No. 666,700. Patented Jan. 29, 1901.

T. H. SAVERY.

LIFTING DEVICE FOR COUCH ROLLS OF PAPER MAKING MACHINERY.

(Application filed July 25, 1900.)

(No Model.)

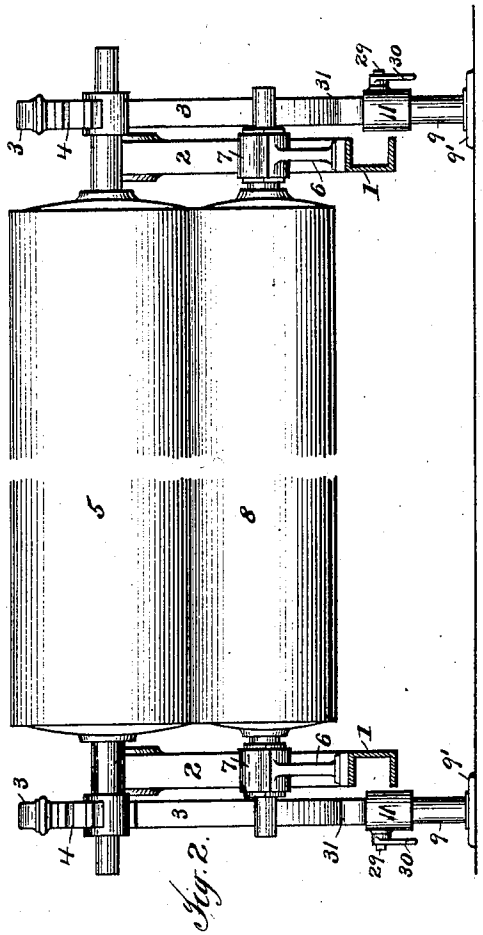

Fig. 2.

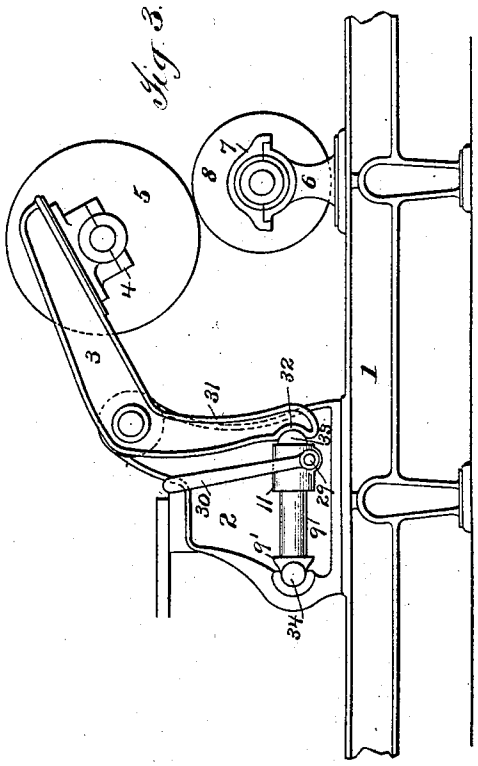

Fig. 3.

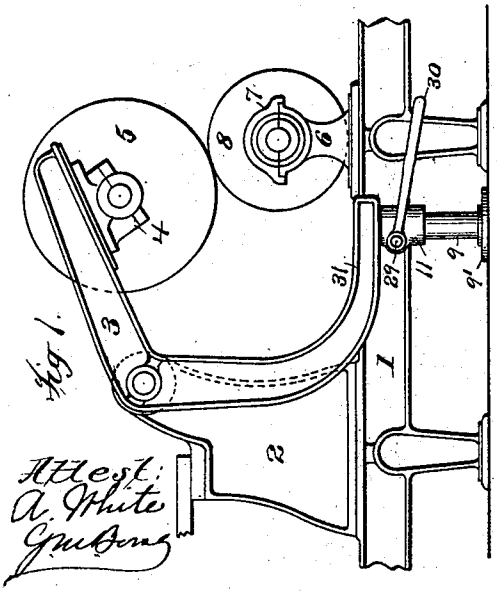

Fig. 1.

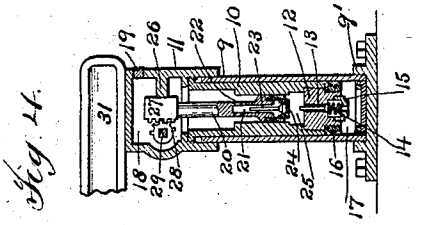

Fig. 4.

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UNITED STATES PATENT OFFICE.

THOMAS H. SAVERY, OF WILMINGTON, DELAWARE.

LIFTING DEVICE FOR COUCH-ROLLS OF PAPER-MAKING MACHINERY.

SPECIFICATION forming part of Letters Patent No. 666,700, dated January 29, 1901.

Application filed July 25, 1900. Serial No. 24,765. (No model.)

To all whom it may concern:

Be it known that I, THOMAS H. SAVERY, a citizen of the United States, residing at Wilmington, county of New Castle, and State of Delaware, have invented certain new and useful Improvements in Lifting Devices for Couch-Rolls of Paper-Making Machinery, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to certain improvements in lifting mechanism for the couch-rolls of paper-making machines.

The object of the invention is to produce a neat, simple, compact, cheap, and efficient lifting device acting on the hydraulic principle for lifting and lowering the couch-rolls of paper-making machinery.

With this and other objects in view the invention consists in certain constructions and in certain parts, improvements, and combinations, as will be hereinafter described and then more specifically pointed out in the claims hereunto appended.

Referring to the drawings hereunto annexed, which form a part of this specification, and in which like characters of reference indicate the same parts, Figure 1 is a side view of a pair of couch-rolls equipped with the improved lifting device. Fig. 2 is a front view of the construction shown in Fig. 1. Fig. 3 is a view illustrating a modified arrangement of the lifting devices. Fig. 4 is a sectional elevation of the fluid-containing cylinder and the parts immediately connected therewith.

Referring to the drawings, 1 indicates a frame of any suitable configuration and construction, said frame being provided with a pair of uprights or standards 2, in which are pivoted arms 3, said arms being provided with suitable bearings 4, which support the upper or movable couch-roll 5. The frame is further provided with shorter standards 6, which are provided with suitable bearings 7, said bearings serving to support the lower stationary couch-roll 8. The upper roll is lifted through the agency of fluid-containing cylinders, which may be varied widely in construction. In the preferred form of the device two such cylinders are used, one for each end of the roll, though a single cylinder might be used. The two cylinders are counterparts in construction, however, and therefore a description of one will do for both.

In the construction shown in Figs. 1, 2, and 3 an outer tube 9 is provided, said tube being screwed or otherwise secured to a base 9', which in turn is bolted or otherwise suitably secured to the floor on which the machine-frame rests. Located in the tube 9 is a second tube 10, said tube being secured to a casting 11 by means of screw-threads or in any other suitable manner. The lower end of the tube 10 is closed by a suitable plug 12, said plug having an aperture therethrough which is closed by a valve 13. The valve is held up to its seat by a suitable spring 14, which is located between the head of the valve and a suitable bonnet 15. Washers 16 are provided, which surround the plug 12 and which make a tight joint between the plug and the end of the tube 10 and a chamber 17, which is located below the end of the plug. The casting 11 is made hollow to provide a fluid-containing chamber 18, said chamber preferably having a suitable filling-orifice closed by a screw-plug 19. The chamber 18 is preferably in open communication with the interior of the tube 10, so that the interior of this tube practically forms a part of the chamber.

The tube 10 is or may be counterbored, as shown, so as to make the opening at its ends slightly larger than at the center, and a pump-piston 20 is arranged to work in the reduced portion of the opening in the tube. This piston is provided with a longitudinal perforation 21, which communicates with the chamber 18 by means of ducts or passages 22. This perforation is closed by a suitable valve 23, said valve having its movement limited by a suitable bonnet 24. Between the lower end of the piston 20 and the plug 12 there is formed a chamber 25.

The casting 11 is preferably formed with a guide 26, in which the upper end of the piston works. Any suitable means may be employed for reciprocating the piston. In the construction shown the upper end of the piston is provided with a suitable rack 27, said rack engaging a toothed segment 28, mounted on a short shaft 29, suitably journaled in the casting 11. The end of the shaft 29 is pro-

vided with a handle 30, by which the shaft may be rocked and the piston operated.

When the piston is operated in the manner to be hereinafter described, it will be seen that the tube 10 and the casting 11, which is connected thereto, which parts constitute the ram, will be caused to move upward in the stationary tube 9.

Any suitable connection may be arranged by which the rams will serve to operate the roll-carrying arms 3 and raise the upper couch-roll 5. Two forms of such connections are shown. In the construction illustrated in Figs. 1 and 2 the arms 3 are formed with curved extensions 31, the ends of said extensions being carried around and so positioned as to be above the fluid-containing cylinders, which are in this modification arranged substantially vertically. In the construction shown in Fig. 3 the extensions 31 are shorter and are provided with concave recesses 32, said recesses being engaged by convex bosses 33, formed on the top of the casting 11. In this construction the base-plate 9' of the cylinder is made much smaller and has formed thereon a convex projection 34, said projection engaging the concave recesses formed on the standards 2.

When it is desired to raise the upper couch-roll, an operator on each side of the machine operates the handle 30 and causes the reciprocation of the piston 20. On the upstroke of the pistons the water or other fluid contained in the chambers 18 passes through the ducts 22 and the longitudinal passages 21 into the chambers 25. On the downstroke of the pistons the water is forced from this chamber around the valves 13, which are moved back away from their seats into the chambers 17, and as the water is forced under high pressure into these chambers the tubes 10 and the castings 11, which, as before said, constitute the rams, will move upward in case the construction shown in Fig. 1 is employed or outward in case the construction shown in Fig. 3 is employed. As the rams move they operate upon the extensions of the arms 3 and cause these arms to rock on their pivots, carrying the roll up with them. In operating the pistons care should be taken not to give them sufficient stroke to cause the bonnets 24 to strike the top of the valve-stems of the valve 13. When, however, it is desired to lower the roll, the pistons are caused to move downward until the bonnets strike the upper projecting ends of the valve-stems of the valves 13. This will force the valves from their seats and allow the water to pass from the chambers 17 out around the valves into the chambers 25, around the valves 23, and back into the chambers 18. Inasmuch as the amount of opening of the valve 13 can be absolutely controlled, the backward flow of the water can be also absolutely controlled, and consequently the downward movement of the roll.

The details of construction by which the invention is carried into effect may be widely varied. The invention is not therefore to be limited to the exact details of the constructions herein shown and described.

What is claimed is—

1. In a paper-making machine, the combination with a couch-roll, of a pair of pivoted arms in which the roll is journaled, one of said arms having a curved extension, a substantially vertically arranged fluid-containing cylinder positioned to act upon the curved extension, a ram inside the cylinder, a pump mechanism in said cylinder, and means for operating the pump mechanism, substantially as described.

2. In a paper-making machine, the combination with a couch-roll, of a pair of arms in which the roll is journaled, a curved extension connected with each of the arms, a pair of vertically-arranged fluid-containing cylinders, one cylinder being positioned beneath each of the curved extensions, a ram in each cylinder, a pump mechanism in each cylinder, and means for operating each pump mechanism, substantially as described.

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

THOMAS H. SAVERY.

Witnesses:
VINCENT G. HAZARD,
WILLIAM H. SAVERY