

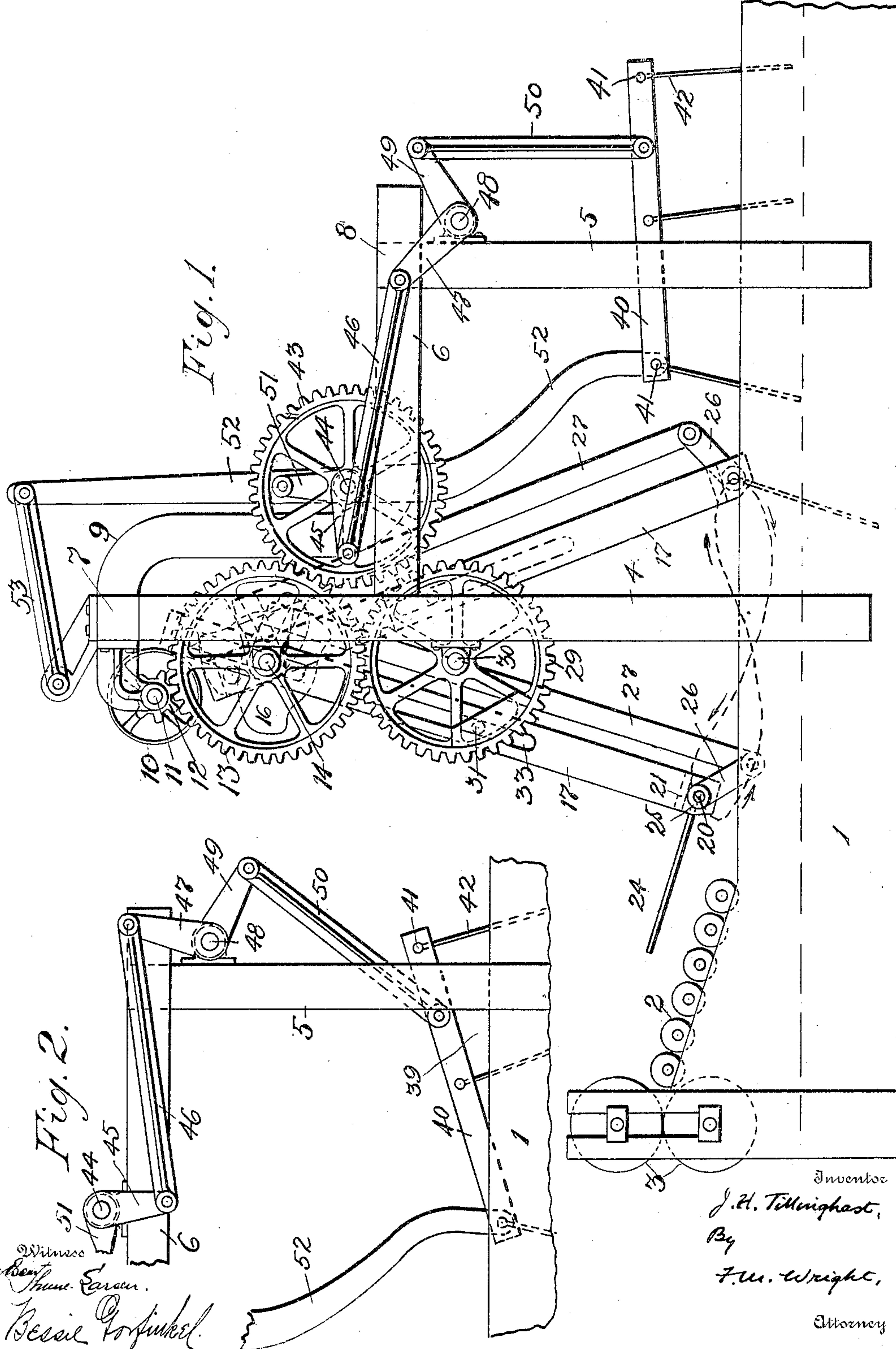
No. 821,139.

PATENTED MAY 22, 1906.

J. H. TILLINGHAST.  
WOOL SCOURING MACHINE.

APPLICATION FILED JUNE 12, 1905.

2 SHEETS—SHEET 1.



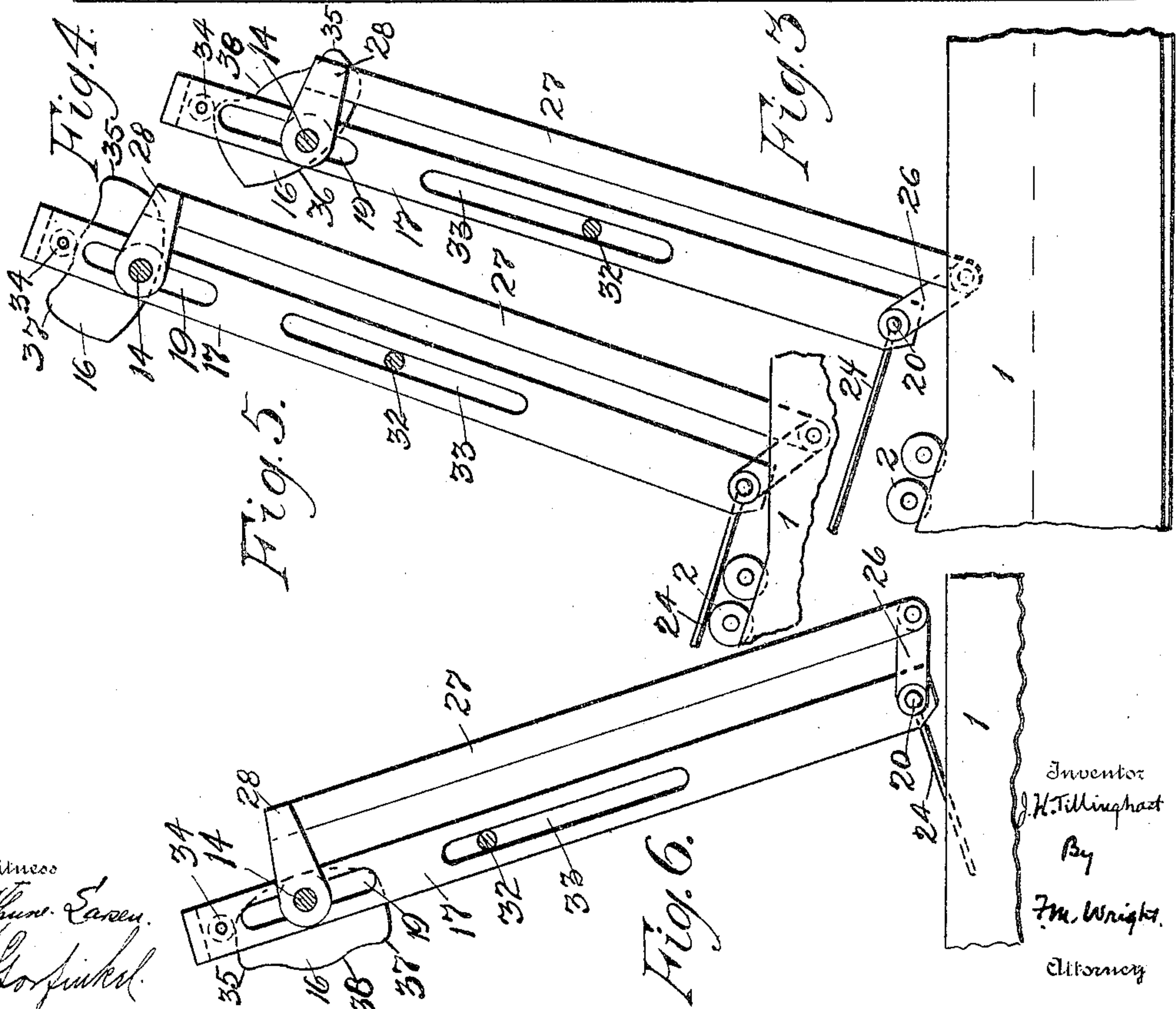
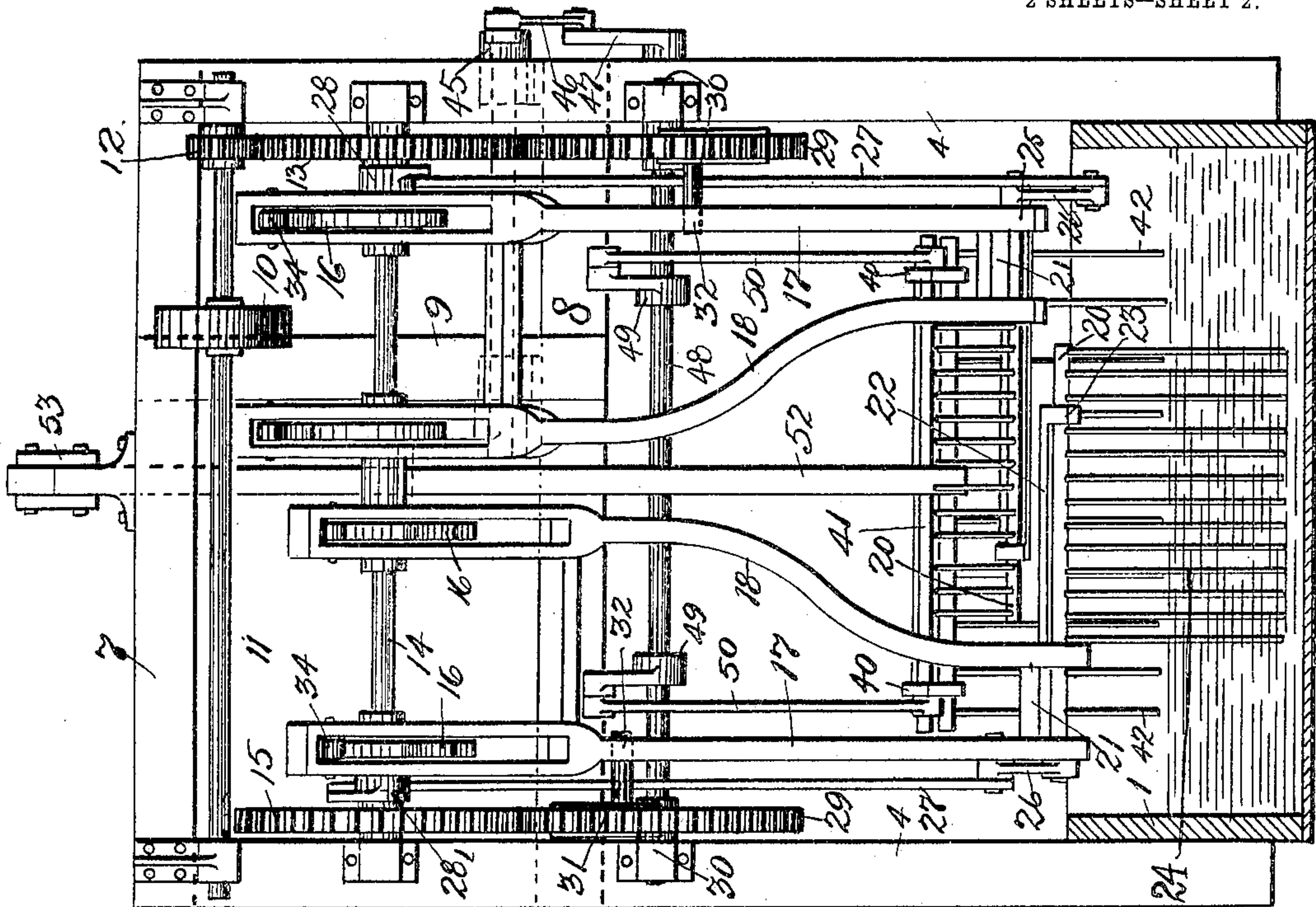
No. 821,139.

PATENTED MAY 22, 1906.

J. H. TILLINGHAST.  
WOOL SCOURING MACHINE.

APPLICATION FILED JUNE 12, 1905.

2 SHEETS—SHEET 2.



Witness  
R. T. Hunt, Esq.  
B. C. Conklin.

Inventor  
J. H. Tillinghast  
By  
F. M. Wright,  
Attorney



# UNITED STATES PATENT OFFICE.

JOSEPH H. TILLINGHAST, OF STOCKTON, CALIFORNIA.

## WOOL-SCOURING MACHINE.

No. 821,139.

Specification of Letters Patent.

Patented May 22, 1906.

Application filed June 12, 1905. Serial No. 264,813.

*To all whom it may concern:*

Be it known that I, JOSEPH H. TILLINGHAST, a citizen of the United States, residing at Stockton, in the county of San Joaquin and State of California, have invented certain new and useful Improvements in Wool-Scouring Machines, of which the following is a specification.

This invention relates to improvements in wool-scouring machines, the object of the invention being to provide a machine of this character which will scour wool without imparting thereto a rotary or felting motion, preserving the wool in an open, loose, or fluffy condition, which will operate more rapidly than machines of this character heretofore used, and yet without danger of splashing the liquid on account of too rapid motion of the parts therethrough, and will be simple and economical in operation and will not readily get out of order, and in any case can easily be repaired.

In the accompanying drawings, Figure 1 is a broken side elevation of a scouring-vat equipped with my improvement. Fig. 2 is a broken side view of a portion of the mechanism in a different position. Fig. 3 is a vertical transverse section of the vat, showing the mechanism in front elevation. Figs. 4, 5, and 6 are detail side elevations of the fork-carriers in various positions.

Referring to the drawings, 1 represents the vat or scouring-tub in which the wool to be scoured, together with the scouring liquid, is placed. In practice there are employed a series of these vats placed end to end, each furnished with scouring mechanism. For the purpose of delivering the wool from one vat of the series to the next there are provided in each vat a series of feed-rollers 2, feeding the wool between a pair of squeezing-rollers 3 at the end of the vat, the wool then passing from said scouring-rollers into the next vat containing clearer liquid.

Upon the sides of the vat is secured a frame comprising the side posts 4 5, the horizontal longitudinal beams 6, the transverse beams 7 8, and the brace 9, connecting the two transverse beams.

10 represents the driving-pulley, driven from any suitable source of power and mounted upon the main shaft 11, having suitable bearings upon the frame and extending transversely thereacross. Upon the end of said power-shaft is mounted a pinion 12, meshing with a gear-wheel 13 upon a

cam-shaft 14, said shaft carrying at the opposite end a second gear-wheel 15. Upon said cam-shaft are secured cams 16 in two pairs, the cams of each pair being similar to each other in the form and angular position on the shaft and being also similar in form to the cams of the other pair, but having a diametrically opposite angular position upon the shaft, whereby the movement produced by each pair of cams is in the reverse direction to that produced by the other pair. These cams are contained in the bifurcated upper ends of fork-carrying arms 17 18, each member thereof being slotted, as shown at 19, to permit the cam-shaft 14 to pass therethrough. Of these arms the outer arm 17 is substantially straight and extends downward close to the side of the vat, while the inner arm 18 is bent outward at the bottom toward the outer arm, so as to avoid the end of the fork-bar 20, carried by the other pair of arms. The arms 17 18 of each pair are at the bottom connected by a short brace 21, extended, as shown at 22, to carry at its end a bearing 23 for the oscillating fork-bar 20, having tines 24 secured thereto, said bar oscillating also in bearings 25 in the lower ends of the fork-carrier arms 17 18. Upon the outer end of said fork-bar 20 is secured a crank-arm 26, which is pivotally attached to a link 27, the upper end of which is rigidly attached to an arm 28, loose upon the cam-shaft 14.

The gear-wheels 13 and 15 mesh with gear-wheels 29 on stud-shafts 30, extending inwardly from the posts 4, said gear-wheels carrying inwardly-extending wrist-pins 31, carrying rollers 32, which enter slots 33 in the outer arms 17 of the fork-carrier, said pins on the two gears 29 being diametrically opposite to each other. Thus by the rotation of the main shaft a horizontal oscillatory movement is imparted to said fork-carriers, each fork moving half a cycle in advance of the other. In order to allow the forks to pass one another when moving in opposite directions, it is necessary to impart a vertical movement in addition to said horizontal movement, and this is imparted by means of said cams 16, which engage rollers 34, carried in the upper ends of the arms of the fork-carriers. The form of each cam is such that each fork-bar on its rearward movement passes over the other fork-bar, which is making its forward movement. The latter is then raised into such a position that it, in its



turn, in its rearward movement passes over the former, returning in its forward movement.

Motion is imparted to the tines of the forks so as to scoop up the wool from the bottom of the vat and lay it upon the rollers by the following construction. This motion is partly derived from the motion of the fork-bar itself, as just explained, the cams being so formed that each fork-bar on arriving near the end of its forward movement rises, but partly also from the swinging movement of the tines of the fork. Said tines toward the close of the forward movement of the fork are pointed downward and extend near to the bottom of the vat, and at the close of the forward movement said tines swing upward, scooping the wool therefrom. This swinging motion of the fork-bar and the tines carried thereby is derived from the crank-arms 26, the links 27, and the arms 28, loose upon the cam-shaft 14, but rigidly attached to said links. This rigid connection between said arms and links is to be particularly noted, as it is more especially this feature which causes this movement to be imparted to the fork-bar.

When the roller reaches the point 35 of the cam and drops suddenly over the surface 36 thereof, the lower end of the fork-carrier is allowed to drop suddenly; but on account of the rigid connection between the arm 28 and the link 27 the outer end of the crank-arm 26 cannot drop in like manner. There is therefore an angular movement of that end of the crank-arm 26 which is attached to the fork-bar relative to that end attached to the link 27—that is to say, there is a rotation of said fork-bar in a direction to cause the tines of the fork to swing downwardly, so that the points of said tines are brought close to the bottom of the vat, and thus when the fork is moved in a forward direction the points of said tines move along the bottom of the vat, scooping the wool. As the bottom of the fork-carrier rises this angular movement of the fork-bar is gradually reversed, bringing up the points of the tines of the fork and scooping up the wool thereon until the rollers arrive at the points 37 on the cams, from which point it will be observed that the cams have a sudden drop 38, the rollers dropping rapidly over the surface of the cams, and this rapid drop of the rollers and the consequent rapid drop of the lower part of the fork-carrier again in like manner as before on account of the rigid connection between the link 27 and the arm 28 imparts a rotation to the fork-bar, so as to cause the tines thereof to drop upon the feed-rollers. From this point the movement of the tines is substantially rearward in the direction of their own length, so that the wool is left upon the feed-rollers, the tines of the fork slipping out from underneath

the wool. In this manner the wool is deposited upon the feed-rollers and is then carried to the squeezing-rollers, as heretofore described.

In order to advance the wool in the bottom of the vat into position to be engaged by said forks, there is provided a rake 39, comprising side bars 40 and transverse bars 41, having downwardly-extending teeth 42 secured thereto. Said rake is operated from the gear-wheel 13 by a gear-wheel 43, meshing therewith on a shaft 44, carrying a crank-arm 45, connected by a link 46 to a crank 47 on a shaft 48, having arms 49 secured thereto, connected by links 50 to the side bars 40 of the rack. A second crank 51 is secured to the end of said shaft 44 and is attached to a pitman 52, pivoted at its upper end to a swinging arm 53 and at the lower end rigidly secured to the front transverse bar 41 of the rack, which is rotatable to its bearings in the side bars 40; so that as the rake swings forward the teeth on the front bar 41 thereof swing upward, as shown in Fig. 2, and thus advance the wool into position to be engaged by the forks which feed it to the feed-rollers.

I claim—

1. In an apparatus of the character described, the combination, with a vat, of a pair of forks therein, each comprising a fork-bar and tines extending therefrom, a carrier for each fork, each fork extending from its carrier toward the other carrier, means for imparting to said carriers horizontal movements of reciprocation alternating in cycle, and means for moving said forks so as to avoid each other in passing in opposite directions, substantially as described.

2. In an apparatus of the character described, the combination, with a vat, of a pair of forks therein, each comprising a fork-bar and tines extending therefrom, a carrier for each fork in which it is rotatable, each fork extending from its carrier toward the other carrier, means for imparting to said carriers horizontal movements of reciprocation alternating in cycle, and means for moving said forks so as to avoid each other in passing in opposite directions, and for rotating each fork-bar in its carrier at the end of its forward movement to scoop up the wool, substantially as described.

3. In an apparatus of the character described, the combination, with a vat, of a fork, a carrier therefor, a transverse shaft having a cam thereon, a roller on said carrier engaged by said cam to impart vertical reciprocation to the carrier, and means operatively connected with the shaft for imparting a horizontal movement of reciprocation to the carrier, substantially as described.

4. In an apparatus of the character described, the combination, with a vat, of a fork, a carrier in which the fork is rotatable, a transverse shaft having a cam thereon, a



roller on said carrier engaged by said cam to impart vertical reciprocation to the carrier, means operatively connected with the shaft for imparting a horizontal movement of reciprocation to the carrier, and means for rotating the fork-bar in the carrier at the end of its forward movement to impart an upward scooping movement to the fork, substantially as described.

5 5. In an apparatus of the character described, the combination, with a vat, of a fork comprising a fork-bar and tines extending therefrom, a carrier comprising a pair of arms, a shaft passing through said arms and  
15 having cams thereon, a roller supported upon each arm and engaged by a corresponding cam to impart a vertical movement to the arm, and means operatively connected with the shaft for imparting a horizontal reciprocation to the arms, substantially as described.

20 6. In an apparatus of the character described, the combination, with a vat, of a fork comprising a fork-bar and tines extending therefrom, a carrier in which said fork-bar is  
25 rotatably supported, comprising a pair of arms, a shaft passing through said arms and having cams thereon, a roller supported upon each arm and engaged by a corresponding cam to impart a vertical movement to the  
30 arm, means operatively connected with the shaft for imparting a horizontal reciprocation to the arms, and means for rotating the fork-bar in the carrier to impart an upward scooping movement to the tines at the  
35 end of the forward movement of the carrier, substantially as described.

7. In an apparatus of the character described, the combination, with a vat, of a pair of forks therein each comprising a fork-bar  
40 and tines extending therefrom, a pair of carriers, each comprising a substantially straight

outer arm and an inner arm bent at its lower end outward or toward the outer arm, a shaft, two pairs of cams on said shaft each adjacent to a corresponding arm, rollers carried by the  
45 arms engaged by the cams to impart a vertical movement of reciprocation to said forks, and means for imparting a horizontal movement of reciprocation thereto, substantially as described.

50 8. In an apparatus of the character described, the combination, with a vat, of a pair of forks therein each comprising a fork-bar and tines extending therefrom a pair of carriers in which said fork-bars are respectively  
55 rotatable, each carrier comprising a substantially straight outer arm and an inner arm bent at its lower end outward or toward the outer arm, a shaft, two pairs of cams on said shaft each adjacent to a corresponding arm, rollers carried by the arms engaged by the  
60 cams to impart a vertical movement of reciprocation thereto, and means for rotating the fork-bars in the carriers, substantially as described.

65 9. In an apparatus of the character described, in combination with a vat, feeding-forks therein, and mechanism for operating said forks, a rake for feeding the wool to the forks, including a front transverse bar, teeth  
70 extending therefrom, and means operatively connected with the mechanism for feeding the forks to impart a scooping movement to said teeth, substantially as described.

In witness whereof I have hereunto set my  
75 hand in the presence of two subscribing witnesses.

J. H. TILLINGHAST.

Witnesses:

FRANCIS M. WRIGHT,  
BESSIE GORFINKEL