

No. 711,041.

Patented Oct. 14, 1902.

J. A. DECKER.
PAPER PULP SCREEN.

(Application filed Aug. 11, 1899. Renewed Mar. 26, 1902.)

(No Model.)

Fig: 1.

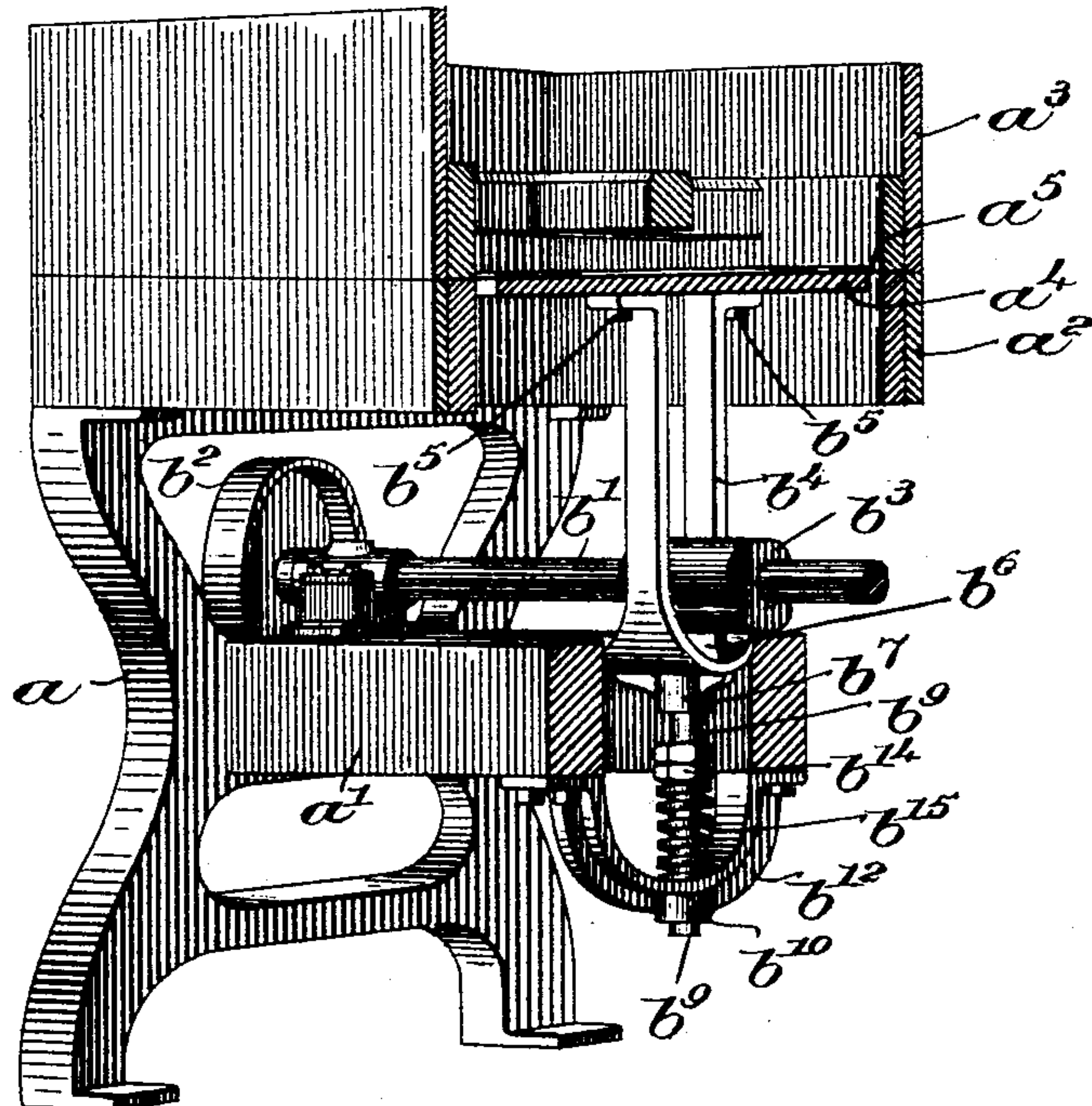
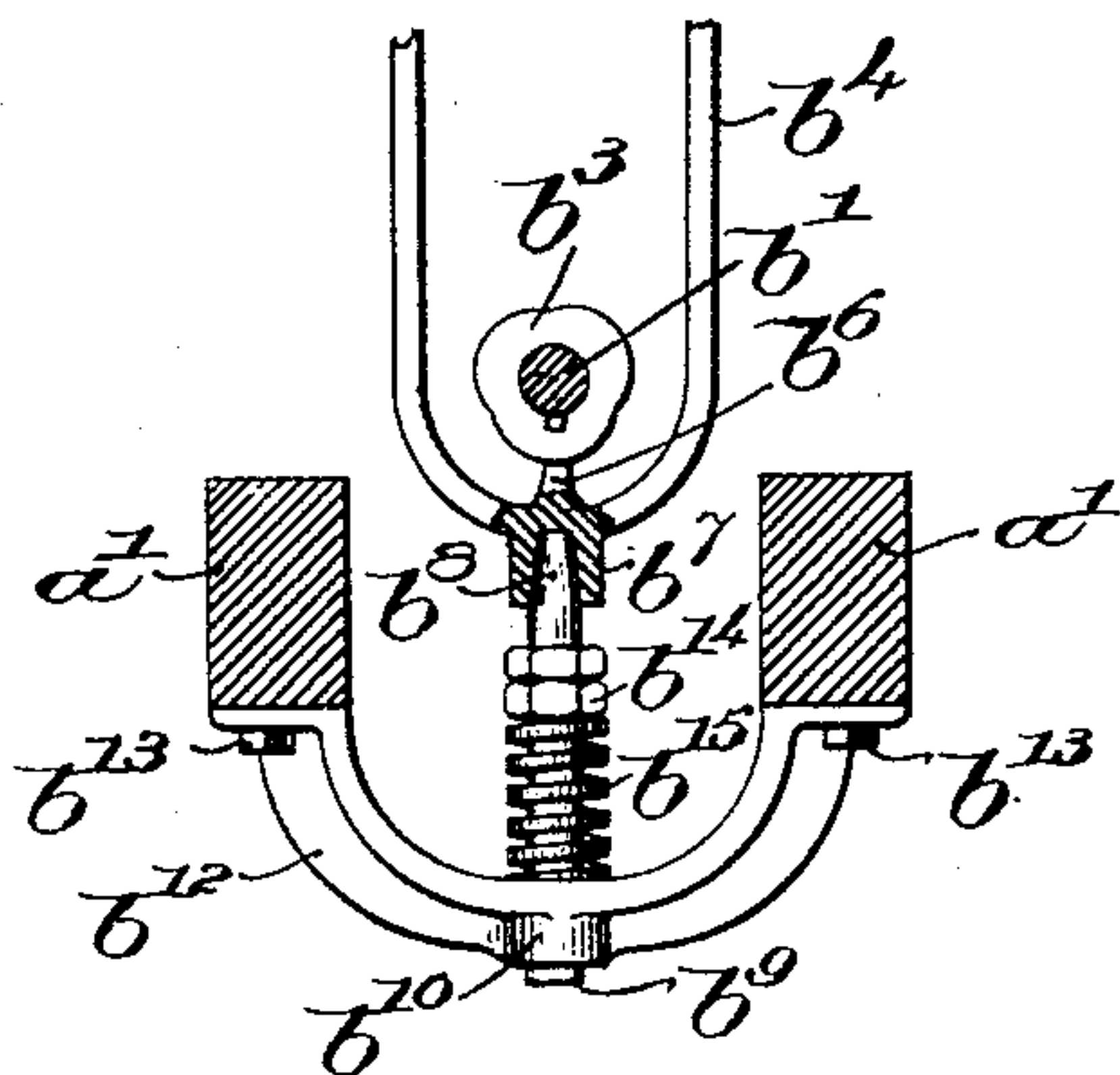


Fig: 2.



Witnesses,
Edward F. Allen.
Thomas Drummond.

Inventor;
John A. Decker;
by Crosby & Gregory
attys.

UNITED STATES PATENT OFFICE.

JOHN A. DECKER, OF MILLINOCKET, MAINE.

PAPER-PULP SCREEN.

SPECIFICATION forming part of Letters Patent No. 711,041, dated October 14, 1902.

Application filed August 11, 1899. Renewed March 26, 1902. Serial No. 100,031. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. DECKER, a citizen of the United States, residing at Millinocket, county of Penobscot, State of Maine, have invented an Improvement in Paper-Pulp Screens, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My invention is an improvement in screens used in paper-mills for screening the paper pulp or stuff; and it has for its object the provision of an improved supporting and lifting apparatus, whereby the output is increased and the power required is decreased.

The general form of screen herein shown and which I have improved by my invention has heretofore had the diaphragm-operating apparatus in the form of a plunger or piston resting on top of a lifting-cam and maintained in contact therewith by a spring acting downwardly. This construction, however, I have found to be extremely objectionable for the reason that the cam and cam-shaft not only are required to carry the weight of the pulp and of the diaphragm, but also to sustain the additional load due to the resiliency of the spring, the result being that the apparatus requires unwarranted amount of power to drive it and it is incapable of the rapid and efficient work which it should accomplish.

My invention overcomes the above-noted objections by providing a support for the diaphragm of the screen which receives all its positive motion downward instead of upward, as has been the case heretofore, and the result of this improvement is that the machine accomplishes from two to three times the amount of its previous output and requires very much less power to operate it. In my preferred construction the weight of the diaphragm and its load are counterbalanced by a spring or equivalent means supported on a hanger or bracket secured to a stationary part of the machine, the form of spring herein shown being a helical spring mounted on a plunger or piston reciprocating through the hanger mentioned vertically beneath the actuating-cam of the machine.

The further details of my invention and the various advantages thereof will be more fully

pointed out in the course of the following description, reference being had to the accompanying drawings, in which I have shown a preferred embodiment of my invention, and the latter will be more particularly defined in the appended claims, also forming a part of this specification.

In the drawings, Figure 1 is a sectional perspective view showing a sufficient portion of the screen to disclose the parts thereof which constitute my invention. Fig. 2 is a vertical transverse section thereof.

It will be understood that the support a , transverse beams a' , box a^2 , vat-frame a^3 , supporting-plate a^4 for the diaphragm a^5 , and other general details of the screen may be of any usual or preferred form and may be varied to any extent desired without departing from my invention, which, as herein shown and described, relates solely to the operating mechanism.

Suitably journaled in the frame of the machine is an operating-shaft b' , which may be driven by a pulley b^2 or in any other manner, and on this shaft at desired intervals, according to the size of the screen, I mount special cams b^3 .

Heretofore cams have been located similarly, as herein shown, and the lifting and lowering mechanism of the diaphragm has been supported on top of these cams, so that all the positive movement of the cams has been transmitted in an upward direction. In my invention, however, I depart entirely from this old method and secure a stirrup or other depending member b^4 to the diaphragm-plate a^4 by bolts or other means b^5 , said depending member being herein shown of a U-shape form (shown clearly in the drawings) and having at its inner lower side a toe-iron b^6 , bearing against the lower side of the cam b^3 . Beneath the toe-iron b^6 is a socket b^7 , which receives removably the upper end b^8 , herein shown as conical, of the piston or plunger b^9 , said plunger reciprocating at its lower end through a perforated boss b^{10} of a hanger b^{12} , secured at b^{13} to the frame of the machine, and between the boss b^{10} and a shoulder or nut b^{14} on the plunger is a spring b^{15} . It will be understood that this plunger may be of different shape and arrangement from that herein shown, although I prefer the construc-

tion shown and intend to cover the same in my more restricted claims. The cam contains three oval projections and three shallow or slight depressions, this form of cam having
5 been proved by me to give the best results for rapid work.

From the above explanation it will be seen that the cam b^3 instead of supporting all the weight, as heretofore, merely acts to give a
10 positive downward movement and does not carry any weight on its upper side whatever. The vacuum or suction of this kind of apparatus tends to hold the diaphragm up, and therefore for this reason also, as well as the
15 balanced-weight effect mentioned, the positive downward motion due to the actual depressing engagement or relation of the cam with the support b^4 is extremely advantageous. The spring b^{15} maintains the toe-iron
20 b^6 in constant engagement with the cam b^3 and tends to counterbalance the weight of the supported parts and the pulp or paper stuff being passed through the machine, and the construction is such that my apparatus will
25 pass through a much larger quantity of stuff, even of slow-cooked sulfite, than the old construction of machine, and it will do this with only a fraction of the power previously required. Moreover, machines constructed
30 thus last longer, are less liable to get out of order, and are more easily repaired.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

35 1. In a paper-screen, an operating-shaft, a cam thereon, and a depending, U-shape member embracing said cam and entirely out of engagement with the upper side of said cam and having a toe part in constant engagement
40 with the bottom side of the cam, substantially as described.

2. In a paper-screen, an operating-shaft, a

cam thereon, said cam having three oval projections and three slight depressions for giving rapid and short vibrations, and a depending member for agitating the screen, said
45 member engaging said cam at the under side thereof only, whereby a positive downward movement is obtained, and a plunger depending from said member, the free end of said
50 plunger being guided in a stationary part of the machine and being held yieldingly upward, substantially as described.

3. In a paper-screen, an operating-shaft, a cam thereon, and a depending member for
55 agitating the screen, said member engaging said cam at the under side thereof, a tapering socket in the under side of said depending member, a plunger removably fitting in said socket and guided in a stationary part
60 of the frame, and a spring normally holding said plunger under an upward pressure, substantially as described.

4. A paper-screen having a vertically-movable diaphragm, and mechanism for agitating
65 said diaphragm with a rapid, gentle and truly vertical movement, said mechanism including a rotary shaft having a cam approximating a cylindrical shape by having its projections and depressions shallow or slight and
70 formed in smooth and gentle curves, combined with an engaging member depending from the screen in engagement with the under side of said cam, and having means holding said member constantly against said cam-
75 surface.

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

JOHN A. DECKER.

Witnesses:

GEO. H. MAXWELL,
GEO. W. GREGORY.