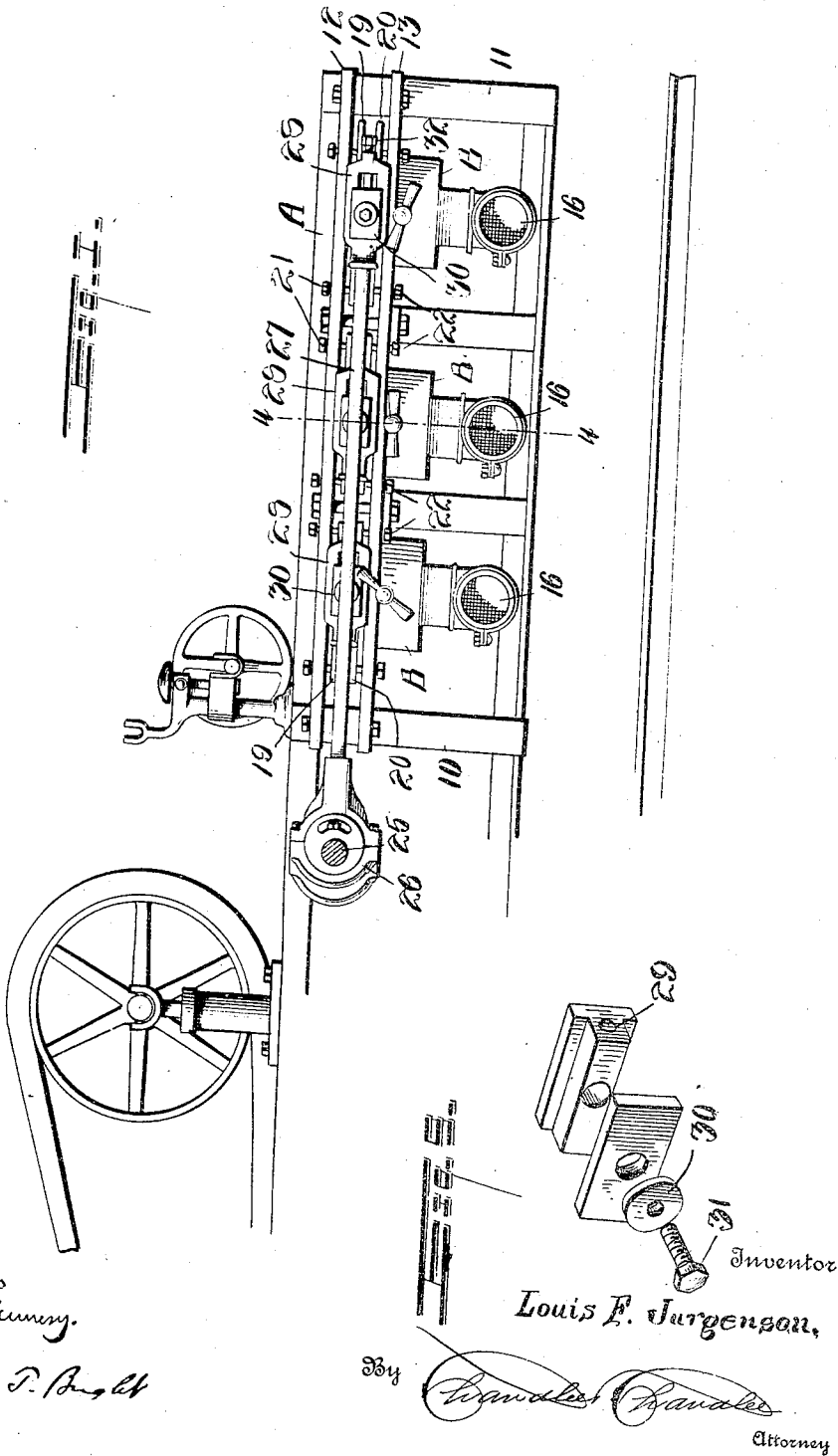


977,654.

L. F. JURGENSON.
PAPER MAKING MACHINE.
APPLICATION FILED FEB. 18, 1910.

Patented Dec. 6, 1910.
3 SHEETS—SHEET 1.



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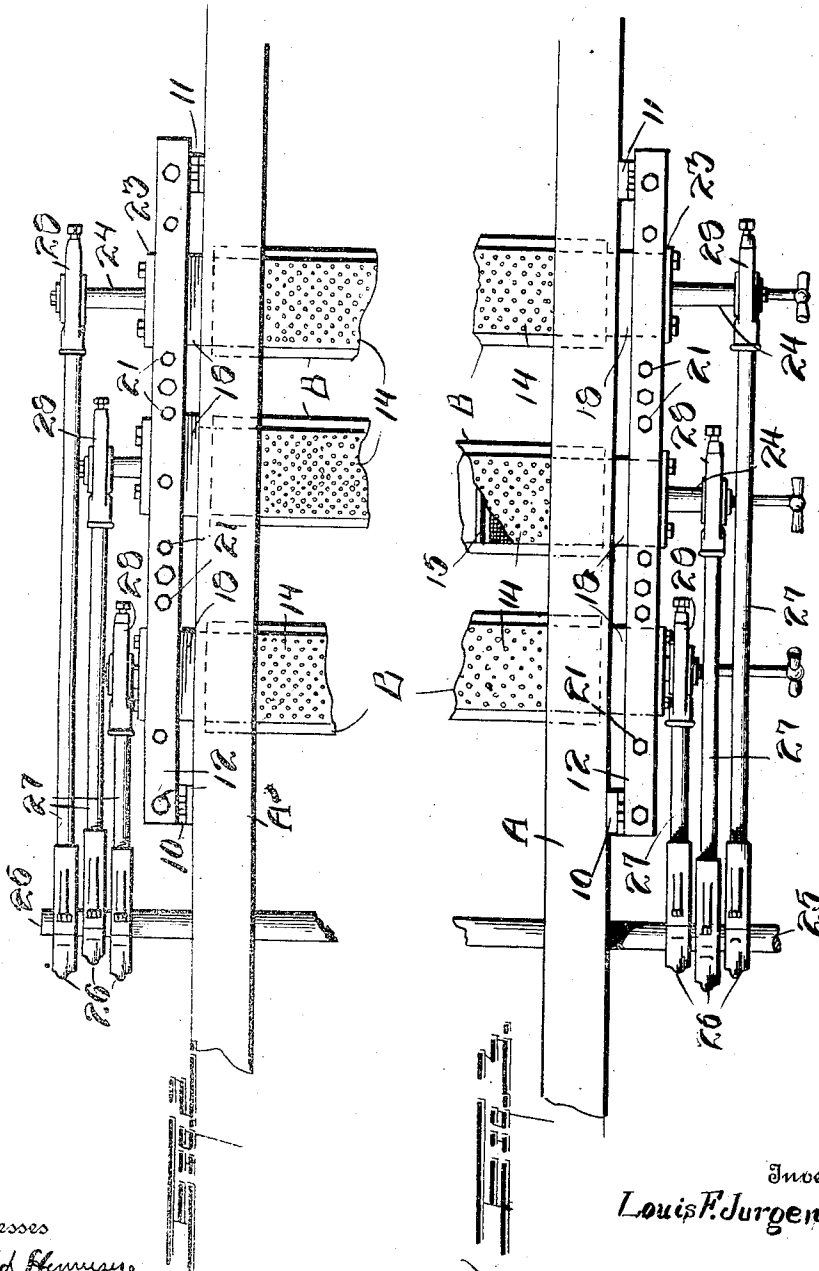
334
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3 SHEETS-SHEET 2.



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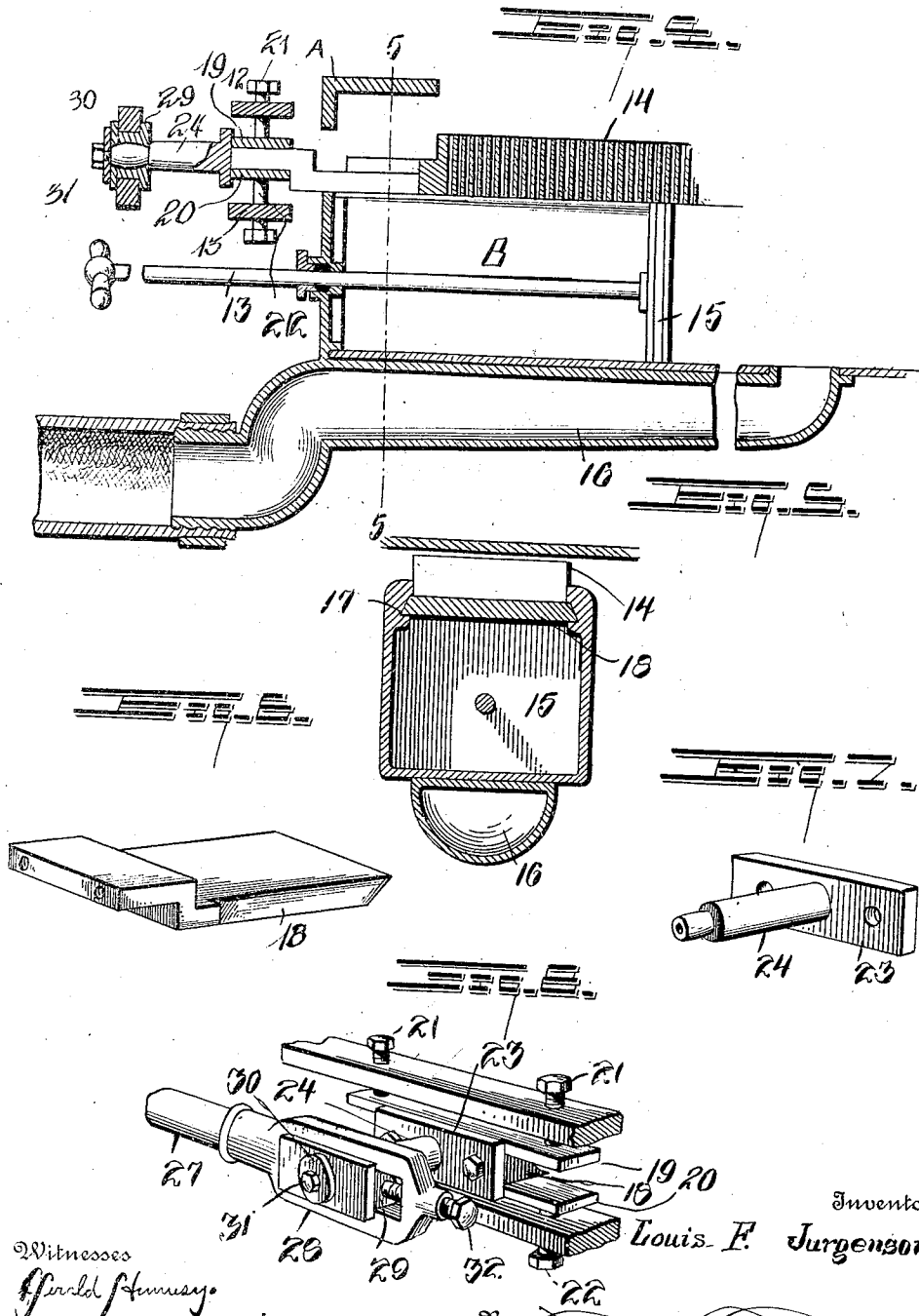
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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PAPER-MAKING MACHINE.

977,654.

Specification of Letters Patent.

Patented Dec. 6, 1910.

Application filed February 18, 1910. Serial No. 544,622.

To all whom it may concern:

Be it known that I, LOUIS F. JURGENSON, a citizen of the United States, residing at Grand Rapids, in the county of Itasca, State of Minnesota, have invented certain new and useful Improvements in Paper-Making Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to paper making machines.

The object of the invention resides in the production of new and improved means for imparting a reciprocatory movement to the suction apparatus utilized in machines of this character for extracting moisture from the pulp formed on any suitable screen, such as Fourdrinier wire.

A further object of the invention resides in the production of improved means for shifting the location of the path of travel traversed by the suction boxes during their reciprocation.

To these ends suitable guides are disposed on each side of the framework of the machine and one or more suction boxes are mounted on said guides in such manner as to permit them to be moved backward and forward in a direction longitudinally of the movement of the forming screen. The mechanism for imparting a reciprocatory movement to each suction box comprises a rotatable shaft disposed transversely of the machine and suitably connected to each end of the box in such manner that the rotary movement of the shaft will produce a reciprocatory movement of the box to which it is connected.

With the above and other objects in view the invention consists in the details of construction and in the arrangement and combination of parts to be hereinafter more fully set forth and claimed.

In describing the invention in detail reference will be had to the accompanying drawings in which like characters of reference denote corresponding parts in the several views; and in which,

Figure 1 is a side elevation of a portion of a paper making machine in which the invention is embodied; Fig. 2, a fragmental top plan view showing the connections between one side of the suction box and the rotatable shaft through the instrumentality

of which said suction boxes are reciprocated; Fig. 3, a view similar to Fig. 2, showing the connections between the rotatable shaft and the opposite ends of the suction boxes; said suction boxes being shown in a position occupied in their reciprocation opposite to that occupied by the suction boxes shown in Fig. 2; Fig. 4, an enlarged partial transverse section on the line 4-4 of Fig. 1; Fig. 5, a section on the line 5-5 of Fig. 4; Fig. 6, a detail perspective view of one of the supporting plates of the suction boxes; Fig. 7, a detail perspective view of the connecting pin which is attached to each of the supporting plates; Fig. 8, a detail perspective view showing the connection between one end of a suction box and the rod which is carried by an eccentric mounted on the rotatable shaft; and, Fig. 9, a detail perspective view of certain parts of the connection between the suction boxes and the rotatable shaft.

Before proceeding with a detail description of the various parts of the invention it will be noted that as the connections between the rotatable shaft and the opposite ends of the suction boxes are identical in every respect reference will only be made to the connections between the rotatable shaft and the ends of the suction boxes on one side of the machine; corresponding parts on the opposite side of the machine herein illustrated being designated by the same reference characters as those parts which are referred to in detail.

The suction apparatus of the machine is mounted in a suitable frame A which is supported upon the usual pedestals. The usual screen upon which the pulp is deposited travels over the top of the frame A. Mounted on the sides of the frame A are the vertical brackets 10 and 11 which support the longitudinally disposed guide rails 12 and 13. Any desired number of suction boxes may be used in the type of apparatus illustrated, the machine shown in the drawings accommodating three boxes designated by B. These suction boxes may be of any desired construction, each of those illustrated being identical and having a perforated suction plate 14 which forms the top of the boxes, and stops 15, by which the active surface of the suction plates 14 may be varied. A suction pipe 16 communicates with the interior of the suction box B and is connected with a suitable suction apparatus. The ver-

tical side members of the suction boxes B are provided on their inner faces at their upper ends with corresponding grooves 17 and 18 which are adapted to receive suitable projecting portions on the longitudinal edges of the suction plate 14 whereby said plate is adjustably connected to the side members of the suction box and constitutes a cover or a top for the latter. The length of the suction plate 14 is somewhat less than the entire length of the sides of the suction boxes so that when said suction plate is moved to its proper position the terminals thereof will lie inward a short distance of the terminals of the sides of the suction boxes. Each of the suction boxes B is supported between guide rails 12 and 13 through the medium of supporting plates 18 formed of two disaligned horizontal portions one of which is inserted in the grooves of the sides of the box which carry the suction plate and the other passes between the guide rails 12 and 13. Disposed above and below the portion of the supporting plate 18 which extends between the guide rails 12 and 13 are suitable shims 19 and 20 constructed preferably of brass, which are adapted to be moved up and down through the medium of suitable cap screws 21 and 22 projecting through both of the guide rails 12 and 13 and extending inwardly thereof, into contact with said shims, the actuation of said cap screws enabling the suction boxes to be leveled up when desired. Secured to the outer end of the supporting plate 18 is another plate 23 which has projecting laterally therefrom a connecting pin 24, the outer end of which is of substantially oval formation for a purpose to be presently described.

Extending transversely of the frame of the machine and journaled in suitable brackets secured thereto is a rotatable shaft 25 which is operatively connected with the bottom coupler shaft of the machine. Mounted upon the shaft 25 are a plurality of eccentrics 26 corresponding in number to the number of suction boxes present in the machine. These eccentrics 26 each have extending rearwardly therefrom and connected thereto a rod 27 provided with a slotted end member 28. Mounted for longitudinal movement in the slot of the end member 28 is a head 29 which is secured to the outer end of the connecting pin 24 through the medium of a cap 30 and a pin 31 which penetrates said cap and extends longitudinally into said connecting pin. The oval formation of the end of said pin permitting sufficient play between said pin and head as they are moved in unison. In order to vary the position of the head 29 in the slot at the end of the rod 27 a relatively long threaded bolt 32 penetrates the end of said rod and extends longitudinally into said slot; said bolt having a threaded engagement with the end will ad-

vance said bolt into and out of the slot into which it projects. The end of the bolt 32 which projects into the slot at the end of the rod has a non-detachable connection with the head 29 so that when said bolt is turned in one direction the head will be drawn away from the eccentrics 26, and moved toward said eccentrics when said bolt is rotated in the opposite direction, thus providing means for shifting the location of the path of travel traversed by any one of the suction boxes during their reciprocation.

From the foregoing description it will be apparent that during the operation of the machine and rotation of the shaft 26 the suction boxes B will be reciprocated bodily in a direction parallel to the longitudinal axis of the forming screen, while the eccentrics 27 which are of an adjustable type will permit the time at which any one suction box is reciprocated to be varied. Likewise it will be apparent that as the connections between the shaft 26 at opposite ends of any one suction box are identical; both ends of said box will be moved in precisely the same manner at precisely the same time and thereby effect a bodily reciprocation of the box in a direction parallel to the longitudinal axis of the forming screen.

While the shaft 25 has been shown as connected directly with each suction box so as to effect a movement of the entire box, it will be noted that in lieu thereof said shaft could be connected directly with the suction plate and effect only a reciprocation of the latter, and thereby avoid the necessity of moving the entire suction box.

What is claimed is:--

1. In a paper making machine, the combination with a traveling web, of suction apparatus mounted beneath the web, and means for causing a relative movement between the web and the suction apparatus in a direction longitudinal of the direction of movement of the web.

2. In a paper making machine, the combination with a traveling web, of suction apparatus mounted beneath the web, a rotatable shaft, and connections between said rotatable shaft and suction apparatus for effecting a reciprocation of said suction apparatus in a direction longitudinal of the direction of movement of the web during the rotation of said shaft.

3. In a paper making machine, the combination with a traveling web, of suction apparatus mounted beneath the web and comprising a plurality of corresponding elements and means for simultaneously effecting the reciprocation of adjacent elements of the suction apparatus in opposite directions and longitudinally of the direction of movement of the web.

4. In a paper making machine, the combination with a traveling web, of suction ap-

paratus mounted beneath the web, means for imparting a reciprocating motion to the suction apparatus longitudinally of the direction of movement of the web; and means for shifting the location of the path of travel traversed by the suction apparatus during its reciprocation.

5 5. In a paper making machine, the combination with a traveling web, of suction apparatus mounted beneath the web and comprising a plurality of corresponding elements, means for imparting a reciprocating motion to each of said elements longitudinally of the direction of movement of the web; and means for shifting the path of travel traversed by each element during its reciprocation.

10 6. In a paper making machine, the combination with a traveling web, of suction apparatus mounted beneath the web, said apparatus being arranged for a reciprocatory movement longitudinally of the direction of movement of the web.

15 7. In a paper making machine, the combination of a frame, a traveling web carried by said frame, guide rails mounted on the opposite sides of said frame, a suction apparatus supported by said guide rails and disposed beneath the web, and means for imparting a reciprocating motion to the suction apparatus longitudinally of the direction of movement of the web.

20 8. In a paper making machine, the combination with a frame, of a traveling web carried by the frame, guide rails mounted on opposite sides of the frame, a plurality of suction boxes supported by said guide rails and disposed beneath the traveling web, a rotatable shaft, and connections between said rotatable shaft and each of said suction boxes, whereby the rotation of said shaft will

effect a reciprocation of each of said suction boxes longitudinally of the direction of movement of the web.

9. In a paper making machine, the combination of a frame, a traveling web carried by the frame, guide rails mounted on opposite sides of the frame, a plurality of suction boxes supported by said guide rails and disposed beneath the traveling web, a rotatable shaft, and eccentric connections between the ends of each suction box and the shaft whereby the rotation of said shaft will effect a reciprocation of said suction boxes longitudinally of the direction of movement of the web.

10. In a paper making machine, the combination of a frame, of a traveling web carried by the frame, guide rails mounted on opposite sides of the frame, a plurality of suction boxes supported by said guide rails and disposed beneath the traveling web, a rotatable shaft disposed transversely of the web, eccentric arms connecting the ends of each suction box with a rotatable shaft and means for adjusting the connection between each suction box and eccentric arm longitudinally of said arm.

11. In a paper making machine, the combination with a traveling web, of suction apparatus mounted beneath the web and comprising a plurality of corresponding elements, and means to impart a reciprocating motion to said elements so that each element moves laterally toward and away from the next adjacent element.

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

LOUIS F. JURGENSON.

Witnesses:

C. EAIKEN,

E. A. McMAHON.