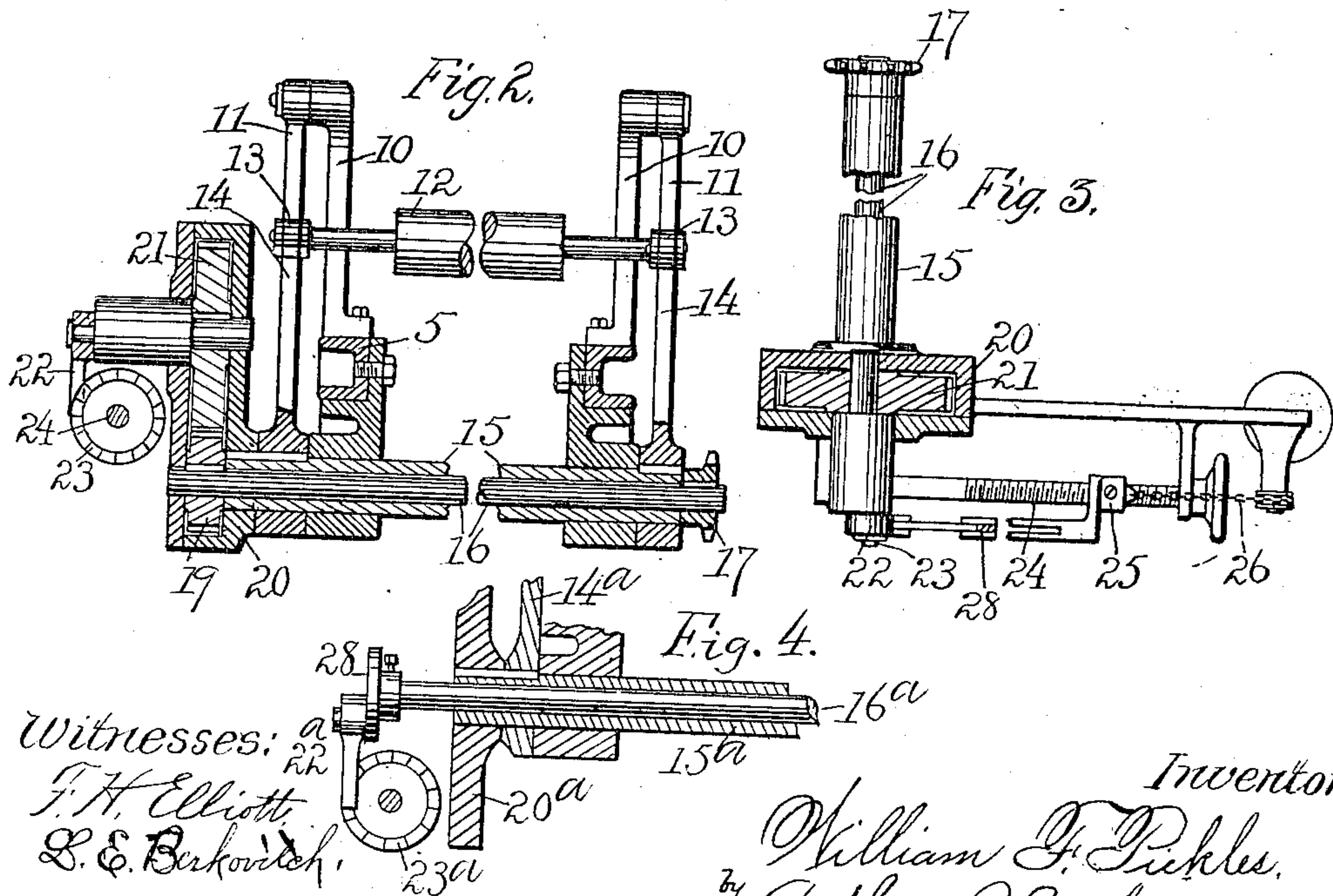
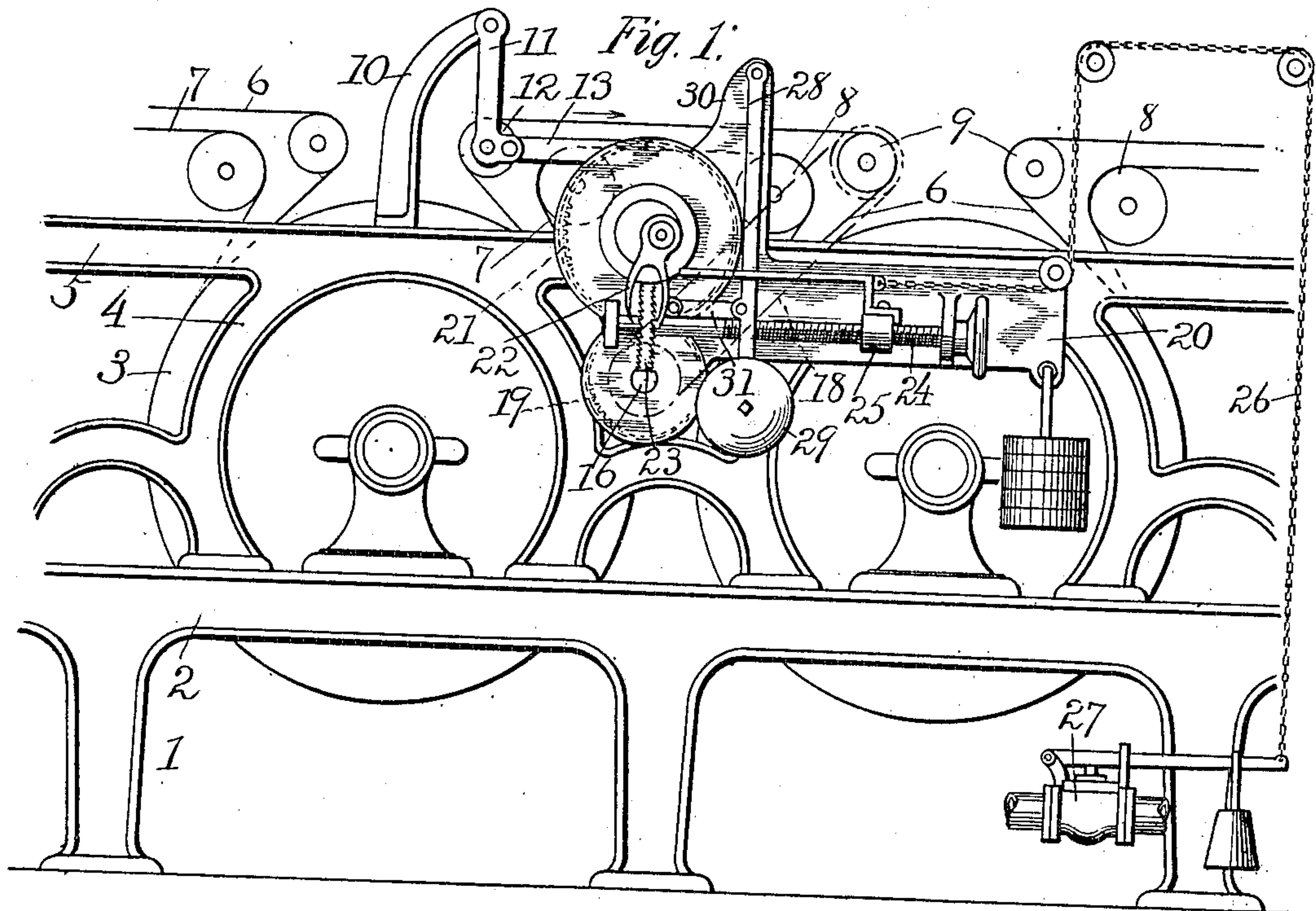


No. 825,612.

PATENTED JULY 10, 1906.

W. F. PICKLES.
PAPER MAKING MACHINE.
APPLICATION FILED JAN. 26, 1906.



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UNITED STATES PATENT OFFICE.

WILLIAM F. PICKLES, OF BUCKLAND, CONNECTICUT.

PAPER-MAKING MACHINE.

No. 825,612.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM F. PICKLES, a citizen of the United States, and a resident of Buckland, in the county of Hartford and State of Connecticut, have invented a new and useful Improvement Relating to Paper-Making Machines, of which the following is a specification.

My invention relates more especially to that class of paper-making machines in which a web is formed from pulp in a wet state, this web being carried, to an extent at least, by an apron and passed around heated cylinders for the purpose of drying the web; and my invention is especially adapted for use in such a machine in which the drying-cylinders are arranged in a single row.

The object of my invention is to provide a machine of the character last described with means for controlling the supply of heat to the cylinders so that the paper or web shall be uniformly and evenly dried as it passes about the cylinders and through the machine; and a further object of the invention is to utilize to a great extent the parts regularly forming a paper-making machine. A form of device in the use of which these objects may be attained is illustrated in the accompanying drawings, in which—

Figure 1 is a view in side elevation of a portion of a paper-making machine, showing my improvement applied thereto. Fig. 2 is a detail view with parts broken away and looking in a direction endwise of the machine, showing the means for attaching my improvement. Fig. 3 is a detail top or plan view of the regulator with parts broken away to show construction. Fig. 4 is a detail view showing a modified form of the invention.

My present invention is for the purpose of enabling a regulator to be produced with the fewest number of parts and to utilize the regular web-rolls of the machine in carrying out my invention. The regulator itself, independent of this roll except in combination with other devices, forms no part of my present invention. It forms the subject-matter of a pending application filed by me July 24, 1905, of Serial No. 271,117, and to which reference is hereby made. In devices of this class prior to the present invention and including the device of my pending application above referred to, a separate roll has been employed for the purpose of operating the

regulator, this roll, in fact, forming a portion of the regulator. This form of construction is not readily adapted for attachment to all forms of paper-making machines, and in an endeavor to adapt the regulator to different forms of machine I have demonstrated that the regular web-rolls forming a part of the paper-making machine may be employed in place of the additional roll which has heretofore been supplied.

In the accompanying drawings I have illustrated a paper-making machine of peculiar construction in connection with which a device embodying my invention is used, and in these drawings the machine includes a frame mounted on legs or supports 1 and having a supporting-rail 2 extending lengthwise of the machine, the legs being disposed at suitable intervals along this rail. It will of course be understood that this frame includes a part located at each side of the machine, the drying-cylinders 3 being supported in suitable bearings on the frame. It will also be understood that heat is applied to the cylinders in a manner well known to machines of this class. Arches 4 are mounted on the rail 2, an arch being usually provided appurtenant to each drying-cylinder, and on these arches a top rail 5 is located, the frame being adapted for supporting the various web and apron supporting rolls to cause proper travel of the web of paper through the machine.

The exact manner of mounting the web and apron supporting rolls, with the exception hereinafter named, has not been shown, for the reason that this is well known to those skilled in the art, the views being somewhat diagrammatic in this respect. The web and apron supporting rolls appurtenant to a pair of cylinders only has been shown herein, as this will be sufficient for a complete and thorough understanding of the application of the invention.

The web of paper 6 is carried through the machine, this web being carried by the apron 7 and passing between said apron and the cylinder, by means of which it is dried. The apron 7 is carried about the cylinders, passing over apron-supporting rolls 8, located above the line of support of the several cylinders, the apron passing from one apron-supporting roll about the cylinder and upward to the next apron-supporting roll, then over a second apron-supporting roll, and then

downward again about the next cylinder, and so on. The web of paper 6 passes from a web-supporting roll 9, these web-supporting rolls being preferably located above the apron-supporting rolls, downward between the apron and the cylinder, and then upward to the next web-supporting roll, over this roll and a succeeding roll, and then downward between the apron and the next drying-cylinder, and so on. It will be noted that the web of paper passes clear of the apron and the drying-cylinder at a certain point and travels separately about the web-supporting rolls located above the apron-rolls to a point where it again enters between the apron and a drying-cylinder.

The parts above described are of well-known construction, the several rolls being stationary so far as the bearings are concerned, or at least the bearings being movable for purposes of adjustment only.

Devices have heretofore been provided, as shown by my copending application above mentioned, for utilizing the tension on the web of paper as a means of controlling the supply of heat to the cylinders. In all prior devices, however, so far as I am aware, it has been necessary to employ a roll in addition to the regular complement of rolls for the machine, this additional roll being acted upon by the tension of the web of paper and through means connected with said roll to control the supply of heat to the cylinders. I have found it possible to dispense with this additional roll and to utilize one of the web-supporting rolls constituting the regular complement of the machine as a means for operating the devices for regulating the supply of heat to the cylinders. In carrying out my invention a bracket 10 is secured to the top rail 5 on each side of the machine and appurtenant to one of the cylinders 3. This bracket projects upward and is of proper length for the purposes in hand. A swinging web-roll support 11 is pivoted to the bracket 10, one end or the support preferably being pivoted to the end of the bracket. It will be understood that there is a support 11 appurtenant to each bracket on each side of the frame, the supports sustaining each end of a movable web-roll 12. By the term "web-roll" as used in the specification and claims herein is meant a web-roll forming the regular complement of the machine, and not a roll which may be attached to the machine and on which the web acts for purposes other than that of conveying the web through the machine. In carrying out my invention I have provided this movable web-roll 12 in place of a fixed roll, as heretofore employed in a regularly-equipped machine of this class. Links 13 extend from the web-roll supports, to which they are pivoted, to arms 14. These arms 14 are secured to a hollow rock-

shaft 15, mounted at each end in the frame of the machine, so that the shaft may be rocked in the swinging movement of the arms.

A shaft 16 extends through the hollow rock-shaft 15, a sprocket-wheel or like part 17 being secured to one end of this shaft. A chain or belt 18 passes from a sprocket-wheel or the like, secured to the shaft of the roll 9 to the sprocket 17. On the opposite end of the shaft 16 a gear 19 is secured. This gear 19 forms one part of the device described in my above-mentioned application, which may be briefly set forth as consisting of a pivoted frame 20, on which is mounted a gear 21, bearing an eccentrically-mounted double-toothed pawl 22, adapted to engage the oppositely-disposed teeth on a ratchet 23, secured to a screw-shaft 24, bearing a nut 25, connected with a cord 26 for operating the valve 27 to supply heat to the cylinders. A counterpoise-lever 28, carrying a counterpoise 29, is pivoted to a counterpoise-support 30, and this lever has a link 31 connecting said lever with the pawl 22.

It will be noted that if the frame 20 is swung on its pivot through the swinging movement of the roll 12 caused by the tension of the web 6, that one or the other of the arms of the pawl 22 will be brought into engagement with the teeth of the ratchet-wheel, rotating the shaft to operate the valve 27. If, however, the proper tension of the web is preserved, the pawls will not come in contact with the teeth of the ratchet-wheel. In carrying out this part of my invention I secure the frame 20 to the hollow rock-shaft 15, this frame and the arm 14 being preferably keyed to the shaft, as shown in Fig. 2 of the drawings.

In the operation of the device should the web of the paper as it passes through that part of the machine at which my regulator is located be too dry the tension on the web would be increased, with the result that the roll 12 would be moved toward its companion roll 9. This would cause the frame 20, through the action of the link 13, arm 14, and rock-shaft 15, to be swung downward, carrying the counterpoise 29 to the right. This would cause a tooth on the left-hand side of the pawl to engage the ratchet-teeth on that side of the ratchet-wheel 23 rotating the screw-shaft 24, which, having a left-hand thread, would carry the nut 25 to the right, closing the valve 27 and cutting off the supply to the cylinder. Should the web of paper at this point be too moist, a reverse action of the parts to that above described would result, with the effect of closing the valve 27.

In the modified form of the invention as shown in Fig. 4 of the drawings the gears for actuating the eccentrically-mounted pawl can be dispensed with, and the shaft 16 has

secured to its outer end a disk 28, on which the pawl 22^a is directly mounted. When this form of construction is used, the required speed is obtained by a proper disposition of the sprocket-wheel or pulleys at the opposite end of the shaft 16^a and of the roll 9. In this form of the device the arms 14^a and frame 20^a are secured to the hollow shaft 15^a, the ratchet-wheel 23^a being mounted on the frame 20, as hereinbefore described.

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

1. In a paper-making machine, including drying-cylinders, means for supplying heat to the cylinders, and means for controlling said heat-supply, a web-roll movably supported on the frame of the machine, a regulator including parts at times disconnected from but timely connected up to operate the heat-supply control, and connections between the regulator and movable web-roll for causing the parts to operate the heat-supply control.

2. In a paper-making machine, including drying-cylinders, means for supplying heat thereto, and means for controlling said supply, a web-supporting roll mounted on a swinging supporting-frame, a regulator including parts at times disconnected from but timely connected up to operate the heat-supply control, and connections between said swinging supporting-frame and regulator for causing the parts to operate the heat-supply control.

3. In a paper-making machine, including drying-cylinders, means for supplying heat thereto and means for controlling the heat-supply, a web-supporting roll movably mounted on the frame of the machine, a regulator-frame pivoted to the machine-frame, regulator parts mounted on the regulator-frame and at times disconnected from but timely connected up to operate the heat-supply control, and connections between the web-supporting frame and regulator-frame for causing the regulator to operate the heat-supply control.

4. In a paper-making machine, including drying-cylinders, means for supplying heat thereto and means for controlling said heat-supply, a web-supporting roll mounted in a swinging supporting-frame, a regulator including a pivoted frame, parts mounted on the regulator-frame at times disconnected from but timely connected up to operate the heat-supply controller, and connections between the web-roll-supporting frame and the regulator-frame for operatively connecting the regulator to operate the heat-supply-controlling means.

5. In a paper-making machine including cylinders, means for supplying heat thereto and means for controlling said heat-supply, a swinging web-supporting frame suspended

from the machine-frame, a web-supporting roll mounted at each end in its frame, a regulator including parts at times disconnected from but timely connected up to operate the heat-supply control, and connections between said regulator and the swinging web-supporting frame for causing operative connection of the regulator to operate the heat-supply controlling means.

6. In a paper-making machine including cylinders, means for supplying heat thereto, and means for controlling the heat-supply, a regulator including movable parts at times disconnected from but timely connected up to operate the heat-supply controller, connections between said movable parts and a web-roll for operating the former, a web-supporting roll movably mounted on the frame of the machine, and connections between said web-supporting roll and the regulator to connect said movable parts to operate the heat-supply control.

7. In a paper-making machine including drying-cylinders, means for supplying heat thereto, and means for controlling the heat-supply, a regulator operatively connected with the heat-supply-controlling means, said regulator including a rotating part, a shaft connected to drive said rotating part, a web-supporting roll, a swinging frame carrying said web-supporting roll, connections between the frame and regulator to primarily operate the latter, and connections between a web-roll and the shaft for operating the rotating part of said regulator.

8. In a paper-making machine including drying-cylinders, means for supplying heat thereto, and means for controlling the heat-supply, a hollow shaft mounted in the frame of the machine, a shaft mounted to rotate in the hollow shaft, a disk secured to the shaft, connections between an operative part of the machine and said shaft to rotate the disk, a pawl eccentrically mounted on the disk, said pawl forming a part of a regulator for controlling the heat-supply, and the other parts completing the regulator.

9. In a paper-making machine including drying-cylinders, means for supplying heat thereto, and means for controlling the heat-supply, a web-roll movably mounted in the frame of the machine, a hollow rock-shaft mounted in the frame of the machine and connected with the movable web-roll, a rotating shaft mounted in said hollow shaft, the frame of a regulator secured to said hollow shaft, a disk mounted on the rotating shaft, a pawl forming part of the regulator mechanism eccentrically mounted on said disk, and the other parts making up a regulator as a whole.

10. In a paper-making machine including drying-cylinders, means for supplying heat thereto, and means for controlling the heat-

supply, a regulator-frame movably mounted
on the machine-frame, movable parts mount-
ed on the regulator-frame and at times dis-
connected from but timely connected up to
5 operate the heat-supply control, connections
between said movable parts and a web-sup-
porting roll, a web-supporting roll movably
mounted on the machine-frame, and connec-

tions between said movable roll and the regu-
lator-frame to cause the movable parts on the 10
latter to be connected with the heat-supply
control.

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