

**No. 654,651.**

**Patented July 31, 1900.**

**H. L. KUTTER.**  
**PAPER MAKING MACHINE.**

(Application filed July 13, 1899.)

(No Model.)

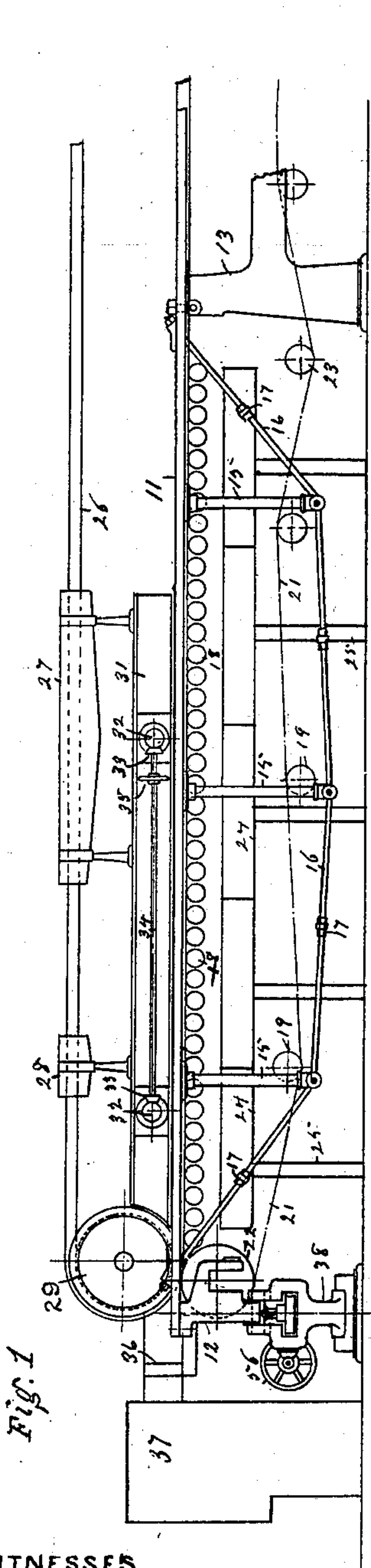


Fig 1

WITNESSES,  
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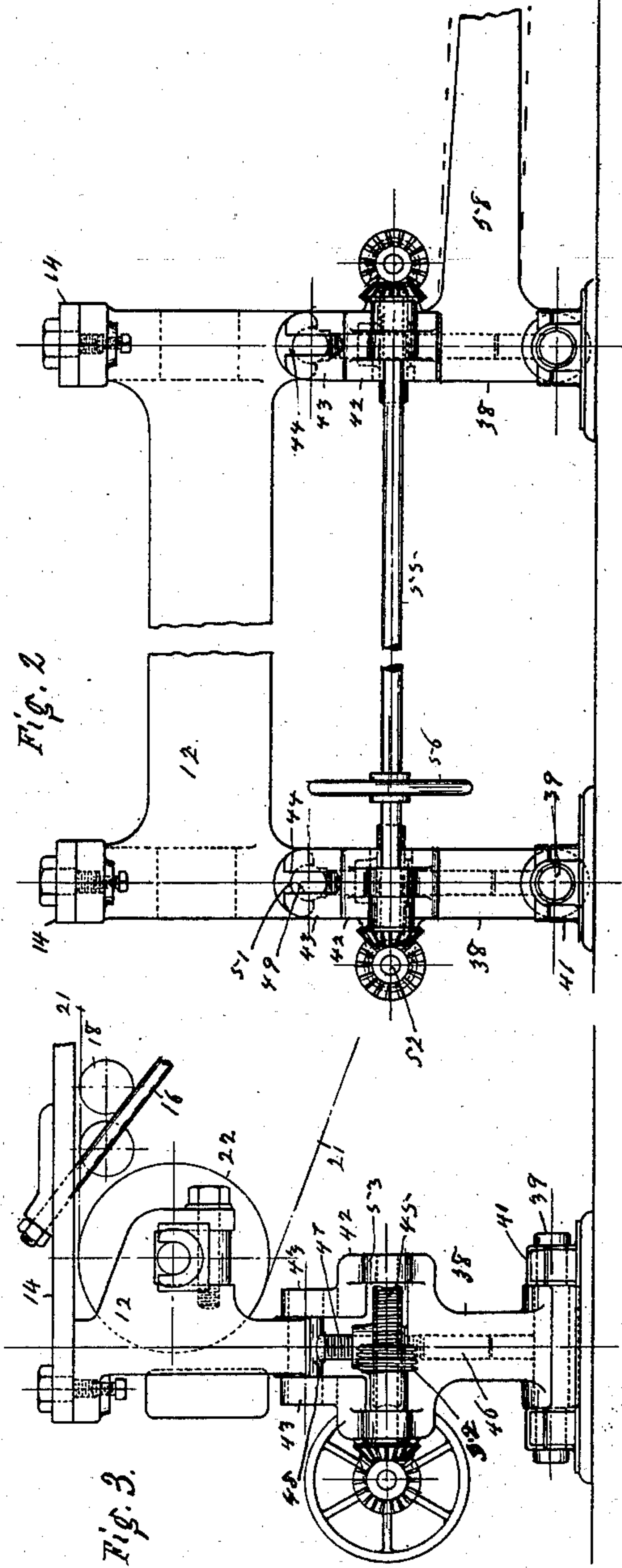


Fig. 2

Fig. 3.

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# UNITED STATES PATENT OFFICE.

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## PAPER-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 654,651, dated July 31, 1900.

Application filed July 13, 1899. Serial No. 723,735. (No model.)

*To all whom it may concern:*

Be it known that I, HERMAN L. KUTTER, a citizen of the United States, and a resident of Hamilton, Ohio, have invented certain new and useful Improvements in Paper-Making Machines, of which the following is a specification.

My invention relates to paper-making machines of that class known as "Fourdrinier" machines, wherein the making-wire is vibrated laterally by a shake-frame to cause the fibers of pulp to become interlaced thereon; and the objects of my improvement are to support the shake-frame at its ends, to strengthen the side rails by means of trusses, to dispense with intermediate floor-supports, to provide extensible supports for the front end of the shake-frame, and to provide mechanism to vertically adjust the front end of the shake-frame during the operation of the machine. These objects are attained in the following-described manner, as illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the shake-frame supported at its ends by a fixed frame and extensible supports; Fig. 2, a front elevation of the extensible supports, with breast-roll frame mounted thereon with parts removed; Fig. 3, a side elevation of one of the extensible supports, showing the end of the breast-roll and the breast-roll frame thereon, together with portions of the shake-frame.

In the drawings, 11 represents the shake-frame, pivotally mounted at its front end on breast-roll frame 12 and at its rear end on fixed or couch roll frame 13. Side rails 14 are undertrussed by means of struts 15 and tie-rods 16, that are adjustable by means of turnbuckles 17, to prevent the side rails from sagging. Table-rolls 18 are journaled in bearings, (not shown,) that are removably attached to the side rails in the usual manner. Wire rolls 19 are removably journaled in bearings on corresponding struts under the rails. Making-wire 21 forms an endless apron that is driven by the usual couch-roll (not shown) and around the breast-roll 22, with its upper run over the table-rolls and its under run carried by the wire rolls. The breast-roll frame is provided with an overhanging bracket portion, with the recess for

the journal of the breast-roll in the under side, so that the breast-roll may be inserted from the bottom or below the bracket. After the roll has been inserted the journal-block is placed in the recess, and a bolt is placed in holes in the walls of the recess, so as to support the block and roll. An adjustably-supported roll 23 is arranged to take up the slack in the making-wire in the ordinary manner. Save-all trough 24 is formed in sections and supported under the table-rolls on floor-stands 25. Deckle-straps 26 travel through wash-troughs 27, guides 28, and around pulleys 29. Deckle-bars 31 are laterally adjustable by means of screws 32, that are operated through bevel-gears 33 by cross-shaft 34, with hand-wheel 35 thereon. Apron 36, attached to the breast-roll frame, receives the pulp from the stationary feed-box 37 and discharges it on the making-wire just over the breast-roll. Standards 38 are journaled by means of trunnions 39, formed thereon to oscillate in fixed floor-bearings 41. Brackets 42, formed on opposite sides of each standard, extend upwardly therefrom and terminate on opposite sides of the breast-roll frame in the form of guides 43, that are parallel with each other. Open slots 44 are formed in the top of the guides and in the same vertical plane. A worm-wheel 45 is mounted on the top of each standard, with one end of its hub over vertical hole 46 therein, and an adjusting-screw 47 is threaded through the hub of each worm-wheel and movably extends within the opening or hole 46 thereunder. A cylindrical transverse bar 48, with flattened ends 49, that move in slots 44 of the guides, is formed on the top of each screw, whereby the movements of the screws are limited to vertical adjustments only. Said bars are seated in transverse grooves 51, formed in the under edge of the breast-roll frame and near its ends, so that said frame may be properly supported thereon. Worm-shafts 52 are journaled in bearings 53 on the respective standards 38 and arranged to rotate the worm-wheels thereon and effect the vertical adjustment of the screws 47 and the breast-roll frame. Cross-shaft 55, provided with hand-wheel 56, spans the distance between the standards and communicates motion through miter-gears at its ends to both



of the worm-shafts simultaneously. Project-  
 ing bar 58 is either formed integral with or  
 secured to one of the standards and is oscil-  
 lated in a vertical plane by the usual eccen-  
 5 tric mechanism (not shown) or otherwise.  
 The vertical oscillation of said bar imparts  
 lateral oscillatory motion to the standards  
 and reciprocates the breast-roll frame there-  
 on. As the front end of the shake-frame is  
 10 mounted on the breast-roll frame, it is given  
 the proper amount of lateral shake by the re-  
 ciprocation of said frame to cause the fibers  
 of pulp on the making-wire to become prop-  
 15 erly interlaced in transit toward the fixed  
 frame. The lateral vibration of the shake-  
 frame is so short that the vertical arc de-  
 scribed in its movement is not appreciable  
 and does not prevent the even distribution  
 of the pulp on the making-wire.  
 20 A vertical adjustment of the front end of  
 the shake-frame is required for the use of  
 pulp of different grades. For this purpose  
 the standards are made extensible by the ad-  
 25 justment of the screws therein by means of  
 the worm-gear mechanism and are simulta-  
 neously adjustable by means of the cross-  
 shaft and hand-wheel that communicate with  
 them through the miter-gears at each end.  
 It is evident that the adjustment of the shake-  
 30 frame may be accomplished while the machine  
 is in operation, and the amount of adjustment  
 may be regulated with much precision by the  
 observation of the pulp in motion.

Having fully described my improvement,  
 35 what I claim as my invention, and desire to  
 secure by Letters Patent of the United States,  
 is—

1. In a paper-making machine, the combi-  
 nation, with oscillatory standards, the upper  
 end of each of which is formed into guides and  
 40 slotted vertically and its intermediate portion  
 is provided with horizontal and vertical re-  
 cesses, a worm-wheel in the horizontal recess  
 and a screw in the vertical recess, the upper  
 45 end of the screw being provided with a trans-  
 verse bar, the ends of which fit in the slots in  
 the guides, means for moving the worm-  
 wheels in unison, and a breast-roll frame sup-  
 ported on said transverse bars.

2. In a paper-making machine, the combi- 50  
 nation, with oscillatory standards, the bot-  
 tom of each of which is provided with a jour-  
 nal-bearing and the upper end is formed into  
 guides and slotted vertically and the inter-  
 55 mediate portion is provided with horizontal  
 and vertical recesses and with a laterally-pro-  
 jecting bar, a worm-wheel in the horizontal  
 recess, a screw in the vertical recess the up-  
 per end of which is provided with a transverse  
 60 bar, and a breast-roll frame on said bars.

3. In a paper-making machine, the combi-  
 nation, with oscillatory standards, each of  
 which is provided with means for adjusting  
 the height of the breast-roll frame, of a breast-  
 65 roll frame thereon, said frame being provided  
 with overhanging brackets, the opening for  
 each of which is downward, a bolt through  
 the walls of said opening, and a breast-roll  
 journaled in the brackets above said bolts.

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Witnesses:

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 DAVID PIERCE.