

(No Model.)

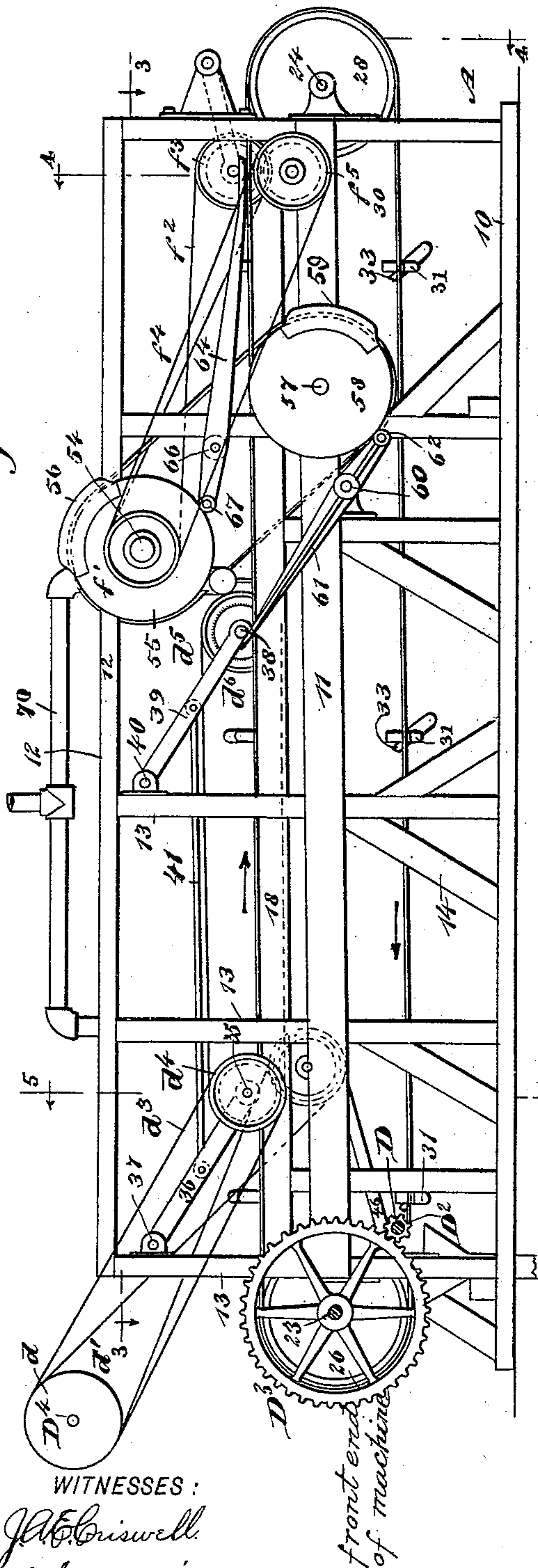
3 Sheets—Sheet 1.

E. W. GERBRACHT.
WASHING MACHINE.

No. 495,324.

Patented Apr. 11, 1893.

Fig. 1.



WITNESSES:

J. H. Griswell
L. Sedgwick

front end
of machine

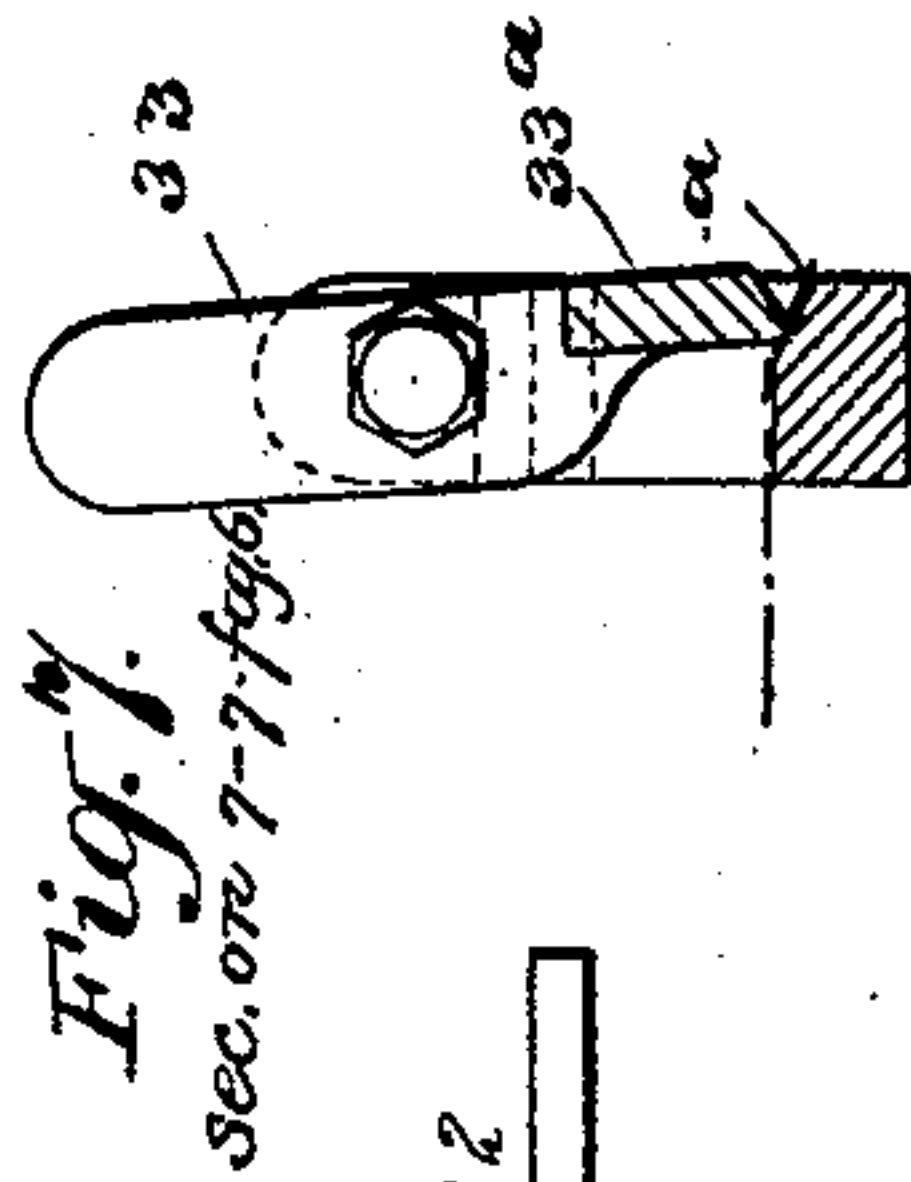


Fig. 7.

sec. on 7-7 fig. 6

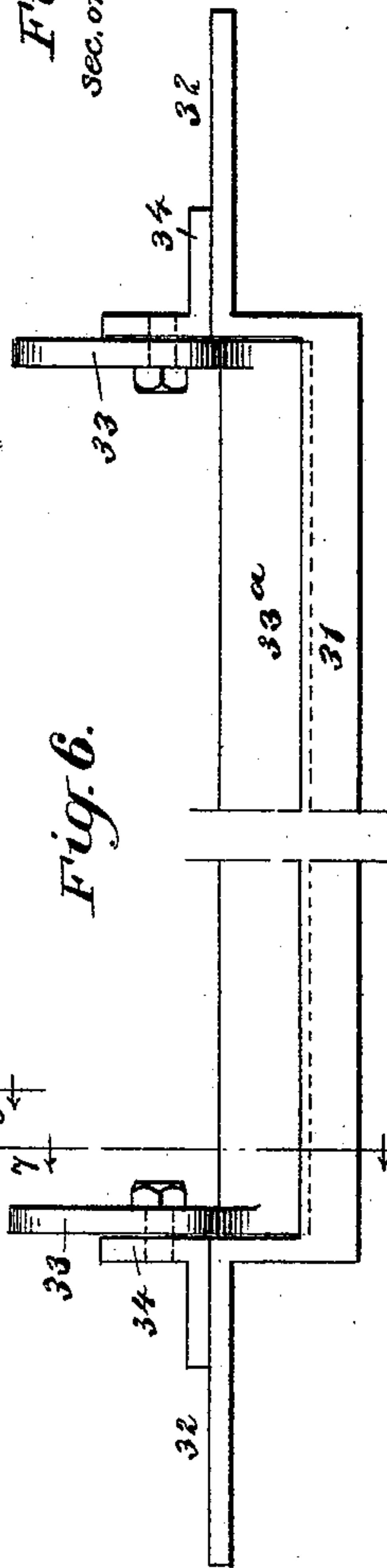


Fig. 6.

Fig. 9. sec. on 9-9 fig. 8

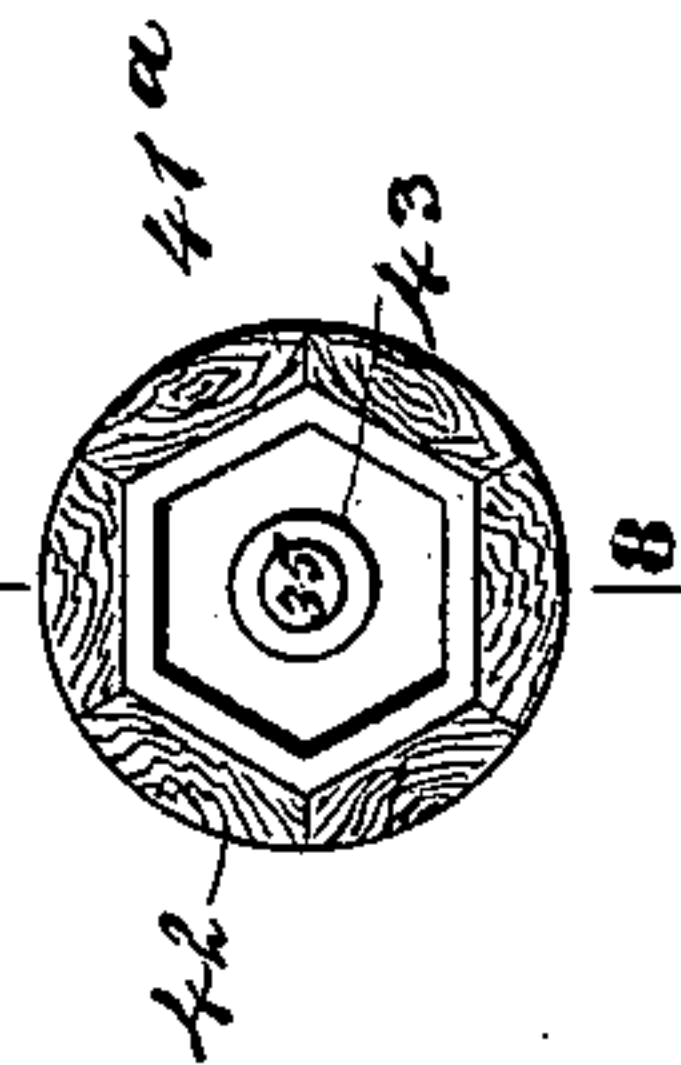
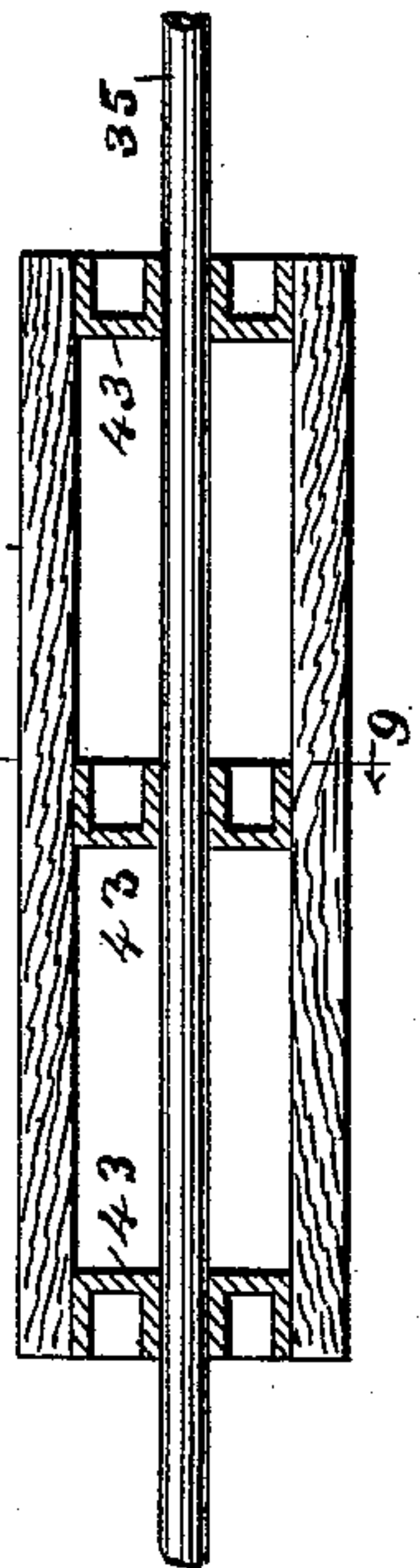


Fig. 8. sec. on 8-8 fig. 9.



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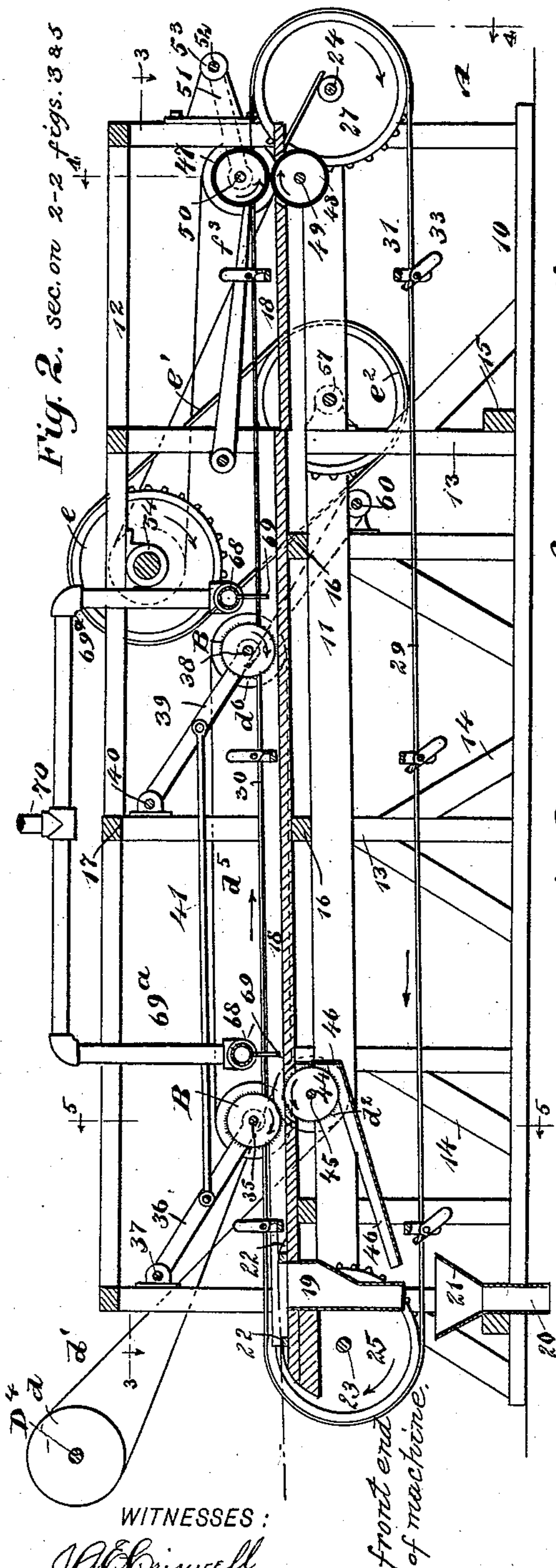
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3 Sheets—Sheet 2.

E. W. GERBRACHT.
WASHING MACHINE.

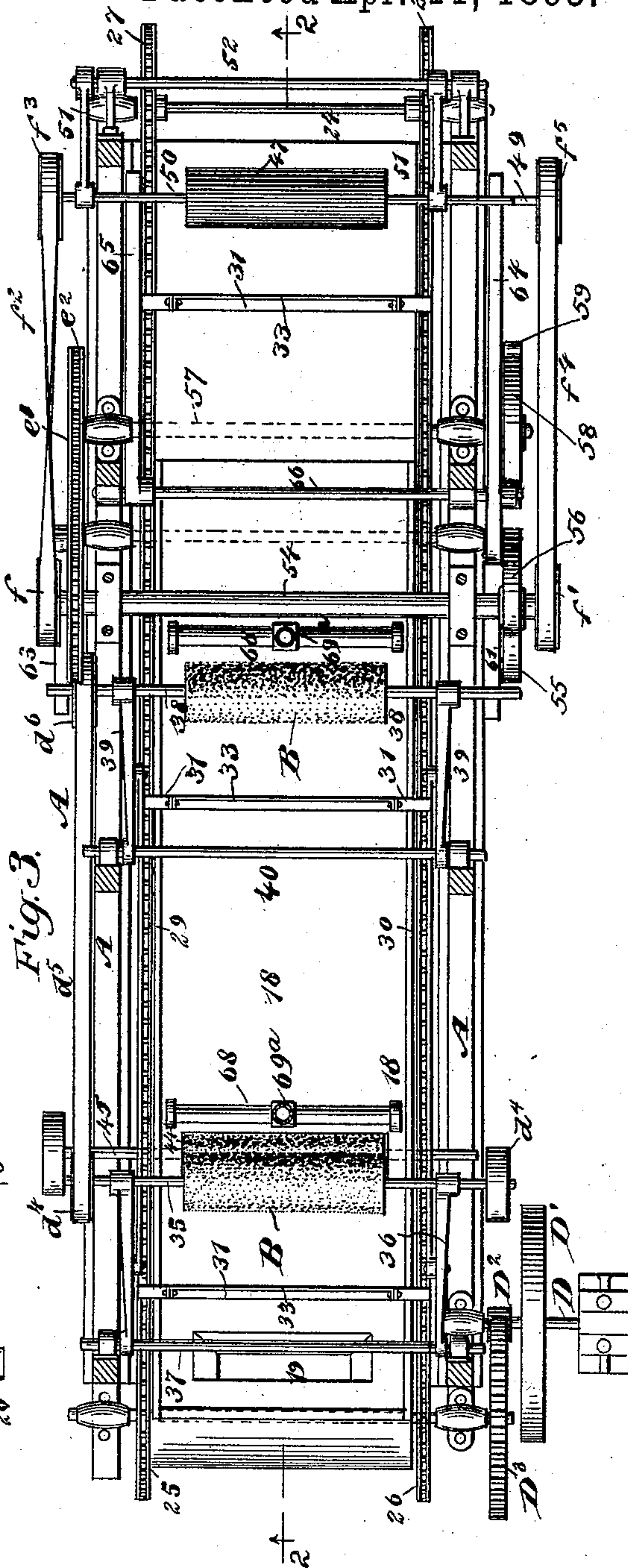
No. 495,324.

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(No Model.)

3 Sheets—Sheet 3.

E. W. GERBRACHT.
WASHING MACHINE.

No. 495,324.

Patented Apr. 11, 1893.

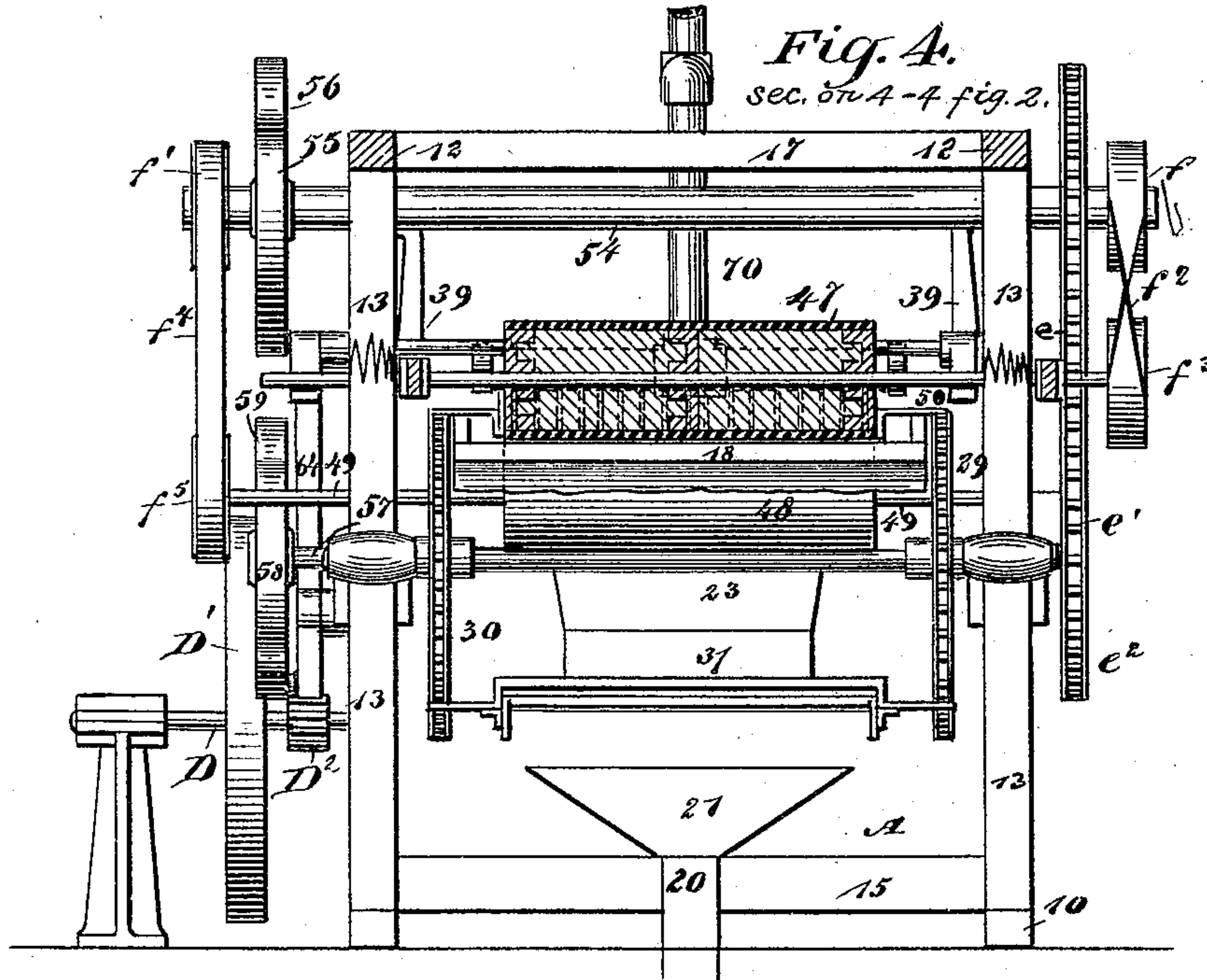
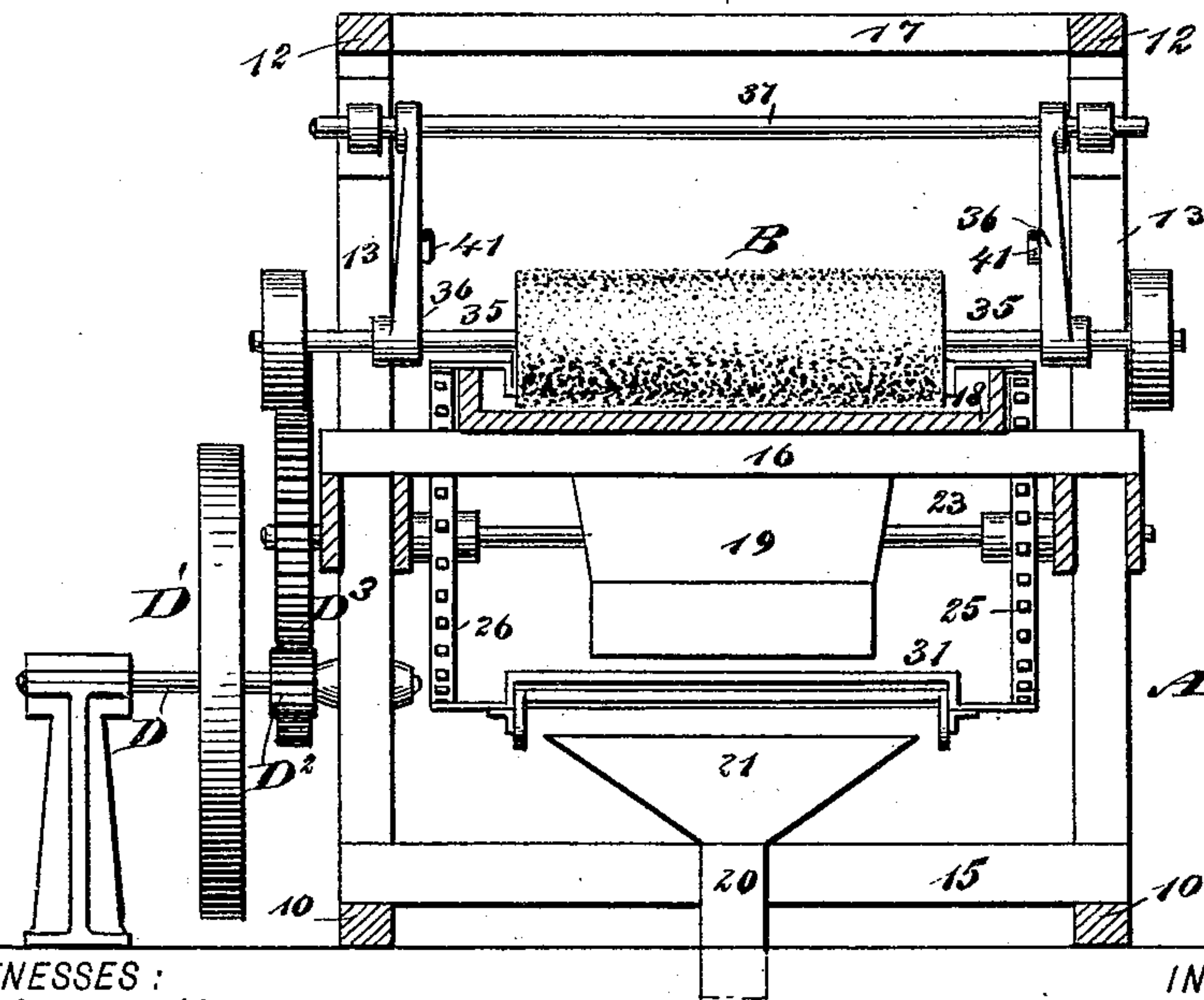


Fig. 5. sec. on B-B fig. 2.
2+



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UNITED STATES PATENT OFFICE.

ERNEST W. GERBRACHT, OF BROOKLYN, NEW YORK.

WASHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 495,324, dated April 11, 1893.

Application filed June 2, 1892. Serial No. 435,277. (No model.)

To all whom it may concern:

Be it known that I, ERNEST W. GERBRACHT, of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Machine for Washing and Cleaning Filter-Press Blankets and Like Articles, of which the following is a full, clear, and exact description.

My invention relates to an improvement in machines for washing, scouring or cleaning filter-press cloth, blankets, bags and other fibrous material, and has for its object to construct the machine in an exceedingly simple, durable and economic manner, and to provide a means whereby the material to be operated upon will be expeditiously and thoroughly cleaned, and whereby the material during the process of cleaning will be made to travel in a direction which will carry the cleansed portion thereof away from the medium employed to cleanse it.

Another object of the invention is to provide a means whereby the operation of the cleansing or cleaning brushes will be rendered automatic with reference to the passage between them of the material to be cleansed; and it is a further object of the invention to construct a machine of the type above described which will not only be simple and durable but which will be economic as well.

It is a further object of the invention to provide adjustable and traveling carriers having automatic clamps adapted to hold blankets or cloths of different thicknesses.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth and pointed out in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar figures and letters of reference indicate corresponding parts in all the views.

Figure 1, is a side elevation of the machine the balance wheel being removed. Fig. 2 is a central longitudinal section, taken practically on the lines 2—2 of Figs. 3 and 5. Fig. 3 is a plan view of the body of the machine, the framework being in horizontal section, which section is taken practically on the line 3—3 of Fig. 2. Fig. 4 is a transverse section

taken through the feed rollers, and practically on the line 4—4 of Fig. 2. Fig. 5 is also a transverse section, but taken practically on the line 5—5 of Fig. 2. Fig. 6 is a side elevation of one of the brace bars and attached clamp to be used in connection with the machine. Fig. 7 is a vertical section taken practically on the line 7—7 of Fig. 6. Fig. 8 is a longitudinal section through one of the brush bodies, taken practically on the line 8—8 of Fig. 9; and Fig. 9 is a transverse section of a brush body, taken practically on the line 9—9 of Fig. 8.

The frame A of the machine may be of any approved construction, but is preferably substantially rectangular in cross section, and is of any desired length and breadth. It comprises parallel base members 10, intermediate longitudinal timbers 11 above the base and upper timbers 12. These timbers are supported upon suitable uprights 13, provided with proper braces 14, and the sides of the frame are connected by cross bars located at the bottom, intermediate of the top and bottom, and at the top, the bottom cross bars being designated as 15, the intermediate as 16 and the upper cross bars as 17.

The intermediate longitudinal side beams 11, are preferably so laid that they incline from the direction of the rear of the machine downward to the front; and upon the intermediate cross beams 16 a sluice way 18, is located, of box-like structure, open at the top, the sluice way being of any desired width and extending from the rear practically to the front, and at the front of the sluice way, which is its lowest point, a chute 19, is located, extending up within the sluice way flush with its bottom, and this chute is arranged directly over an offtake pipe 20, preferably provided with a funnel top 21, as is best shown in Fig. 2. In order that the material, which is water, contained in the sluice way shall all pass off through the chute 19, stops 22, are arranged in such manner as to compel the water to flow down through the chute, the stops being indicated in Fig. 2.

Beneath the sluice way, at the front of the machine, a transverse shaft 23, is journaled in suitable bearings; and beneath the sluice way, at the rear of the machine, a like shaft 24, is journaled. The shaft 23, carries two

sprocket wheels designated as 25 and 26, and the shaft 24, at the rear, also carries two sprocket wheels designated as 27 and 28, the sprocket wheels of the two shafts being in longitudinal alignment, and each longitudinally-aligning pair of sprocket wheels carries an endless chain, the chains being designated as 29 and 30. At intervals these chains are connected by brace bars 31, which are shown in detail in Fig. 6. These brace bars are substantially U-shaped in cross section, and their upright members are provided with horizontal extensions 32, by means of which extensions they are bolted or otherwise secured to the chains. The front upper edges of the body portion of the brace bars are beveled, as indicated at *a* in Fig. 7; and in each brace bar a correspondingly shaped clamp bar 33, is pivoted. The clamp bars are like the brace bars only in general contour, and are not provided with the extensions 32, as their upright members are pivotally attached to blocks 34, preferably of an angular character, which blocks are rigidly secured upon the extensions 32 of the brace bars, and the inner faces of the blocks are in vertical alignment with the inner faces of the vertical members of the brace bars, as is likewise best shown in Fig. 6. The body member of each of the clamp bars stands vertically instead of horizontally, as is best shown in Fig. 7; and the under edge of the body member, which member is designated as 33^a, is beveled at its rear lower edge so as to produce a point to rest upon the beveled surface *a* of the brace bar. The said body portion 33^a is heavier than the parallel arms (see Fig. 6) by which it is pivoted to the brace bar 31, and hence overbalances them so that when the said bar 31 is uppermost, as in passing rearward over the sluiceway 18 (see Fig. 2), the body portion 33^a of the clamps swings downward and thus the clamp closes, automatically, upon the filter blanket or cloth. On the contrary, when the brace bars and clamps are passing back to the front, underneath the sluice-way 18, the body portion 33^a of the clamps swings downward, and thus the clamp opens automatically.

The material to be cleaned is stretched along the brace bars in engagement with the body portions thereof, and is held in contact with the brace bars by the body portions 33^a of the clamp bars; and as the latter bars are pivoted to the brace bars the moment the two bars commence to travel in direction of the rear of the machine, which will be when they are above the sluice way, the clamps will exert tension automatically upon the material in a sufficient degree to hold it firmly to the brace bars; but the moment the brace and clamp bars commence to pass around the rear sprocket wheel and assume a forward direction beneath the sluice way, the clamp bars open automatically from the brace bars and the blankets to be acted upon may be placed in position upon the carrier.

Near the forward end of the machine above

the sluice way 18, a transverse shaft 35, is journaled in the lower ends of links 36; and these links at their upper ends are pivotally connected with a fixed shaft 37, extending transversely across the frame near its upper end, as shown in Fig. 5, the said fixed shaft being preferably connected with the inner portion of the forward end of the frame, as indicated in Fig. 2; and at or near the center of the frame, another shaft capable of being revolved and designated as 38, is located parallel with the shaft 35; and the shaft 38 is likewise journaled in the lower ends of links 39, which links are pivotally attached to a fixed shaft 40, supported by convenient intermediate uprights 13, as shown best in Figs. 2 and 3; and the links 36 and 39, supporting the two shafts 35 and 38, are connected by rods or bars 41, the said rods being pivotally connected with the links so that both shafts 35 and 38 may be simultaneously raised when pressure is applied as hereinafter described. Each shaft 35 and 38, is adapted to carry a brush B. These brushes are rigidly secured to the shafts and extend downward within the sluice way, as shown best in Fig. 5, in which one of the brushes is illustrated in side elevation. The length of the brushes corresponds very nearly to that of the body portion 33^a of the clamps.

While the brushes B may be of any approved construction, they are preferably made as illustrated in Figs. 8 and 9, in which it will be observed that the body 41^a of the brush, which only is shown in said figures, is made of a series of segmental sections 42, of wood or other material, united in a manner to combinedly produce an exterior cylindrical or circular surface and an interior polygonal surface, shown best in the cross section in Fig. 9; and these sections are held in place by end and intermediate supporting heads 43, corresponding in peripheral contour to the inner contour of the united body sections, and these heads are preferably made of metal and are apertured to receive the shaft upon which the brush is to be mounted, being secured to the shaft in any approved manner; and the sections of the body are attached to the head by bolts, rivets, cement, or by any equivalent means or material.

The upper set of brushes only may be employed if in practice it is found desirable; or each upper brush may have a corresponding lower brush. In the drawings two brushes are shown as located one above and the other below the sluice way near the forward end of the latter. The lower brush 44, is mounted upon a shaft 45, journaled transversely below the sluice way slightly rearward of the shaft 35, upon which the upper brush is mounted; and an opening is therefore created in the sluice way in which the brush revolves, the opening being so produced that the bristles of the lower brush will extend upward beyond the lower or base face of the sluice way. The brushes are adapted to revolve in a di-

rection contrary to the movement of the chains, and consequently in a reverse direction to the movement of the material to be cleansed, the direction in which the brushes move being indicated by arrows in Fig. 2.

As an opening is made in the bottom of the sluice way to receive the lower brush 44, provision must be made for the disposal of the water or cleansing fluid that may waste at this point. The amount of waste may not be great, but a chute 46, is provided to conduct it to the funnel 21 of the offtake 20, and this chute is preferably connected to the under face of the sluice way back of the lower roller, and extends diagonally downward over the funnel 21, as is best shown in Fig. 2.

At the rear of the machine a wringer is located, comprising two rollers 47 and 48, the roller 47, being located above the sluice way and the roller 48, below it, the latter roller revolving in an opening produced in the bottom of the sluice way. The two rollers are normally in contact, and they revolve in a direction the reverse of the direction of the brushes. The lower roller is mounted upon a shaft 49, which is journaled in fixed bearings; but the shaft 50 of the upper roller is mounted in links or arms 51, which links or arms are pivoted upon a shaft 52, secured in brackets 53, attached to the rear of the frame above the level of the sluice way, in any suitable or approved manner, as illustrated in Fig. 2. The shafts of the upper brushes and the upper roller extend some distance beyond the outer sides of the sluice way. The rollers acting as a wringer are intended to squeeze from the cleaned cloths or blankets the water or the compound used in cleaning them.

The movement of the chains, and consequently the movement of the material to be cleaned, is in direction from front to rear of the machine, and as the brushes, and likewise the upper wringer roller are set well down in the sluice way, it is necessary that the upper brushes and upper wringer roller should be elevated each time that a combined brace and clamp bar is brought beneath them; otherwise the brushes and the roller would become damaged, and the movement of the chains up to a certain extent would be retarded. In order to accomplish this result, the two upper brushes, and likewise the upper wringer roller, are placed at equal distances apart, and the space between the forward and the intermediate brush, and the intermediate brush and rear wringer roller, corresponds to the distance that exists between the combined clamping and brace bars. Thus when a combined brace and clamp bar closely approaches the forward brush, a second bar will in like manner have approached the intermediate brush, and a third bar will be immediately in front of the upper wringer roller, so that, if all of the brushes and the upper wringer roller are simultaneously elevated, the bars connected with the chains may pass through without interfering with the proper action of the ma-

chine. There is no waste of cleansing power at this operation, as the brushes and the upper wringer roller are only elevated a sufficient length of time to clear the bars upon the chain, and the material at the point clamped by these bars can not be reached, so that in cleaning the material it may be necessary to shift it slightly and pass it beneath the brushes for a second time; however, in practice this has not been found to be really necessary, as the contact between the clamp and the brace bars is exceedingly narrow.

The lifting of the brushes and of the upper wringer roller is accomplished in the following manner: A shaft 54, is mounted in bearings connected with the upper portion of the frame, slightly rearward of the intermediate brush, as shown in Figs. 1 and 2. At one end the shaft 54, carries a disk 55, having a cam peripheral projection 56; and beneath the sluice way between the intermediate brush and the friction rollers a shaft 57, is journaled, which carries a disk 58, located upon the same side of the machine as the disk 55, and the disk 58, is provided also with a cam peripheral extension 59. Slightly in advance of the shaft 57, and slightly below its horizontal plane, a shaft 60, is journaled in the frame; and upon one end of this shaft a lever arm 61, is secured, one end of which lever arm has bearing against one end of the intermediate brush shaft 38, and the opposite end of the lever arm is provided with a friction roller 62, which travels upon the periphery of the disk 58. At the opposite end of the shaft 60, a second lever arm 63, is secured, which engages with the opposite end of the shaft 38. By this means when the cam surface of the disk reaches the roller of the lever arm 61 its lower end is pressed downward, thereby rocking the shaft 60, and the upper ends of both lever arms 61 and 63, are carried upward, and therefore the intermediate brush is elevated and likewise the links 39 in which it is journaled; and as the links 39, are connected with the links 36, journaling the shaft of the forward brush, the forward brush is carried up simultaneously with and also the same distance as the intermediate brush. When the cam on the disk 58 acts upon the lever arms 61 and 63, the cam surface of the disk 55 acts upon the lever arms 64 and 65 secured to a shaft 66, journaled in the frame, which arms engage with the shaft 50 upon which the upper wringer roller 47 is secured; and therefore this roller is elevated simultaneously with the brushes. The cams act upon the lever arms only a sufficient time to permit of the passage of the combined clamp and brace bars, and the moment that these bars have cleared the brushes and the friction rollers the cam surfaces upon the disks release the lever arms, and the brushes and the upper wringer roller drop to their normal position and continue their work.

The lever arm 64, is provided with a friction roller 67, in constant engagement with

the disk 55, as shown in Fig. 1. In the rear of each upper brush a water supply pipe 68, is located, and this pipe corresponds in length practically to the length of the brush near which it is located. The supply pipes are provided with a series of nipples 69, projecting downward in such manner as to deliver streams of water upon the material to be treated along its full width; and in order that the force of the water may be utilized to its fullest extent these nipples closely approach the cloth, they being removed from it only a sufficient distance to admit of the passage of the clamp and brace bars. These supply pipes 68, are connected by pipes 69^a with a service pipe 70, which may lead to any convenient source of water supply.

The driving mechanism of the machine is as follows: A drive shaft D, is mounted near the forward end of the machine, and it carries a driving pulley D', which serves also as a balance wheel. The drive shaft further carries a pinion D², which meshes with a large gear D³ upon the end of the shaft 23, which shaft carries the forward sprocket wheels supporting the chain. A second drive shaft D⁴, is employed, which latter may be a counter-shaft; and a pulley d, mounted thereon, is connected by a cross belt d' with a pulley d², upon the lower forward brush 44. A second pulley is adjacent to the pulley d, and this second pulley is connected by a straight belt d³ with a pulley d⁴ fast upon one end of the shaft upon which the upper forward brush is mounted. A second pulley is contained upon this shaft, which is connected by a belt d⁵ with a pulley d⁶, secured upon the shaft upon which the rear upper brush is mounted. A second counter-shaft is usually employed for driving the cam disks and the wringer rollers; and power is communicated from the second counter-shaft to the upper shaft 54, carrying the upper cam disk, and this shaft is also provided with an attached sprocket wheel e, which is connected by a chain belt e' with a sprocket wheel e², secured upon the shaft 57, which carries the lower cam disk. The upper shaft 54, is also provided at each end with a pulley, said pulleys being designated as f and f'. The pulley f is connected by a cross belt f² with the pulley f³ secured upon the shaft of the upper wringer roller; while the pulley f' is connected by a straight belt f⁴ with a pulley f⁵ carried by the shaft to which the lower wringer roller is secured.

In the operation of the machine it will be observed that the chain belt travels from the front in direction of the rear. The material is carried by the chain belt, being clamped between the clamp bars 33 and the brace bars 31. As the chain passes over the forward sprocket wheels the clamps automatically tighten upon the article to be clamped and cleaned and hold it fast, and as has heretofore been stated, the movement of the machine is so timed that when the bars 33 and 31 closely approach the upper brushes and

upper wringer roller, these brushes and the roller are lifted to permit the bars to pass. As soon as the cloth passes the first set of brushes, water or other cleansing compound is forced thereon, and the brushes thoroughly clean or scrub the material; a second scrubbing is obtained when the second brush is reached, and after the material has passed the second brush it is rinsed by the flow of water it receives back of that brush.

When the washed material has been passed through the wringers it is comparatively dry; and at this point I desire it to be distinctly understood, that the material, such as filter-press blankets, filter bags and cloths used for filtering purposes become so hardened and stiff from usage, the pores being filled up by the material forced against and into them, that ordinary washing, even in a strong cleansing or alkaline solution, does not remove the foreign matter from the cloths, blankets or bags, nor does it soften them to the extent desired. I accomplish this result by bringing the brushes in positive engagement with either the upper, or with the upper and lower surfaces of the material being cleansed while the material is in the presence of the cleaning compound, and by abrading the surface by means of the brushes, and disturbing the fiber of the material, the water or cleansing compound is enabled to pass through it and thus expeditiously and effectually clean and soften the material. Thus it will be observed that the material is constantly passed forward to a fresh supply of water, and is not subjected to the water which passes from it or through it, as that flows off through the sluice way into the offtake pipe 20. When the chains pass over the rear set of sprocket wheels, the clamp bars 33, automatically disengage from the brace bars, and the material carried by the latter is freed from pressure.

This machine is not only simple and durable, but it is capable of being manipulated automatically as far as the lifting of the brushes is concerned and the releasing of the material to be washed, and the machine is also exceedingly economic in its construction.

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

1. In a machine of the character described, the sluice way, a device for supplying cleansing material thereto, a carrier passing over the sluice way and adapted to receive the fabrics to be operated upon, and scouring devices capable of abrading or roughening the surface of the fabrics and revolving in the presence of the cleansing compound and adapted to act upon the material to be cleaned, as and for the purpose specified.

2. In a machine of the character described, the combination, with a sluice way, and endless belts traveling above and below the sluice way, of brace bars connecting the endless belts, and clamp bars pivoted to the brace

bars, substantially as and for the purpose specified.

3. In a machine of the character described, the combination, with a sluice way and an endless belt traveling above and below said sluice way, of brace bars essentially U-shaped connecting the endless belts, the body portions of the said brace bars being beveled at one edge, and correspondingly shaped clamp bars pivotally connected with the brace bars, the lower edges of the clamp bars being also beveled and engaging with the beveled surface or the brace bars, as and for the purpose set forth.

4. In a machine of the character described, the combination, with the sluice way and endless belts traveling above and below the same, of clamps carried by the endless belts and adapted to hold the material to be operated upon, brushes located above the sluice way and entering the same, a drive mechanism for revolving the brushes in a direction contrary to the travel of the belts, wringers located at one end of the sluice way, and a driving mechanism revolving said wringers in the same direction that the belt travels, as and for the purpose set forth.

5. In a machine of the character described, the combination, with a sluice way, an endless belt traveling above and below the same, adjustable brace bars, and clamps carried by the belt and adapted to receive and hold the material to be acted upon, of brushes arranged above the sluice way and entering the same, a mechanism revolving the brushes in a direction contrary to the travel of the belt, connecting bars uniting the brushes, a lift mechanism connected with one of the brushes, and a time mechanism operating the lift mechanism, as and for the purpose set forth.

6. In a machine of the character described, the combination, with a sluice way, an endless belt traveling above and below the same and clamps connecting the belts and adapted to receive and hold the material to be acted upon, of brushes held to revolve above the sluice way and entering the same, connecting rods uniting the brushes, a driving mechanism rotating the brushes in a direction contrary to the travel of the belts, a lift mechanism applied to one of the brushes, a time driving mechanism connected with the lift mechanism, and spray tubes arranged at one side of the brushes, substantially as shown and described.

7. In a machine of the character described, the combination, with a sluice way, endless belts traveling above and below the same, clamps connecting the belts and adapted to hold the material to be operated upon, the said clamps having pivoted supports, and

brushes held to revolve above the sluice way and entering the same, the brush mounted below one of the upper brushes revolving in an opening in the sluice way, and a chute partially surrounding the lower brush, of a connection between the upper brushes, a driving mechanism rotating the brushes in a direction contrary to the travel of the belts, a spray mechanism located adjacent to the brushes, lifting devices engaging with the upper brushes, a time mechanism operating upon the lifting devices, wringer rollers turning in the direction in which the belt travels, and a lifting device connected with the upper wringer roller and operated in unison with the lifting devices of the brushes, substantially as and for the purpose set forth.

8. In a machine of the character described, the combination, with an inclined sluice way, endless belts traveling above and below the sluice way, their travel being in direction of the upper end of the sluice way, brace bars essentially U-shaped and provided with a beveled body connecting the belts, clamp bars pivoted to the brace bars and provided with a beveled body engaging with the body of the brace bars, and brushes held to revolve above the sluice way and entering the same, the said brushes being connected with a spray device located adjacent to the brushes, of a driving mechanism revolving the brushes in a direction contrary to the travel of the belts, a lifting mechanism connected with the brushes, a time mechanism operating upon the lifting devices, wringer rolls located at the upper end of the sluice way, one above and the other below it, the lower feed roll extending upward through the sluice way, a driving mechanism rotating the wringer rolls in the same direction that the belts travel, and a lifting mechanism connected with the upper wringer roll and acting in conjunction with the lifting mechanism of the brushes, as and for the purpose set forth.

9. In a machine of the character described, the combination, with endless belts, of brace bars arranged at right angles to said belts and U-shaped in general contour, secured at their ends to the belts and connecting the same, clamps of corresponding contour fitted to move in the brace bars and pivotally connected therewith, the body portions of the brace bars being beveled and likewise the body portions of the clamp bars, the two beveled surfaces being adapted for engagement, as and for the purpose set forth.

ERNEST W. GERBRACHT.

Witnesses:

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C. SEDGWICK.