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W. F. PICKLES.

REGULATOR FOR PAPER MAKING MACHINES.

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Fig. 2.

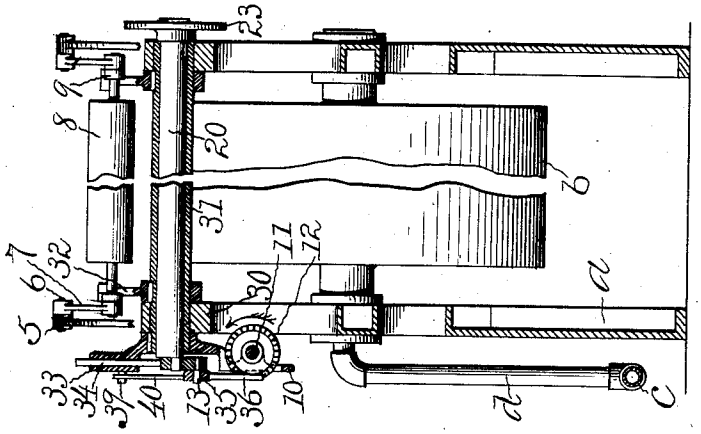
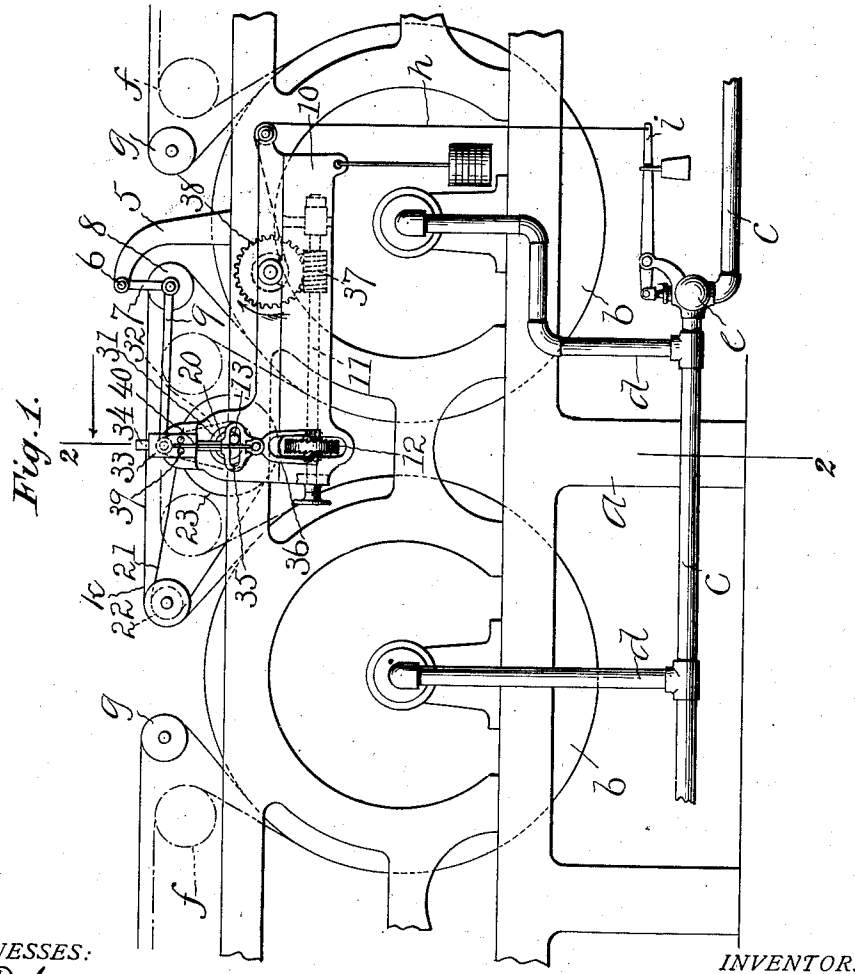


Fig. 1.



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REGULATOR FOR PAPER-MAKING MACHINES.

No. 866,513. Specification of Letters Patent. Patented Sept. 17, 1907.

Application filed October 13, 1906. Serial No. 338,797.

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 Improved Regulator for Paper-Making Machines, of which the following is a specification.

My invention relates to the class of devices for regulating the heat supply to a cylinder or the cylinders of paper making machines, and the object of my invention is to provide a device of simple construction which will effectively accomplish the purpose in view; and a further object of the invention is to provide a device of this class that shall readily and quickly respond to the forces upon which it depends for operation.

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 invention applied thereto. Fig. 2 is a detail view in cross-section through the machine showing one end thereof and a portion of the opposite end, the center being broken out.

In the accompanying drawings the letter *a* denotes the frame of the machine, *b* the cylinders suitably mounted thereon, *c* a supply pipe for a heat medium for said cylinders, *d* delivery pipes to the cylinders, *e* a valve for controlling the supply of the heat medium, *f* apron rolls for supporting the wire or apron as it travels in the machine, and *g* web rolls for supporting the web of paper as it travels through the machine. All of the parts above described may be of well-known form and construction and a further detailed description is therefore deemed unnecessary herein, as the method of operation will be readily understood by those skilled in the art merely from an examination of the drawings. The web rolls, in the ordinary construction of such a machine proper, are rigidly mounted on the frame, but I have ascertained that by mounting one roll so that it may have other than a rotatable movement in its bearings such movement may be utilized in the operation of a device for regulating the supply of heat or of a heat medium to the cylinders. Such a device is illustrated and described in my United States patent dated July 10, 1906, No. 825,612, to which reference is hereby made for such understanding of the invention as may not be obtained herefrom.

The numeral 5 indicates bracket arms rigidly secured to the machine frame, 6 pivots secured to said arms, 7 movable web roll supports pivotally sustained by said pivots, 8 a web roll mounted in said supports, 9 a link extending from the supports to a regulator frame 10, pivotally mounted on the machine frame, 11 a regulator shaft mounted on the regulator frame, 12 a ratchet wheel secured to said shaft, and 13 a pin eccentrically mounted in the end of a shaft hereinafter mentioned. All of the parts just mentioned and designated by numerical characters are shown and described in my patent above named. The numerals from 20 upward are hereinafter employed to designate the parts forming novel features herein.

The numeral 20 indicates a shaft extending across the machine from side to side and driven as by means of a belt 21 passing from a pulley 22 on the shaft of one of the web rolls *g* to a pulley 23 secured to the shaft 20. The pin 13 is revolved or eccentrically moved by means of this shaft 20 to which it is secured. Bearings 30 are formed on the frame of the machine within which a sleeve 31 extending across the machine is mounted. The shaft 20 extends through and is rotatably supported in the sleeve 31 and arms 32, keyed to this sleeve at opposite ends, extend upward and are pivotally connected by the link 9 with the movable web roll supports 7, so that swinging movement of the web roll is communicated to the arms 32.

A slide support 33 is formed on the regulator frame 10 within which is located a slide 34. The lower end of this slide has an opening or slot 35 for the reception of the pin 13. To this slide, preferably at its lower end, a pawl 36 is pivoted. This pawl is forked, its branches lying on opposite sides of the ratchet 12, and the ends of the branches being formed to engage the face ratchet teeth formed on the opposite sides of the ratchet, said teeth being inclined in opposite directions as shown.

The shaft 11 bears a movable member consisting of a worm 37 meshing with a worm wheel 38 about the hub of which a flexible connection *h* is wound, said connection extending to the valve lever *i* of the valve *e*.

The pawl 36 is engaged and disengaged from the ratchet wheel by means of a part located in the path of movement of a part on the regulator frame 10. The means herein shown for accomplishing this result consists of an arm 40 from the pawl 36 extending between pins 39 on the face of the support 33. These pins are preferably located in sliding engagement with the arm 40, so that the latter may freely move in the reciprocation of the pawl, but the least movement of the frame 10 will be imparted to the arm 40 and hence to the pawl 36.

From the above description the operation of the device will be readily understood, the roll 8 moving to the right or left, as seen in Fig. 1, under the expansion or contraction of the web *k* caused by the decrease or increase of heat in the cylinders. Supposing the cylinder to be heated beyond a degree required to secure proper drying of the web, such web will contract and cause the roll 8 to be swung to the left. This movement will swing the regulator frame 10 on its pivot, carrying the upper portion to the left, and by engagement of the pins 39 the arm 40 from the pawl 36 is carried to the left swinging the left branch of the pawl into engagement with the ratchet wheel 12. As the pawl moves downward in its reciprocating movement it

causes the ratchet 12 and shaft 11 to be rotated in the direction of the arrow shown in Fig. 2. The worm 37 being a right-hand worm the worm wheel 38 is rotated in the direction of the arrow in Fig. 1, causing the connection *h* to be wound upon the hub of the worm wheel 38 thus closing the valve *e* and reducing the supply of heat to the cylinders. Should the web be insufficiently dried the operation of the parts above described is reversed.

It will be noted, as shown by the drawings herein, that the shaft 11 is located on the back of the regulator frame, the ratchet wheel 12 projecting through an opening in the regulator frame.

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

1. In a machine for drying a web passing therethrough, a cylinder to engage said web, means for delivering heat to said cylinder, a valve for controlling the heat supply, valve controlling devices located at one side of the machine, operating devices for the valve controlling devices, said operating devices including means for controlling the direction of movement of the said valve and controlling devices and extending to the opposite side of the machine, and driving means for the said operating devices located on the last mentioned side of the machine.

2. In a machine for drying a web passing therethrough and including web rolls, a cylinder to engage said web, means for delivering heat to said cylinder, a valve for controlling the heat supply, valve-controlling devices located on one side of the machine, operating devices for the valve-controlling devices, said operating devices including means for controlling the direction of movement of said valve and extending to the opposite side of the machine, driving means for said operating devices located on the last-mentioned side of the machine, and connections between said operating devices and a web roll, for operating the former.

3. In a machine for drying a web of paper passing therethrough, a cylinder to engage said web, means for delivering heat thereto, means for controlling the supply of heat, a web roll, means located at one side of the machine and operatively connected with the heat supply control, a shaft extending transversely to the opposite side of the machine and driven therefrom, connections between said shaft and said means including parts to control the direction of movement of the latter, and connections between said shaft and the web roll for operating the former.

4. In a machine for drying a web of paper passing therethrough, a cylinder to engage said web, means for delivering heat to said cylinder, a valve for controlling the supply of heat to said cylinder, means located at one side of the machine and operatively connected with the said valve, a worm and worm wheel to operate said means, operating means for said shaft extending to the opposite side of the machine and driven therefrom, and connections between said operating means and shaft for controlling the direction of movement of the latter.

5. In a machine for drying a web passing therethrough, a cylinder to engage said web, means for delivering heat to said cylinder, means for controlling the supply of heat thereto, rotating devices connected with said heat supply, a continuously reciprocating pawl intermittently connected to control the direction of movement of the said devices, a web roll movably mounted, and connections between said web roll and pawl to move the latter to operate the rotating devices.

6. In a machine for drying a web passing therethrough, a cylinder to engage said web, means for supplying heat to said cylinder, means for controlling the heat supply, winding devices operatively connected with the heat supply control, a ratchet in connection therewith, a reciprocating pawl intermittently connected with the ratchet, all located at one side of the machine, means extending to and operated from the opposite side of the machine for reciprocating the pawl, and means controlled by the tension of the web for causing the operative connection of the pawl with said ratchet.

7. In a regulator for paper making machines, the combination with a drying cylinder, heat supplying means connected therewith, and means for controlling the said heat supply, of a regulator frame movably mounted on the machine, a shaft mounted on said frame and operatively connected with the means for controlling a supply of heat to the cylinder, a continuously reciprocating pawl intermittently connected to control the direction of movement of the shaft, a web roll movably supported, connections between said web roll and regulator frame to operate the latter, and connections between said frame and pawl to cause operative connection between said pawl and shaft.

8. In a regulator for paper making machines, a movably mounted regulator frame, a movable member mounted on said frame, a reciprocating pawl intermittently connected to operate said movable member, means influenced by the tension of the web for moving the regulator frame, and means rigidly secured to said frame to engage said pawl to cause its intermittent connection to operate said movable member.

9. In a regulator for paper making machines, the combination with a drying cylinder, heat supplying means connected therewith, and means for controlling the said heat supply, of a regulator frame pivoted on the machine frame, a movable member operatively connected with the heat supply controlling means for the cylinder, a slide mounted on the regulator frame, a pawl pivotally mounted on said slide and intermittently connected to operate said movable member, means on said frame to engage said pawl to cause said intermittent connection, and means influenced by the tension of the web for controlling the movements of the regulator frame.

10. In a regulator for paper making machines, the combination with a drying cylinder, heat supplying means connected therewith, and means for controlling the said heat supply, of a regulator frame movably mounted on the machine frame, a hub operatively connected with the heat supply control for the cylinder, a threaded shaft borne on the regulator frame and connected to move said hub, a ratchet having teeth projecting in opposite directions, a branched pawl to engage each of said teeth, means for reciprocating the pawl, means on the frame to move the pawl into engagement with the ratchet, and means influenced by the tension on the web for controlling the movement of the regulator frame.

11. In a regulator for paper making machines, the combination with a drying cylinder, heat supplying means connected therewith, and means for controlling the said heat supply, of a regulator frame movably mounted on the machine frame, a movable member mounted on the regulator frame and operatively connected with the heat supply control for the cylinder, a threaded shaft for operating said movable member, a ratchet wheel on said shaft and having sets of teeth projecting in opposite directions, a branched pawl, a reciprocating slide supporting said pawl, means for reciprocating the slide, connections between the regulator frame and pawl to operatively connect the latter with the ratchet, and means influenced by the tension of the web for directing the movement of the regulator frame.

12. In a regulator for paper making machines, the combination with a drying cylinder, heat supplying means connected therewith, and means for controlling the said heat supply, of a regulator frame movably mounted on the machine frame, a movable member on the regulator frame operatively connected with the heat supply control for the cylinder, a slide mounted on the regulator frame, a shaft connected with said movable member, a ratchet wheel having teeth extending in opposite directions mounted on said shaft, a pawl pivoted on said slide to intermittently engage said ratchet wheel, an arm extending from said pawl, a recess on the regulator frame to receive said arm, and connections influenced by the tension of the web for directing the movement of the regulator frame.

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