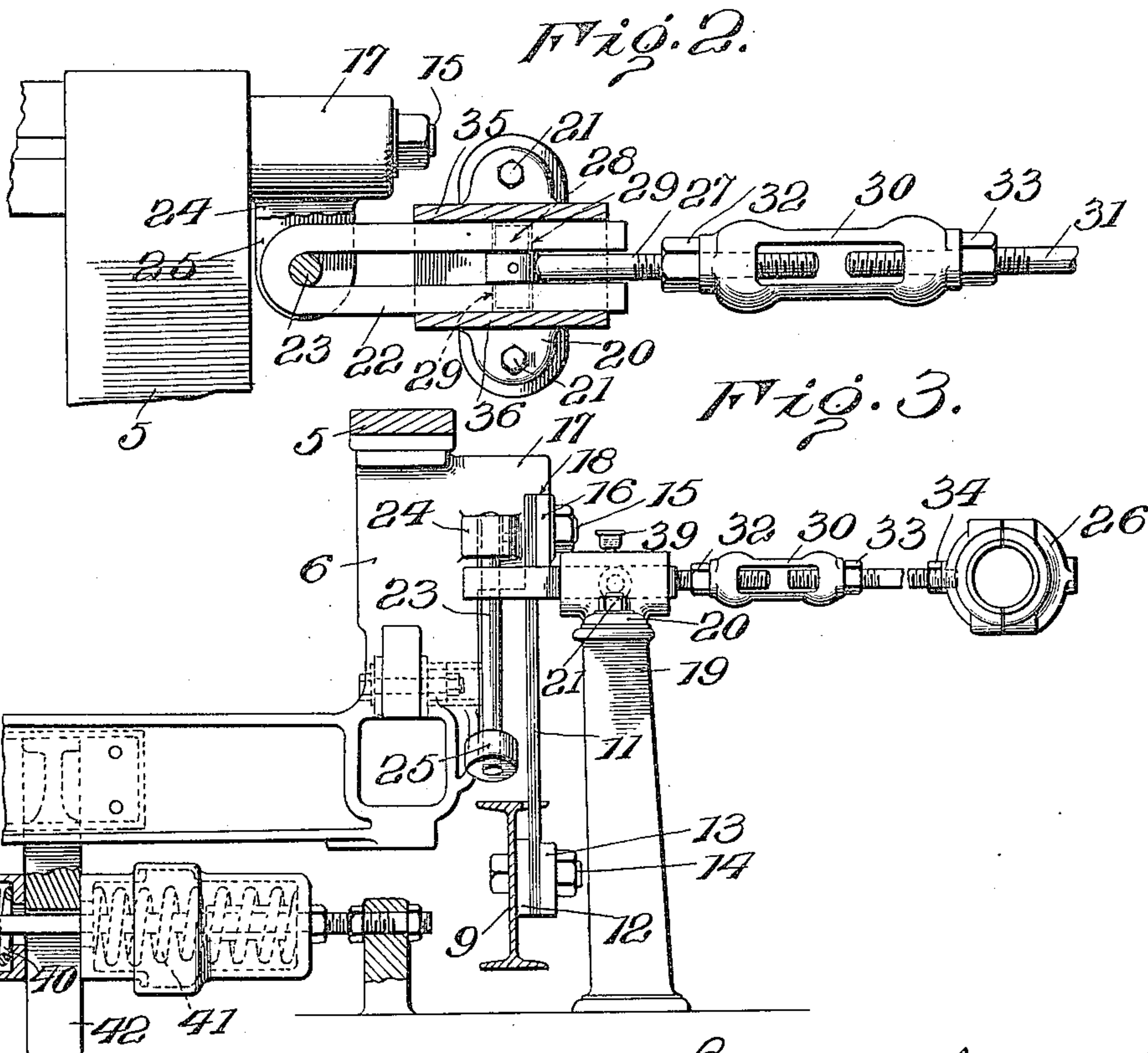
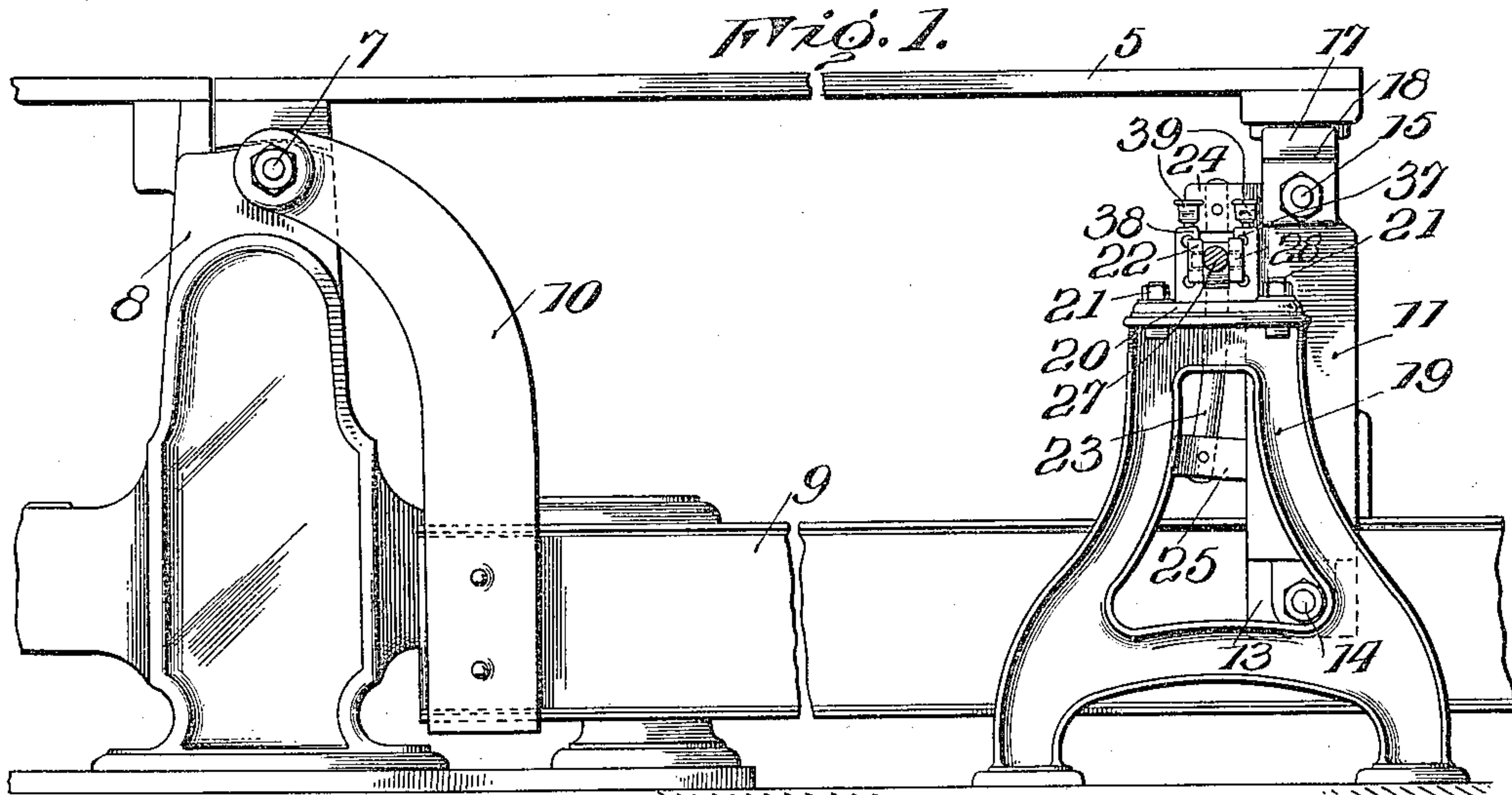


B. D. COPPAGE.
SHAKE HEAD CONNECTION.
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1,154,613.

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UNITED STATES PATENT OFFICE.

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SHAKE-HEAD CONNECTION.

1,154,613.

Specification of Letters Patent.

Patented Sept. 28, 1915.

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To all whom it may concern:

Be it known that I, BENJAMIN DENVER COPPAGE, a resident of Wilmington, Delaware, (whose post-office address is care of
5 The Pusey & Jones Company, Wilmington, Delaware,) have invented a new and useful Improvement in Shake-Head Connections, which invention is fully set forth in the following specification.

10 The present invention relates to paper-making machines, and particularly is an improved shake-head connection for the Fourdrinier part of such a machine.

15 Considerable difficulty has been experienced in practice with shake-head connections such as illustrated in U. S. Patent #1,118,366, dated Nov. 24, 1914, due to the bending of the shake rod when the front end of the base-frame was elevated to incline the
20 Fourdrinier wire. As shown in said patent, a curved bar mounted on the shake-frame passes through an eye in the end of the shake rod, this rod being reciprocated from an eccentric which usually makes about 250
25 revolutions per minute. The shake-frame weighs up to about seventeen tons and, when it was desired to elevate the front end of the base-frame, the operation of the machine would be stopped. Frequently the eccentric
30 would stop in a position in which a considerable pull was being exercised on the curved bar on the shake-frame and, without slacking away to relieve the tension on the shake rod, the operator would proceed
35 to elevate the seventeen ton shake-frame and the exceedingly heavy base-frame with the parts carried thereby. Under these conditions, the eye in the end of the shake rod would frequently bind and grip the curved
40 bar carried by the shake-frame, and a bent shake rod would result.

With this difficulty in view, one of the objects of the present invention is to provide a connection that renders it unnecessary to
45 stop the machine when it is desired to elevate the front end of the base-frame, and which will prevent any binding or gripping between the shake rod and the curved bar on the shake-frame, thus avoiding any bending of said shake rod. The construction in this respect is, as it is colloquially expressed, "fool-proof," inasmuch as it is immaterial
50 what tension is on the shake rod when raising and lowering the base-frame. Another difficulty experienced with the shake-head connection of the patent is that it is com-

monly adjusted at the mills to both pull and push. When it is remembered that the eccentric usually makes about 250 revolutions per minute, that the shake-frame weighs up
60 to seventeen tons, and that its lateral movement is from one-eighth to three-quarters of an inch, it is readily appreciated that the eye in the end of the shake rod will soon become worn and that lost motion will be in-
65 troduced. Considerable shock to the parts will accordingly result on every push and pull.

A further object of the present invention is to provide a connection that can only be
70 adjusted to move the shake-frame in one direction; for example, to pull the shake-frame and not push the same, to the end that all shock will be avoided.

The invention will be better understood by
75 reference to the accompanying drawings, illustrating one expression of the inventive idea, and wherein:

Figure 1 is a side elevation showing the manner in which the base-frame is pivoted
80 and the connection between the shake-frame and the shake rod; Fig. 2 is a plan view partly in section, of a detail showing the connection between the curved bar carried by the shake-frame and the shake-rod; and
85 Fig. 3 is an end elevation showing the improved connection.

Referring to the drawings, wherein like reference numerals indicate like parts, 5 is one of a pair of longitudinal side rails,
90 forming part of the shake-frame, the outer ends of which are connected by a U-shaped frame 6, as in the patent above referred to. The shake-frame, of which the rails 5 are a part, is tiltable on the horizontal axis of
95 bolts 7 carried by the housing 8, and is also adapted to receive horizontal shaking movement. The base-frame is constituted by a pair of beams 9 (only one of which is shown) and said frame is pivotally supported
100 on bolts 7 by upwardly-extending curved arms 10, one for each beam. The common axis of said bolts thus constitutes a single axis on which the rigid base-frame and also the shake-frame pivot in the tilting thereof
105 to vary the inclination of the Fourdrinier part of the machine. The forward part of the shake-frame is preferably supported from the base-frame by two multiple-leaf flat spring bars 11, one of which is shown.
110 The lower end of each bar is preferably clamped between a block 12 and plate 13 by

a bolt 14 passing through said block and plate and through beam 9, rigidly securing said parts to said beam. A bolt 15 and plate 16 rigidly clamp the upper end of each spring bar to a flat face of an outward projection 17 on the upper end of each arm of U-shaped frame 6, beneath an overhanging shoulder 18 on said projection.

The mechanism herein illustrated is designed to provide for elevating the front end of the base-frame as much as from 16 to 18 inches or more above a horizontal position. The device as thus far described is that shown in the patent above referred to and is preferably, though not necessarily, the construction employed in connection with the mechanism hereinafter described for laterally vibrating the shake-frame.

Mounted on a standard 19 is a casting 20 which is held in place by suitable means, as bolts 21. This casting constitutes a bearing for an elongated hair-pin shaped member or rod 22 which slides therein and engages around a curved bar 23 carried by lugs 24 and 25 on the U-shaped member 6 of the shake-frame. This hair-pin shaped member 22 is of substantial construction, and is preferably flat on its top and bottom. It is reciprocated in casting 20 in any suitable manner, as by an eccentric 26 rotated from any desired source of power, and suitable means are provided for varying the extent of lateral vibration of the shake-frame. As here shown, a screw-threaded rod 27 is provided at one end with an eye through which projects a pin 28 the ends of which are carried in openings 29, one in each arm of member 22. A turn-buckle 30 engages the screw-threaded part of said rod 27 and also the screw-threads on one end of a second rod 31, the other end of which rod 31 is screwed into, or otherwise secured to, eccentric 26. Rod 27 is provided with a right-hand screw-thread and rod 31 with a left-hand screw-thread, or vice versa so that, when the turn-buckle 30 is rotated in one direction or the other the effective length of rods 27 and 31 is either increased or diminished. Lock nuts 32 and 33 hold the turn-buckle in its adjusted position and lock nut 34 maintains the connection between rod 31 and eccentric 26.

The member 22 is guided in its reciprocations by vertical walls 35 and 36 of casting 20 and said member is held in engagement with said walls and the bottom of the casting by flanges 37 and 38 (Fig. 1) that project over said member. The member 22 is moved endwise into casting 20, and oil cups 39 supply the necessary lubricant to the moving parts.

It will be observed that the connection from eccentric 26 acts only to pull the shake-frame and that the shake-frame must be returned by some other means. Preferably

springs 40 and 41, engage on either side of a downwardly-extending member 42 which is carried by the U-frame 6, and these springs act to return the shake-frame after it has been vibrated or pulled in one direction by eccentric 26 and the described connections. After the member 22 is adjusted into proper engagement with bar 23 said bar and member move as a unit and accordingly shock due to lost motion is avoided. Further, the open, bifurcated or slotted construction of member 22 prevents any binding therebetween and bar 23, and the substantial construction of said member and the form of its bearing prevents bending of the same when the Fourdrinier part is raised or lowered, however great the pull on said bar 23 may be. This bar 23 is arc-shaped and is struck on a curve the center of which is the axis of bolts 7. Accordingly undue strain on this bar is avoided when the base-frame and the shake-frame are moved about this same center.

While for the purpose of illustration one embodiment of the inventive idea is herein illustrated and described in considerable detail, it is to be understood that the invention is not limited to the construction shown but that the inventive idea is susceptible of various mechanical expressions within the limits of the appended claims.

What is claimed is:

1. The combination in a paper-making machine, of a shake-frame; a bar carried thereby; means for raising and lowering said shake-frame; and means for vibrating said shake-frame including a bifurcated member that engages around said bar.
2. The combination in a paper-making machine, of a shake-frame; a bar carried thereby; means for raising and lowering said shake-frame; and means for vibrating said shake-frame including an open loop member that engages around said bar.
3. The combination in a paper-making machine, of a shake-frame; a bar carried thereby; means for raising and lowering said shake-frame; and means for vibrating said shake-frame including an elongated hook member that engages around said bar.
4. The combination in a paper-making machine, of a shake-frame; means for raising and lowering said shake-frame; a rotary member; connections between said member and shake-frame including an elongated hook member that engages around a part of said shake-frame.
5. The combination in a paper-making machine, of a shake-frame; means for raising and lowering said shake-frame; a rotary member; connections between said member and shake-frame including an elongated hook member that engages around a part of said shake-frame and means for varying the effective length of said connections.

6. The combination in a paper-making machine, of a shake-frame; means for raising and lowering said shake-frame; a rotary member; connections between said member and shake-frame including an elongated hook member that engages around a part of said shake-frame; a bearing in which said hook member engages; and means for varying the effective length of said connections.

7. The combination in a paper-making machine, of a shake-frame; means for raising and lowering said shake-frame; a rotary member; connections between said member and shake-frame including an elongated hook member that engages around a part of said shake-frame and moves said shake-frame only in one direction; and means for moving said shake-frame in the opposite direction.

8. The combination in a paper-making machine, of a shake-frame; means for raising and lowering said shake-frame; a rotary member; connections between said member and shake-frame including an elongated hook member that engages around a part of said shake-frame and moves said shake-frame only in one direction; and spring mechanism for moving said shake-frame in the opposite direction.

9. The combination in a paper-making machine, of a shake-frame; a curved bar carried thereby; and means for vibrating

said shake-frame through said bar, said means including a hook member that engages around said bar; a rotary member; and connections between said rotary member and said hook member.

10. The combination in a paper-making machine, of a shake-frame; a bar carried thereby; a rotary member; one-way connections between said bar and member whereby the latter operates to move said frame only in one direction; and means for moving said frame in the opposite direction.

11. The combination in a paper-making machine, of a shake-frame; a bar carried thereby; a member having an elongated slot engaging around said bar; a bearing for said member projecting over the same; a rotary element; and adjustable connections between said member and element.

12. The combination in a paper-making machine, of a shake-frame; a bar carried thereby; and means for vibrating said shake-frame including a member having an elongated slot through which slot said bar passes.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

BENJAMIN DENVER COPPAGE.

Witnesses:

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