

(No Model.)

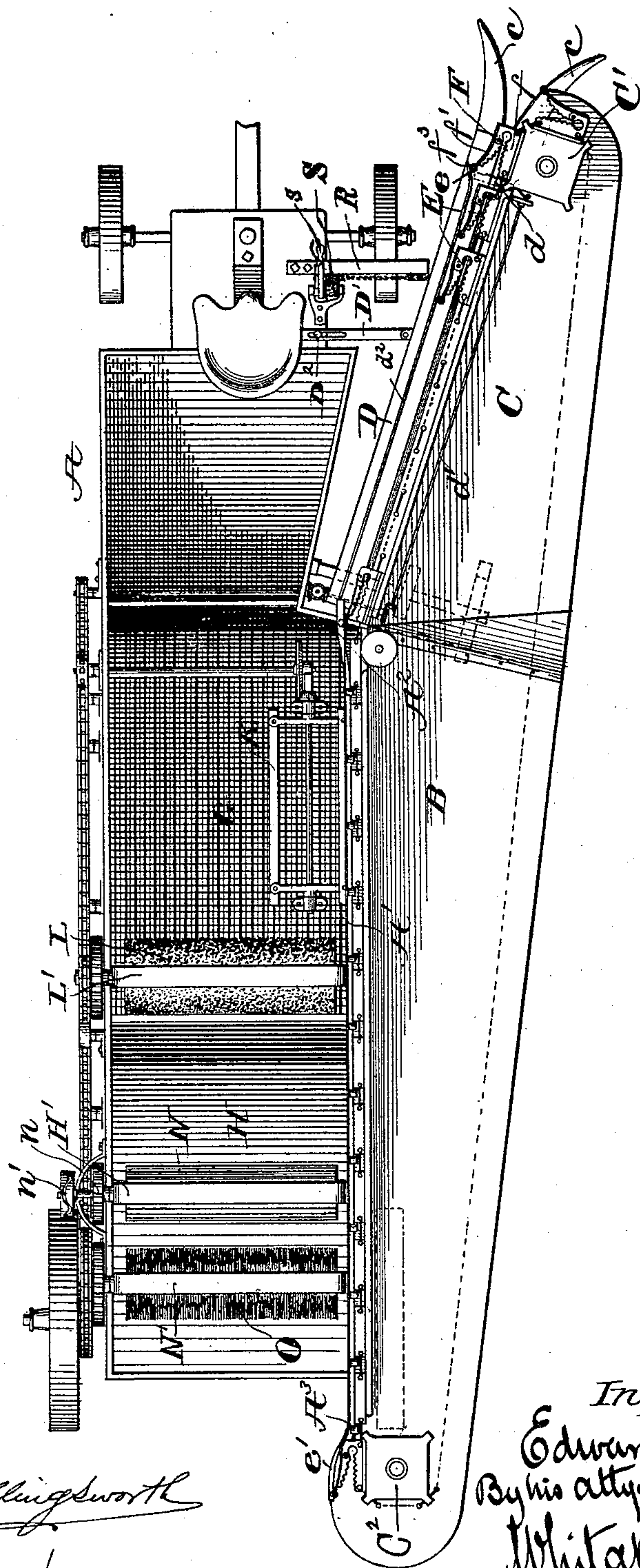
3 Sheets—Sheet 1.

E. L. BAKER.
COTTON HARVESTING MACHINE.

No. 459,621.

Patented Sept. 15, 1891.

Fig. 1



Attest:

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By his atty.
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Fig. 2

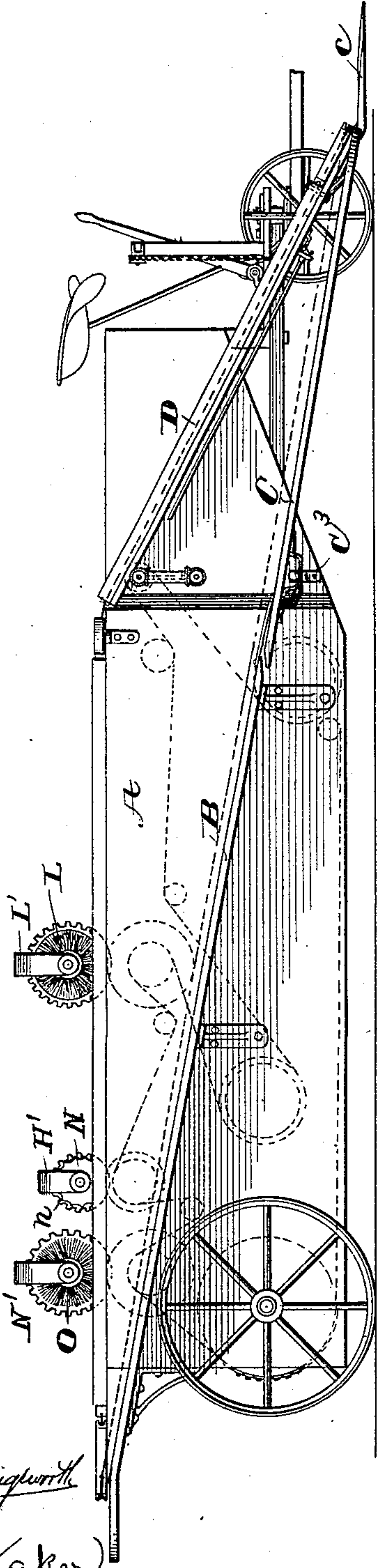


Fig. 4.

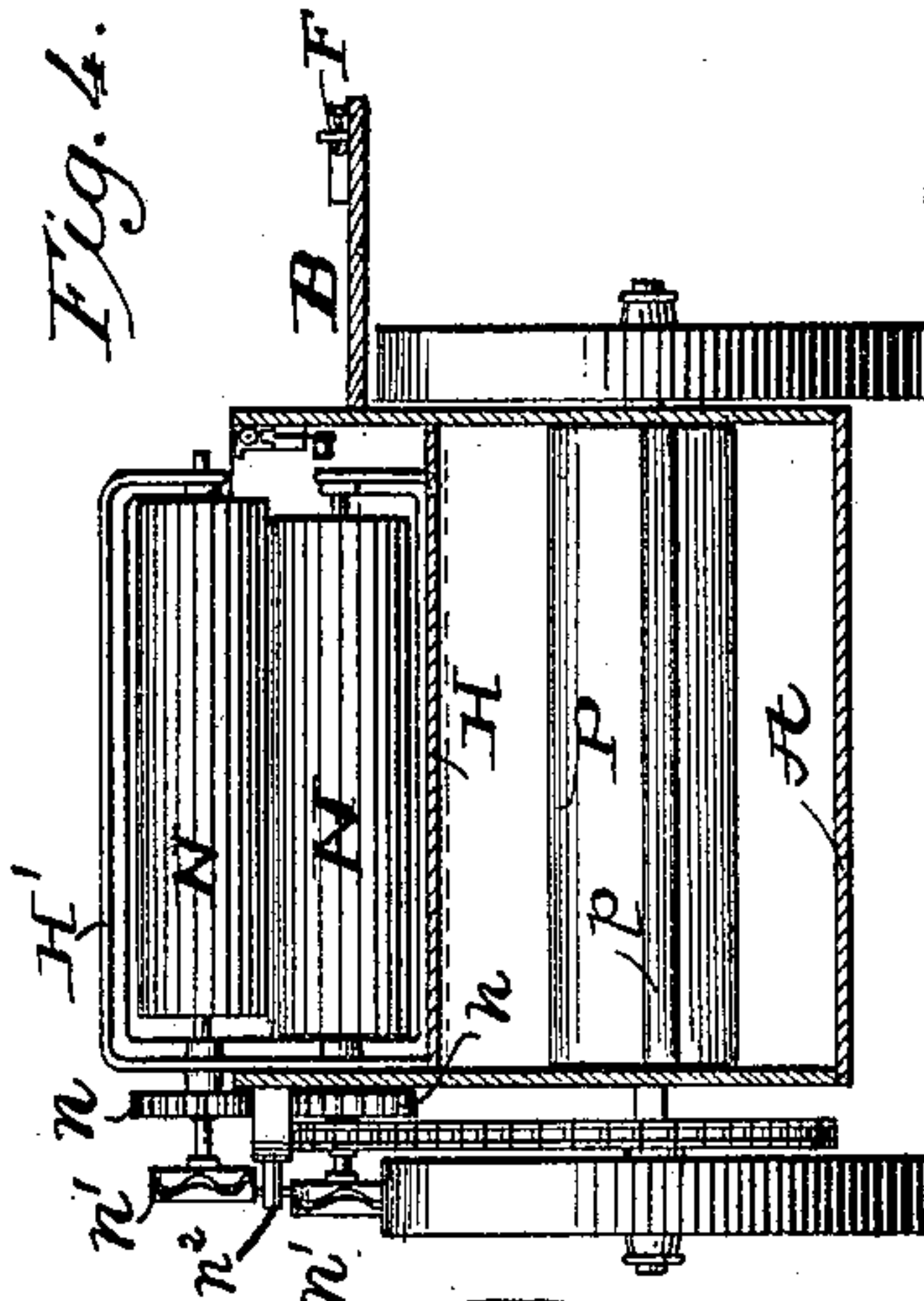
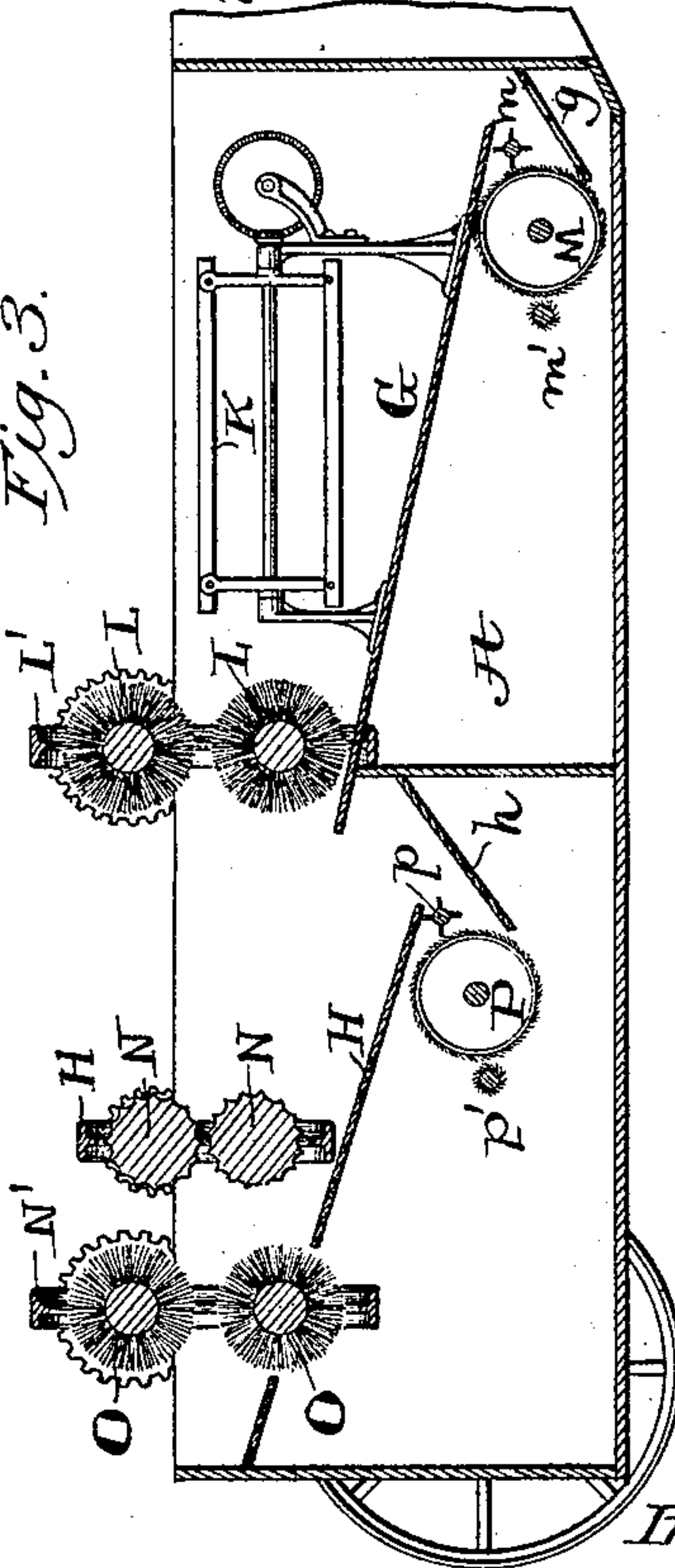


Fig. 3.



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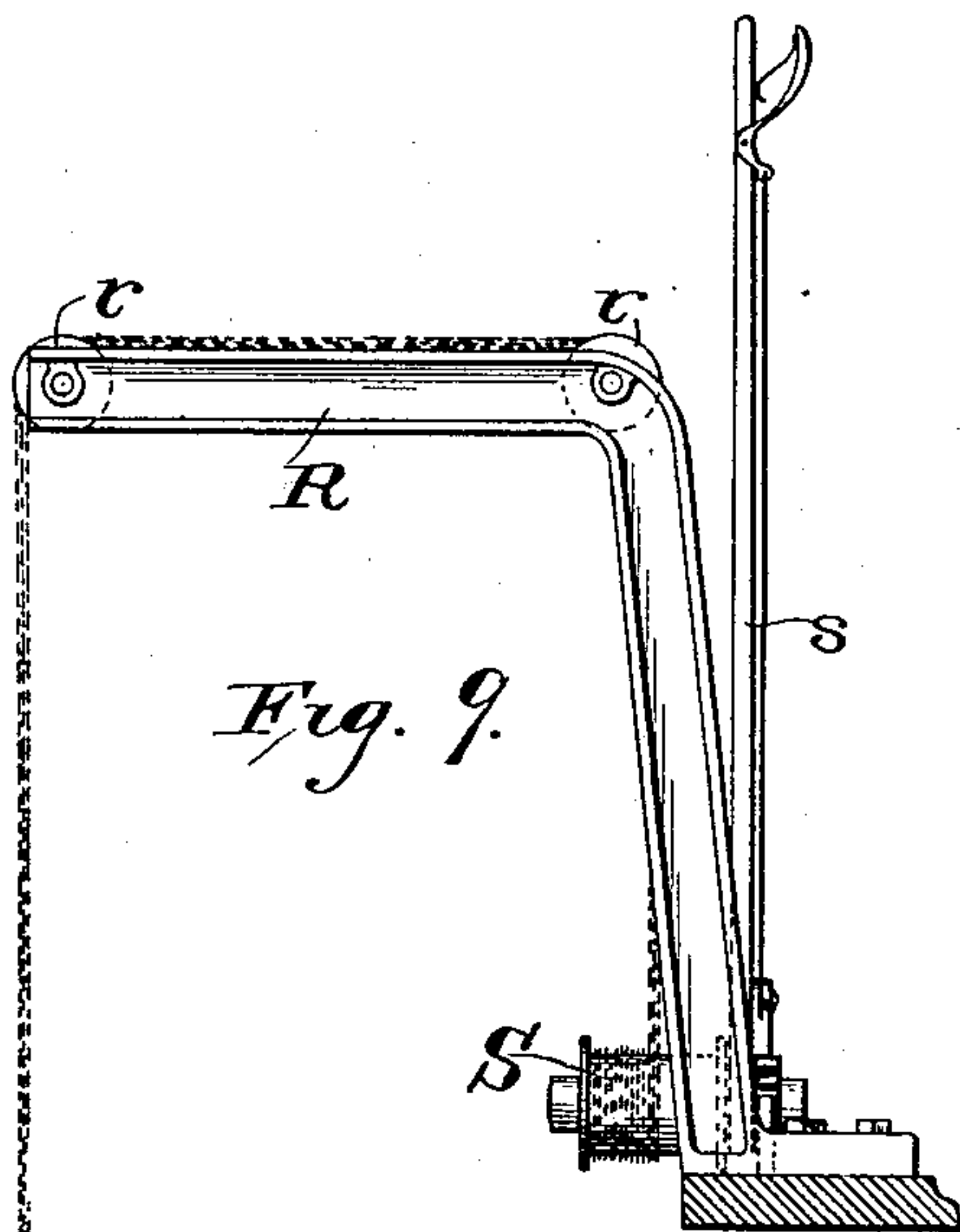
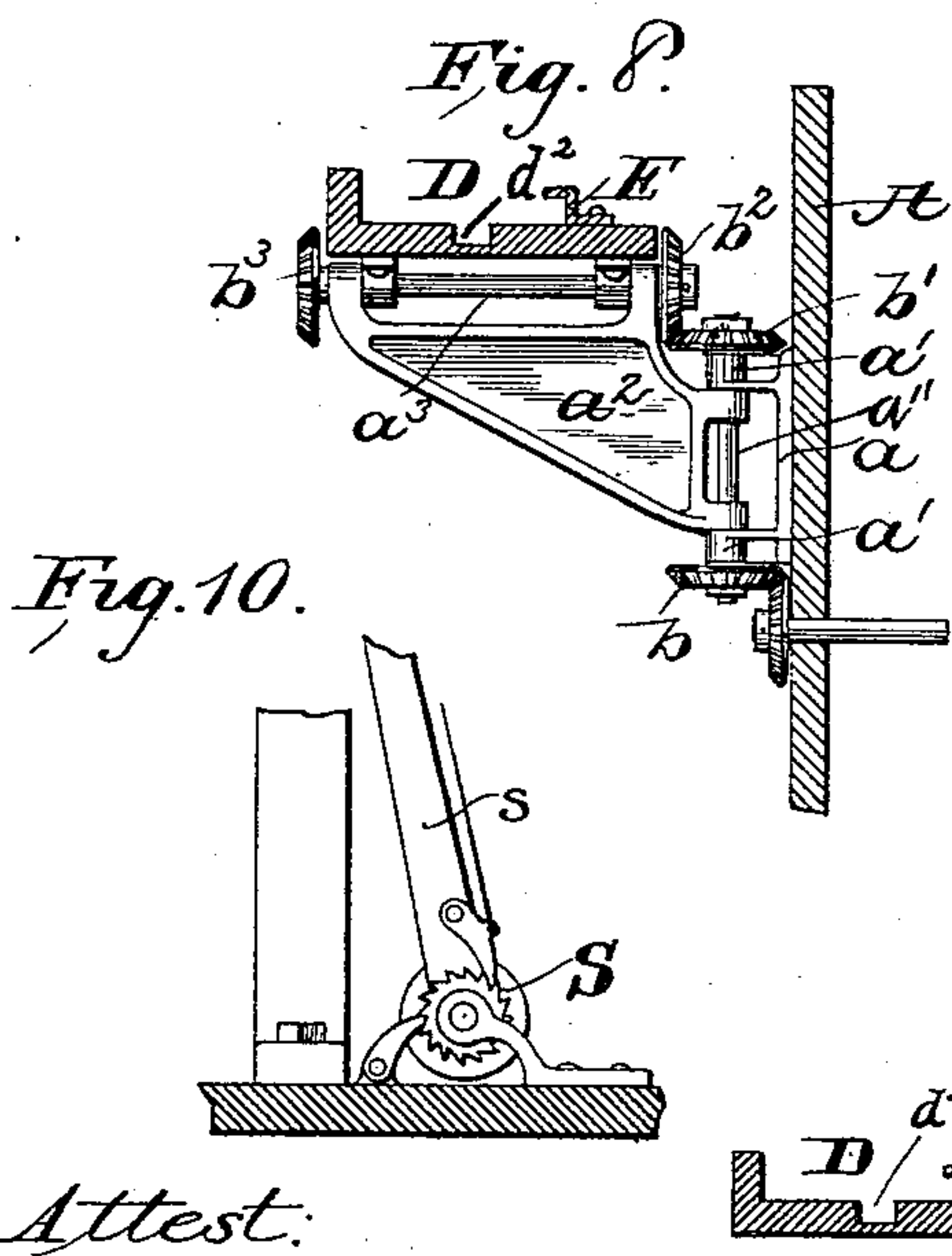
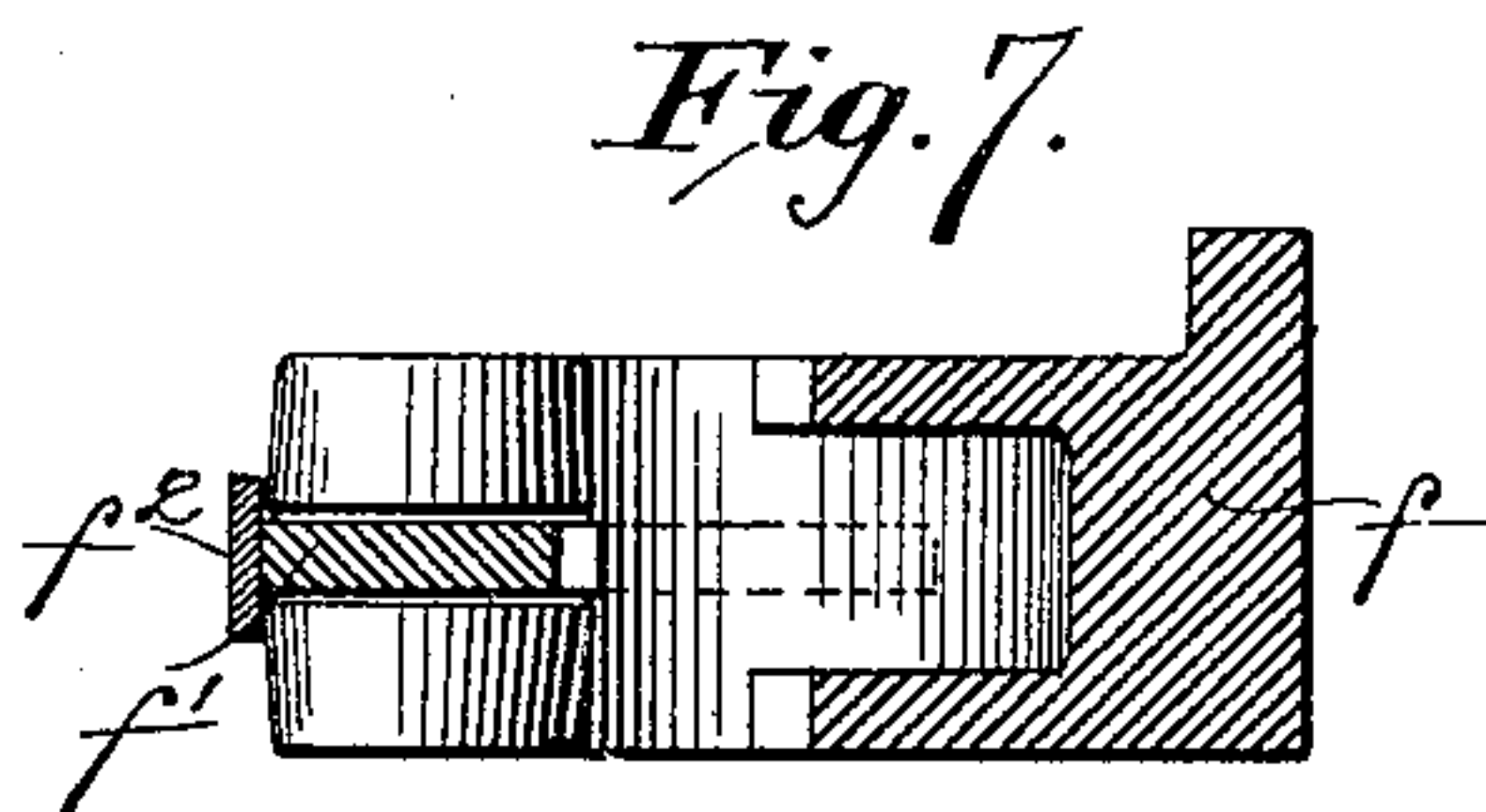
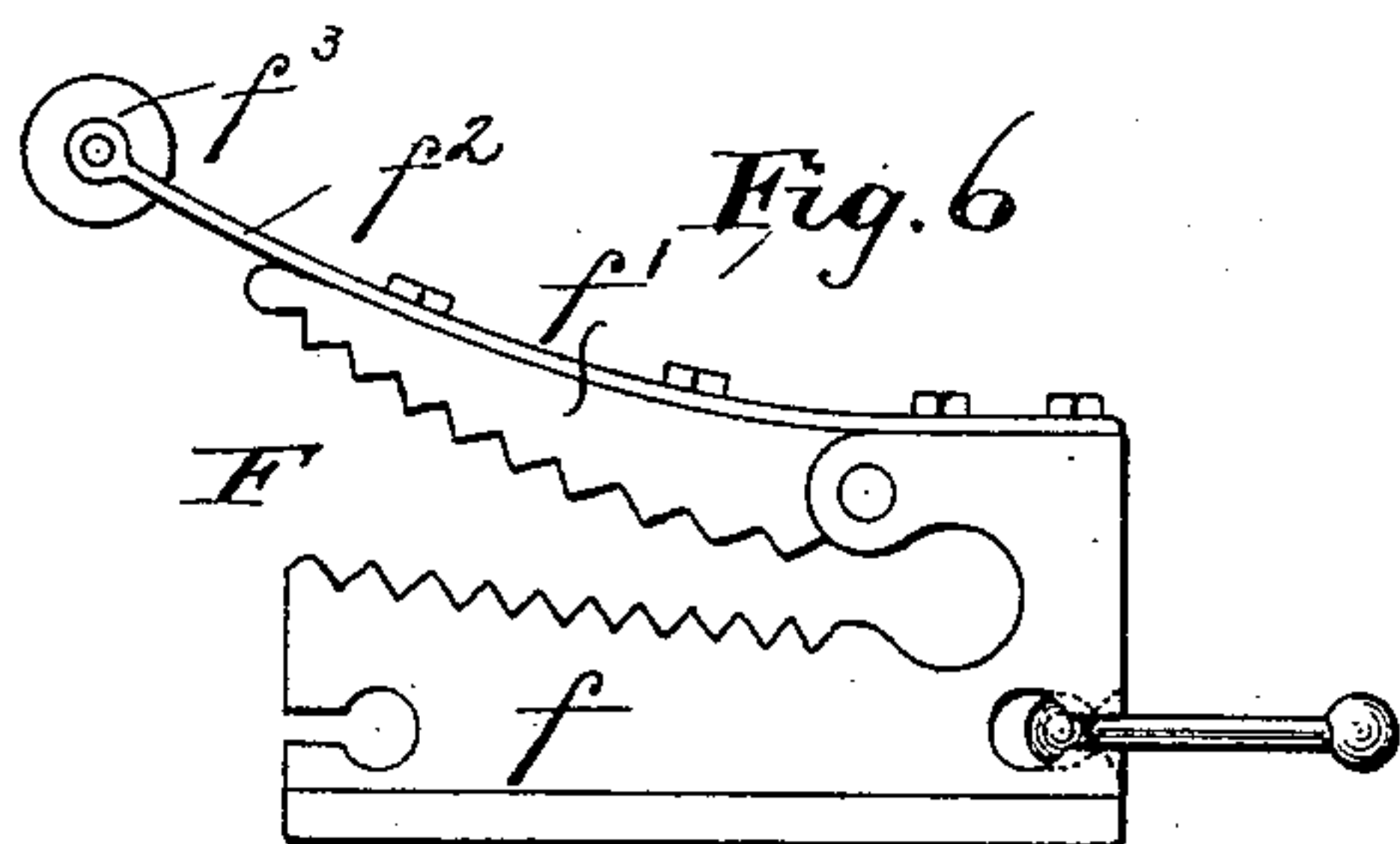
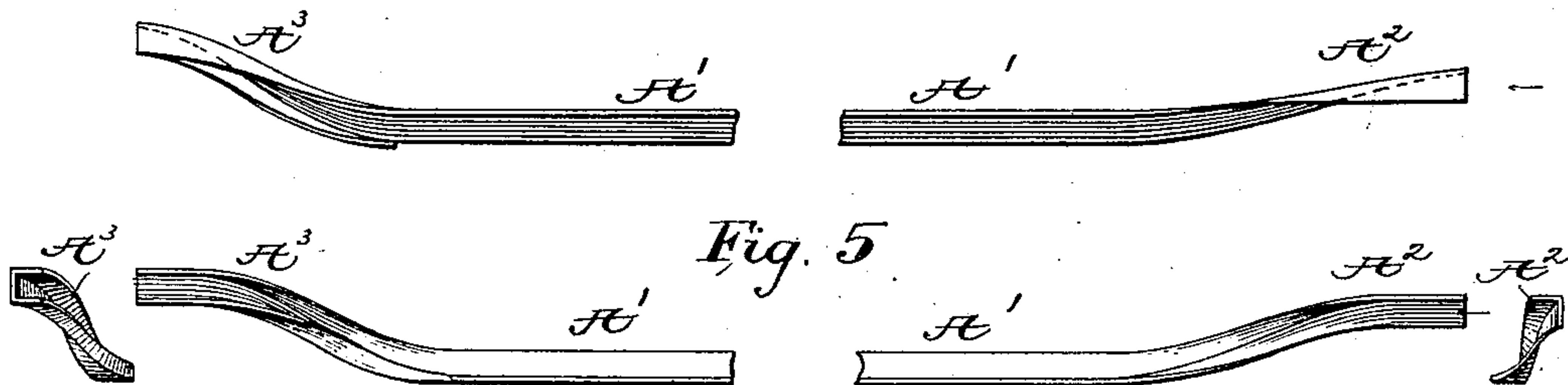
(No Model.)

3 Sheets—Sheet 3.

E. L. BAKER.
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Attest:

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Inventor:

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UNITED STATES PATENT OFFICE.

EDWARD LARRABEE BAKER, OF RACINE, WISCONSIN.

COTTON-HARVESTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 459,621, dated September 15, 1891.

Application filed April 12, 1889. Serial No. 306,641. (No model.)

To all whom it may concern:

Be it known that I, EDWARD LARRABEE BAKER, a citizen of the United States, residing at Racine, in the county of Racine and State of Wisconsin, have invented certain new and useful Improvements in Cotton-Harvesting Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to cotton-harvesters; and it consists in certain novel features of construction and combination, which will be hereinafter more particularly pointed out.

I have illustrated one form in which I have contemplated embodying my invention in the accompanying drawings, which form a part of this specification, and said invention is fully disclosed in the following description and claims.

In the said drawings, Figure 1 is a plan view of my improved cotton-harvester. Fig. 2 is a side elevation. Fig. 3 is a vertical longitudinal section through the body of the machine, showing the position of operating parts. Fig. 4 is a vertical transverse section of the body of the machine. Fig. 5 is a detail of the track employed in the apparatus. Figs. 6 and 7 are an elevation and section, respectively, of the grippers used in my improved harvester. Fig. 8 is a view of the universal joint between the picker-platform and the main body of the machine. Figs. 9 and 10 are detail views of the mechanism for raising and lowering the picker-platform and supporting the same.

A designates the body of a harvester mounted on suitable wheels. This main body comprises a box or frame of rectangular shape in plan view. At one side of this main body and suitably supported by braces or brackets is an inclined platform B, which I denominate the "chain-platform," and to the main body, at or near the front of the same, is attached the picker-platform C, which in its operative position forms a continuation of the chain-platform. A chain, which I term the "gripping-chain," passes around suitable rotating devices or sprocket-wheels C' C², situated at or near the front end of the picker-platform

and at or near the rear end of the chain-platform, one part of which extends from the device C' up an inclined track or guideway D to the top of one side of the machine, thence along the side of the machine on either side of the same to the rear end of the said machine and the device C². The other portion of the chain lies upon the chain-platform B and picker-platform C. The platform C is connected to the main body of the separator, which is cut away to receive it by a joint C³, permitting the platform vertical and lateral movement. The inclined track-guide D is connected to the forward portion of the picker-platform, so as to permit a slight movement of the one in respect to the other, and its rear end is connected to the main body A by means of the universal-joint connection shown in detail in Fig. 8. The side wall of the main body A is provided with a casting a, which consists of a plate for attaching said casting to the harvester, and two bearings a', which receive a shaft a''. This shaft also passes through bearings formed on the end of a bracket a², the other extremity of which is also provided with similar bearings to receive a shaft a³. The shaft a³ extends through said bearings and through bearings provided on the under side of the guideway D at right angles to the shaft a''. This construction forms two hinge connections at right angles to each other and permits the platform C and guideway D to be moved laterally and vertically when desired.

In case it is desired to transmit power from a shaft upon the body of the harvester to an operative part or parts upon the platform C or guideway D, I provide the shaft a'' with a bevel-gear b, gearing with a bevel-gear on a shaft mounted in the main body, and a similar gear b' on its other extremity gearing with a bevel-pinion b² on the shaft a³ for imparting motion thereto. The front part of platform C is provided with two outwardly-extending fingers c c, which guide the stalks of cotton to a cutter d, of any preferred form, to which motion is imparted from the shaft a³. I have shown a reciprocating cutter operated by a pitman from a shaft d', to which motion is imparted from shaft a³ by means of bevel-gears.

The guideway D is provided near its center with a longitudinal groove d^2 , and a track E is secured adjacent to said groove to the frame of said guideway and provided at its forward extremity with a curved portion e , for a purpose hereinafter fully explained.

The gripping-chain is composed of a series of blocks or grippers F, which are suitably connected together by ball-and-socket joints or other connections which will permit of a universal movement between said grippers. I have shown each block as provided with a suitable aperture or recess adjacent to each end and links consisting of a body provided at each end with a ball-like projection for engaging such recesses. The blocks or grippers F each consist of the stationary serrated jaw f , to which is pivoted the serrated movable jaw f' . I prefer to provide the jaw f' with two serrated portions and pivot the jaw f' so that it will act between them, as shown in Fig. 7; but this not essential. The movable jaw f' is normally held away from jaw f by means of a spring f^2 , which is preferably attached to the main body of the gripper and to the movable jaw. Said jaw f' is also provided with a projection the outer extremity of which carries the friction-roll f^3 , which projection is preferably formed by a prolongation of the spring f^2 . When one of the grippers F passes around the sprocket-wheel C' , it will engage the stalks of cotton which have been brought between the fingers $c c$. As soon as the stalks are engaged by the gripper the friction-roll f^3 will engage the curved portion e of the track E, thereby forcing the movable jaw f' inwardly and causing the said stalks to be firmly gripped. As the chain moves rearwardly the track E holds the grippers in firm engagement with the stalks.

The side wall of the main body of the machine is provided with a track A' , formed as shown in plan and elevation in Fig. 5. This track is constructed at the end adjacent to the end of the track E, so that the roller f^3 will enter a portion A^2 , corresponding to and forming a continuation of track E. As the roller moves along the part A^2 it will be guided downward in such a manner as to turn the block or gripper F at right angles and thereby throw the stalks over upon the devices mounted in the main body of the machine without releasing said stalks. The opposite end of the track A' is provided with a portion A^3 , which conducts the roller into the horizontal plane of the body of the gripper, and said track is also provided with a curved part e' , which permits the roll f^3 to move outwardly under the force of the spring f^2 , which releases the stalks and permits them to fall from the machine.

The interior of the body A is provided with two inclined tables G and H. The table G is secured in position in the forward part of the body A, and upon it, adjacent to the gripping-chain, is the beater K, which is supported

revolvably in suitable standards provided with bearings to receive its shaft. Motion may be imparted to this beater in any desired way. I have shown its shaft provided with a bevel-gear meshing with a bevel-gear on a counter-shaft which is driven from the driving-wheel of the machine. In rear of the beater K are two revolving brushes L L, mounted one above the other and supported in bearings provided in a frame L' , which is supported by the frame of the machine, and is so constructed as to allow the stalks to be drawn between said rollers on one side of the machine. These brushes may be geared together by means of pinions and run from the driving-wheel of the harvester. Beneath the lower extremity of the inclined table G is a chute or table g , inclined in the opposite direction and preferably of slatted construction. A card-roller M is mounted in suitable bearings and rotates with its periphery in close proximity to the lower edge of the table g . Above table g is a small roller m , provided with spike-teeth adapted to beat back all impurities in the cotton taken up by the card-roller, and a stripping-brush m' is provided in rear of the roller M to remove all the cotton and deposit it in the body of the separator or in a suitable receptacle.

Above the table H are mounted two serrated or fluted crushing-rolls N N, journaled in a suitable frame H, which will permit the stalks to be introduced between said rolls on one side. The shafts of the rolls N N are mounted in their bearings so as to be capable of longitudinal movement and said shafts are provided with pinions $n n$, geared together, which are secured to said shafts by splines or feathers which actuate the same, but permit the shafts to move through them. The outer extremities of said shafts are provided with wheels $n' n'$, the faces of which are provided with cam-grooves. Upon some rigid portion of the frame of the machine is mounted a rigid arm n^2 , which is provided with projecting lugs for engaging the grooves of the wheels $n' n'$, thereby to impart a longitudinal movement to the rollers N N when they are rotated. The shaft of one of said rolls is actuated from the driving-shaft by means of sprocket-wheels and chains or other preferred means. In rear of rollers N N two revolving brushes O O are similarly mounted in a frame N' and are rotated from the driving-wheel of the machine; but the shafts of said brushes are not shown in this instance as provided with means for reciprocating the same longitudinally. They may, however, reciprocate, as before described, with reference to rollers N N, if found necessary or convenient. Beneath the lower end of table H is an inclined slatted chute or slide h , which conducts the material falling upon it to the cleaning devices consisting of card-roller P, beater p , and stripping-roller p' , exactly similar to the parts M $m m'$, before described.

The operation of the machine is as follows: The machine is drawn along the side of a

field of cotton, with the fingers *c c* in position to grasp the stalks of a row of cotton-plants and conduct them to a point where they will be grasped by the gripper *F*, which is in position to engage them. The gripper *F* will grip the stalks, as before described, and the gripping-chain, which is actuated from the driving-shaft, will convey the stalk up the inclined guideway *D*. The grippers may tear up the stalks by the roots, or they may be severed by the cutter *d*, or they may be pulled up and then severed, as desired. As the stalks are drawn up the guideway the butts will enter a groove *d*², provided in the guideway *D*. As soon as the roller *f*³ of the block *F* enters the portion *A*² of the track *A'* it will be drawn down and turn said block at right angles, thereby permitting the stalks to fall upon the beater *K*. As the beater revolves it will beat against the branches of the stalks and shake therefrom all loose ripe cotton, which will fall upon the inclined table *G*. The stalks are then drawn between the rotary brushes *L L*, which brush all the cotton which is loose but which has not been freed by the beater *K*. This will also fall upon the inclined table *G*. As the stalks are drawn along farther they will pass between the fluted crushing-rollers *N N*, which, by reason of their rotary and longitudinal movements, crush and open the partially-ripened bolls and free the cotton therein. They next pass between the brushes *O O*, which brush all the remaining cotton and loose bolls from the branches, thus completely stripping them. They are then drawn out from between said brushes, when the roller *f*³ of the gripper will engage the portion *A*³ of the track, which restores the block to a horizontal position. The roller *f*³ then engages the inclined or curved portion *e'* of the track, which permits the arm *f* to release its grasp, as before described, and the stalks are thus discharged from the machine. The cotton falling upon table *G* will be conducted to the slatted incline *g* and thence to the card-roller *M*. This roller will take up the cotton from the incline, while the sticks, dirt, and other impurities will fall between the slats upon the bottom of the machine or through a suitable opening to the ground. The spike-teeth of roller *m* will beat back any impurities which might adhere to the cotton on the card-roller *M* upon the incline *g* and the cotton, free from impurities, will be freed from the card-roller by the stripping brush or roller *m'*, which deposits the cotton upon the bottom of the machine or in a suitable receptacle. The material falling upon the table *H* will be conducted to the slatted incline *h* and the crushed and broken bolls allowed to fall through the same, while the cotton will be taken up by the card-roller *P*. The teeth of roller *p* will beat back the impurities adhering to the cotton on the card-roller, and the freeing brush or roller *p'* will remove the cotton and deposit it in a suitable receptacle or on the bottom of the ma-

chine. Each of the grippers *F* forming the gripping-chain will grasp a number of stalks and carry them through the machine, as above described, and the operation is thus rendered continuous.

In order to regulate the vertical adjustment of the picker-platform *C*, I prefer to employ the devices shown in Figs. 9 and 10. In these figures I have shown a bent arm *R*, rigidly secured to the frame of the harvester adjacent to the driver's seat and provided with suitable pulleys *r*. A supporting-chain passes from the picker-platform over said pulleys *r* to a drum *S*, mounted on the body of the machine and provided with a lever and pawls for operating and retaining the same. By these constructions the operator can control the vertical adjustment of the picker-platform, and I may also provide suitable means whereby the lateral movement of said platform may be controlled in order to insure the stalks being caught between the fingers *c c*, or said parts may be adjustably secured in any desired position by means of the slotted link *D'* and adjusting-nut *D*², as shown in Fig. 1.

I do not wish to be limited to the exact construction herein shown and described, as many changes might be made therein without departing from the spirit of my invention.

What I claim, and desire to secure by Letters Patent, is—

1. The process of picking cotton, which consists in disconnecting the plants from the ground, beating them to loosen and detach all ripe cotton, and then brushing the plants to free them from adhering cotton, substantially as described.

2. The process of picking cotton, which consists in disconnecting the plant from the ground, beating to loosen and detach the ripe cotton, brushing it to free the plant from adhering cotton, and then subjecting the plant to the action of crushing-rollers to break the partially-ripened bolls and detach all of such bolls as may be of value, substantially as described.

3. In a cotton-harvester, the cotton-stripping devices consisting of a beater, a cleaning-brush, crushing-rolls, and a supplemental cleaning-brush, substantially as described.

4. In a cotton-harvester, the combination, with the gripping and carrying chain and its supporting and operating devices, of the crushing-rolls located adjacent thereto and having a revolving and laterally-reciprocating movement, substantially as described.

5. In a cotton-harvester, the combination, with the gripping and carrying chain and its supporting and operating devices, of cotton-stripping devices arranged in pairs and supported from the side of the machine opposite to said chain, whereby free access to the devices is given on the side adjacent to said chain, substantially as described.

6. In a cotton-harvester, a gripping and carrying chain composed of gripping blocks ca-

pable of a rotary movement on the axis of the chain, and connections for said blocks, each of said blocks consisting of a fixed jaw and a movable jaw, in combination with supporting
5 and actuating devices and a guide adapted to be engaged by the movable jaw to close the same and hold it in its closed position, substantially as described.

7. In a cotton-harvester, a gripping and carrying chain composed of gripping blocks capable of a rotary movement on the axis of said chain, and connections for said blocks, each of said blocks consisting of a fixed jaw and a pivoted jaw, in combination with supporting and actuating devices and a guide
15 adapted to be engaged by the movable jaw to close the same and hold it in a closed position, the said guide having a part in the horizontal plane of the chain and a part in the
20 vertical plane of the chain, the two parts connected by curved connections, substantially as described.

8. A gripping and carrying chain consisting of a series of blocks provided with gripping devices, and connecting-bars having a
25 universal connection with said blocks, substantially as described.

9. A gripping and carrying chain for harvesters, consisting of gripping-blocks having a fixed and a movable jaw, and connecting-bars
30 having a universal-joint connection with said blocks, substantially as described.

10. A gripping and carrying chain consisting of gripping-blocks having a fixed and a movable jaw, and connecting-bars connecting
35 with said blocks by ball-and-socket joints, substantially as described.

11. A gripping and carrying chain consisting of gripping-blocks having a fixed and a movable jaw, a spring for holding said movable jaw, and a friction-roller having a flexible
40 connection with said movable jaw, substantially as described.

12. In a cotton-harvester, the combination, with a gripping and carrying chain, of cotton-
45 stripping devices located adjacent to the line of travel of said chain, and cotton-cleaning devices, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

EDWARD LARRABEE BAKER.

Witnesses:

RICHARD EMERSON,
C. C. HALL.