

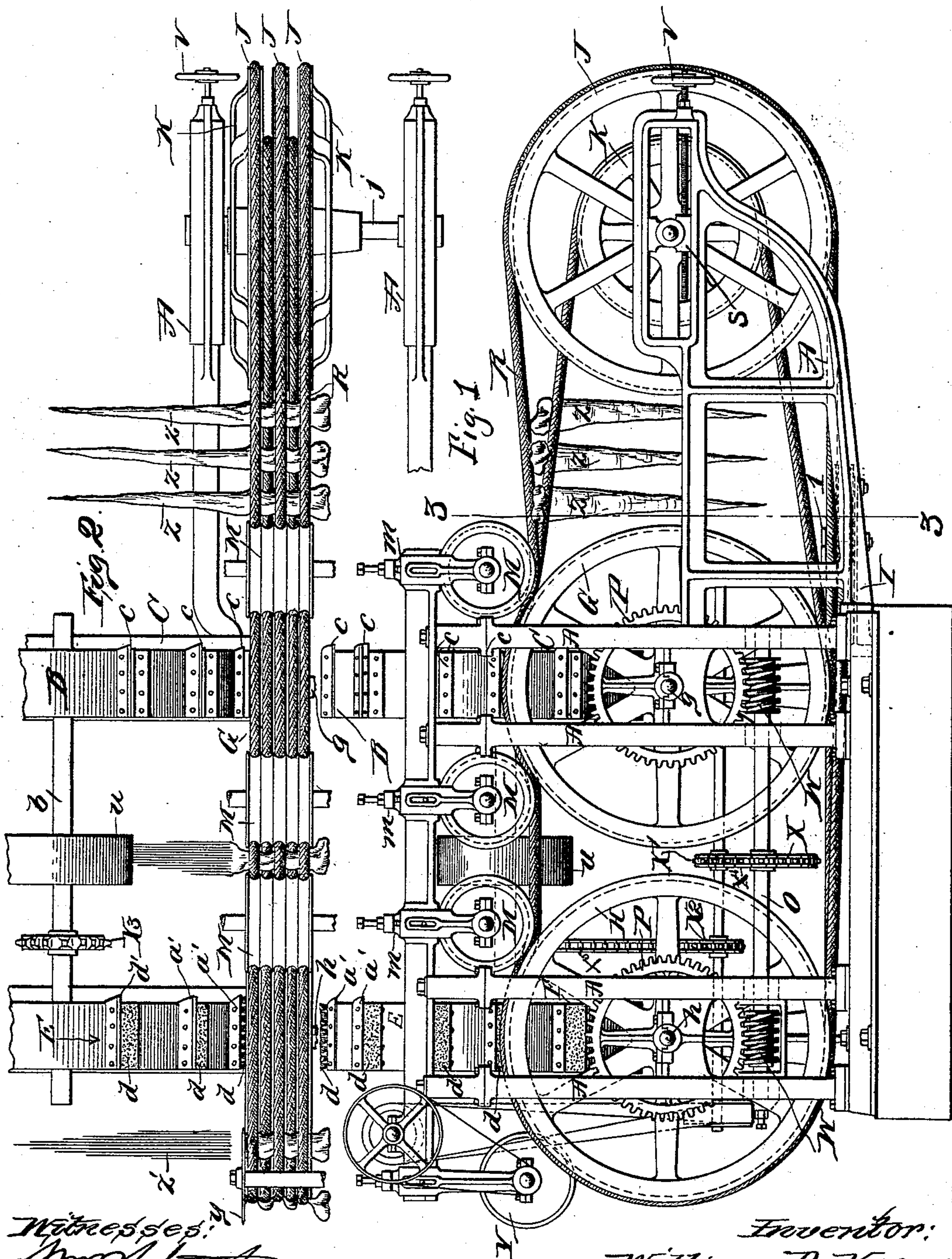
(No Model.)

3 Sheets—Sheet 1.

W. A. KEENE.
FIBER CLEANING MACHINE.

No. 509,314.

Patented Nov. 21, 1893.



Witnesses:
J. H. A. A.
Charles Pickles

Inventor:
William A. Keene
By J. M. Eccles

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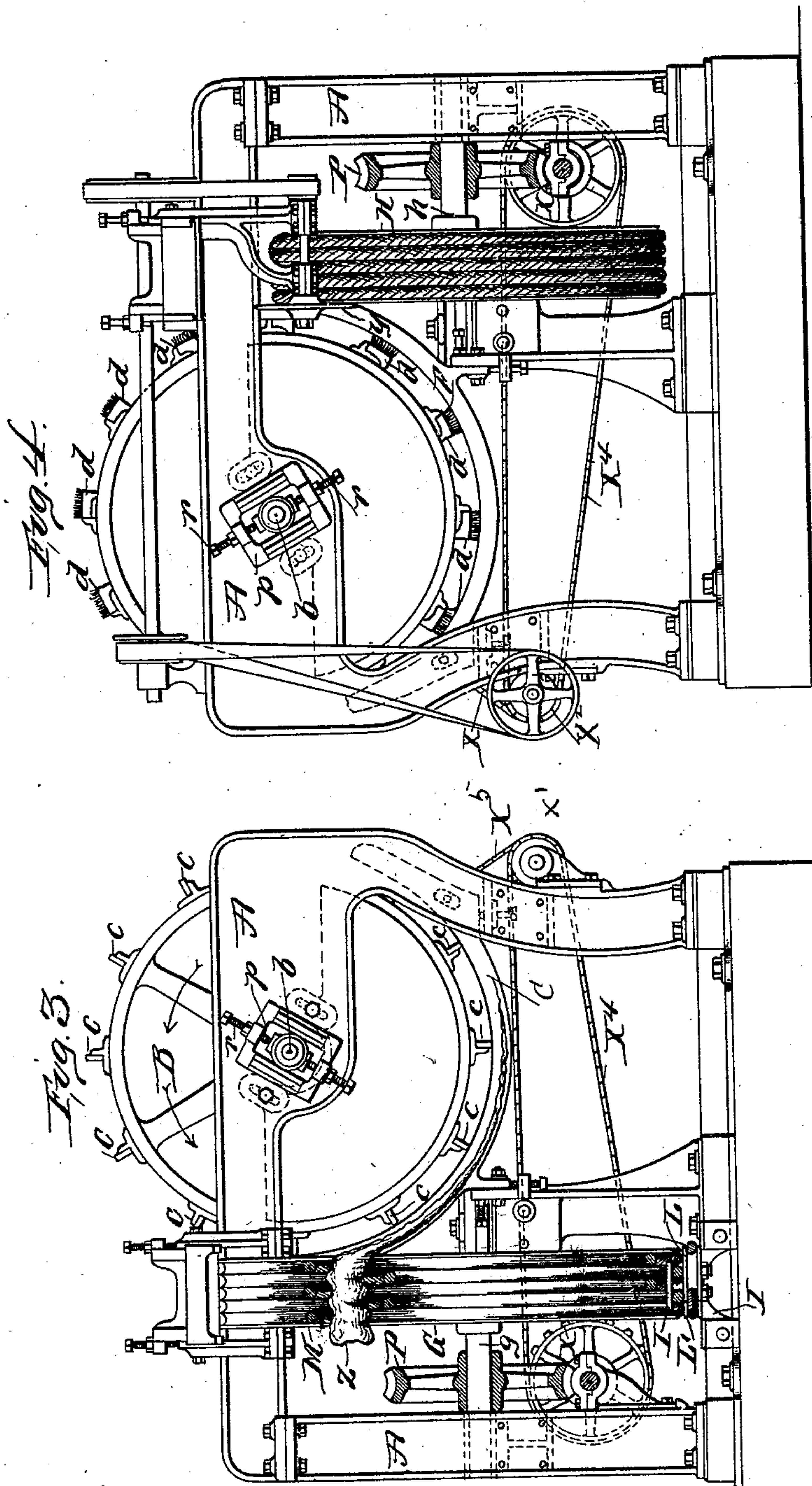
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3 Sheets—Sheet 2.

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Charles Pickles

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By *Wm. M. Eccles*
Att'y

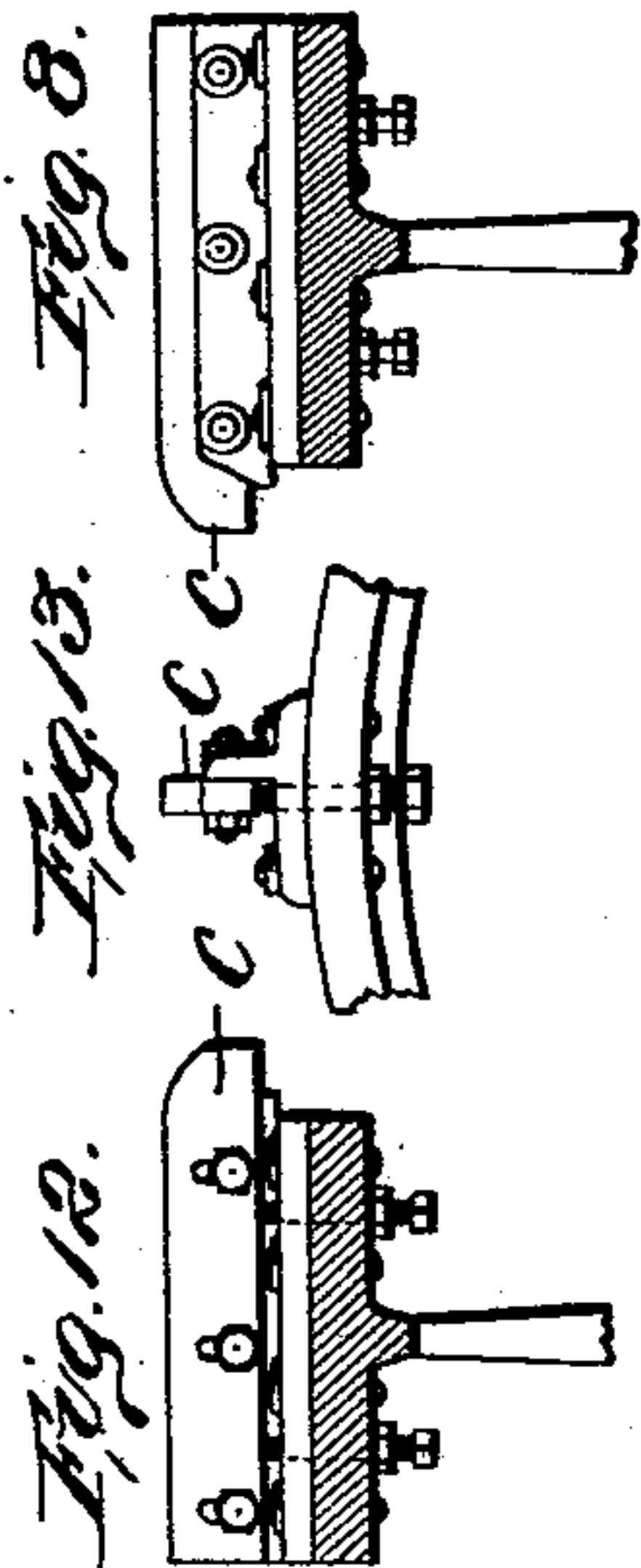
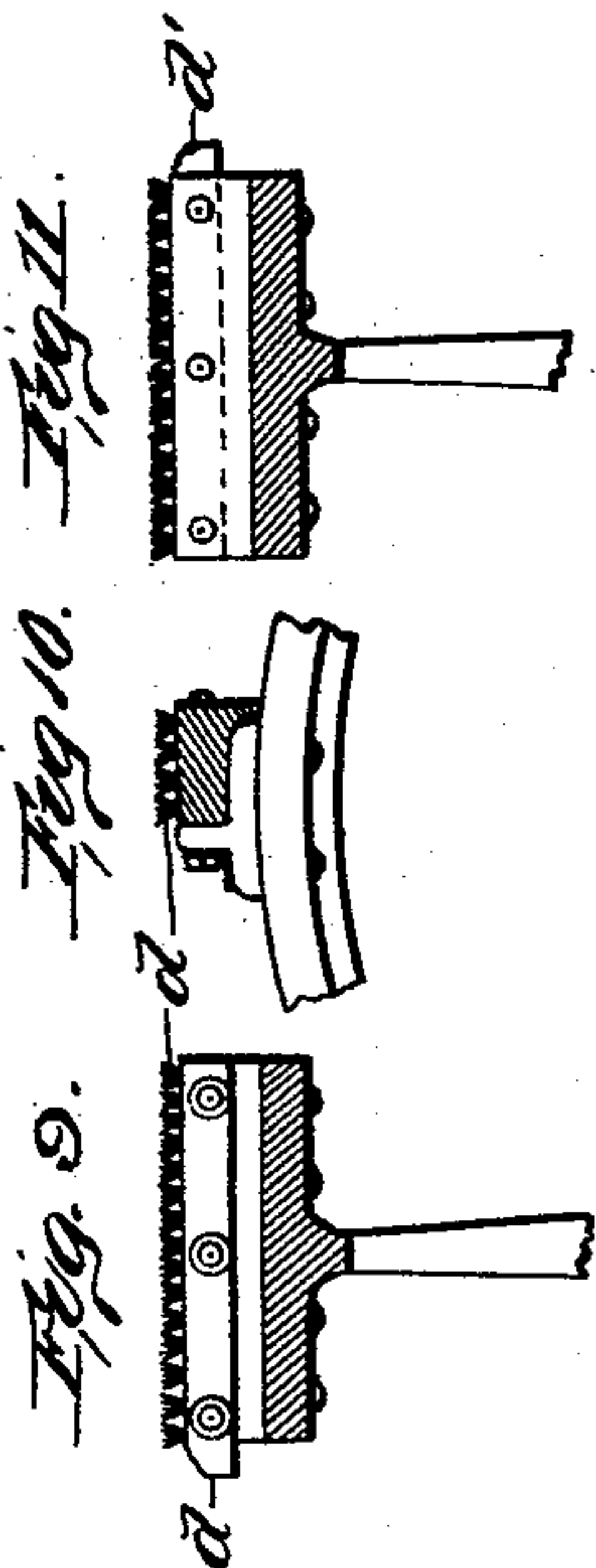
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3 Sheets—Sheet 3.

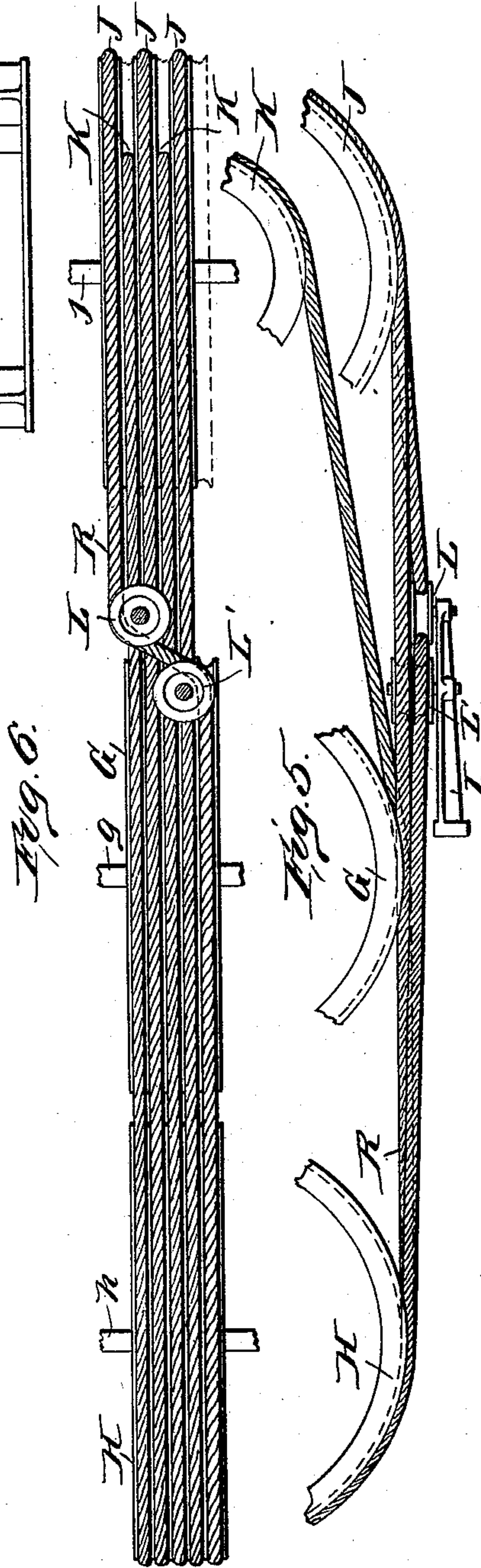
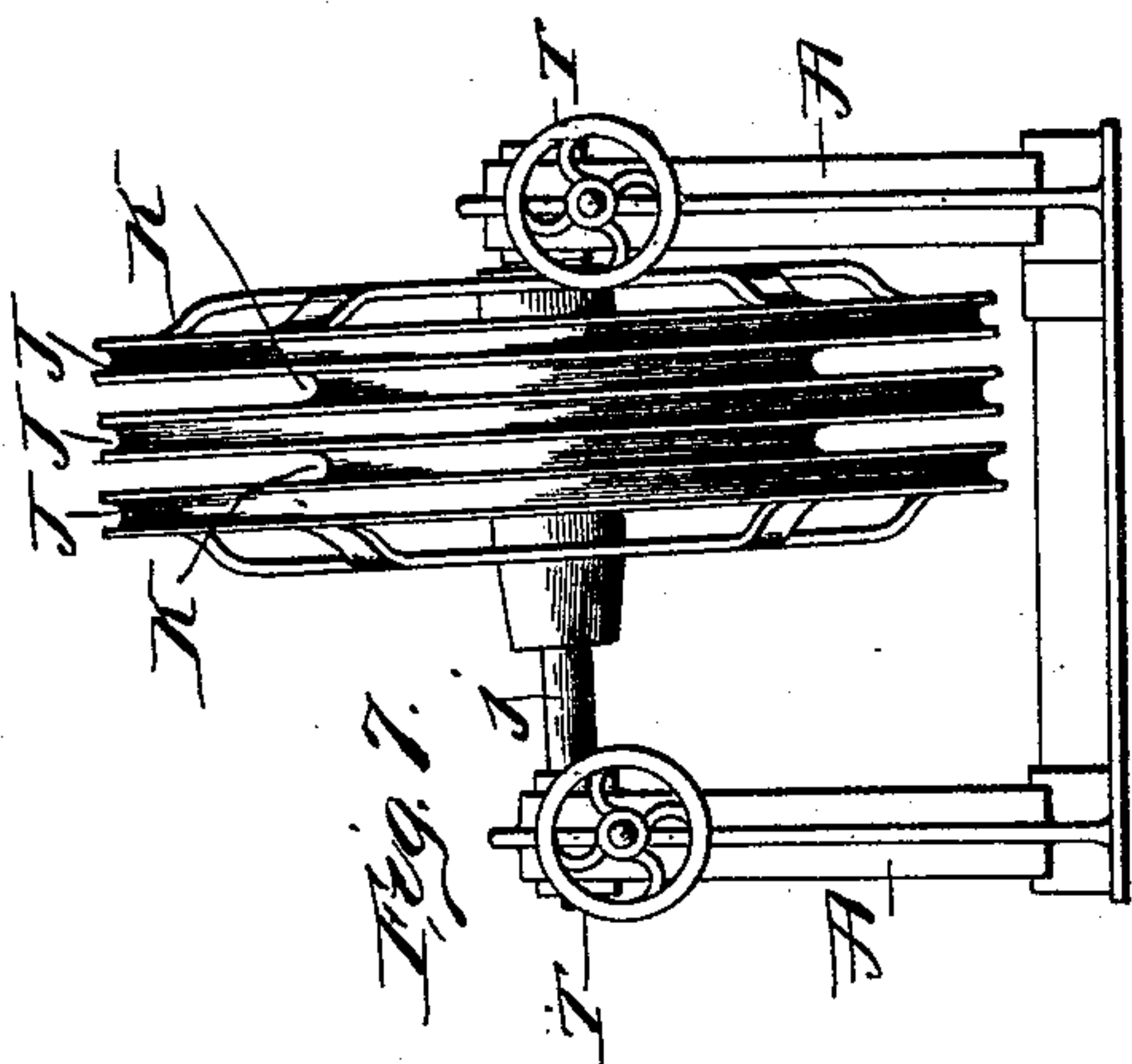
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William A. Keene

By Wm M Eccles

Atty

UNITED STATES PATENT OFFICE.

WILLIAM A. KEENE, OF ST. LOUIS, MISSOURI, ASSIGNOR TO THE MEXICAN MACHINE COMPANY, OF ILLINOIS.

FIBER-CLEANING MACHINE.

SPECIFICATION forming part of Letters Patent No. 509,314, dated November 21, 1893.

Application filed May 4, 1892. Serial No. 431,857. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. KEENE, a citizen of the United States, residing in the city of St. Louis, in the State of Missouri, have
5 invented a new and useful Fiber-Cleaning Machine, of which the following is a specification.

My invention relates to improvements in fiber cleaning machines.

The objects of my invention are first to securely hold the fiber by the butt ends while
10 it passes under the scutching knives; second, to hold the fiber firmly by its butt ends and move it along thus firmly held into and under the brushing wheel and deliver it from
15 this brushing wheel in a clean and merchantable condition; third, to take the fiber in its raw state and not only scutch the fiber, but by means of brushes arranged on a brushing wheel, brush all the gummy matter out of the
20 fiber after it has been scutched, and thus without taking it out of the machine to prepare it ready for market; fourth, to treat the fiber effectually without cutting or bruising the same. I attain these objects by the mechanism illustrated in the accompanying drawings,
25 in which—

Figure 1 Sheet 1 is a side elevation of my machine. Fig. 2 Sheet 1 is a top view of my machine showing the rope, the wheels that
30 carry the rope, the adjustable mechanism for tightening the rope and a portion of the scutching wheel and brush wheel, also three depression sheaves for the rope, the fiber being treated and a knife to cut the treated
35 part of the fiber from the butt ends. Fig. 3 is a transverse section of my machine drawn on line 3 3 in Fig. 1 of Sheet 1 and is shown on Sheet 2. Fig. 4 Sheet 2 is a rear end elevation of my machine. Fig. 5 is a side elevation of the lower part of the working mechanism of my machine. Seen in Sheet 3. Fig.
40 6 is a bottom view of Fig. 5 with the arm I, removed. Seen in Sheet 3. Fig. 7 Sheet 3 is an end elevation of the adjustable wheels and adjustable mechanism shown at the right
45 hand of Figs. 1 and 2 Sheet 1. Fig. 8 Sheet 3 is a detached view of one of the scutching knives and a cross section of the periphery and a part of one of the arms of the scutching wheel and is the reverse side of the scutching knife shown in Fig. 12 Sheet 3. Fig. 9

Sheet 3 shows one of the brushes and a cross section of the periphery of the brush wheel. Fig. 10 Sheet 3 is a side elevation of Fig. 9. Fig. 11 Sheet 3 is the reverse side of Fig. 9. 55 Fig. 12 Sheet 3 is the reverse side of Fig. 8. Fig. 13 Sheet 3 is an elevation of Fig. 8.

Letter A represents the frame-work of the machine. It is made preferably of iron and sufficiently heavy to carry the operating machinery suspended thereon. 60

Letter B represents a large scutching wheel mounted upon a shaft *b* which shaft is adjustably journaled in the frame work A. It is only adjustably journaled to the frame 65 work in order that it may be pressed down upon the fiber which it is operating upon, and may therefore be securely journaled in the frame work. This shaft is connected to the power mechanism by appropriate power transmitting devices whereby it may be caused to revolve from right to left or in direction of the arrows as shown in Fig. 3 in a rapid manner. It is provided on its periphery with
70 scutching knives *c*, which are made sharp on their outer edges, and with said edges rounding off at one end so as to permit of the easy introduction of the fiber under the knives. These scutching knives are arranged substantially transversely across the face of the
75 scutching wheel, and are adjustably connected thereto by appropriate adjusting devices, whereby they can be moved in and out radially on the scutching wheel so as to compensate for their wear as well as to adjust
80 them for the different weight or bulk of fiber to be treated. 85

Letter C represents a concave piece of metal securely fastened to the frame work of the machine and having its concave upper surface substantially coextensive with a circle 90 prescribing the outer edges of the knives arranged on the periphery of the scutching wheel. This concave rises up even with the top of the carrying wheel G. and serves to
95 hold the fiber to the knives of the scutching wheel as it passes under the same. It is made wider than the scutching wheel so as to secure the impact of the fiber under the wheel the whole length of the knives. 100

Letter E, represents a similarly constructed wheel to the wheel B, and may be hung on

the same or a different shaft from the one on which the wheel B, is hung. It is provided on its periphery with brushes arranged transversely across its face and which serve when the wheel is revolved rapidly to remove all the gummy substance from the fiber. These brushes are designated by letter *d*, and their base has one end with a corner rounded off from the outer edge as shown at *d'*, as seen at Figs. 9 and 11 and serve by being so rounded to allow the fiber to be more readily inserted under the brush wheel between the brushes and the concave of the wheel.

F, is the concave of the wheel E, and is constructed like the concave C, and is arranged in the same manner with reference to the wheel E, and serves the same purpose.

Letter G represents a wheel hung on a shaft *g*, which is arranged substantially at right angles to the shaft *b*. This shaft *g*, is journaled in the frame work in such manner that the upper surface of the wheel G, will rise approximately as high as the shaft *b*, and run close to the upper edge of the end of the concave C, so as to carry, by means of the ropes running in its grooves, the butt ends of the fiber over the upper end of the concave C, and to pass the fiber transversely under the scutching wheel B and between said scutching wheel and its concave C. This wheel G, has grooves in its periphery extending around the same, and adapted to carry therein an endless rope hereinafter described. These grooves are five in number, but may be of any number sufficient to suit the kind of fiber to be treated. H, is a similar wheel hung upon a shaft *h*, and is journaled to the frame work and is arranged in front of the wheel E and its concave in a similar manner to the wheel G, and with its attendant rope serves to pass the fiber between the wheel E, and its concave. It is also provided with grooves in a similar manner to the wheel G.

J. J. J. are three wheels placed side by side on a shaft *j*. They are preferably hung loosely so as to revolve separately upon said shaft. These wheels are provided with grooves extending around the same on their peripheries and serve to carry a rope which passes in the grooves of the wheels G, and H.

K. K. are two wheels of smaller diameter than the wheels J, and are arranged loosely on the shaft *j*, between the wheels J, J, J, as shown at Fig. 2. These wheels are also provided on their peripheries with a groove extending around the same which is adapted to carry the rope that passes around the wheels G, and H. They are made smaller than the wheels J. J. J. in order that the strands of the rope passing in the grooves of these wheels may separate from the strands of the rope passing in the grooves of the wheels J. J. J. so that the butt ends of the fiber may be readily introduced between the two lower strands and the three upper strands before it reaches the wheel G. When the butt ends of the fiber are introduced between the two lower

strands and the three upper strands these strands approach each other and as they carry the fiber on toward the wheel G, they clamp the butt ends of the fiber and hold them firmly as they pass over the wheel G.

The wheels J, J, and the wheels K. K. are preferably set so that their top grooves will be in line with the corresponding grooves on the top of the wheels G. and H. so that the strands of the rope will pass from wheel to wheel without rubbing on the sides of the grooves and thus chafing the rope; but the lower portions of the peripheries of the wheels J. J. J and K, K, are caused to run approximately the width of one wheel to the right so as to take on a straight line the rope from the friction wheel L, into the groove of the first wheel from the right of the series of wheels J. J. J. and deliver it at the top into the first groove from the right on the wheels G, and H, in a straight line. By this arrangement and tipping of the wheels out of a perpendicular the rope which is endless passes on from the wheel H, around in the first groove at the bottom, thence into the first groove of the wheel G, at the bottom, thence in a straight line into the groove of the first wheel K, at the bottom; thence rising around the wheel K, it is inclined to the left as it rises to the top of the wheel so as to be directly in line with the second groove from the right on the wheels G, and H; thence it is carried around the second groove at the bottom of G, and H, and is delivered in a straight line into the bottom groove of the third wheel of the series of wheels J. J. J. and K. K.; thence rising around the groove of this wheel to the top, being inclined to the left the width of one groove, it is delivered from the top in a straight line into the third groove of the wheels G, and H, and around the third groove of these wheels and along the bottom of the same it is delivered on a straight line into the bottom groove of the fourth wheel of the series of wheels J. J. J and K. K., rising to the top and inclining the width of one groove to the left it is delivered in a straight line into the fourth groove of the wheels G, and H, at their tops; thence around said grooves and along the bottom of the wheels it is delivered in a straight line into the groove of the fifth wheel of the series of wheels J. J. J. and K. K. as seen at Fig. 6; thence rising and passing to the left by the inclination of the wheel the width of one groove it is delivered at the top in a straight line with the fifth grooves of the wheels G, and H, thence around said wheel H, and into the fifth groove of the wheel G, at its bottom, thence onward in a straight line until it reaches the friction pulley L'; thence partially around said pulley it is deflected out of its straight line on to and partially around the friction pulley L, to the starting point. Thus it will be seen that by this arrangement of wheels the rope will always be delivered from one groove to its corresponding groove in straight lines, which is a great advantage in that it

saves the rope from chafing against the side of the grooves and unnecessarily wearing the same. This rope I designate by the letter R. It is made of any suitable material and is an endless rope and in one continuous piece. The advantages of this rope being endless and in one piece are readily observed, for the series of wheels J. J. J. and K. K. are adjustably mounted by suitable mechanism upon the end of the frame work A, as shown at T. (See Fig. 7.) The object of adjustably mounting these wheels is to take up the slack of the rope at will and thus keep it very taut in all its parts so as to enable it to clamp securely the butt ends of the fiber as it passes into the machine. The object in making the rope all in one piece is to enable the operator to keep his rope equally taut in all its parts and thus equally bind the fiber throughout its entire course after it has entered into the machine, which could not be done if there was a separate strand for each series of grooves. The friction rollers L', and L, are journaled on the bottom of the frame work and one of said pulleys is provided with an arm which revolves with said pulley and designated by the letter I, seen in dotted lines at Fig. 1 and in elevation at Fig. 5. Its function is to strike the butts of the fiber and clear them of the rope when they are delivered at the bottom of the wheel G and released from the ropes by the parting of the strands at that point.

M, M, M, are pressure rollers placed on the top of the rope near the periphery of the wheels G, and H, and adjustably connected with their journal boxes to the frame work by an ordinary slide and set screw *m, m, m*, as seen in Fig. 1. They serve to hold the rope closely down on the wheels G, and H, while the fiber is passing between the ropes and over said wheels.

While I do not confine myself to the particular device shown in the drawings for adjusting the series of wheels J. J. J. and K. K, I show it as a preferable means of adjustment in this machine; it consists of a screw V, passing through and mounted in the frame work and working in a female screw in the slide S, which slide carries the shaft upon which is mounted the series of wheels J. J. J. and K. K. and moves back and forth between two ordinary guides in said frame work. There is one of these slides provided for each end of the shaft.

P, P are two worm wheels secured to the shafts of the wheels G, and H, respectively. They are of equal size or bearing the same proportion to each other in size as the wheels G and H do and are made to engage worms W, W, which are mounted on a shaft O, and from which they receive a slow and regular movement by the revolution of said shaft O, which shaft gets its motion from a series of sprocket wheels and sprocket chains X, X', X², and a sprocket wheel (not shown) mounted upon the shaft *b*, and from which it receives its power.

Y, is a knife mounted on a shaft in the frame work and is circular in form, set close the side of the wheel H, and is caused to revolve by a series of belts and pulleys which take their power from the shaft of the sprocket wheel X² as seen at Figs. 1, and 4. As the fiber is delivered from under the wheel E, and over the crest of the wheel H, the knife Y, comes in contact with it and cuts the treated portion from the butts, the butts are carried round beyond the bottom of the wheel G, where they are released from the rope and knocked away by the arm I, and the finished portion falls to the ground whence it can be taken and baled.

The letter X represents the sprocket chain operating over the sprocket wheels X, X', and the letter *x*⁵, is the sprocket chain connecting the wheel X², with the wheel on shaft *b*.

The letter *p* represents a movable journal box carrying the shaft *b*, and is provided with slots at each end secured to the frame work by pins. This journal box is provided with set screws *r, r*, passing through a projection in the frame work and against each side of the journal-box. By this means I am enabled to adjust the scutching wheel B, either close to its concave or farther from it according to the fiber to be treated. I do not wish to confine myself to this particular method of adjusting the scutching wheel to its concave, but the advantage is in adjusting and having a scutching wheel that is susceptible of being adjusted to the concave so as to prevent the fiber from being bruised or cut by the knives *c*. The same adjusting device is used on the shaft of the wheel E, and is used for the same purpose.

Letter *u* represents the pulley with which the whole machine is driven.

Letter Z represents the fiber before it is treated.

Letter Z', represents the fiber after it is treated.

It is obvious from the construction of my machine that the operator can readily feed the machine by inserting bunches of fiber with their butt ends between the converging ropes R, at the largest opening where they leave the wheels J, J, J, and K, K, and holding them there until they are tightly clamped by the converging of the ropes and passed on between the concave and the scutching wheel. It is plain also that the manner in which the butt ends of the fiber are held between the different strands of rope as seen at Fig. 2 will secure them against being jerked out by the scutching wheel when passed through it and that they will also be held firmly while passing under the brush wheel and between it and its concave. This brushing of the fiber is very essential because it takes away all the gummy substance which is left in it by the scutching wheel, and it does this immediately, before it has time to dry and discolor the fiber and render it hard to remove. By reason of the