Apr. 10, 1923. 1,451,659

R. HOCKMAN

AUTOMATIC STOCK REGULATOR FOR PAPER MAKING MACHINES

Filed Sept. 3, 1920 3 sheets-sheet 1

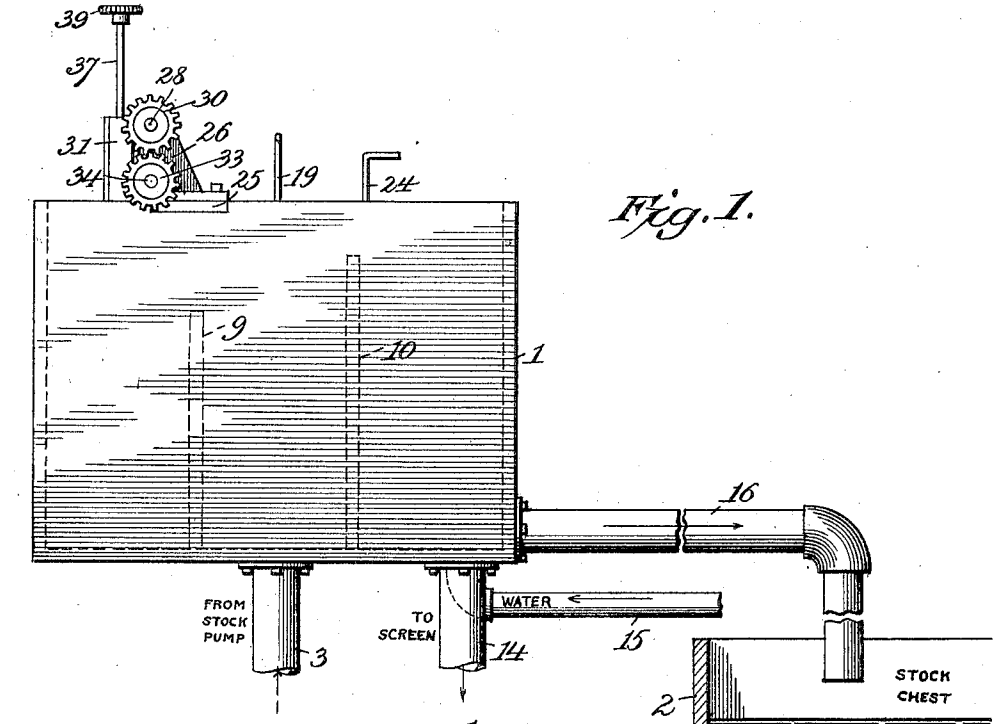


Fig. 1.

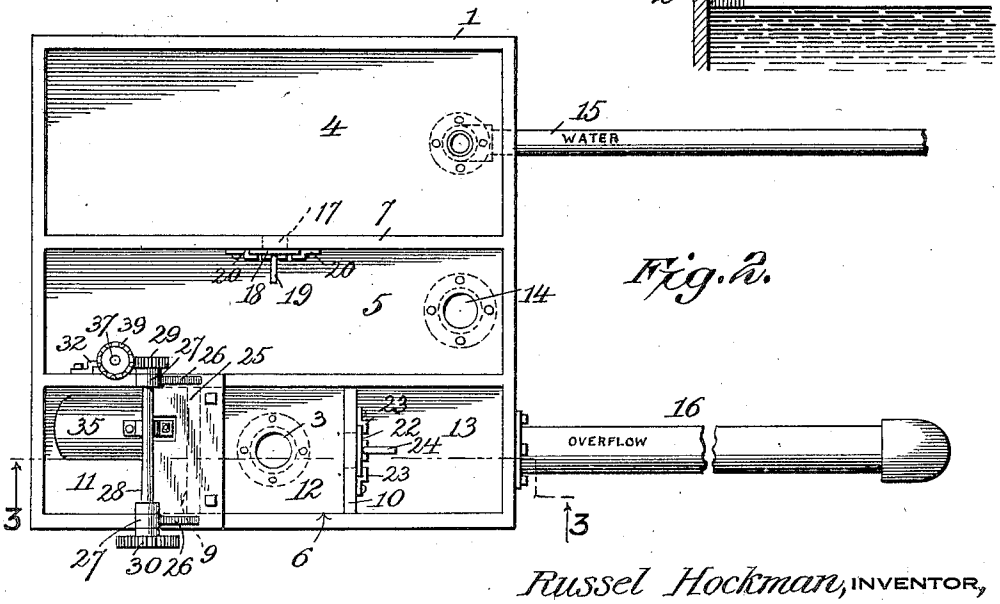


Fig. 2.

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Fig. 3.

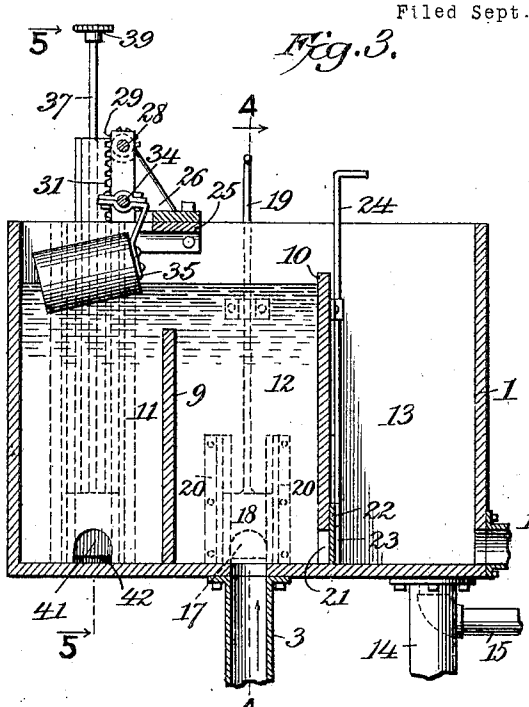


Fig. 4.

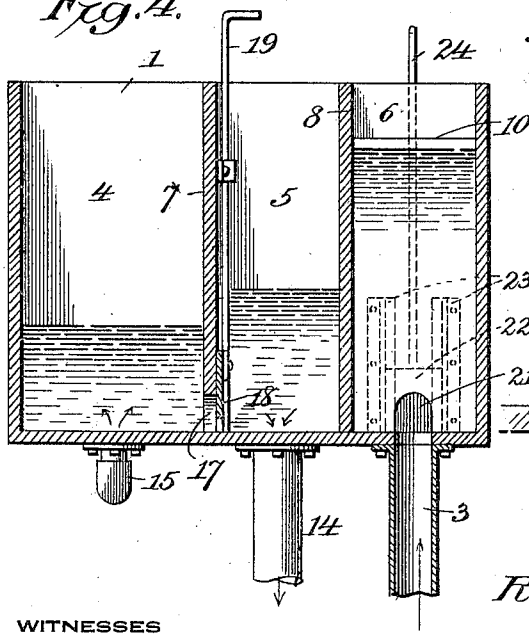
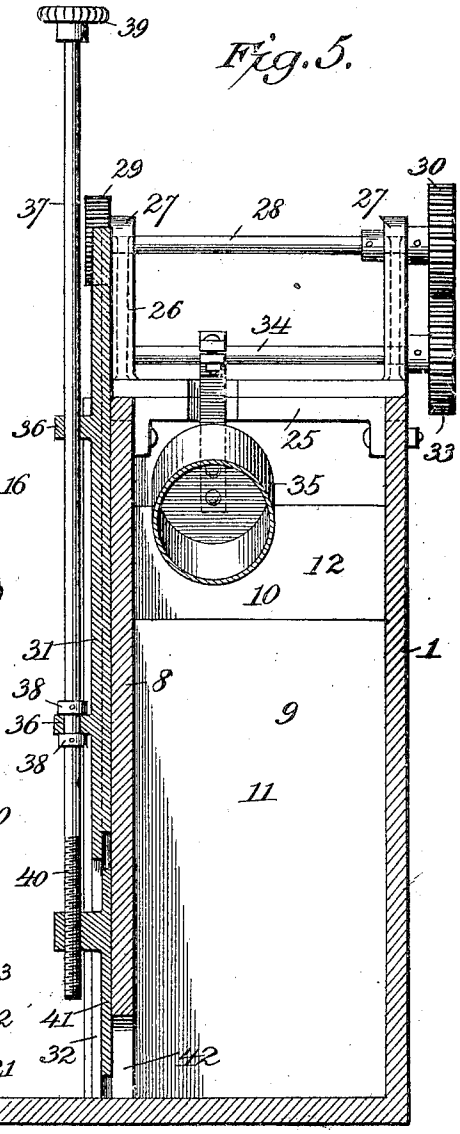


Fig. 5.



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Fig. 6.

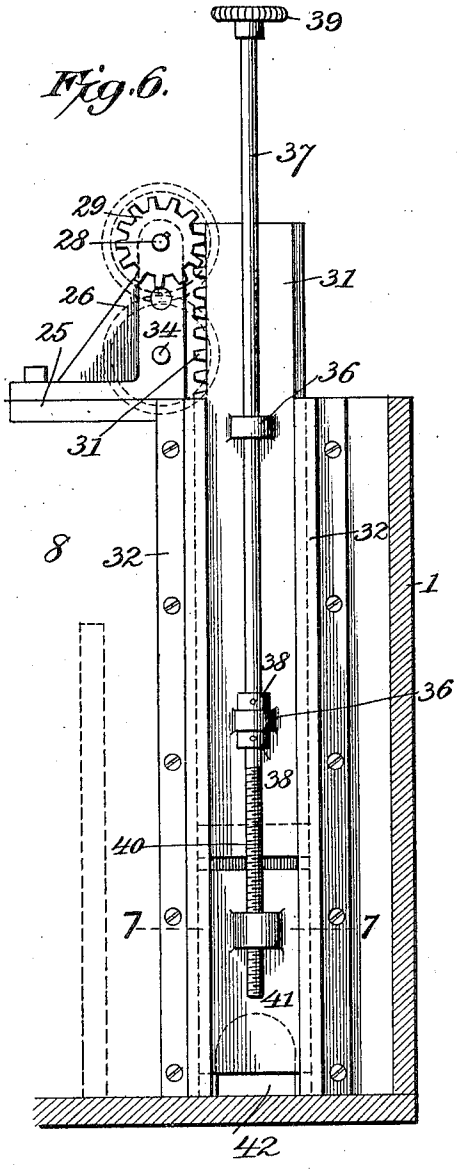


Fig. 7.

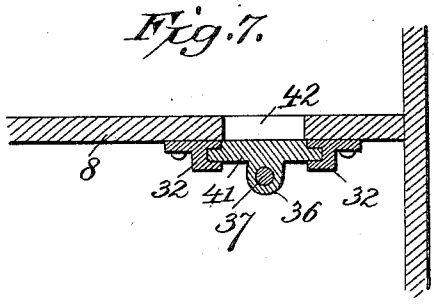


Fig. 8.

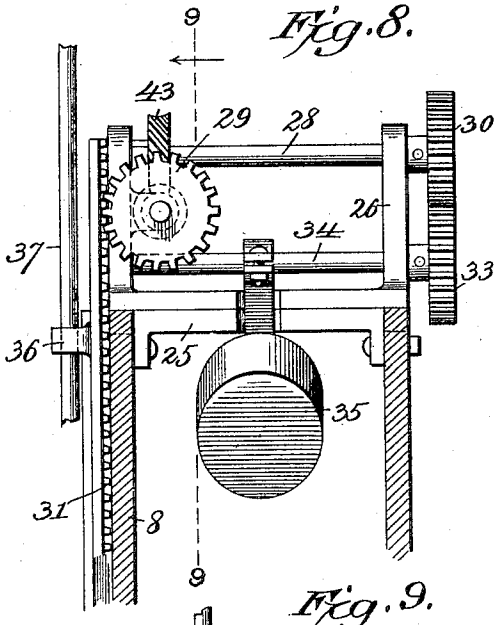
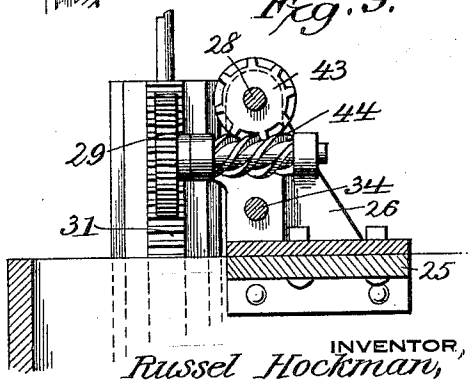


Fig. 9.



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Patented Apr. 10, 1923. 1,451,659

UNITED STATES PATENT OFFICE.

RUSSEL HOCKMAN, OF LOCK HAVEN, PENNSYLVANIA, ASSIGNOR OF ONE-THIRD TO HARRY H. WILSON AND ONE-THIRD TO ELLIS B. SHAFFER, BOTH OF LOCK HAVEN, PENNSYLVANIA.

AUTOMATIC STOCK REGULATOR FOR PAPER-MAKING MACHINES.

Application filed September 3, 1920. Serial No. 407,856.

To all whom it may concern:

Be it known that I, RUSSEL HOCKMAN, citizen of the United States, residing at Lock Haven, in the county of Clinton and State of Pennsylvania, have invented a new and useful Automatic Stock Regulator for Paper-Making Machines, of which the following is a specification.

This invention has reference to automatic stock regulators for paper making machines, and its object is to provide for maintaining the stock in a suitable degree of fluidity, either automatically or manually or both.

In accordance with the invention there is provided a suitably subdivided tank connected to a stock pump in such manner that the stock enters one compartment of the tank and overflows into another compartment while water is admitted to the first compartment for mixture with the stock therein to thin the latter. Provision is made for causing the stock, should it become too thick, or should it be desired to empty the compartment, to return to the stock chest.

The invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawings forming part of this specification, with the understanding, however, that the invention is not confined to any strict conformity with the showing in the drawings, but may be changed and modified so long as such changes and modifications mark no material departure from the salient features of the invention as expressed in the appended claims.

In the drawings:

Fig. 1 is a side elevation of a structure embodying the invention.

Fig. 2 is a plan view thereof.

Fig. 3 is a section on the line 3—3 of Fig. 2.

Fig. 4 is a section on the line 4—4 of Fig. 3.

Fig. 5 is a section on the line 5—5 of Fig. 3, but drawn on a larger scale.

Fig. 6 is an elevation of one of the controlling gates with a portion of the tank shown in section.

Fig. 7 is a section on the line 7—7 of Fig. 6.

Fig. 8 is a view similar to Fig. 5 but of less extent and illustrating a modification.

Fig. 9 is a section on the line 9—9 of Fig. 8.

Referring to the drawings there is shown in Fig. 1, and associated figures, a tank 1 of suitable dimensions and located so that it may receive from and return material to a stock chest 2 through a pipe 3 from a stock pump of ordinary construction and therefore not shown in the drawings.

The tank 1 is divided into compartments 4, 5, 6, by upright partitions 7, 8, of the same height as the walls of the tank 1. The compartment 6 is divided by other partitions 9, 10, respectively, into sub-compartments 11, 12 and 13, the partitions 9 and 10 being of less height than the walls of the tank 1 with the partition 9 lower than the partition 10.

The sub-compartment 12 is entered at the bottom by the pipe 3 coming from the stock pump. The compartment 5 communicates at the bottom with a pipe 14 leading to the screen or screens of the paper making machine and the compartment 4 is entered at the bottom by a pipe 15 for conveying water thereto. Leading from the bottom portion of the sub-compartment 13 is a pipe 16 delivering into the stock chest 2.

The partition 7 has at its lower end an opening 17 controlled by a gate 18 capable of being manually raised and lowered by means of a handle 19, the gate being directed by guides 20 fast to the sides of the partition 7.

The partition 10, at the bottom portion thereof, is provided with an opening or passage 21 controlled by a gate 22 movable between guides 23 and controlled by a handle 24.

Extending across the top of the sub-compartment 11 is a strip 25 carrying bracket supports 26 furnished with journal bearings 27 for a shaft 28. At opposite ends of the shaft 28 are gear wheels 29, 30 respectively, the gear wheel 29 meshing with an upright

rack bar 31 having upright guides fast to the partition 8. Meshing with the gear wheel 30 is another gear wheel 33 on a stub-shaft 34 and this stub-shaft has fast thereto a float 35 so situated that when stock fills the sub-compartments 11 and 12 to a depth where the accumulated stock would overflow the partition 10 into the sub-compartment 13, the float is raised, thereby turning the gear wheel 33 in a direction to propel the gear wheel 30 in the opposite direction.

The rack bar 31 mounted between the guides 32 has lugs 36 thereon in spaced relation and alined with each other. These lugs are traversed by a rod 37 held to one of the lugs by collars 38 so that the rod may be turned in the lugs but will not move lengthwise therethrough. At the upper end, the rod 37 is provided with a manipulating wheel 39 and at the lower end has a screw threaded portion 40 extending below the lower end of the rack bar 31.

Below the rack bar is a gate 41 movable between the guides 32 and arranged to open and close a passage 42 at the lower end of the partition 8 to provide controllable communication between the compartment 5 and the sub-compartment 11. By means of the rod 37 the relation of the gate 41 to the passage 42 may be varied at will so that the effective size of the passage from the compartment 5 to the sub-compartment 11 may be correspondingly varied at the will of the operator.

Instead of providing the rack bar driving gearing shown in Fig. 1 and associated figures, the driving gearing of Figs. 8 and 9 furnishes a more delicate adjustment. In the last named structure the shaft 28 carries a worm gear 43 meshing with a worm 44 carrying at one end the gear wheel 29 engaging the rack bar 31.

The paper stock used in the paper making machine is pumped from the stock chest 2 through the pipe 3, into the sub-compartment 12.

Ultimately the height of the stock in the sub-compartment 12 reaches the top of the partition 9 and overflows it into the sub-compartment 11, from whence the paper stock finds its way into the compartment 5 meeting water. The water first enters the compartment 4 by way of the pipe 15 then enters the compartment 5 through the passage 17 and controlled by the gate 18. The water and paper stock mix in the compartment 5 and then pass by way of a pipe 14 to the screen or screens (not shown) of the paper making machine.

Ultimately the paper stock entering the mixing and distributing tank 1 may become thick and may accumulate in the sub-compartment 11 to such an extent as finally to reach the float 35 and raise the latter. This thick stock automatically acts upon the gate 41 through the float 35 with the result that the outflow of paper stock to the mixing chamber 5 is lessened so that the mixture passing through the pipe 14 is correspondingly thinned.

By means of the automatically controlled feed of the paper stock to the mixing chamber and the manual control of water to the mixing chamber it is possible to provide a desirable dilution or thinning of the paper stock passing the screen or screens of the paper making machine. Should the flow of the paper stock into the sub-compartment 12 become sufficiently abundant it will ultimately rise over the partition 10 and pass into the sub-compartment 13 to return to the stock chest 2 by way of the pipe 16. Such overflow may be avoided by a suitable opening of the gate 22 which ordinarily remains closed.

At times it becomes advisable to clean out the tank 1, whereupon by a suitable manipulation of the different gates, the stock in the tank 1 may be directed from the several compartments and sub-compartments to the sub-compartment 13 by opening the gate 22 and permitting the material to find its way to the pipe 16 and back to the stock chest 2.

What is claimed is:

1. An automatic stock regulator for paper making machines, comprising a receptacle for receiving the stock and delivering it to the paper making machine, said receptacle having compartments, one into which the stock is delivered, another into which water is delivered, and another intermediate of the first two compartments and constituting a mixing and delivering chamber, and means for controlling the access of water and of stock to the mixing compartment from the other two compartments.

2. An automatic stock regulator for paper making machines, comprising a tank or receptacle with a compartment therein having partitions of different heights dividing it into sub-compartments, a pipe communicating with the intermediate one of the sub-compartments for delivering paper stock thereinto, a valve structure in another one of the sub-compartments and having means responsive to a rising level of paper stock in the sub-compartment to which it belongs, and a pipe communicating with still another one of the sub-compartments for disposing of overflow reaching said sub-compartment.

3. An automatic stock regulator for paper making machines, comprising a tank divided into compartments, with one compartment subdivided into other compartments, one of the sub-compartments having means for directing paper stock thereinto, another one of the sub-compartments having means for directing thereinto paper stock from the first compartment, and a third compartment hav-

ing means for the overflow of the paper stock thereinto from the first compartment, another of the compartments in the tank having means for introducing water thereinto, and an intermediate compartment in the tank communicating with the first and second compartments to provide a mixing chamber for paper stock and water.

4. An automatic stock regulator for paper making machines, comprising a tank divided into compartments, with one compartment sub-divided into other compartments, one of the sub-compartments having means for directing paper stock thereinto, another one of the sub-compartments having means for directing thereinto paper stock from the first compartment and a third sub-compartment having means for the overflow of the paper stock thereinto from the first compartment, another of the compartments in the tank having means for introducing water thereinto, and an intermediate compartment in the tank communicating with the first and second compartments to provide a mixing chamber for paper stock and water, the second named sub-compartment having automatic means associated therewith for causing the flow of paper stock therefrom to the mixing compartment.

5. In an automatic stock regulator for paper making machines a tank divided into a series of main compartments with one of the main compartments having partitions of different heights dividing it into sub-compartments all rising from the bottom of the tank, an inlet for paper stock into one of the sub-compartments, a valved outlet for paper stock between another one of the sub-compartments and one of the main compartments, a water feed for another one of the main compartments, a valve between the water compartment and the intermediate one of the main compartments, whereby said intermediate compartment comprises a mixing chamber for water and paper stock, a float structure and valve between one of the sub-compartments and the intermediate main or mixing compartment to automatically regulate the flow of paper stock fed to the intermediate main compartment, a valve structure between the sub-compartment receiving the paper stock and the sub-compartment remote from that having the float structure, and an overflow pipe for disposing of paper stock entering the last named one of the sub-compartments.

6. In an automatic stock regulator for paper making machines, a tank for receiving and delivering paper stock, said tank having compartments therein with one of the compartments sub-divided into other compartments, pipes leading into the bottoms of the several compartments for supplying stock, supplying water, and disposing of overflow, and gates constituting valves for controlling the flow of material from one compartment to another, all of said gates being located to afford communication between the lower ends of the compartments.

7. In an automatic stock regulator for paper making machines, a tank for receiving and delivering paper stock, said tanks having compartments therein, with one of the compartments subdivided into other compartments, pipes leading into the lower ends of the compartments for supplying stock, delivering stock, supplying water, and disposing of overflow, and certain of the compartments having gates constituting valves, said gates being all located to communicate with the lower ends of the compartments, one of the gates having automatic controlling means responsive to rising level of paper stock of a predetermined density in said compartment, and the other gates having manual controlling means.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature.

RUSSEL HOCKMAN.