(No Model.)

G. D. ROWELL.

PULP SCREEN MACHINE.

No. 457,013. Patented Aug. 4, 1891.

Fig. 1.

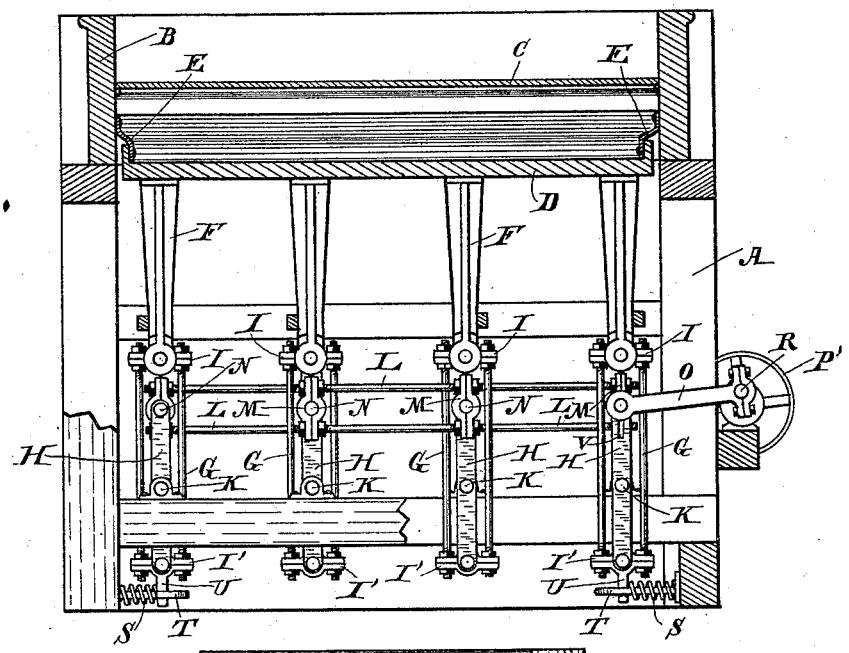
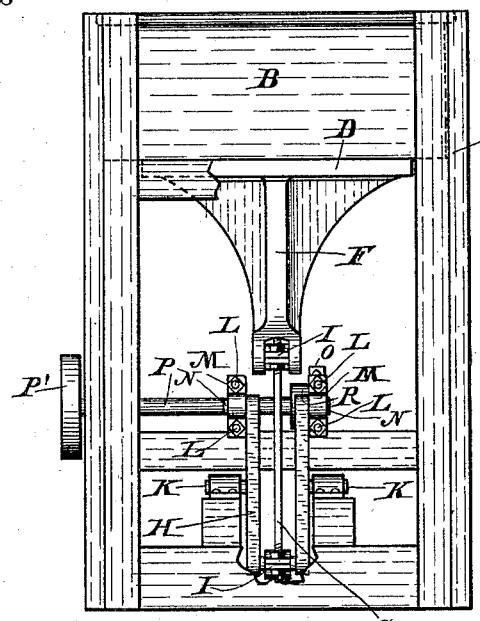


Fig. 2.



Witnesses.

C. F. Kinsey.

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Fig. 3.

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UNITED STATES PATENT OFFICE.

GUILFORD D. ROWELL, OF APPLETON, WISCONSIN.

PULP-SCREEN MACHINE.

SPECIFICATION forming part of Letters Patent No. 457,013, dated August 4, 1891.

Application filed July 19, 1890. Serial No. 359,259. (No model.)

To all whom it may concern:

Be it known that I, GUILFORD D. ROWELL, of Appleton, in the county of Outagamie and State of Wisconsin, have invented a new and useful Improvement in Pulp-Screen Machines, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

In pulp-screen machines a limited but very rapid vertical reciprocating movement is used for drawing the pulp through the screen, and it is very desirable to accomplish this rapid vertical reciprocating movement with the least possible shock to the machine.

My invention relates to the construction and arrangement of the machine and operative mechanism in such manner as to get great rapidity of movement with the minimum amount of shock.

My device is so constructed as to give two vertical movements of the screen-diaphragm or bellows by one revolution of the driving-shaft the mechanism for converting a rotary motion into vertical reciprocating motion being so contructed and arranged in harmony with the law of gravity as to get the oscillating and vertical movements of the mechanism by the least expenditure of power and with the minimum amount of shock.

In the drawings, Figure 1 is a side elevation of the complete device, parts being broken away and other parts being in section to show interior construction. Fig. 2 is an end elevation of the same device, parts being broken away to show other parts more clearly. Fig. 3 is a plan of a detail of the construction.

A is the frame of the machine.

B is a box or tank supported on the frame, which tank is adapted to receive and hold the water and pulp during the process of screening the pulp.

C is a screen supported removably in the tank at a distance above the bottom thereof. The bottom of the tank consists of a flat movable plate or diaphragm D, secured watertight and movably to the sides of the tank B by means of the flexible leather or rubber strip E. The diaphragm D is slightly smaller horizontally than the tank B, and is arranged to move freely vertically within the tank by means of the flexible connection thereto formed through the strip E. The tank is supplied with water and the pulp is placed on the screen C, and by the rapid vertical reciprocating movement of the diaphragm D the pulp is gradually drawn through the screen C downwardly.

To give the diaphragm D the desired vertical reciprocating movement, legs F F are secured to the under side of the diaphragm, and pitmen, each formed of two rods G G, are used to connect the legs F F with the lower ends of the vertically-suspended oscillating levers H H. These rods G G are in pairs and are connected together at their upper and lower extremities, respectively, by the pillow-blocks I and I′. In the upper of these blocks I I the legs F F are pivoted or journaled, and in the lower blocks I′ I′ connecting bolts or pins of the levers H H have journal-bearings. The levers H H are provided medially with trunnions K K, which have bearings in journal-blocks supported on the frame. The lever-arms are arranged in pairs, and the several pairs of levers are connected movably together above the trunnions by means of the connecting-rods L L, which are also arranged in pairs and are provided with pillow-blocks M M, in which pillow-blocks the upper extremities of the lever-arms are journaled by means of the gudgeons or short journals N N, integral therewith. By this means the levers are connected together, so as to have simultaneous and harmonious oscillating movement. The outer levers H at one end of the machine are connected at their upper ends by a pitman O to the driving-shaft P, the pitman being journaled on the wrist of an eccentric R on the driving-shaft P and on a pin in the lever H, which pin is made adjustable in the slot V toward and from the axis of the lever, whereby the length of the oscillation of the levers is adjusted. It will be seen that the rotary motion of the driving-shaft is communicated to the lever-arms in and by an oscillating movement, and that by each complete oscillation the diaphragm D is twice carried up and down vertically.

To steady the movement of the oscillating arms and to modify the shock of the constantly-reversing motion of the arms, springs S S are coiled about guides T T, which springs,

at their outer ends in opposite directions, respectively, bear against the frame, and at their inner ends toward each other bear against projections or studs U U, fixed on the pillow-blocks I′ I′. The guides T T are slotted or are made U-shaped, so as to receive therein studs U U, which swing therein. The driving-shaft is provided with a fixed pulley P′ for communicating motion to the driving-shaft. The double levers H H are so constructed and arranged that in their normal positions their pins, serving for journal-bearings for the pitmen G G, are suspended directly below the trunnions K K, on which the lever-arms oscillate. By this construction and arrangement the diaphragm D, when at rest, is at its lowest position supported on the pins of the lever-arms at their lowest position, and so that any movement of the arms either to right or left will at once raise the diaphragm, it being lowered by the swinging of the lever-arms by gravity or otherwise, back to their normal positions.

As my invention relates to the device for accomplishing the rapid vertical reciprocating movement of the pulp-screening mechanism, I do not wish to limit my claims on the operative mechanism by any particular form of pulp-screen mechanism, it being intended and adapted to be used either with a tank having a movable bottom or with a tank having a fixed bottom and a movable screen, or with any other pulp-screen mechanism to which it can be connected.

In my drawings and in the foregoing description I have illustrated and described pulp-screen mechanism having a tank with a movable bottom and a fixed screen merely for the purpose of showing one kind of pulp mechanism with which my devices can be used. My devices can, however, be used equally well with other forms of pulp-screen mechanism.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a pulp-screen machine, the combination, with a tank having a vertically-movable pulp-screening device, of legs fixed thereto, which legs at their lower ends are connected by pitmen to the lower ends of medially-suspended oscillating levers, and suitable means for oscillating the levers, substantially as described.

2. In a pulp-screen machine, the combination of lever-arms journaled medially on the frame of the machine, with pitmen connected at their lower ends to the lower extremities of the lever-arms and at their upper ends to a vertically-movable part of the pulp-screening mechanism, and means for connecting the several lever-arms together and oscillating them, substantially as described.

3. In a pulp-screen machine, the combination, with levers journaled medially on the frame and connected movably together, and pitmen connecting the lower arms of the levers to the vertically-movable part of the pulp-screening device, of a pitman connected to the upper arms of the levers, which pitman rides on an eccentric on the driving-shaft, substantially as described.

4. In a pulp-screen machine, the combination, with oscillating levers connected by pitmen with the vertically-moving part of the pulp-screen mechanism, of springs arranged to bear against the frame in opposite directions and to bear in reverse directions against the arms of the levers, whereby the motion of the oscillating levers is limited and controlled, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

GUILFORD D. ROWELL.

Witnesses:
JOHN BOTTENSEK,
B. H. MILLS.