E. WESSMAN.

WASHING MACHINE.

APPLICATION FILED OCT. 8, 1915.

1,213,048.

Patented Jan. 16, 1917.

8 SHEETS—SHEET 1.

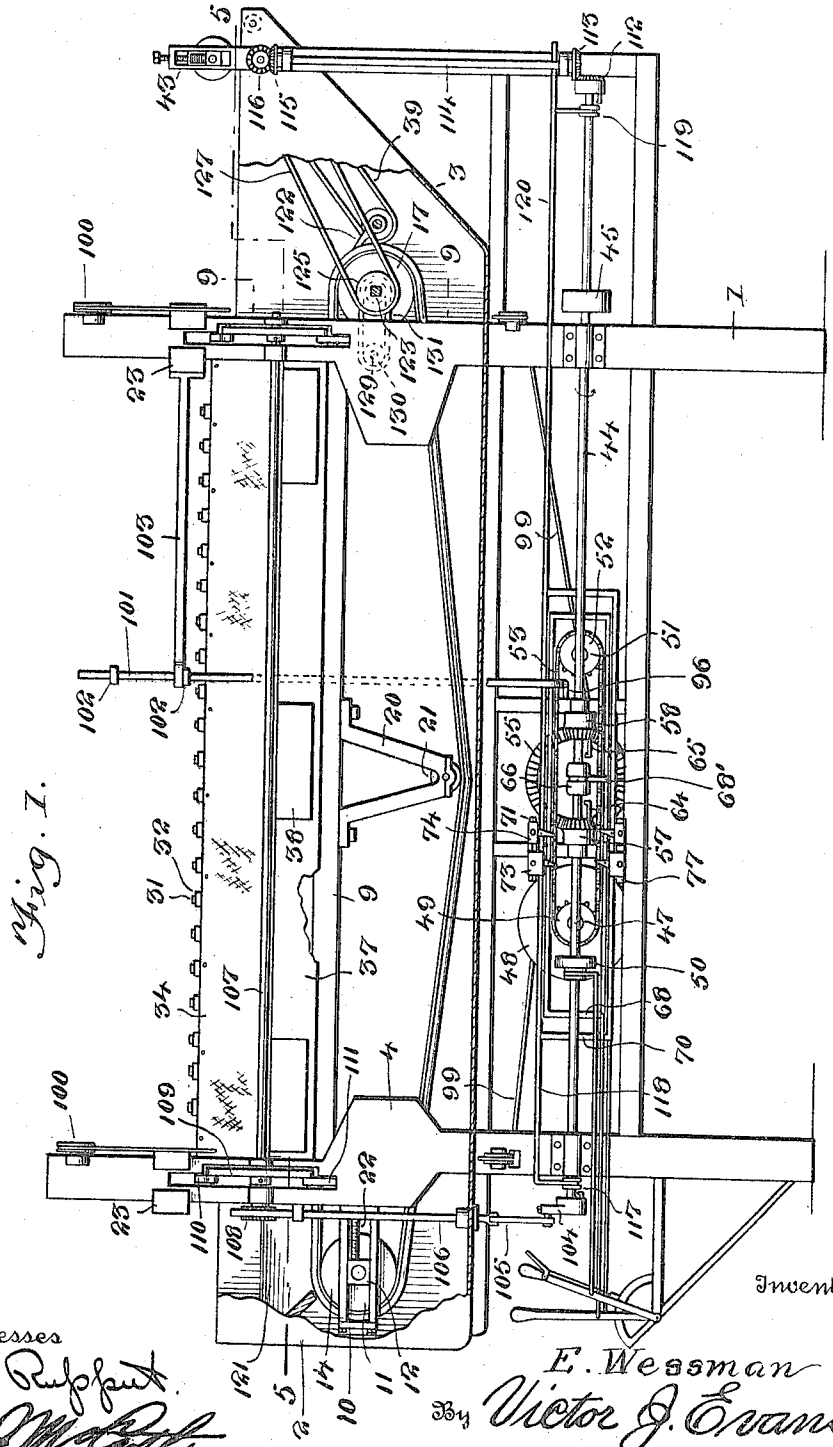


Fig. 1.

Witnesses

E. R. Ruppert.

Jno. J. McCarthy

Inventor

E. Wessman

By Victor J. Evans

Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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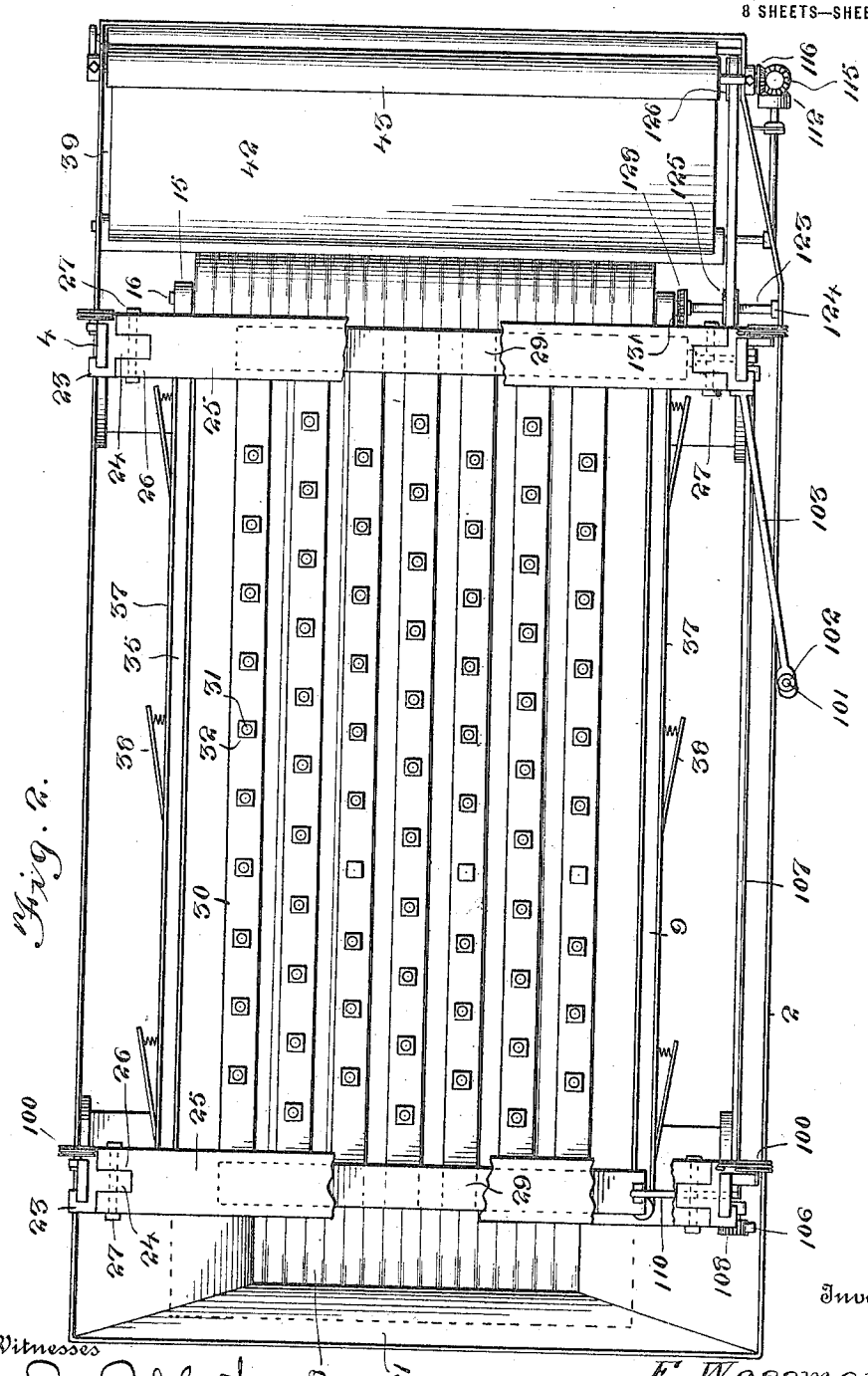


Fig. 2.

Witnesses

E. R. Ruppert

Jno. J. McCarthy

Inventor

E. Wessman

By Victor J. Evans

Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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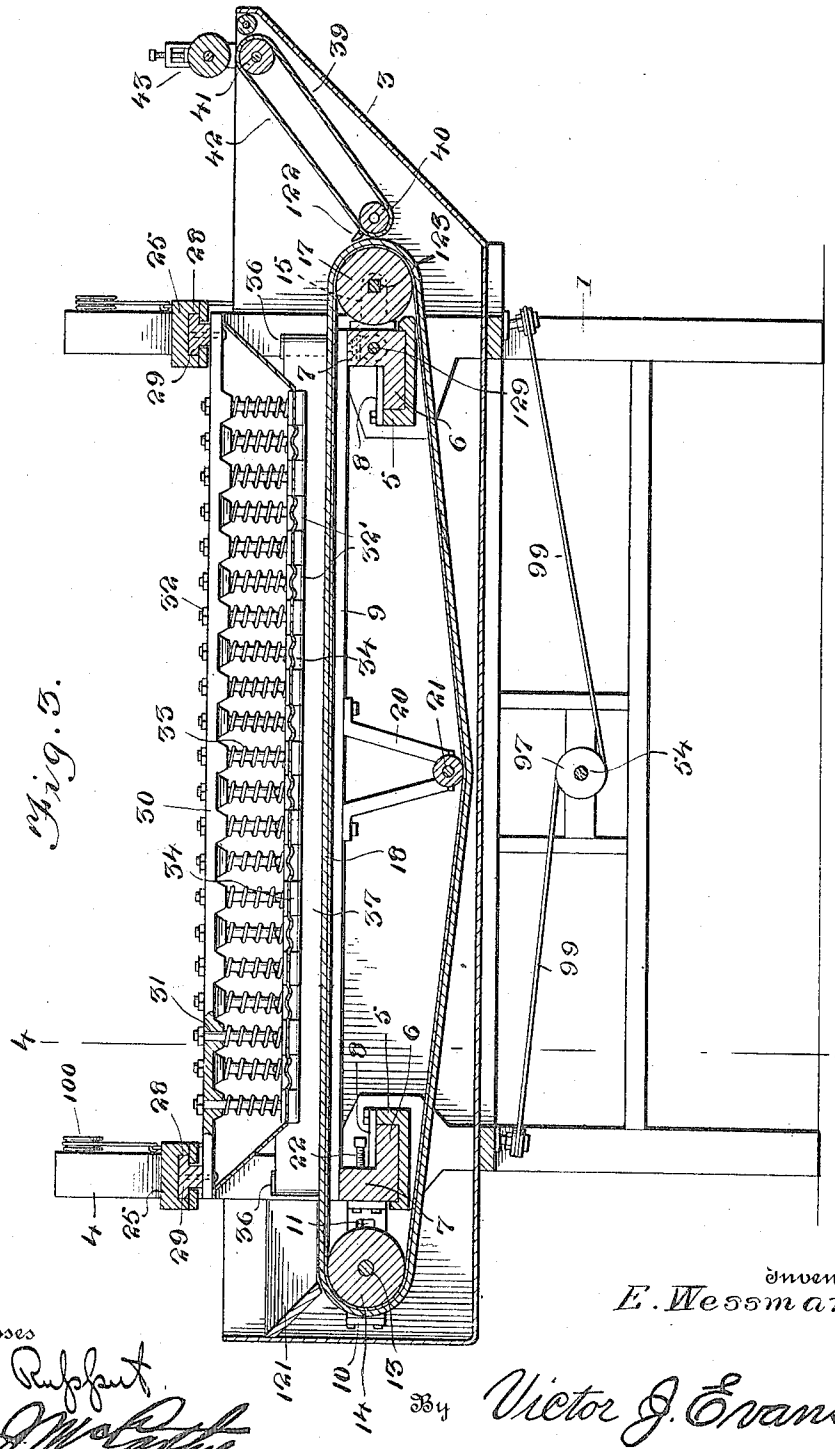


Fig. 3.

Witnesses

E. R. Ruppert

Jno. J. Wolfe

Inventor

E. Wessman

By Victor J. Evans

Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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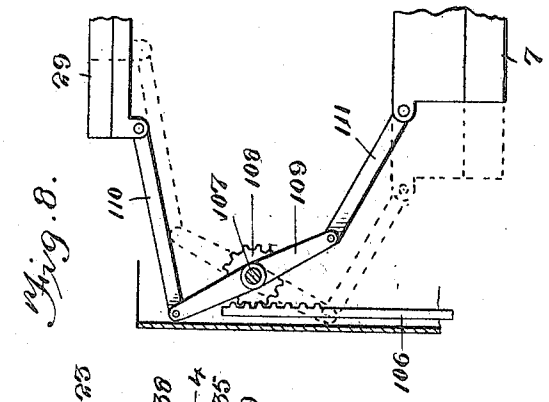


Fig. 8.

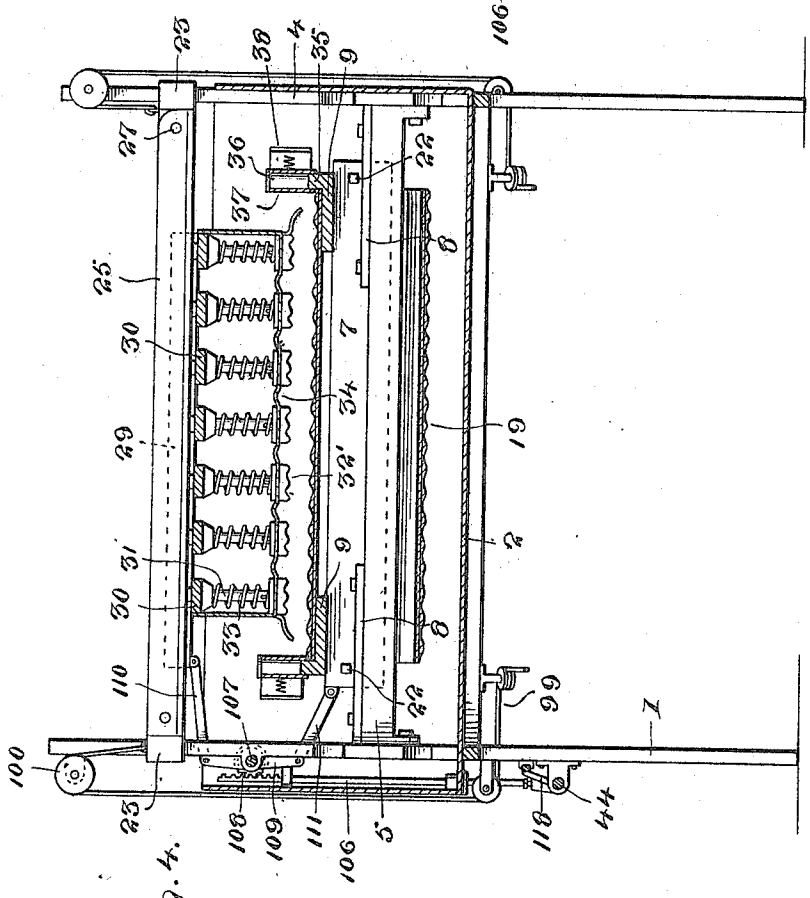


Fig. 4.

Witnesses

E. R. Ruplaut

Jno. J. McCarthy

Inventor

E. Wessman

By Victor J. Evans

Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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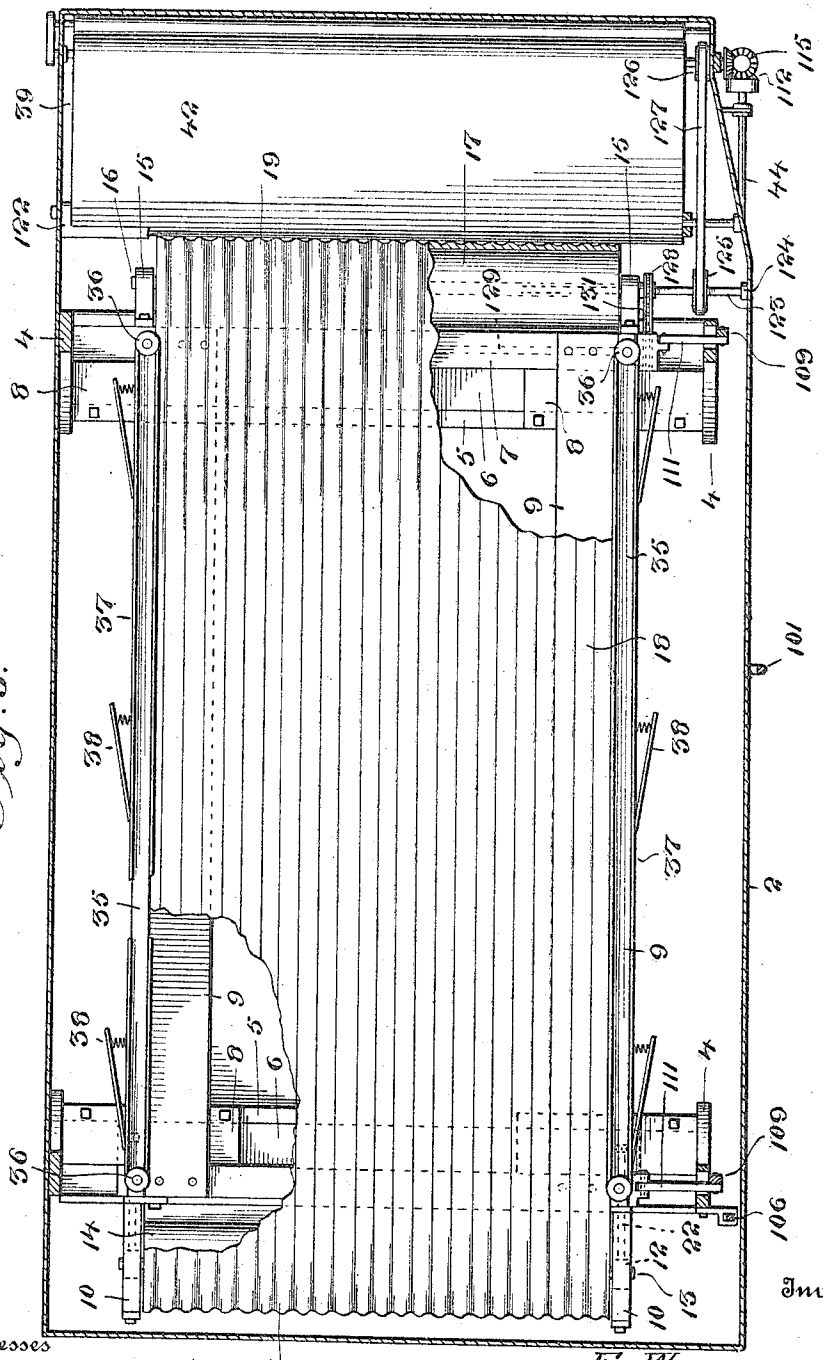


Fig. 5.

Witnesses

E. R. Ruppert

Jno. J. McCarthy

Inventor

E. Wessman

By Victor J. Evans

Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

E. WESSMAN.

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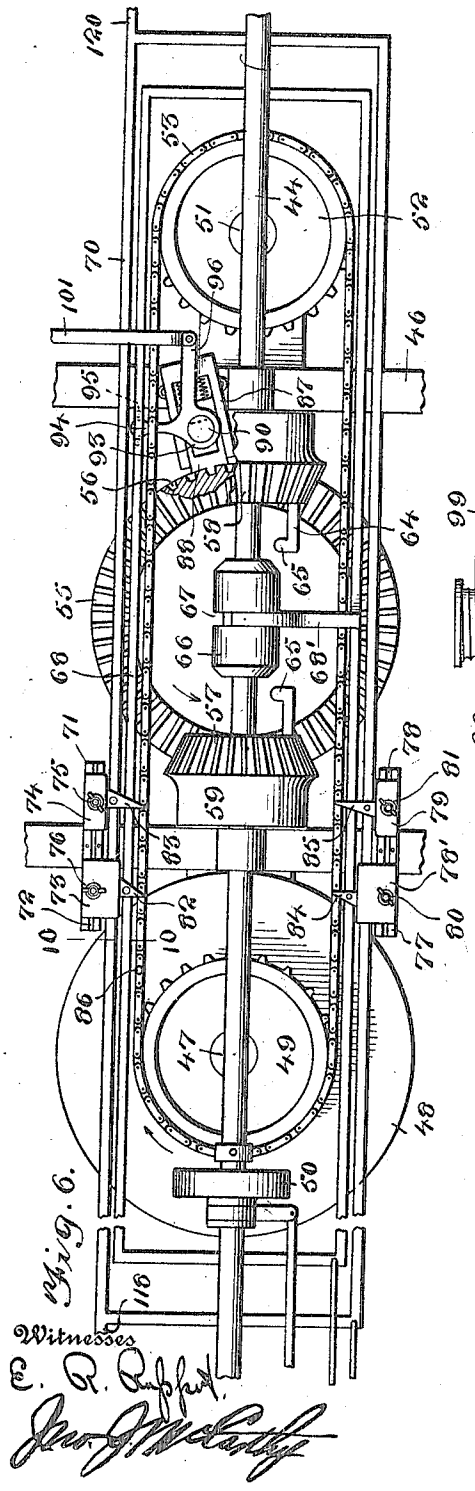


Fig. 6.

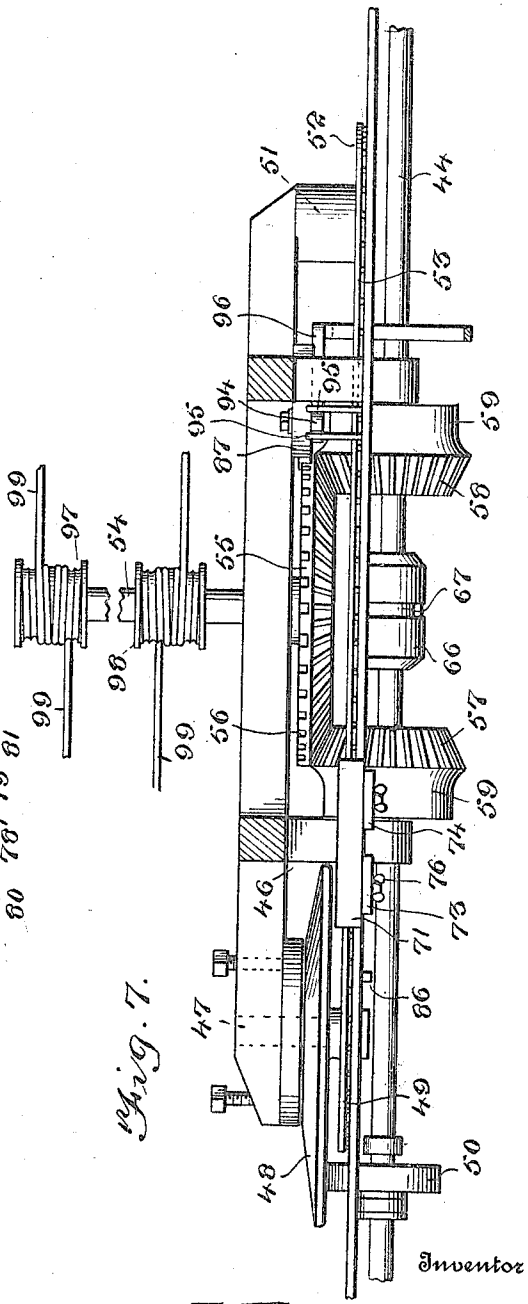


Fig. 7.

Witnesses

E. R. Ruppert

Jno. J. McCarthy

Inventor

E. Wessman

By Victor J. Evans

Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

E. WESSMAN.

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8 SHEETS—SHEET 7.

Fig. 12.

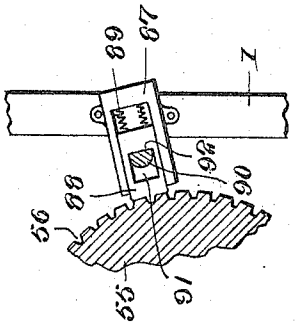


Fig. 13.

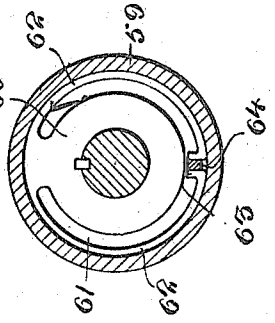


Fig. 9.

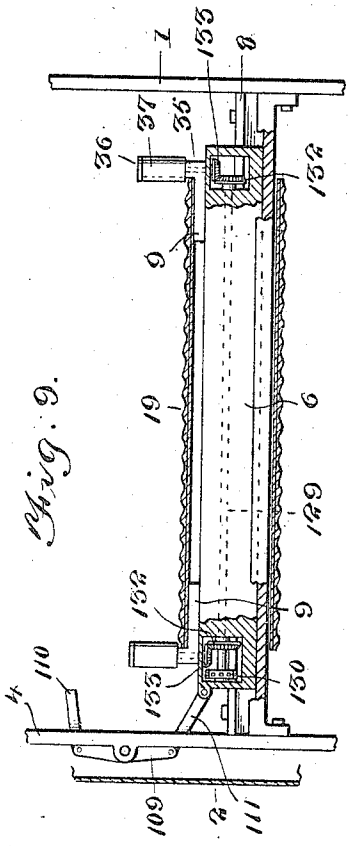


Fig. 11.

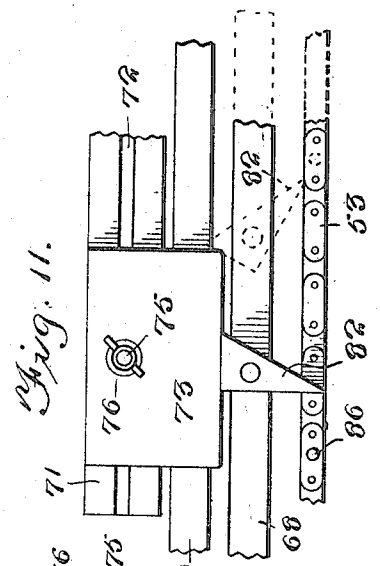
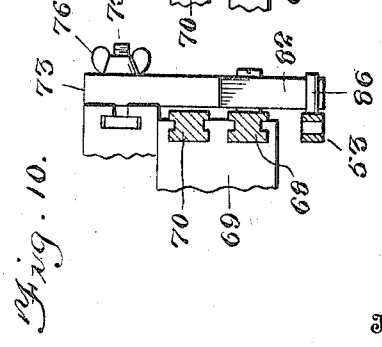


Fig. 10.



Witnesses

E. R. Ruppert

Jno. J. McCarthy

Inventor

E. Wessman

By Victor J. Evans

Attorney

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8 SHEETS—SHEET 8.

Fig. 14.

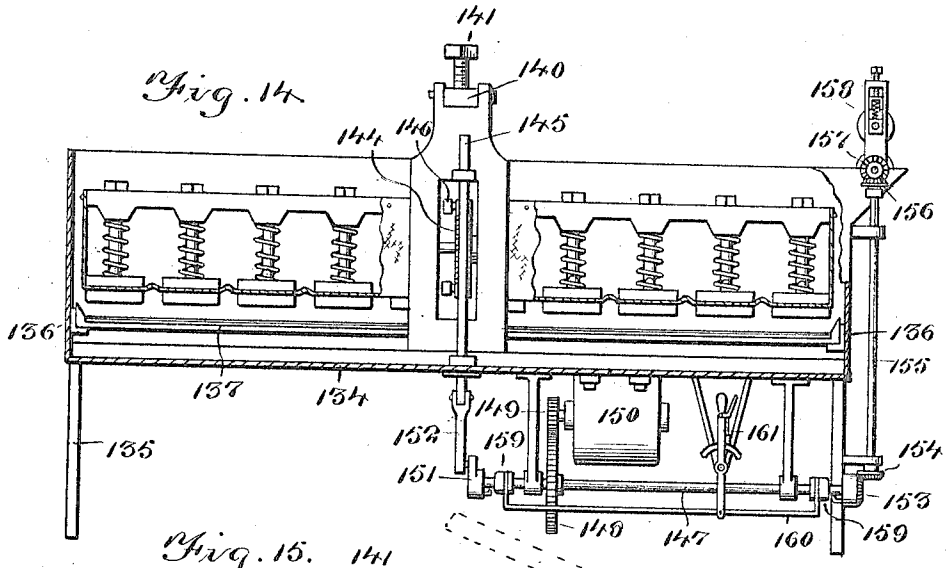


Fig. 15.

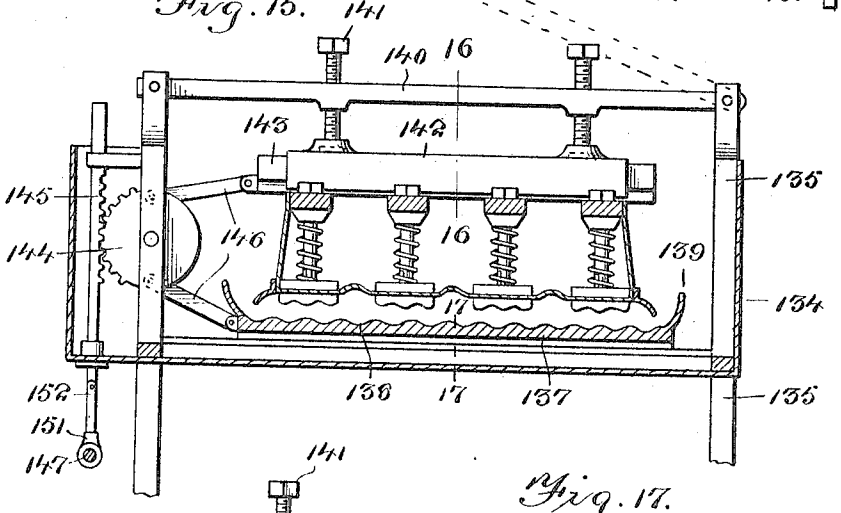


Fig. 16.

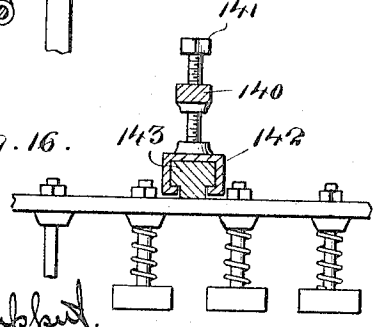
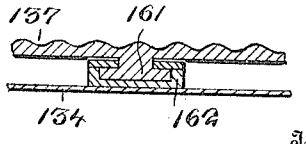


Fig. 17.



Witnesses

E. R. Ruppert.

Jno. J. McCarthy

Inventor

E. Wessman

By Victor J. Evans

Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

EDWIN WESSMAN, OF NEW YORK, N. Y.

WASHING-MACHINE.

1,213,048. Specification of Letters Patent. Patented Jan. 16, 1917.

Application filed October 8, 1915. Serial No. 54,794.

To all whom it may concern:

Be it known that I, EDWIN WESSMAN, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented new and useful Improvements in Washing-Machines, of which the following is a specification.

This invention relates to improvements in washing machines and has particular application to an automatic washing and wringing machine.

In carrying out the present invention it is my purpose to provide a washing and wringing machine which will be positive in operation and whereby the clothes may be thoroughly and effectively scrubbed and then discharged from the machine.

It is also my purpose to provide a machine of the class described which may be operated through any suitable or convenient source of power wherein the clothes will be automatically carried into the influence of the scrubbing means and subsequently scrubbed and wherein the clothes will be automatically discharged from the machine immediately succeeding the scrubbing operation.

With the above and other objects in view, the invention consists in the construction, combination and arrangement of parts hereinafter set forth in and falling within the scope of the claims.

In the accompanying drawings, Figure 1 is a view in side elevation of a washing machine constructed in accordance with my present invention parts being broken away and other parts being shown in section. Fig. 2 is a top plan view of the machine parts being broken away. Fig. 3 is a longitudinal sectional view through the machine. Fig. 4 is a cross sectional view on the line 4—4 of Fig. 3. Fig. 5 is a horizontal sectional view on the line 5—5 of Fig. 1. Fig. 6 is an enlarged side portion of the operating mechanism. Fig. 7 is a top plan view thereof. Fig. 8 is an enlarged detail view of a portion of the operating mechanism. Fig. 9 is a cross sectional view through one end of the carrier. Fig. 10 is a sectional view on the line 10—10 of Fig. 6. Fig. 11 is an enlarged fragmentary side elevation of a portion of the mechanism shown in Fig. 6. Fig. 12 is an enlarged sectional view of the locking device. Fig. 13 is a transverse sectional view through the main drive shaft and one of the driving gears, showing the clutch between the driving gears and the shaft. Fig. 14 is a longitudinal sectional view showing a modified form of washing machine. Fig. 15 is a cross sectional view therethrough. Fig. 16 is a sectional view on the line 16—16 of Fig. 15. Fig. 17 is a similar view on the line 17—17 of Fig. 15.

Referring now to the drawings in detail 1 designates a supporting frame of suitable construction, while 2 designates a receptacle mounted upon the frame 1 and appropriately fastened thereto. This receptacle 2 is of any desired capacity and the bottom wall, at one end thereof, is inclined upwardly as at 3. Mounted upon the bottom wall of the receptacle 2 and projecting upwardly therefrom are uprights 4 disposed adjacent to the respective corners of the receptacle and in line with the standards of the frame 1, the alining of the uprights and standards removing strain from the bottom wall of the receptacle 2. Arranged transversely of the receptacle 2 adjacent to each end thereof is a horizontal channel iron 5 having the opposite ends thereof secured to the respective uprights 4 at the particular end of the receptacle. These channel irons 5 constitute guides and are spaced apart from the bottom wall of the receptacle and lie parallel with each other.

Mounted within each guide channel 5 and capable of sliding movement therein is a bar 6 and formed on the upper surface of the bar 6 at the outer edge thereof is an upwardly extending flange 7, while secured to the upper edge of the inner flange of each channel iron 5 are plates 8 overlying the bar 6 within the channel and serving to prevent accidental vertical movement of the bar out of the channel. These bars 6 are of less length than the respective channel irons so that the bars may slide freely within the guide channels and spanning the space between the flanges 7 of the respective bars are guide tracks 9—9 arranged longitudinally of the receptacle and spaced apart from each other in parallelism and each having the opposite ends thereof secured to the respective flanges 7 adjacent to one side wall of the receptacle. Suitably secured to the bar 6 at one end of the receptacle are bearing brackets 10 projecting toward the adjacent end wall of the receptacle and formed with alining horizontal slots 11. These bearing brackets are arranged adjacent to the respective ends of the bar and

mounted within the slots 11 are bearings 12 respectively in which is journaled a shaft 13 and mounted upon the shaft 13 is a roller 14. Secured to the outer edge of the other bar 6 adjacent to the respective ends thereof are bearing brackets 15 projecting toward the adjacent end wall of the receptacle and journaled in the brackets 15 is a horizontal shaft 16 angular in cross section and fixed upon the shaft 16 between the bearing brackets 15 is a roller 17. Trained over the rollers 14 and 17 is an endless carrier belt 18 of suitable construction having the side edges of the upper run thereof disposed upon the tracks 9—9 and the lower run arranged below the channel irons 5. The outer surface of the belt 18 is preferably formed with longitudinally extending ribs 19, clearly illustrated in Fig. 4 of the drawings.

Secured to the under surface of the respective tracks 9 approximately centrally thereof and depending therefrom are bearing brackets 20 and journaled in horizontally alining bearings carried by the lower ends of the brackets 20 is an idler roller 21 against which the lower run of the carrier bears. The bearings 12 in the slots 11 are capable of longitudinal movement within such slots so that the tension of the carrier 18 may be varied and, in the present instance, these bearings are under the control of the adjusting screws 22 threaded through the flange 7.

Slidably mounted upon the upper end portions of the respective uprights 4 are blocks 23 formed with lugs 24 projecting toward the center of the receptacle, and spanning the space between the blocks 23 at each end of the machine is a bar 25 having the opposite extremities thereof bifurcated as at 26 to receive the lugs 24, while passed through alining openings in the bifurcated portions of the bar and in the lugs are bolts 27 that act to hold the bar in horizontal position. When one of the bolts 27 is removed from the alining openings the particular bar may be swung about the other bolt. These bars 25 are arranged in parallelism as illustrated in Figs. 2 and 3 of the drawings and the lower edges thereof are formed with longitudinally extending channels 28 respectively. Disposed within each channel 28 and capable of sliding movement therein is a substantially T-shaped bar 29. The bars 29 are of less length than the channels so that the bars may slide freely therein across the machine. 30 indicates strips arranged longitudinally of the machine and disposed side by side and the ends of the strips at one extremity of the machine are fastened to the lower end of the stem of the T-shaped bar 29 at such end of the machine, while the remaining extremities of the strips 30 are secured to the other bar 29. Formed in each strip 30 are apertures spaced apart longitudinally of the strip and alternating with the apertures in the adjacent strips and mounted within the respective apertures in each bar are vertical stems 31 having the upper ends thereof equipped with nuts 32 and the lower extremities projecting below the bars, the nuts 32 acting to hold the stems suspended from the bars. Secured to the lower ends of the stems 31 respectively are scrubber heads 32′ and surrounding each stem 31 is a coiled expansion spring 33 having the lower end thereof abutting the scrubber on the stem and the upper extremity bearing against the under surface of the bar, the springs 33 acting to hold the stems normally at their limits of downward movement. In the present instance the spaces between the scrubber heads are closed by means of a flexible sheet 34 and the marginal edges of this sheet are fastened to the outer ends and edges respectively, of the strips 30, the sheet preventing water and other matter from entering the space between the scrubber heads in the operation of the machine.

The strips 30, the stems 31, and the scrubber heads 32 constitute a scrubbing device and this scrubbing device is arranged above the upper run of the carrier 18, clearly illustrated in Figs. 3 and 4 of the drawings and is capable of vertical movement toward and away from the carrier, owing to the blocks 23 being slidably mounted upon the respective uprights 4, as shown at Fig. 2 of the drawings. Although I have shown and described particular forms of carrier and scrubber it is conceivable that the carrier and scrubber may be otherwise constructed and such is contemplated by me in the practice of my invention.

Formed on the outer edges of the respective tracks 9 are upwardly projecting flanges 35 and mounted in each flange 35 adjacent to the respective ends thereof are vertical shafts and rotatably mounted upon these shafts are rollers 36. Trained over the rollers 36 on each flange 35 is an nedless belt 37 lying parallel with the belt on the other flange and coöperating therewith to form sides for the carrier so that the clothes on the carrier belt or conveyer will be confined thereto.. In the present instance each belt 37 is equipped with a number of spring pressed wings 38 as shown in Figs. 4 and 5 of the drawings and these wings are spaced apart and adapted to throw the clothes on the carrier toward the center of the carrier in the movement of the carrier 18 and the belts 37.

39 designates a discharge conveyer mounted in the end portion of the receptacle having the upwardly inclined bottom 3 and this conveyer comprises a roller 40 journaled in the opposite side wall of the receptacle ad-

jacent to the roller 17 and a roller 41 journaled in the opposite side walls of the receptacle adjacent to the upper edges of such walls and over these rollers 40 and 41 is trained an endless belt 42. A wringer 43 of suitable construction is mounted upon the upper edges of the side walls of the receptacle 2 above the roller 41 and coöperates with the roller 41 and the belt passing thereover to wring the water from the clothes discharged from the machine by the conveyer 39.

Journaled in horizontally alining bearings carried by the standards of the frame 1 at one side of the machine below the receptacle 2 is a horizontal main shaft 44 and fixed upon the main shaft 44 is a pulley 45 adapted to be connected by means of a belt with a suitable source of power. Secured to the frame 1 at one side of the shaft 44 and disposed approximately centrally of the distance between the legs of the frame carrying the shaft 44 is a supporting frame 46. Mounted upon the frame 46 is a stub shaft 47 arranged at right angles to the shaft 44 and rotatably mounted upon the stub shaft 47 is a friction disk 48 while fixed to the hub of the friction disk 48 between such disk and the shaft 44 is a relatively small sprocket wheel 49. Mounted upon the shaft 44 and having the periphery thereof adapted to engage the outer face of the friction disk 48 is a friction disk 50 capable of longitudinal movement along the shaft 44 so that the speed of the disk 48 may be varied and the disk 50 disconnected from the disk 48 to break the driving connection between the shaft 44 and the sprocket wheel. Rotatably mounted upon the stub shaft 51 carried by the frame 46 at a point remote from the shaft 47 is a sprocket wheel 52 and over the sprocket wheels 49 and 52 is trained an endless chain 53 adapted to travel in the movement of the sprocket wheel 49 from the shaft 44 through the disks 50 and 48.

54 designates a transverse shaft journaled in horizontally alining bearings carried by the frame 1 and rotatable at right angles to the shaft 44 and having one end thereof journaled in the frame 46 between the shafts 47 and 51. Keyed upon said end of the shaft 54 is a beveled gear 55 having the periphery thereof formed with notches 56 spaced apart equal distances around the gear. Loosely mounted upon the shaft 44 are beveled pinions 57 and 58 meshing with the beveled gear 55 at diametrically opposite points. Formed on the outer side of each pinion 57, 58 is an outwardly projecting collar 59 arranged concentrically of the shaft 44. Keyed upon the shaft 44 and disposed within the collars 59 respectively are disks 60, as shown in Fig. 13. Each disk 60 is formed with a partially circular slot 61 adjacent to the periphery thereof and the portion of the disk surrounding the slot is split at a point approximately centrally of the slot to provide fingers 62 having the meeting ends thereof inturned as at 63. Disposed between the inwardly bent ends of the fingers 62 is a rod 64 angular in cross section and the outer ends of the rods 64 projecting toward each other are spaced apart and formed with upwardly projecting horns 65—65 respectively. Slidably mounted upon the shaft 44 between the confronting faces of the pinions 57 and 58 is a sleeve 66 formed centrally with a groove 67 and capable of longitudinal movement along the shaft toward one or the other of the pinions 57, 58. When the sleeve 66 is moved toward the pinion 58 such sleeve engages the horn 65 and rotates the rod 64 thereby expanding the fingers 62 against the inner surface of the collar 59 on the pinion 58 with the effect to lock the pinion to the shaft so that the pinion and shaft will revolve together. On the other hand when the sleeve 66 is moved toward the pinion 57 such sleeve engages the horn 65 and rotates the rod 64 whereby the finger 62 on the disk 60 within the collar 59 on the pinion 57 are expanded to lock the last named pinion to the shaft 44. When the pinion 58 is locked to the shaft 44 the beveled gear 55 and the shaft 54 are rotated in one direction, while when the pinion 57 is locked to the shaft 44 the beveled gear 55 and shaft 54 are rotated in the reverse direction.

68 designates a substantially rectangular frame arranged upon one side of the shaft 44 between the latter and the frame 46 and having the upper and lower longitudinal bars thereof slidably mounted within grooves formed in arms 69 projecting outwardly from the frame 46, as illustrated in Fig. 10. The lower member of the frame 68 is equipped with an upwardly projecting arm 68′ having the upper end thereof bifurcated and seated within the grooves 67 in the sleeve 66. Surrounding the frame 68 is a second arm 70 having the top and bottom bars thereof slidably mounted within grooves formed in the arms 69 as illustrated in Fig. 10. Fixed upon the frame 46 above one of the arms 69 adjacent to one end of the frame 48 is a horizontal strip 71 having the outer edge thereof formed with a longitudinal channel 72. Placed in face to face contact with the outer face of the strip 71 adjacent to the ends of the strip are blocks 73 and 74 each secured to the strip by means of a bolt 75 having the head end thereof disposed within the channel 72 and the outer end equipped with a winged nut 76. The block 73 is relatively wide as compared with the width of the block 74, as shown in Fig. 6. Secured to the frame 46 below the frames 68 and 70 and in line with the strip 71 is a strip 77 formed with a longitudinal channel

78 and placed in face to face contact with the outer side of the strip 77 are blocks 78′ and 79 corresponding to the blocks 73 and 74 respectively and arranged adjacent to the respective ends of the strip 77. Each block 78′, 79 is secured to the strip by means of a headed bolt 80 having the headed end thereof disposed within the channel 78 and the outer extremity equipped with a winged nut 81. Owing to the bolt and nut connection between each block 73, 74, 78′ and 79 and the particular strip, the blocks may be adjusted along the strips and secured in the desired adjusted position. Pivoted upon the top bars of the frames 68 and 70 are triangular shaped dogs 82 and 83 respectively having the base portion thereof normally engaging the lower edges of the blocks 73 and 74 while pivoted upon the lower bars of the frames 68 and 70 are triangular shaped dogs 84 and 85 having the base portions thereof engaging the upper edges of the respective blocks 78′ and 79. Secured to one of the links of the chain 53 and projecting outwardly therefrom is a pin 86 adapted to engage the dogs 82, 83, 85 and 84 successively and in the order named in the travel of the chain. Fastened to one of the members of the frame 46 in proximity to the notched periphery of the beveled gear 55 is a locking device. In the present instance this locking device, clearly illustrated in Figs. 6 and 12 comprises a casing 87 fastened to the particular portion of the frame 46 and a locking bolt 88 slidably mounted within the casing 87 and normally projected through one end of the casing and into the adjacent notch 56 in the periphery of the gear 55. Interposed between the inend of the bolt and the end wall of the casing 87 are springs 89 which act to hold the bolt normally in locking position. Rotatably mounted in the opposite side walls of the casing 87 is a shaft 90 passed through a square opening 91 in the bolt and having a portion thereof within such opening formed with a flat edge 92 bearing against the inner end wall of the opening 91 so that when the shaft is turned in one direction or the other out of normal position the bolts will be retracted against the action of the springs 89 to release the beveled gear 55. Fixed upon one end of the shaft 90 is a collar 93 equipped with an upwardly projecting arm 94, as shown in Fig. 6 of the drawings, and the upper end of this arm 94 is disposed between pins 95 carried by one side of the frame 68, as illustrated in Fig. 7 of the drawings. Also secured to the collar 93 and projecting outwardly therefrom is a horizontal arm 96.

Fixed upon the shaft 54 and adapted to rotate therewith are drums 97 and 98 arranged beyond the respective side walls of the receptacle 1 and wrapped about each drum 97, 98 are cables 99 trained over guide sheaves 100 journaled in the upper ends of the uprights 4 respectively at the particular side of the machine. The ends of the cables after being trained over the respective guide sheaves are connected with the blocks 23 respectively, as shown in Fig. 2. When the shaft 54 is revolved in one direction the drums 97 and 98 wind up the cables 99 and elevate the scrubbing mechanism to increase the distance between the scrubber heads and the carrier. On the contrary, however, when the direction of rotation of the drums 97 and 98 is reversed the cables are paid out from the drums and the scrubbing mechanism permitted to lower under the action of gravity so that the scrubber heads may move toward the carrier.

101 designates a vertical connecting rod having the lower end thereof pivotally connected to the arm 96, as shown in Figs. 1, 6 and 7 of the drawing while threaded on to the upper end of the rod are stub nuts 102—102 spaced apart. An arm 103 has one end fastened to one of the blocks 23 and the opposite end formed with an opening through which the upper end of the rod 101 passes, the nuts 102 being disposed above and below the arm 103, as shown in Fig. 1.

One end of the main drive shaft 44 is equipped with a crank arm 104 and this crank arm is connected through the medium of a pitman 105 with the lower end of a vertical rack bar 106 rotatably mounted within suitable guides carried by one of the uprights 4, the lower end of the rack bar working within a stuffing box carried by the bottom wall of the receptacle. Journaled in horizontal alining bearings carried by the uprights 4 at one side of the receptacle is a horizontal shaft 107 and keyed upon one end of the shaft 107 is a pinion 108 meshing with the teeth of the rack bar 106. Fixed upon the shaft 107 adjacent to the respective ends thereof are arms 109 and the upper ends of the arms 109 are connected by links 110 with the adjacent ends of the respective bars 29, while the lower ends of the arms 109 are connected through the medium of links 111 with the adjacent ends of the respective bars 6, as clearly illustrated in Fig. 4 of the drawings so that in the rotation of the crank arm 104 rocking motion will be transmitted through the rack bar 106 and the pinion 108 to the shaft 107 thereby reciprocating the scrubbing mechanism and the carrier simultaneously in relatively reverse directions so that the clothes on the carrier between the latter and the scrubber heads will be scrubbed. Loosely mounted upon the remaining end of the shaft 44 is a beveled pinion 112 meshing with a similar pinion 113 keyed upon the lower end of the vertical shaft 114 journaled in vertically alining bearings carried by the

adjacent member of the frame 1. The upper end of the shaft 114 is equipped with a beveled pinion 115 meshing with a similar pinion 116 fast upon one end of the shaft of the roller 41. The crank arm 104 is loose upon the particular end of the main shaft 44 and this crank arm and the beveled pinion 112 are adapted to be connected to the shaft by means of clutches respectively, each of such clutches being identical in construction to the clutches hereinbefore described and shown in Fig. 13. The clutch of the crank arm 104 is controlled by a collar 117 loosely mounted upon the shaft 44 and connected through the medium of an arm 118 with the adjacent end of the frame 70 while the clutch of the beveled pinion 112 is under the control of a collar 119 loosely mounted upon the shaft 44 and connected through the medium of an arm 120 with the adjacent end of the frame 70, as shown in Fig. 1 of the drawings.

Disposed within the receptacle 1 at the end of the carrier remote from the conveyer 39 is a feed board 121 while arranged adjacent to the opposite end of the carrier is a delivery board 122 by means of which the clothes may be delivered from the carrier to the belt 42 of the conveyer 39.

123 designates a shaft angular in cross section and having one end telescoping into one extremity of the shaft 16 and the remaining end journaled in a bearing 124 carried by the adjacent side wall of the receptacle 2. Fixed upon this shaft 123 is a pulley wheel 125, while fixed upon the shaft of the roller 41 is a pulley wheel 126 and over this pulley wheel is trained a belt 127 whereby motion may be transmitted to the shafts 123 and 16 from the shaft of the roller 41 in the rotation of the last named shaft from the shaft 44. Also mounted upon the shaft 123 and adapted to rotate therewith and capable of longitudinal movement thereon is a sprocket wheel 128 while rotatably mounted within a bore formed in the flange 7 on the adjacent bar 6 is a shaft 129 and keyed upon one end of this shaft 129 is a sprocket wheel 130 over which and the sprocket wheel 128 is trained a chain 131 through which the shaft 129 may be driven from the shaft 123. Fixed upon the shaft 129 adjacent to the respective ends thereof are beveled pinions 132 meshing with similar pinions 133 on the lower ends of the shafts of the adjacent rollers 36.

In practice power is imparted to the shaft 44 from the prime mover and the disk 50 adjusted over the face of the disk 48 to the desired position so that the disk 48 may be rotated from the shaft 44 at the desired speed. In the rotation of the disk 48 motion is transmitted from the sprocket wheel 49 to the chain 53. In the initial movement of the chain 53 the pin 86 thereon engages the lower end of the dog 82 and owing to the upper edge of the dog engaging the block 73, slides the dog and the frame 68 longitudinally in one direction. In this movement of the frame 68 the arm 68′ slides the sleeve 66 along the shaft 44 into engagement with the horn 65 to operate the clutch mechanism of the pinion 58 thereby locking said pinion to the shaft 44. Simultaneously with the movement of the sleeve 66 to actuate said clutch mechanism, the frame swings the lever 94 with the effect to rotate the shaft 90 to withdraw the locking dog from engagement with the gear 55 to unlock said gear. In the rotation of the pinion 58 motion is transmitted through the gear 55 to the shaft 54 and the latter rotated to revolve the drums 97 and 98 to wind the cables on such drums. As the cables are wound upon the drums the scrubbing mechanism is elevated and the arm 103 moved upwardly with such mechanism. As the scrubbing mechanism reaches its limit of upward movement, determined by the position of the upper nut 102 on the rod 101, the arm 103 engages the upper nut and so elevates the rod 101. In the upward movement of the rod 101 the shaft 90 is rocked through the medium of the arm 96 and restored to normal position thereby projecting the locking bolt from the casing into the adjacent notch in the beveled gear 55. Simultaneously with the release of the locking bolt the arm 94 restores the frame 68 to normal position thereby moving the sleeve 66 to normal position and relieving the clutch member of the pinion 58 of the influence of such sleeve so as to disconnect the pinion 58 from the sleeve 44. After the scrubbing mechanism has been thus elevated the clothes and other articles to be washed are deposited in the receptacle upon the feed board 121 and fall on to the adjacent end of the carrier 18. Previous to the scrubbing mechanism reaching the limit of its upward movement, the dog 82 rides out of engagement with the block 73 and swings about its pivotal connection with the frame 68 and in the continued travel of the chain the pin 86 disengages said dog 82 and engages the dog 83 and slides the last named dog and the frame 70 longitudinally in one direction and in this movement of the frame 70 the arm 120 actuates the collar 119 to operate the clutch mechanism of the pinion 112 to lock said pinion to the shaft 44 so that motion may be transmitted from the shaft 44 to the shaft 114 and from the last named shaft to the roller 41 of the conveyer 39 motion is transmitted through the belt 127 to the shaft 123 and from the shaft 123 to the shaft 16 thereby revolving the carrier to draw the clothes into the space between the scrubbers and the carrier and any material that is on the carrier adjacent to the discharge board 122 will be thrown on

to the latter and then deposited upon the conveyer belt 42 and carried by said belt through the wringer and discharged from the machine. During this movement of the carrier the chain 53 continues to travel and when the dog 83 is released by the block 74 the pin 86 passes such dog and continues around the chain and engages the dog 85 thereby sliding the frame 70 in the reverse direction to disconnect the pinion 112 from the shaft 44 and slide the collar 117 through the medium of the arm 118 to actuate the clutch mechanism of the crank arm 104 to lock said arm to the shaft 44 so that a reciprocatory motion will be transmitted to the vertical rack bar 106 and a rocking motion imparted to the shaft 107 through the rack bar and the pinion 108. In this movement of the shaft 107 the scrubbing mechanism and the carrier are reciprocated in relatively reverse directions, as previously described, and when the dog 85 is relieved of the influence of the block 79 such dog swings about the pivotal connection with the frame 70 and permits the pin 86 on the chain to engage the dog 84 thereby sliding the frame 68 in the reverse direction to lock the pinion 57 to the shaft 44 so that the beveled gear 55 and shaft 54 may be turned in reverse directions to unwind the cables 99. In this last movement of the frame 68 under the action of the dog 84 the arm 94 is swung to slide the bolt 88 to release position so that the gear 55 may be revolved. In the unwinding of the cables 99 the scrubbing mechanism descends and as such mechanism reaches the limit of its downward movement determined by the position of the nut 102 and the rod 101, the arm 103 engages the lower nut and moves the arm 101 downwardly to restore the frame 68 to normal position and again lock the gear wheels 55. In the downward movement of the scrubbing mechanism the scrubber heads engage the articles on the carrier and, owing to the reciprocatory movement of the scrubbing mechanism and the carrier, the clothes are thoroughly and effectively cleansed.

Before the rod 101 is lowered by the arm 103, the dog 84 disengages the block 78′ thereby releasing the pin 86 on the chain 53 and as the chain continues to travel the pin 86 reëngages the dog 82 and in the continued travel of the chain the above cycle of operations is repeated. Thus, it will be seen that the clothes and other articles to be washed will be carried into the machine for scrubbing and, after being scrubbed, discharged from the machine.

By means of the adjustable connections between the blocks 73, 74, 78′ and 79 and the strips carrying such blocks, the time that the various operations take place relatively to one another may be varied.

In the rotation of the shaft 123 motion is imparted to the shaft 129 and the latter revolves the belts 37 and the wings 38 on such belts throw the articles on the carrier toward the center thereof to facilitate the scrubbing.

When it is desired to swing the scrubbing mechanism upwardly for the purpose of repairing, cleaning, etc., the bolts 27 at one side of the machine may be withdrawn and the bars 25 carrying the scrubbing mechanism swung upwardly about the remaining bolts.

In the modified form of the invention illustrated in Figs. 14, 15, 16 and 17 I have shown the machine as embodying a receptacle 134 supported upon legs 135 and having the opposite end walls thereof equipped with longitudinally extending tracks 136—136 disposed in proximity to the bottom wall of the receptacle. Mounted upon these tracks 136 and extending longitudinally of the receptacle is a carrier 137 of less width than the similar dimension of the receptacle and having the upper surface thereof corrugated as at 138 and the side edges formed with upwardly extending wings 139 designed to confine the articles to the upper surface of the carrier. This carrier is capable of reciprocatory movement within the receptacle upon the tracks 136 and upstanding from the bottom wall of the receptacle adjacent to the opposite side walls thereof are uprights 139 arranged centrally of the ends of the receptacle and mounted upon the upper ends of the uprights 139 and spanning the space between the same is a cross bar 140 having one end pivoted to one of the uprights and the other end suitably fastened to the remaining upright. Threaded through the cross bar 140 are screw bolts 141 spaced apart longitudinally of the bar and having the lower ends thereof connected through the medium of swiveled joints to the upper surface of a channeled guide 142. Slidably mounted within the channeled guide 142 is a bar 143 and secured to the bar 143 and depending therefrom is a scrubbing mechanism identical in construction to the scrubbing mechanism hereinbefore described and coöperating with the carrier 138.

Journaled upon the stub shaft carried by one of the uprights 139 is a pinion 144 meshing with a vertical rack bar 145 slidably mounted within vertical alining bearings and adapted to be reciprocated. The pinion 144 is connected at diametrically opposite points, with the bar 143 and the carrier 137 by means of links 146. Journaled in horizontally alining bearings carried by the bottom wall of the receptacle is an operating shaft 147 and keyed upon the shaft 147 is a spur gear 148 meshing with a pinion 149 fast upon a shaft of a motor 150 secured to the bottom wall of the receptacle.

Loosely mounted upon one end of the shaft 147 is a crank arm 151 connected through the medium of a pitman 152 with the lower end of the rack bar 145. Loosely mounted upon the remaining end of the shaft 147 is a beveled pinion 153 meshing with a similar pinion 154 and the lower end of a vertical shaft 155 journaled in vertically alining bearings carried by one of the legs 135 on the adjacent wall of the receptacle 134. Fixed on the upper end of the shaft 155 is a beveled pinion 156 meshing with a similar pinion 157 keyed upon the shaft of one roller of a wringer 158. The crank arm 151 and the pinion 153 are equipped with clutches respectively, each identical in construction to the clutch shown in Fig. 13 and under the control of a collar 159 loosely mounted upon the adjacent portion of the shaft 147. These collars 159 are connected to the extremities of a rod 160 and the rod 160 is under the control of a hand lever 161. Depending from the bottom of the carrier 138 at a point centrally of the length of the carrier is a transverse inverted T-shaped bar 161 slidably mounted within the channel 162 secured to the bottom wall of the receptacle.

The operation of the machine shown in the modified form of the invention may be briefly described as follows: The bar 140 carrying the scrubbing mechanism is swung upwardly and the clothes deposited upon the carrier and the scrubbing mechanism lowered. The motor 150 is then placed in operation and the rod 160 moved in a direction to slide the collar 159 controlling the clutch of the crank arm 151 to actuate said clutch to lock the crank arm to the shaft. In the rotation of the crank arm 151 the rack bar 145 is actuated to rock the pinion 144 and in the rocking of the pinion the scrubbing mechanism and the carrier are reciprocated in relatively reverse directions thereby scrubbing the articles upon the carrier. After the scrubbing operation the rod 160 is moved in the reverse direction to render the scrubbing mechanism and the carrier inactive and to lock the beveled pinion 153 to the shaft 147 thereby setting the wringer in action.

While I have herein shown and described certain preferred forms of my invention, by way of illustration, I wish it to be understood that I do not limit or confine myself to the precise details of construction herein described and delineated, as modification and variation may be made within the scope of the claims and without departing from the spirit of the invention.

I claim:—

1. A washing machine comprising a traveling carrier adapted to receive the articles to be washed, scrubbing mechanism above the carrier and coöperating therewith and movable across the carrier to scrub the articles thereon and embodying vertical stems, scrubber heads on the lower ends of said stems, respectively, and a flexible sheet interconnecting all of said scrubber heads and closing the spaces between the same.

2. A washing machine comprising a traveling carrier adapted to receive the articles to be washed, scrubbing mechanism above the carrier and coöperating therewith and movable across the carrier to scrub the articles thereon and embodying vertical stems, scrubber heads on the lower ends of said stems, respectively, a flexible sheet interconnecting all of said scrubber heads and closing the spaces between the same, and springs surrounding said stems and acting to permit upward movement of the stems and scrubber heads under the action of the articles being washed.

3. A washing machine comprising a carrier adapted to receive the articles to be washed, scrubbing mechanism coöperating with said carrier and arranged above the latter, and means for moving said scrubbing mechanism transversely of the carrier to scrub the articles on the carrier.

4. In a washing machine, a receptacle adapted to contain a washing medium, a carrier in said receptacle adapted to receive the articles to be washed, scrubbing mechanism above said carrier and coöperating therewith to scrub the articles thereon, means for reciprocating said scrubbing mechanism and carrier in relatively reverse directions to scrub the articles on the carrier, and means for moving the carrier longitudinally of the scrubbing mechanism to discharge the washed articles from the machine and bring unclean articles into position to be washed.

5. In a washing machine, a receptacle adapted to contain a washing medium, a carrier in said receptacle adapted to receive the articles to be washed, scrubbing mechanism above said carrier and coöperating therewith to scrub the articles thereon, means for actuating said scrubbing mechanism to scrub the articles on the carrier, and means on the respective sides of the carrier to throw the articles toward the center of the latter.

6. In a washing machine, a receptacle adapted to contain a washing medium, a carrier in said receptacle adapted to receive the articles to be washed, scrubbing mechanism above said carrier and coöperating therewith to scrub the articles thereon, means for actuating said scrubbing mechanism to scrub the articles on the carrier, traveling belts at the respective sides of said carrier, and spring pressed wings on said belts operable to throw the articles toward the center of the carrier.

7. In a washing machine, a receptacle adapted to contain a washing medium, a carrier in said receptacle, adapted to receive the articles to be washed and capable of longi-

tudinal movement within the receptacle to bring the articles into and out of washing position, scrubbing mechanism above said carrier coöperating therewith to scrub the articles thereon, and means for reciprocating said scrubbing mechanism and carrier in relatively reversed directions and at right angles to the travel of the carrier.

8. In automatic washing machine mechanism, the combination with a member capable of vertical and horizontal movements, and a second member below the first member capable of longitudinal movement and lateral movement, of a main drive shaft, a second shaft at right angles to said main shaft and said first member whereby the first member may be elevated and lowered according to the movement of the second shaft, reversible driving connections between said main shaft and said second shaft, means for locking said second shaft against movement, mechanism for operating said locking means to release the second named shaft and controlling said reversible driving connections to connect the main shaft to the second named shaft upon the release of said locking means, driving connections between said main shaft and said first and second named members whereby the latter may be operated horizontally and laterally, respectively, driving connections between said main drive shaft and said second named member whereby the latter may be moved longitudinally, means operable from said mechanism succeeding the unlocking of said reversible driving connections to elevate said first member to render the last named connections active whereby longitudinal motion may be imparted to the second named member from said drive shaft, means under the control of said first member to relock said reversible connections and disconnect said second shaft from the main drive shaft when the first named member reaches the limit of its upward and downward movements, and mechanism for rendering the driving connections between said main shaft and said first and second named members active to move the first and second named members horizontally and laterally succeeding the longitudinal movement of the second named member.

9. The combination with a member capable of vertical and horizontal movements, and a second member below the first member capable of longitudinal movement and lateral movement, of a main drive shaft, a second shaft at right angles to said main shaft and said first member whereby the first member may be elevated and lowered according to the movement of the second shaft, reversible driving connections between said main shaft and said second shaft, means for locking said second shaft against movement, mechanism for operating said locking means to release the second named shaft and controlling said reversible driving connections to connect the main shaft to the second named shaft upon the release of said locking means, driving connections between said main shaft and said first and second named members whereby the latter may be operated horizontally and laterally, respectively, driving connections between said main drive shaft and said second named member whereby the latter may be moved longitudinally, means operable from said mechanism succeeding the unlocking of said reversible driving connections to elevate said first member to render the last named connection active whereby longitudinal motion may be imparted to the second named member from said drive shaft, means under the control of said first member to relock said reversible connections and disconnect said second shaft from the main drive shaft when the first named member reaches the limit of its upward and downward movements, mechanism for rendering the driving connections between said main shaft and said first and second named members active to move the first and second named members horizontally and laterally succeeding the longitudinal movement of the second named member, and a power driven device controlling the operation of all of said mechanisms and means.

10. The combination with a rotary shaft, of two devices capable of vertical and horizontal movements and longitudinal and lateral movements, respectively, of mechanism between said shaft and devices for converting the rotary motion of said shaft into the respective movements of said devices, and means for connecting said mechanism to said shaft to impart the proper movement to said devices in regular sequence.

11. The combination with a rotary shaft, of two devices capable of vertical and horizontal movements and longitudinal and lateral movements, respectively, of mechanism between said shaft and devices for converting the rotary motion of said shaft into the respective movements of said devices, means for connecting said mechanism to said shaft to impart the proper movement to said devices in regular sequence, and means for locking that part of the mechanism controlling the vertical movement of the particular device against operation at certain intervals in the operation of the mechanism.

12. The combination with a rotary shaft, of devices capable of vertical and horizontal movements and longitudinal and lateral movements, respectively, of mechanism between said shaft and devices for converting the rotary motion of said shaft into the respective movements of said devices, means for connecting said mechanism to said shaft to impart the proper movement to said de-

vices in regular sequence, means for locking that part of the mechanism controlling the vertical movement of the particular device against operation at certain intervals in the operation of the mechanism, and means under the control of said vertically movable device for releasing said locking mechanism at regular intervals.

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

EDWIN WESSMAN.

Witnesses:
RUSH M. HOAG,
VICTOR T. FIAND.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."