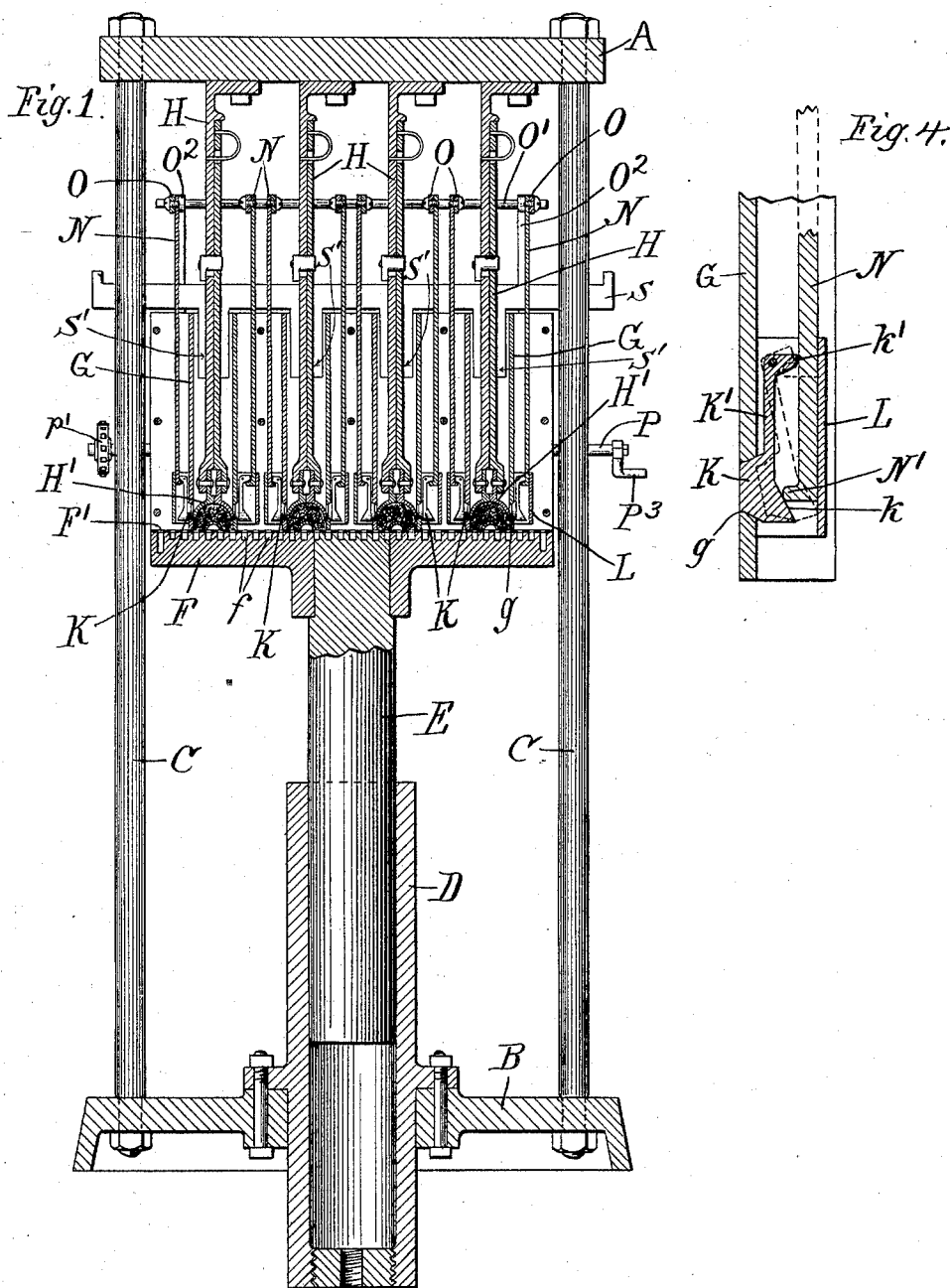


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PRESS FOR MAKING SPOOLS FROM FIBROUS PULP.

No. 524,680.

Patented Aug. 14, 1894.



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 J. A. Elliott.

Inventor  
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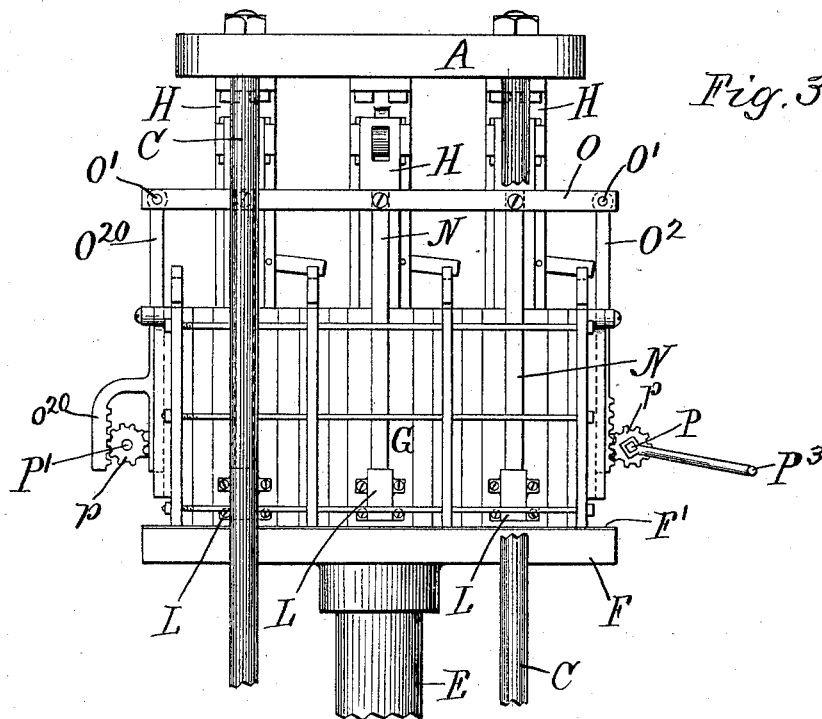


Fig. 3.

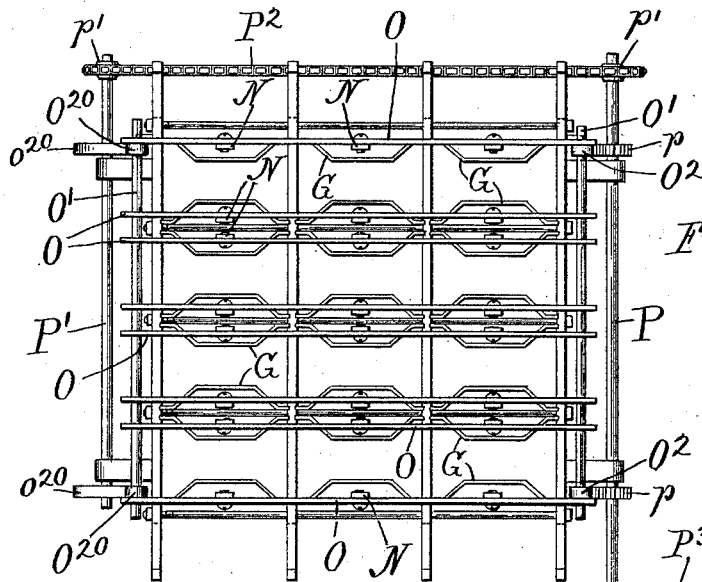


Fig. 2.

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# UNITED STATES PATENT OFFICE.

EBER HUBBARD, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE WILLIMANTIC  
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## PRESS FOR MAKING SPOOLS FROM FIBROUS PULP.

SPECIFICATION forming part of Letters Patent No. 524,680, dated August 14, 1894.

Application filed January 9, 1894. Serial No. 496,269. (No model.)

*To all whom it may concern:*

Be it known that I, EBER HUBBARD, a citizen of the United States, residing at Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Presses for Making Spools from Fibrous Pulp, which are fully set forth in the following specification, reference being had to the accompanying drawings, forming a part thereof.

This invention is an improvement in details of construction upon an invention for which my application, Serial No. 482,571, was filed in the United States Patent Office August 7, 1893.

In the drawings,—Figure 1 is a vertical section of a press having molds thereon to which my improvement is applied. Fig. 2 is a plan of the assemblage of molds on the press and valve-operating slide-bars pertaining to my invention and their connections, other parts of the press being omitted. Fig. 3 is a detail side elevation of a portion of the press with the molds on the bed showing the means for operating the drainage valves which constitute my invention, all portions of the press not necessary to show this feature being omitted or broken away. Fig. 4 is an enlarged detail section of one of my drainage valves and its operating slides partly broken away above its connection with the valve.

I will describe in general the character and mode of operation of the press, as it is more fully shown in my said application, Serial No. 482,571.

The top and bottom plates A and B, are bound together by vertical tie-rods or posts C C. The bottom plate supports a cylinder D in which the ram E reciprocates, the cylinder being adapted to admit water pressure at the lower end to operate the ram. The ram carries at its upper end a platform F, on which rest a plurality of molds in which half spools of fibrous pulp are designed to be formed. These molds comprise vertical walls G G, of a form in horizontal section or plan corresponding to the diametrical section of the half spool, the bottom of the mold being formed by the upper surface of the platform F, or of a perforated sheet F' which rests

thereon, the platform itself having furrows for the purpose of drainage.

To the cap or top plate A, there are secured the followers or stems H, to which, at the lower ends, are secured the pistons or followers H', which constitute respectively the upper walls of the mold cavities; and the mode of operation in the formation of the half spool in the mold, is, that the cavities are filled with liquid pulp which is poured or run in while the platform is at a low point, so that the space in the mold cavity below the pistons or followers H' is in depth several times the ultimately desired thickness of the half spool to be molded, and the cavities are accessible below the follower, and having been thus filled, the platform F is forced up by hydraulic pressure operating through the ram, the piston H' thereby relatively descending in the mold cavities, forcing out the water in the pulp and compacting the latter. The followers H' are themselves perforated so that the water passes out through them and stands above them in the mold cavities as they themselves descend therein. The manner in which the mold cavity becomes accessible for filling is not material; but they may be filled through gateways which are closed by the gates S' on the bar S, and opened by lifting the bars and gates thereon when the bed is low enough to leave the followers above the lower margin of the gateway.

The specific purpose of this invention is to provide suitable means for draining the water out of the space in the mold cavity above the piston or follower, so that the molded half spool may not be soaked again before it can be taken out of the mold cavity or off from the bed, as the machine is adapted to permit; the vertical walls of the mold cavities being arranged to be lifted off the bed for that purpose, as fully explained in my said patent application, Serial No. 482,571. The expedient shown for thus draining the mold cavity above the piston or follower consists in providing a drainage aperture g in the side walls G, at a point which will be passed by the lower edge of the follower H' as it descends, a little before its descent is complete, so that while the follower is completing its

descent a distance of perhaps a half an inch farther, and thus putting the last pressure onto the contents of the mold, the water may be draining off from the space above it and escaping through the drainage channels of the bed F. It involves also, of necessity, providing a valve which shall close this cavity until after the lower edge of the follower has thus passed it, since otherwise the entire pulp contents of the mold cavity would be liable to be forced out through the aperture while the follower is moving down to it and before it passes it. Such a valve, K, is provided, the aperture *g* being slightly tapered from the outer side toward the inner, and the valve being tapered to fit and to seat with its inner face flush with the inner wall of the mold, so that the piston or follower H', descending, passes the valve without colliding with it, and cleans its face as perfectly as it does the remainder of the wall of the mold. For the purpose of protecting and operating this valve, I provide, inclosing it on the outside, a shield or hood L, which is rigid with the mold wall G, and constitutes a vertical chamber open at the top and bottom about the valve with space enough for the valve to play, and affording a means of pivoting the valve. The valve is provided with a stem or handle K', and is pivoted to the side-walls of the chamber L, by the upper end of the handle, so that it hangs from its pivotal support in a position adapted to swing pendulumwise into and out of its seat in the aperture *g*; and normally, by the action of gravity, it will hang a little out of its seat. The back or outer face of the valve is inclined at *k*, and the upper end of the valve arm or handle is provided with a short arm *k'*, jutting off from the pivotal bearing outward, and for the purpose of operating the valve, a vertical slide N is provided, which bears against the wall of the chamber L, and has at its lower end a projection N' which bears against the inclined surface *k* on the back of the valve, and when the slide is depressed, crowds the valve into its seat. When the slide is lifted, this projection engages the short arm *k'* at the upper end of the valve handle, and swings the valve out of its seat. The slides N pertaining to all the molds in the press protrude above the mold walls G and are connected together, first, those in each row in one direction across the press being connected to bars O, and these bars extending beyond the molds at opposite sides of the press are connected by the cross-rods O', and to these cross-rods are connected vertical rack bars O<sup>2</sup> O<sup>20</sup>, which are suitably guided on the outer sides of the outer mold walls, so that they reciprocate vertically, and on said mold walls are journaled the shafts P and P', at opposite sides respectively, having pinions *p* engaging the racks on the rack-bars respectively, said shafts having at their rear ends sprocket wheels *p'* *p'* which are connected by a chain P<sup>2</sup>, the oppo-

site end of one of the shafts having the crank handle P<sup>3</sup>, by which it may be rotated.

It may be seen that the rotation of one of the shafts P, causing its pinions to engage the racks on that side, will also rotate the other shaft through the medium of the sprocket wheels and chain, and cause its pinions to engage the racks upon the other side, and so lift the gang of slides N equally and simultaneously. The operator will produce this movement by means of the crank handle P<sup>3</sup> at the proper time,—that is, when the bed and molds have been so far elevated that the followers H' have descended in the mold cavities past the apertures *g*.

The remainder of the process is the same as in my former application above-mentioned, the platform or bed F being dropped, and the side-walls of the mold being, by means not herein shown but fully set forth in my said former application, lifted from the bed enough to permit the spools to be taken off from it.

The difference between the form of the rack-bars O<sup>2</sup> and O<sup>20</sup> is such merely as to avoid the necessity of twisting the chain P<sup>2</sup> or otherwise reversing the rotation of the two shafts P and P', in order that the motion communicated from one shaft to the other shall give the same movement, either upward or downward, to the rack-bars on the two sides. The bars O<sup>2</sup>, having the racks engaging the inner side of the pinions and the bars O<sup>20</sup> necessarily engaging the outer side in order to have the same direction of motion, have the racks on the offset arms o<sup>20</sup>.

I claim—

1. In combination with the molds and the followers adapted to be advanced thereinto to compress the pulp contents, the lateral walls of the mold having the apertures *g* near the end toward which the followers advance in compressing the pulp, and the valves K adapted to seat in such aperture with the face flush with the inner wall of the mold when so seated: substantially as set forth.

2. In combination with the mold comprising the lateral walls and the perforated follower adapted to be advanced thereinto between such walls, the walls having the apertures *g* near the end toward which the followers advance; the valves K supported upon the outside of the molds and adapted to seat inwardly in said apertures with the face flush with the inner wall of the mold when seated.

3. In combination with the mold which comprises the lateral walls and the perforated follower adapted to be advanced into the mold between such walls, the walls having the aperture *g* near the end toward which the follower advances; the valve K hung pendulumwise on the outer side of the mold wall and adapted to swing in toward the aperture *g* and seat therein; the back of the valve having the inclined face *k*, and the slide *n* guided on the mold wall adapted to engage said incline *k* to

force and hold the valve seated: substantially as set forth.

4. In combination with the mold having the vertical side-walls, and the perforated fold 5 lower adapted to be advanced into the mold between the walls; side walls having the apertures *g* near the end toward which the follower advances; the valve *K* hung upon the outer side of the mold within the guard or chamber- 10 wall *L*, and having at the lower end the incline *k*, and at the upper end the projection *k'*; the slide *N*, guided on said outer guard or chamber wall *L*, and having the projection *N'*, which encounters the incline *k* when mov- 15 ing in one direction and the projection *k'* when moving in the other direction, to close and open the valve: substantially as set forth.

5. In combination with the press having a plurality of molds carried on its bed, the 20 molds having the drainage aperture *g*; the valves which close said aperture hung upon

the outer side of the molds, respectively; the slides *N* adapted to operate the valves and projecting up above the molds and connected together in rows in one direction across the 25 press, the bars which connect them being connected together by rods across the press in the other direction; rack-bars connected to said rods, and shafts journaled on the mold walls having pinions to engage said racks, and 30 suitable connection between such shafts by which the rotation of one rotates the other to lift the system of slides simultaneously and equally: substantially as set forth.

In testimony whereof I have hereunto set 35 my hand, at Chicago, Illinois, this 5th day of January, 1894, in the presence of two witnesses.

EBER HUBBARD.

Witnesses:

CHAS. S. BURTON,  
JEAN ELLIOTT.