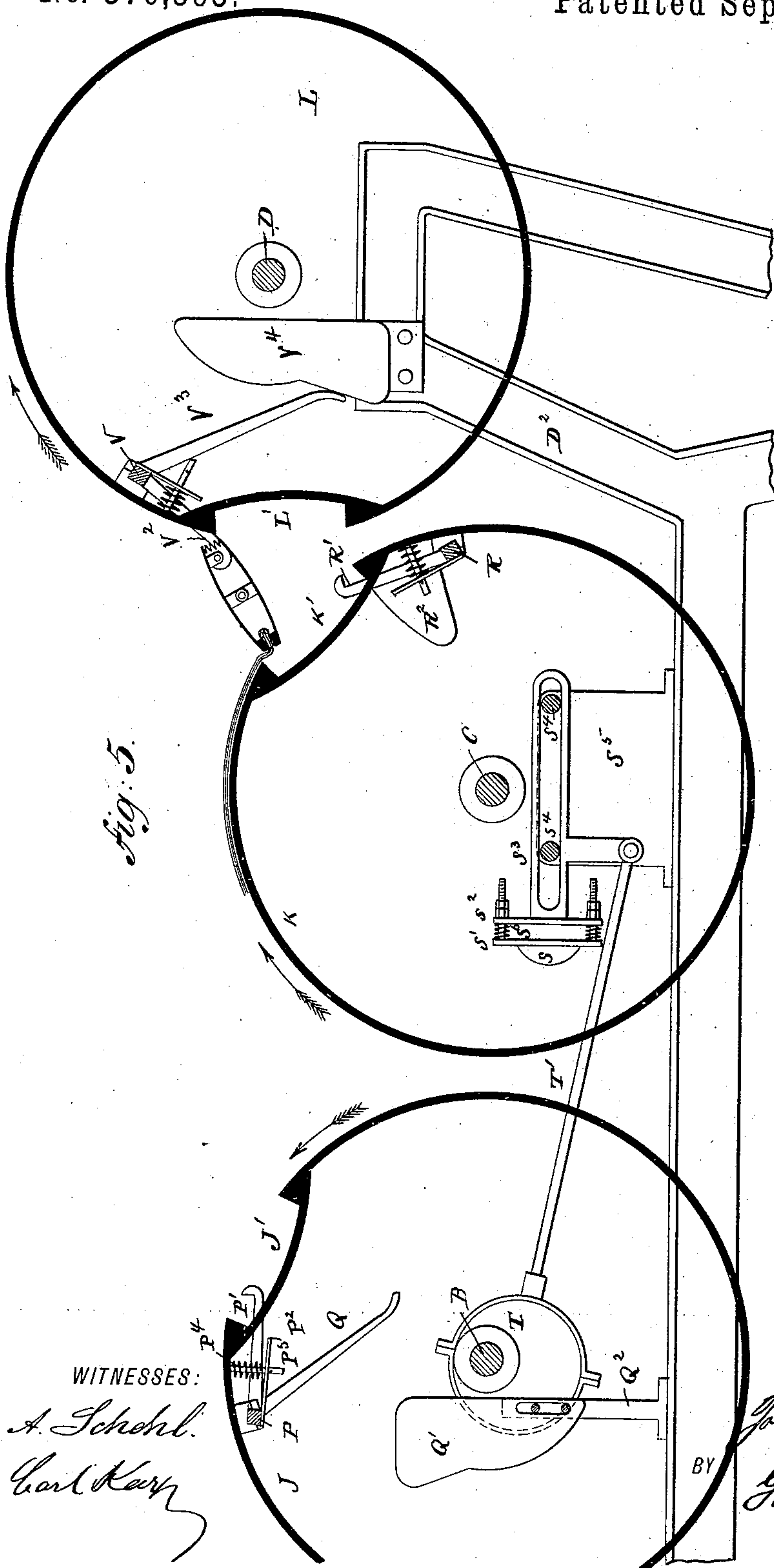


Fig. 5.

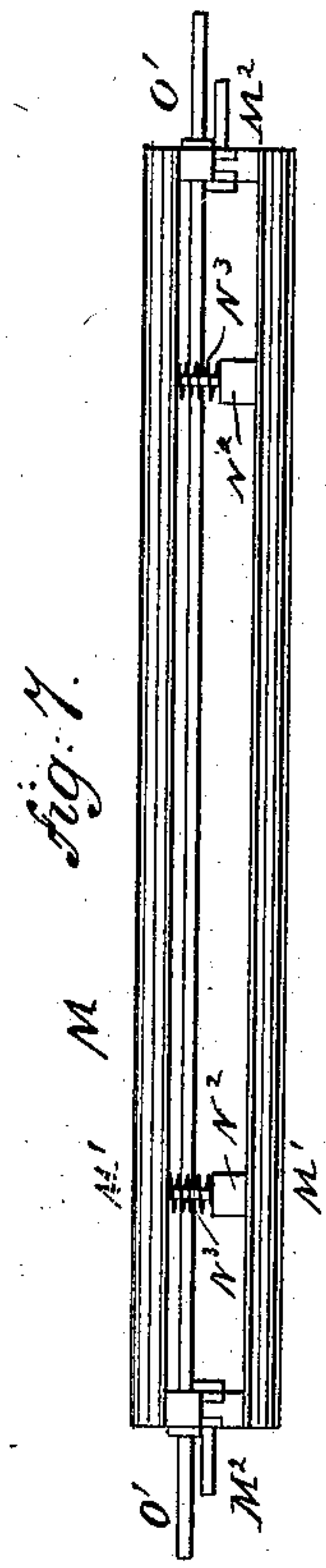


Fig. 6.

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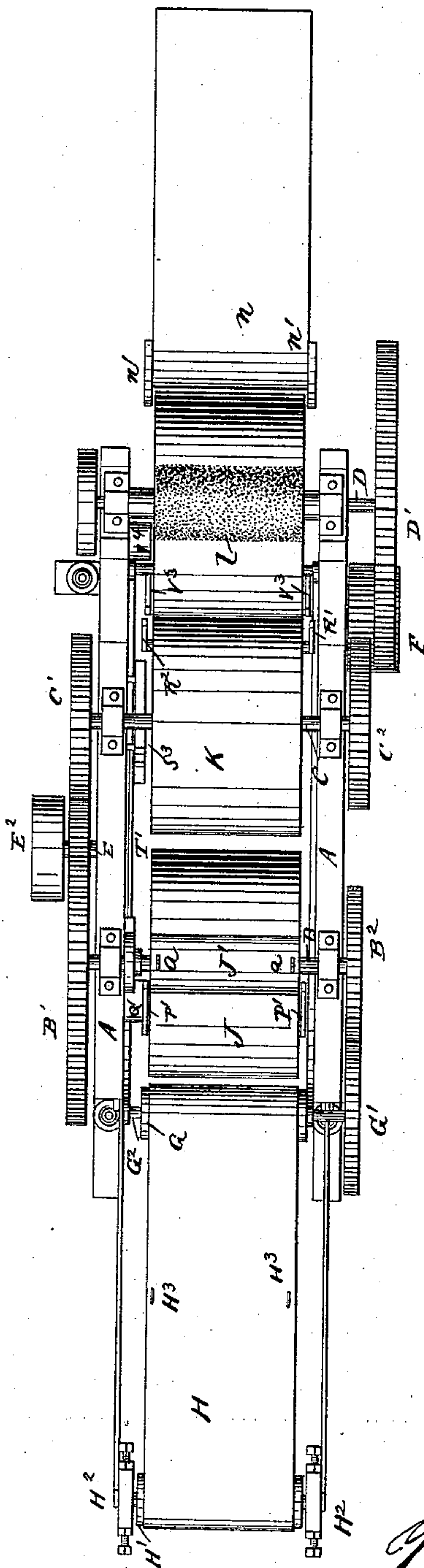
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Fig. 8.



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MACHINE FOR EXTRACTING FIBER.

SPECIFICATION forming part of Letters Patent No. 370,393, dated September 27, 1887.

Application filed December 15, 1886. Serial No. 221,608. (No model.)

To all whom it may concern:

Be it known that I, JOHN HEMPHILL, of Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Machines for Extracting Fiber, of which the following is a specification.

This invention relates to that class of machines used for extracting fiber contained in the leaves of the maguey, heneguen, palma, lechuguilla, and all other leaves containing fiber.

The object of my invention is to provide a new and improved machine which thoroughly removes the codilla from the fiber, said leaves being previously crushed before being passed through my machine.

The invention consists in the combination, with a series of drums having holders for clamps, in which the leaves are held, of spring-scrappers over the ends of which the leaves are drawn by the drums.

The invention also consists in the construction and combination of parts and details, which will be fully described and set forth hereinafter, and finally pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of my improved fiber-cleaning machine. Fig. 2 is a longitudinal sectional view of the same. Fig. 3 is an enlarged longitudinal sectional elevation of two drums and the spring-scrappers for the same. Fig. 4 is a cross-sectional view through one of the drums and of scrappers below the same, parts being broken out. Fig. 5 is an enlarged detail cross-sectional view of three drums. Fig. 6 is a cross-sectional view of one of the clamps. Fig. 7 is a side view of the same. Fig. 8 is a plan view of the machine.

Similar letters of reference indicate corresponding parts.

The main frame A of the machine is made of cast or wrought iron, and serves to support the entire mechanism.

In suitable bearings of the main frame the shafts B and C are journaled transversely to the axis of the frame, and on a bracket-arm, D², of the frame, at one end, a shaft, D, is journaled, which is parallel with the shafts B C.

On one end of the shaft B the cog-wheel B'

is mounted, which engages with a cog-wheel, E', on the shaft E, carrying the driving-pulley E², and the cog-wheel B', also engaging with the cog-wheel C', mounted on the shaft C, and having one-half the diameter of the wheel B.

On that end of the shaft C opposite the one carrying the cog-wheel C' is mounted the cog-wheel C², engaging with the cog-wheel F', which in turn is engaged with the cog-wheel D' on one end of the shaft D.

On that end of the shaft B opposite the one carrying the cog-wheel B' is mounted the cog-wheel B², engaged with the cog-wheel G', mounted on one end of the shaft G, carrying a roller, G², over which the endless belt H passes, said belt also passing over a roller, H', mounted in an upright frame, H², located some distance from the end of the frame A and connected with the same by suitable rods. At suitable intervals hooks H³ are fastened on the outer surface of the belt H at the edges and opposite points.

Drums J and K are rigidly mounted on the shafts B and C, respectively, each of said drums being provided in its rim with a longitudinal groove, J' K', respectively, said grooves serving to receive the clamps M, (shown in Fig. 6,) which clamps consist of two segmental plates, M', having lugs on their inner side, which are mounted to turn on a longitudinal shaft, M², projecting from the ends of the clamps, said plates being provided with jaws or offsets N on the inner surface at one edge, and at the opposite edge one plate is provided with pins N', projecting from the inner surface of one plate into sockets N² on the inner surface of the other plate, the pins N' being surrounded by spiral springs N³, which serve to press the jaws N of the clamp M toward each other. At the ends of one plate of the clamp downwardly inwardly-projecting lugs O are provided, in which a shaft, O', is held, the ends of which project a short distance beyond the ends of the shaft M², as shown in Fig. 7. In most cases I have found two springs N³ sufficient for each clamp; but more or less can be provided. As the faces of the said clamps are curved segmentally, the bottoms of the grooves in the drums must be curved correspondingly. A short distance from one edge of the groove J' of the cylinder J a rocking shaft, P, is mounted in the

drum a short distance from the shell, said shaft being provided at each end of the cylinder with a hook-arm, P', adapted to engage the projecting ends of the shaft O', said arms being outside of the end of the drum. The rocking shaft P is also provided with two or more arms, P², through which pins P³, projecting from the inside of the drum pass, said pins being surrounded by spiral springs P⁴ between said arms P² and the inside of the drum. At one end the rocking shaft P is provided with an arm, Q, outside of the end of the drum, upon which a cam-piece, Q', can act, which is held vertically adjustable on the standard Q² on the machine-frame at one end of the drum J.

The drum K is provided with a groove, K', as stated, and adjacent to said groove the rocking shaft R is mounted in the drum, which has hook-arms R' at the ends of the drum, and plates and springs which act on said shaft in the same manner as those previously described in relation to the drum J. One of the hook-arms R' is provided with a cam-projection, R², upon which a curved block, S, can act, which is formed on a plate, S', connected with the plate S² of a slotted frame, S³, mounted to slide on pins S⁴, passed through a slot of the frame S³ and fixed in a suitable standard, S⁵, at one end of the drum K. Suitable buffer-springs, S⁶, are interposed between the plates S' and S², and prevent undue shocks or jars. A downwardly-projecting lug or arm on the slide S³ is connected by a connecting-rod, T', with a ring of the eccentric T on one end of the shaft B of the drum J, so that the slide S³ is operated from the shaft B.

The third drum, L, has the longitudinal groove L', arranged in the manner previously described, and adjacent to said groove the shaft V is mounted in the drum, on the ends of which the hook-arms V² are provided, said shaft B being provided with arms and springs for pressing the hook-arms inward in the same manner as on the drums J and K. An arm, V³, on one end of the rocking shaft V is acted upon by the edge of a cam-piece, V⁴, at the end of the drum L. At each end of each groove J' K' L' of the drums J, K, and L a U-shaped spring-clamp, a, projects from the bottom of the groove, midway between the sides, said spring-clamp serving to receive the projecting ends of the shafts M² of the clamps M. Below the cylinders J and K two segmental frames, b, are held at each end, said united segmental frame having about the shape shown in Fig. 3. Transverse shafts d, parallel with the axis of the cylinders J K, are mounted to rock in the two frames b, and to said rocking shafts steel scrapers or blades e are secured, each having one end rested against the rim of one of the cylinders J and K, and the other rested against a spiral spring, g, surrounding a pin, f, projecting from a lug, h, fastened on a bar, s, between the frames b, said springs g serving to press the fixed ends of the blades or scrapers e against the faces of the drums. Some of the scrapers may be replaced by brushes. As

shown in Figs. 3 and 4, the scrapers or blades are arranged approximately tangentially to the drums, and the scrapers below the drum J project in the reverse direction to those below the drum K.

The shaft G², on which the roller G and cog-wheel G', previously mentioned, are mounted, is journaled in the forked ends j of the said frames b, Fig. 3. In the opposite ends of said frames a roller, k, is journaled, which is between the drums K and L. A brush, l, is journaled above the top of the drum L, parallel with the same, and at one side of said brush a plate or scraper, m, is pivoted in a suitable frame on the bracket-arm D². A spring acting on one end of said scraper end presses the other end upon the rim of the drum L. A table, n, is arranged for receiving the cleaned fiber.

The operation is as follows: The leaves are crushed in any suitable crusher for the purpose of breaking, crushing, and disintegrating the cuticle or epidermis. Those parts of a clamp M opposite the jaws N are pressed together for the purpose of separating the jaws, and the butt-ends of a number of leaves are inserted between the jaws N when the opposite side of the clamp is released, and the springs N³, expanding, press the jaws firmly upon the butt-end of the leaves, which are thus held securely. A number of clamps are filled by an attendant in this manner and then placed upon the endless belt H, at the end farthest from the machine, said belt traveling in the direction of its arrow, Fig. 1. The hooks H³ on the belt catch on the projecting ends of the shaft M², and thus carry the clamp and the leaves in the direction of the arrow above the belt, Fig. 1, and down over the roller G at the side of the drum J. When the clamp arrives at the roller G, the drum J is in such a position that its groove J' faces the said roller G, as shown in Figs. 1 and 2, so that the clamp can pass into said groove. The projecting ends of the shaft M² pass into the forked spring-clamps A² at the end of the groove. The edge of the cam-piece Q' now acts on the end of the arm Q, whereby the hooks on the ends of the arms P' are swung down upon the ends of the shaft O', engage the same, and pull the clamp into the groove J' of the drum J. The outside of the clamp is now in line with the circumference of the drum, as shown in Fig. 2. The drum revolves in the direction of its arrow, Fig. 2, and the leaves are drawn over the spring-scrapers E and brush between them, as shown in Fig. 3. The spring-scrapers E give slightly, so as not to destroy the fibers, and only scrape off the crushed outer coating or epidermis. After about one-third of a revolution of the drum J the end of the arm O slides off the end of the cam-piece Q'. When the drum J has made about one-half of a revolution, the drums J and K are in the relative position shown in Fig. 3, and their grooves almost face each other. By this time the slide S³ has been moved into the po-

sition shown in Fig. 3 by the action of the eccentric T. The projections S on the end of the slide S³ having acted upon the cam projection R² of one hook, R', on the shaft R in the cylinder K, said hooks are thrown outward—that is, toward the cylinder J—and their prongs engage with the projecting ends of the pins O' of the clamp held in the drum J, as shown in Fig. 3. The hooks P' of the drum J are thrown inward by this time, owing to the action of the springs P⁴. As the clamp is now connected with and held by the hooks of the drum K, said drum K revolves in the direction of its arrow, Fig. 3, the clamp is withdrawn from the groove in the drum K and drawn into the groove K', the clamp being again held by the engagement of the ends of the shaft M² with the forked spring-clamps a. Immediately after the parts are in the position shown in Fig. 3 the slide S³ is withdrawn to permit the spring acting on the shaft in the drum K to throw the arms R' inward, as otherwise the clamp could not pass into the groove of the drum K. The clamp remains in the groove of the drum K during two revolutions of the drum, as the gearing is such that the drum K makes two revolutions for every revolution of the drum J. During the revolutions of the drum K the leaves are drawn over the scrapers below the drum K, and still more of the covering of the leaves removed. After the drum K has made two revolutions the drums K and L are in the relative position shown in Fig. 5, the drum L revolving in the direction of its arrow. Just before the drum L is in the position shown in Fig. 5 the cam projection V⁴ acts on the end of the arm V³, and thereby the ends of the hook-arms V² on the shaft V are thrown outward, so as to engage with the projecting ends of the shaft O' of the clamp, thereby withdrawing said clamp from the groove K' of the cylinder K, and as the said drum L continues to revolve the clamp swings into the groove L' of the said drum L, and is held in the same by the forked clamps a, in the manner previously described. The leaves are drawn under the spring-scraper e and the brush l, which brush removes the fine powdered material, &c. The ends of the shaft O' of the clamp then strike the inclined arms n' of the table n, which throws the clamps out of the groove in the drum L. The cleaned fiber is then taken out of the clamp and the clamp returned to the other end of the machine, to be again filled.

The U-shaped spring-clamps a serve mainly for holding the clamps M in place, but are assisted by the hook-arms of the rock-shaft, the main functions of said hook-arms, however, being to draw the clamps from the groove of one cylinder into the groove of another cylinder, and for this reason the hook-arms are so arranged as to release the clamps a short time before they are withdrawn from the groove of one cylinder by the hook-arms of the adjacent cylinder.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A machine for cleaning leaves containing fiber, constructed with a revolving drum and a series of spring-scrapers resting against the drum, substantially as shown and described. 70
2. A machine for cleaning leaves containing fiber, constructed with a revolving drum having a recess for receiving a leaf-clamp and with scrapers, substantially as shown and described. 75
3. A machine for cleaning leaves containing fiber, constructed with two revolving drums for holding leaf-clamps, and mechanism on said drums for transferring the clamps or leaf-holders from one drum to the other, substantially as shown and described. 80
4. A machine for cleaning leaves containing fiber, constructed with three drums constructed to hold leaf clamps or holders, each drum having mechanism for transferring the clamps or leaf-holders from one drum to the other, and scrapers resting against the rims of two of the drums, substantially as shown and described. 85
5. In a machine for cleaning leaves containing fiber, the combination, with two drums, of scrapers resting against the rims of the same, leaf clamps or holders which can be held by the drums, and an endless belt for conveying the clamps or holders to the drums, substantially as shown and described. 90 95
6. In a machine for cleaning leaves containing fiber, the combination, with two drums having grooves for receiving leaf clamps or holders, mechanism on the drums for transferring the leaf-clamp from one drum to the other, and an endless belt for conveying the leaf clamps or holders to the drum, substantially as shown and described. 100
7. In a machine for cleaning leaves containing fiber, the combination, with a drum having a groove for receiving a leaf holder or clamp, of a rocking shaft in said drum, hook-arms in the end of the rocking shaft, and a cam for swinging the shaft carrying the hook-arms, and scrapers, substantially as shown and described. 105 110
8. In a machine for cleaning leaves containing fiber, the combination, with a drum having a groove for receiving the leaf clamp or holder, of a rocking shaft, hook-arms on the ends of the same, springs acting on the rocking shaft and throwing the hook-arms inward, and a cam for throwing the hook-arms outward, substantially as shown and described. 115 120
9. In a machine for cleaning leaves containing fiber, a drum having a longitudinal groove for receiving the leaf clamp or holder, and catches in said groove for holding the clamp, substantially as shown and described. 125
10. In a machine for cleaning leaves containing fiber, a drum provided with a longitudinal groove for receiving a leaf clamp or holder, and a U-shaped spring-clamp at each end of the groove, substantially as shown and described. 130
11. In a machine for cleaning leaves containing fiber, the combination, with two drums,

each having a longitudinal groove for receiving a leaf clamp or holder, of a rocking shaft in each drum, each shaft having hook-arms at the ends, and a sliding frame for operating the hook-arms in one drum, which sliding frame is operated from the shaft of the other drum, substantially as shown and described.

12. In a machine for cleaning leaves containing fiber, the combination, with two drums, each having a longitudinal groove for receiving a leaf clamp or holder, of a rocking shaft in each drum, hook-arms on the ends of the rocking shaft, a sliding frame at the end of one drum for operating the hook-arms of said drum, an eccentric on the shaft of the other drum, and a rod connecting the eccentric with the sliding frame, substantially as shown and described.

13. In a machine for cleaning leaves containing fiber, the combination, with two drums, each having a longitudinal groove for receiving a leaf clamp or holder, of a rocking shaft in each drum, hook-arms on the ends of the shafts, a fixed cam-piece at one end of one drum for operating its hook-arms, a sliding frame at the end of the other drum for operating the hook-arms of the said drum, an eccentric on the shaft of that drum at the end of which the cam-piece is provided, and a rod connecting said eccentric with the slide at the end of the other drum, substantially as shown and described.

14. In a machine for cleaning leaves containing fiber, the combination, with the drums J K, each having a longitudinal groove for receiving a leaf clamp or holder, of the rocking shafts P R in the drums, the hook-arms P' R' on the ends of the shafts P and R, respectively, the cam-piece Q', fixed at the end of the drum J, the arm Q on the shaft P, the cam-piece R' on one of the hooks R', a sliding frame, S³, at the end of the drum K, the eccentric T on the shaft of the drum J, and the rod T', connected with the sliding frame S³, and the eccentric T, substantially as shown and described.

15. In a machine for cleaning leaves containing fiber, the combination, with the drums J K L, having grooves for receiving leaf clamps or holders, of rocking shafts P R V in said drums, hook-arms on the ends of the shafts, the cam-piece Q' for operating the hook-arms of the drum K, and the cam-piece V⁴ for operating the hook-arms of the drum L, substantially as shown and described.

16. In a machine for cleaning leaves containing fiber, the combination of the drums J K L, constructed to hold leaf-clamps, scrapers resting on the rims of the drums J K, a scraper above the drum L, and a brush, Z, above the drum L, substantially as shown and described.

17. In a machine for cleaning leaves containing fiber, the combination, with the drums J K L, constructed to hold leaf-clamps, of blades resting against the rims of the drums J K, and the fixed arms N' at the ends of the drum L, substantially as shown and described.

18. In a machine for cleaning leaves containing fiber, the combination, with three drums, J K L, constructed to hold leaf-clamps, of a rocking shaft in each drum, hook-arms on the ends of each rocking shaft for shifting the leaf-clamps from one drum to the other, and fixed arms N' at the ends of the drum L, substantially as shown and described.

19. In a machine for cleaning leaves containing fiber, the combination, with a drum, of curved frames at the side of and below the drum, rocking shafts mounted on said frames, scrapers on the rocking shafts, each scraper having one end rested against a drum, and springs acting on the opposite ends of the scrapers, substantially as shown and described.

20. In a machine for cleaning leaves containing fiber, a clamp constructed of two pivoted plates having jaws, springs for pressing the jaws together, and two projections on each end of the clamp, substantially as shown and described.

21. In a machine for cleaning leaves containing fiber, a clamp for holding leaves, constructed of two pivoted plates having jaws, springs for pressing the jaws together, and projections on the ends of the clamps for engagement with hooks, substantially as shown and described.

22. In a machine for cleaning leaves containing fiber, constructed with the three cylinders J, K, and L, scrapers resting against the rims of the drums J K, and gearing for revolving the drum K twice as rapidly as the drum J and in the reverse direction, and gearing for revolving the drum L in the same direction as the drum K and with half the speed of the same, substantially as shown and described.

23. In a machine for cleaning leaves containing fiber, constructed with two cylinders constructed to hold leaf-clamps, and scrapers rested against the rims of the drums, one drum being geared to revolve twice as fast as the other, and the drums revolving in opposite directions, substantially as shown and described.

24. A machine for cleaning leaves containing fiber, having two drums, the drums being geared to revolve in opposite directions and with two sets of scrapers, one set resting against the rim of each drum, and the scrapers of the two drums extending in opposite directions, substantially as shown and described.

25. A machine for cleaning leaves containing fiber, constructed with drums, and scrapers resting tangentially on the rims of the drums, substantially as shown and described.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

JOHN HEMPHILL.

Witnesses:

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