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Patented Dec. 20, 1898.

P. PRIEM.  
PAPER MAKING MACHINE.

(Application filed July 23, 1898.)

(No Model.)

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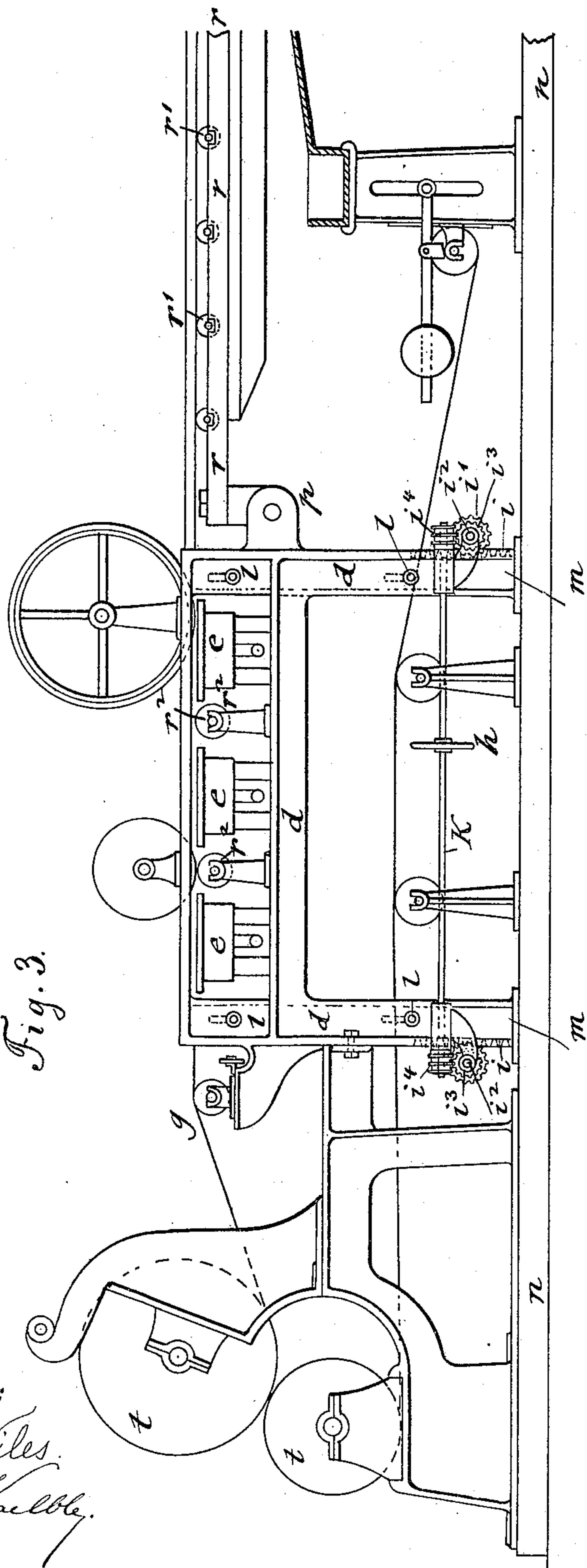
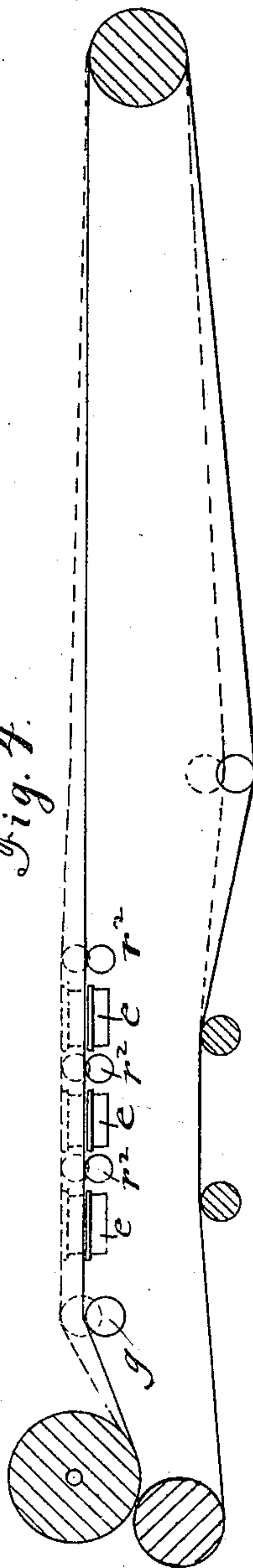


Fig. 3.

Fig. 4.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

PAUL PRIEM, OF HEIDENHEIM-ON-THE-BRENTZ, GERMANY, ASSIGNOR TO  
THE FIRM OF J. M. VOITH, OF SAME PLACE.

## PAPER-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 616,423, dated December 20, 1898.

Application filed July 23, 1898. Serial No. 686,726. (No model.)

*To all whom it may concern:*

Be it known that I, PAUL PRIEM, a citizen of the Empire of Germany, residing at Heidenheim-on-the-Brenz, in the Kingdom of Württemberg and Empire of Germany, have invented certain new and useful Improvements in Paper-Making Machines, of which the following is a specification.

In paper-making machines heretofore known the inclination of the wire is adjusted in such a manner that the entire system of wire-carrying rolls and their rails is raised or lowered near the breast-roll at the ingoing end of the wire. In this disposition a change in the inclination of the wire necessitates also a change in the height of the supply of pulp, while the connecting-rod of the shaking mechanism by which the lateral motion is imparted to the wire-carrying rolls has to be simultaneously adjusted. This adjustment of the wire can, however, not be employed when a stationary supply-box for the pulp is used. Consequently the adjustment of the wire near the breast-roll is in this case precluded.

The object of my invention is to construct a paper-making machine in which in place of the adjustment of the wire at the ingoing end the inclination of the same is produced at the suction-box portion, which has the advantage that the curve by which the wire laps around the upper couch-roll is simultaneously changed, and thereby a favorable influence exerted on such paper which is made with a greater inclination of the wire.

The invention consists of a paper-making machine in which the suction-box portion is made vertically adjustable by suitable mechanism and in which the wire-carrying rolls and their rails are simultaneously adjusted relatively to the breast-roll.

In the accompanying drawings, Figure 1 represents a side elevation of a paper-making machine with my improved vertically-adjustable suction-box portion. Fig. 2 is also a side elevation of a modified form of the machine. Fig. 3 is a side elevation of the adjustable suction-box portion drawn on a larger scale, and Fig. 4 is a diagram showing the arrangement and adjustment of the endless wire.

Similar letters of reference indicate corresponding parts.

In the drawings, *a* represents the breast-roll, and *b* the stationary supply-box through which the product is delivered onto the endless wire, which is carried in the usual manner by a series of tube-rolls *r'*. The rails *r* are provided with bearings for the rolls *r'* and are connected by a pivot-link at the ingoing end of the wire with a pivot *c* on the breast-roll support and at the opposite end by a second pivot-link with a lug *p* on the frame *d* of the suction-box portion. The suction-box portion is made vertically adjustable by means of the frame *d*, on which the suction-boxes *e*, the intermediate wire-carrying rolls *r''*, and the wire guide-roll *g* are mounted. The downwardly-extending portions or legs of the frame *d* are provided with slots and connected by screw-bolts *l* with stationary standards *m* and with the supporting-frame of the couch-rolls. *n* is the bed-plate of the entire machine. The upright standards *m* are provided with racks *i*, which are engaged by pinions *i'*, that are keyed to transverse shafts *i''*, which turn in bearings of the frame *d*. The shafts *i''* are rotated by worm-wheels *i'''*, keyed to the same, said worm-wheels being engaged by worms *i''''* at the ends of a longitudinal shaft *k*, which is turned by a hand-wheel *h* on the same, so that by the intermediate transmitting mechanism described the entire suction-box portion can be raised or lowered, as required. The vertical adjustment of the suction-box portion can also be accomplished by other means—such as screw-bolts, eccentric cams, toggle-levers, wedge-keys, &c.—it being not necessary that the entire frame be simultaneously adjusted, as one end after the other may be independently adjusted. The entire system of wire-carrying rolls participates in this vertical adjustment for the reason that the rails *r* are pivotally connected with the frame *d* at *p* and with the laterally-oscillating portion *x* of the breast-roll support at *c*, as shown in Fig. 1.

For paper-making machines of very large size, in which a very long screen portion is used, it is advisable not to connect the entire system of wire-carrying rolls with the frame

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*d*, but to arrange non-adjustable shake-rails *q* as shown in Fig. 2, which are supported in the well-known manner on uprights *y*, said shake-rails *q* being used in connection with the ordinary rails *r*. The rails *r* are pivotally connected at the point *s* with the breast-roll support and support by vertically-adjustable arms *v* the rails *q*, as shown in Fig. 2. With this construction the rails *r* can be connected with the frame *d*, as shown at *w*, Fig. 2, so that they participate in the vertical adjustment of the frame. It is obvious, however, that they can be adjusted independently of the same.

Any change in the inclination of the wire produces also the changing of the so-called "curve" or "lap" formed by the wire around the upper couch-roll *t*. Any increase in the inclination of the wire increases also the arc of lap or "couch-angle," which forms a special advantage of this construction, inasmuch as papers which are made with a large angle of inclination of the wire require also a large couch-angle. The diagram Fig. 4 shows clearly how by the vertical adjustment of the suction-box portion the inclination of the wire from the breast-roll to the suction-box portion and from the latter to the upper couch-roll is changed, while that portion of the wire above the suction-box always remains in a horizontal position.

Having thus described my invention, what I claim is—

1. In paper-making machines, the combination, with the endless wire, carrying-rolls for the same and the rails for supporting said rolls, of a suction-box portion, and means for vertically adjusting the suction-box portion substantially as set forth.

2. In paper-making machines, the combination, with the endless wire, carrying-rolls for the same, and rails for supporting said rolls, of a suction-box portion, a frame for

supporting said suction-box portion, stationary standards, and means for vertically adjusting the suction-box frame on said standards, substantially as set forth.

3. In paper-making machines, the combination, with the endless wire, carrying-rolls for the same, and the rails for supporting said rolls, of a suction-box portion, means for vertically adjusting said suction-box portion, and means for simultaneously adjusting the roll-supporting rails substantially to a suitable angle of inclination, substantially as set forth.

4. In paper-making machines, the combination, with the endless wire, carrying-rolls for the same, and rails for supporting said rolls, of a suction-box portion, means for vertically adjusting said suction-box portion, said rails being pivotally connected with the suction-box portion and with a stationary point near the breast-roll, so that the portion of the wire above the carrying-rails is set into inclined position simultaneously with the adjustment of the suction-box portion, substantially as set forth.

5. In paper-making machines, the combination, with the endless wire, rolls for carrying the same and rails for supporting said rolls of non-adjustable shake-rails, means for supporting the roll-carrying rails from the same a suction-box portion, means for vertically adjusting the suction-box portion, and means for simultaneously setting the roll-carrying rails into inclined position, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

PAUL PRIEM.

Witnesses:

WM. HAHN,  
EDWARD H. OGRUM.