No. 685,222. Patented Oct. 22, 1901.

H. S. ROLLINS.

WATER MEASURING APPARATUS FOR CENTRIFUGALS.

(Application filed Mar. 18, 1901.)

(No Model.) 2 Sheets—Sheet 1.

FIG. 1.

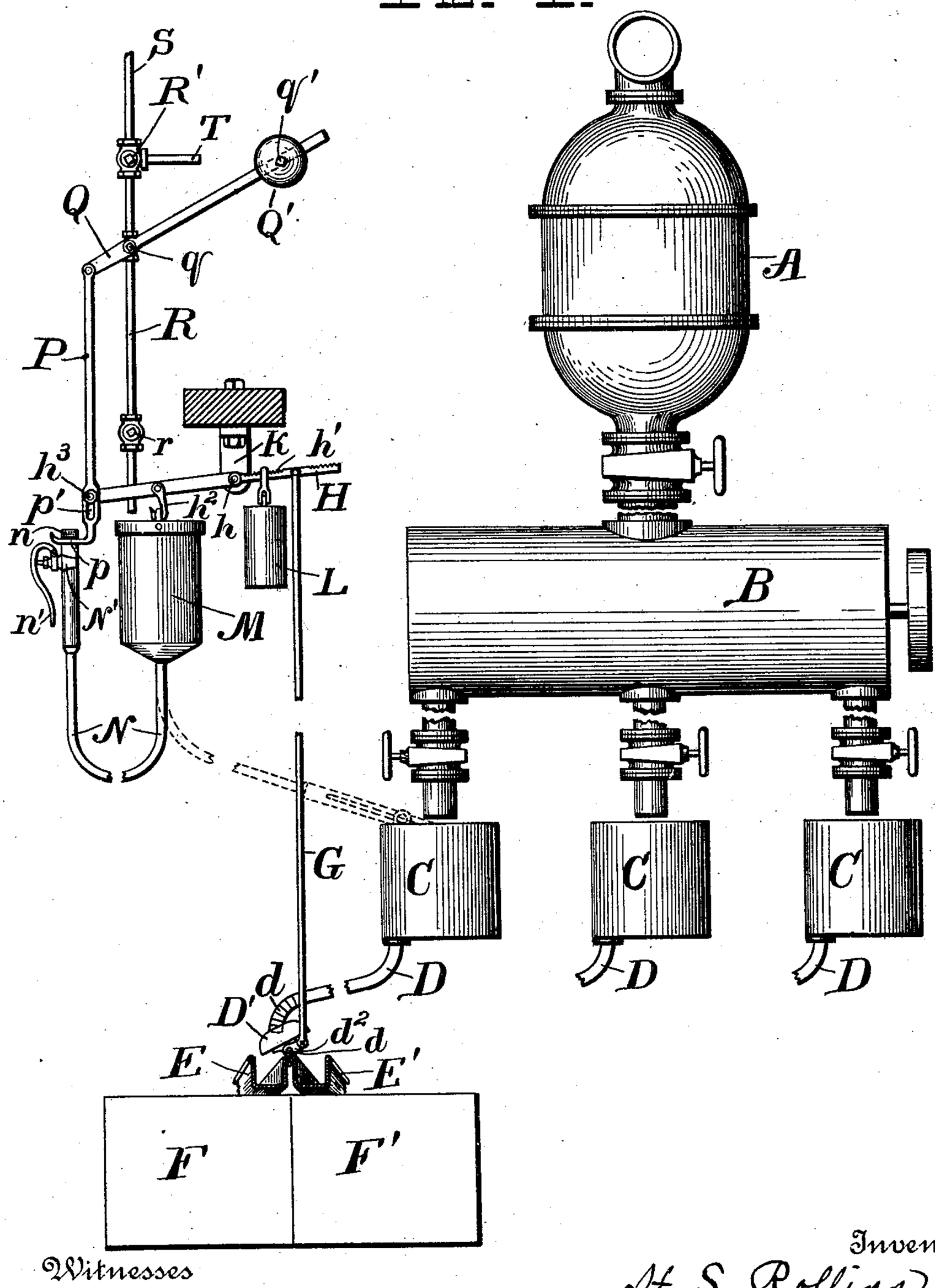

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FIG. 2.

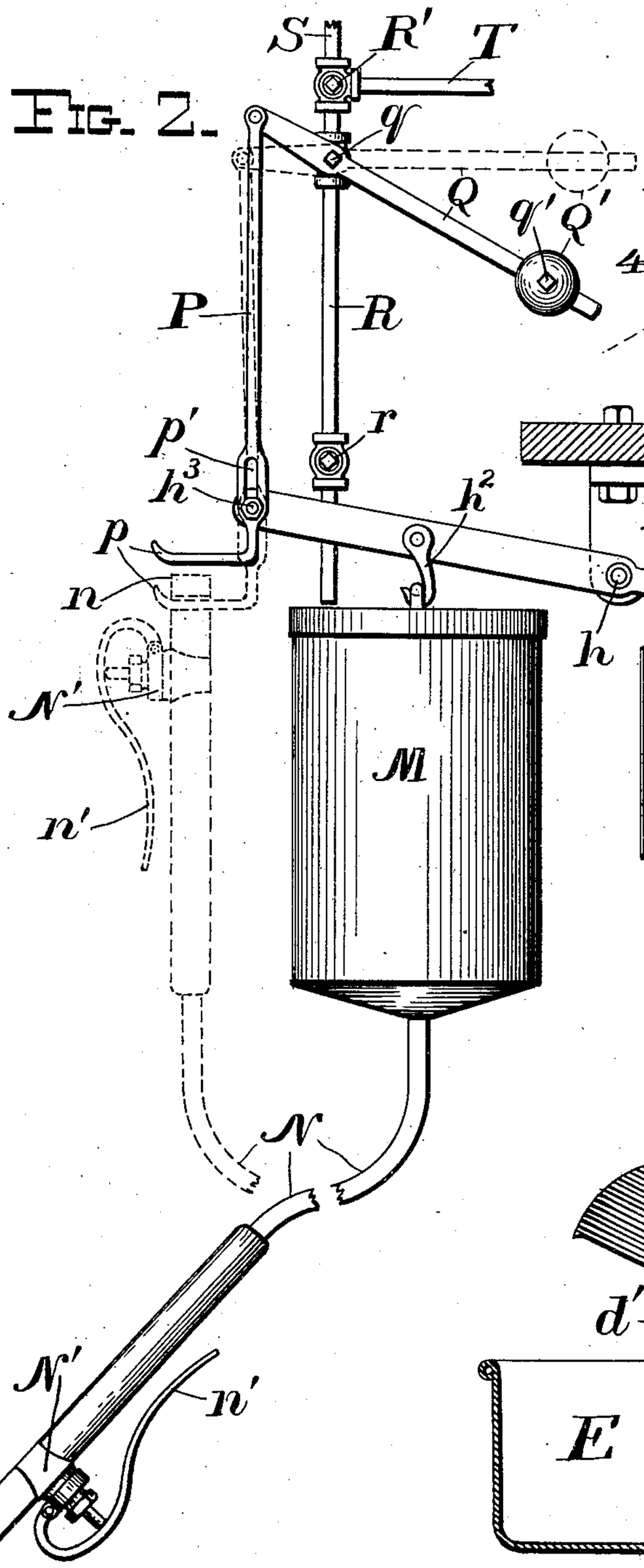

FIG. 3.

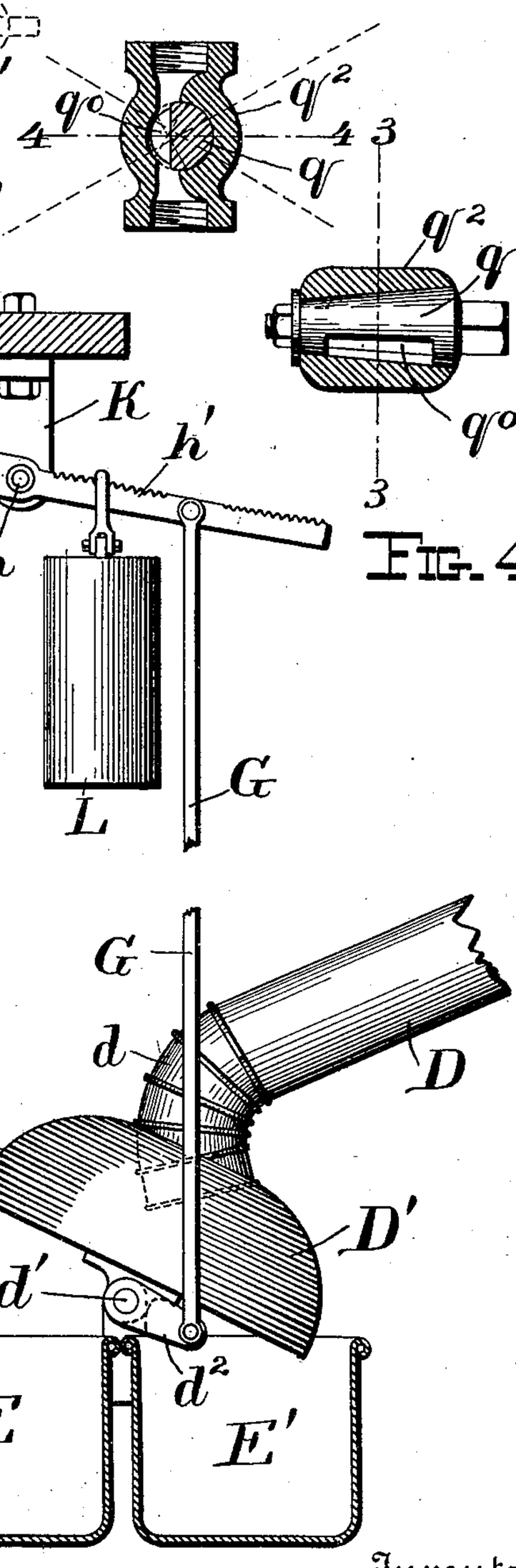

FIG. 4.

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UNITED STATES PATENT OFFICE.

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WATER-MEASURING APPARATUS FOR CENTRIFUGALS.

SPECIFICATION forming part of Letters Patent No. 685,222, dated October 22, 1901.

Application filed March 18, 1901. Serial No. 51,709. (No model.)

To all whom it may concern:

Be it known that I, HARRISON S. ROLLINS, a citizen of the United States, residing at Rockyford, in the county of Otero and State of Colorado, have invented certain new and useful Improvements in Water-Measuring Apparatus for Centrifugals; 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.

My invention relates to improvements in automatic attachments for use in connection with centrifugals for drying sugar or other articles in which it is desired either to limit the amount of washing fluid or to vary the direction of the fluid thrown off by the centrifugal, or both.

In the manufacture of sugar it is found desirable to wash the sugar while being dried in the centrifugal with a limited amount of water, which sometimes is clear water and sometimes contains a small percentage of bluing, the latter to give brilliancy to the grains of the sugar, and it is desirable that the sugar from a given strike should be uniformly washed and also that the amount of water used in washing be kept as small as practicable; otherwise the size of the grains would be decreased and an unnecessary amount of sugar dissolved. For this reason it becomes desirable to regulate the supply of water and to provide that all the centrifugals charged from any particular strike shall have the same quantity of washing fluid sprayed into them. To avoid the necessity of measuring this fluid out by hand, I provide an automatic attachment for this purpose, which is simple and effective in its operation. Furthermore, since the syrup thrown off by the centrifugals, commonly known as "green" syrup, during the first part of the drying operation, when no washing fluid is used, will be lower in purity than during the close of the operation, when this syrup is diluted with the water from the spray, it becomes desirable to shift the flow of the syrup from the centrifugal from one tank to another or from what I would call the "green-syrup" tank to the "wash-syrup" tank. I provide an automatic attachment for this purpose, which is operated by the automatic measuring attachment for the washing fluid; but it will be evident that the automatic attachment for the washing fluid may be used by itself and the flow of the syrup shifted by hand, as heretofore.

My invention will be understood by reference to the accompanying drawings, in which the same parts are indicated by the same letters throughout the several views.

Figure 1 shows diagrammatically a strike-pan, mixer, centrifugals, and the automatic attachments for weighing the washing fluid and for shifting the flow of the syrup. Fig. 2 is an enlarged detail view showing the automatic attachments as detached from the rest of the apparatus. Fig. 3 represents a vertical section through the controlling-valve, taken on the line 3 3 of Fig. 4; and Fig. 4 represents a horizontal section of the same, taken on the line 4 4 of Fig. 3.

A represents the strike-pan, B the mixer, and C the centrifugals, which may be of any well-known or preferred construction. Each centrifugal is provided with a drain-pipe D, which I will call the "syrup-pipe," and this pipe is provided with a flexible end d, connected to the rocking hood D'. The syrup-pipe D opens into one or the other of the troughs E or E', which flow into the green-syrup tank F and the wash-syrup tank F', respectively.

The hood D' rocks about the pivots d' and is controlled by the arm d^2, the rod G, and the scale-beam H. This scale-beam H is pivoted, as at h, on the hanger K and is graduated at h', where it supports the movable weight L. The other end of the scale-beam carries a hook h^2, from which is suspended the bucket M for the washing fluid, to which is connected the hose N, provided with the spraying-nozzle n. This nozzle is provided with a valve N', controlled by the handle n', so that the fluid may be sprayed into the centrifugal from the bucket M as desired.

It will be understood that each of the centrifugals is provided with a separate pipe D and rocking hood D', connected with an independent bucket M and attachments for weighing the washing fluid.

P represents a rod slotted, as at p', and provided with a hook or yoke p to engage and

support the nozzle of the hose when the latter is not in use in spraying the centrifugal. A pin h^3 on the scale-beam H passes into the slot p', and thus allows this rod P to have a limited movement without movement of the scale-beam H. This rod P is connected to a lever Q, which operates the cock q in the pipe R, and adjustably mounted on the opposite arm of this lever is a weight Q', which may be clamped in the desired position by the clamp-screw q'. This cock q is arranged to close when the lever Q is in the position shown in Fig. 1 or in full lines in Fig. 2 and to open when in the intermediate position (shown in dotted lines in Fig. 2)—that is, the cock is closed when the lever Q reaches either limit of its travel and is open when the lever is in the intermediate position. (Shown, for instance, in the dotted lines in Fig. 2.) The valve q, as shown in Figs. 3 and 4, has the opening q^0 cut through one side thereof and is set to one side of the opening through the valve-casing q^2, so that when the valve is open, as shown, a small movement in either direction will be sufficient to close it.

The pipe R for the washing fluid is provided with a hand-valve r, which is set to regulate the flow of fluid to the bucket M. Thus the length of time taken to fill the bucket may be regulated by the amount of opening given the valve r, and the fluid is admitted through one or the other of the pipes S or T through a three-way cock R', which cock is operated by hand. Where only one kind of washing fluid is used, this cock would be permanently open, but where two kinds of fluid are used the cock would be turned as desired by one of the attendants at the centrifugals.

The operation of the device is as follows: Suppose the bucket M to be empty, with the hose N off the hook p, as shown in full lines in Fig. 2. The weight L will drag down the scale-beam H and the weight Q' will drag up the rod P until the lower end of the slot p' engages the pin h^3. At this time the hood D' will be rocked over to the right and the syrup-pipe D will empty into the wash-syrup trough E', and the parts then will be all out of operation, the valve q being closed. Now suppose the nozzle of the hose is hung over the hook p. The weight of the hose and nozzle will drag down the bar P, lifting the weight to the position shown in dotted lines and opening the cock q, allowing the water to flow down through the pipe R into the bucket M. The water will continue flowing until the weight in the bucket M counterbalances the mass of the weight L and of the rod G and also the inertia of the parts operated by said rod, and as soon as the predetermined amount of water gets into the bucket M the end of the scale-beam H will tilt down to the position shown in Fig. 1, at which time the supply of water for a given centrifugal is ready. This movement of the scale-beam H will rock the hood D' to the left, causing the pipe D to empty into the green-syrup trough E. While the bucket M is filling the centrifugal has received its charge of sugar and green syrup, which latter begins to drain out through the pipe D into the green-syrup trough E. When the sugar in the centrifugal is ready for spraying, the hose may be taken down and the centrifugal sprayed out, as shown in dotted lines in Fig. 1. The weight L is so proportioned that when the spraying-nozzle and hose are unhooked from the rod P the bucket M will immediately be raised to its highest position, as also will the rod P, as shown in Fig. 2, thus causing the rocking hood D' to shift the end of the pipe D from the green-syrup trough E to the wash-syrup trough E'. When the nozzle n is again hung upon the hook p, its weight will pull the rod P down until the upper end of the slot p' rests upon the pin h^3, thus bringing the parts to the position shown in dotted lines in Fig. 2 and opening the valve q, thus allowing the fluid to again flow into the bucket M. The valve r is set to regulate the flow of fluid to the bucket M so that it will fill sufficiently to weigh the bucket down by the time the next charge of sugar is ready in the centrifugal and shift the end of the pipe D back to the green-syrup trough E, when the operation is repeated. It will be seen that while the bucket M is being filled, which will only occur when the nozzle n is hooked up, the hood D' will be rocked to the right, causing the syrup or molasses which drains from the centrifugal after washing to flow into the wash-syrup trough E', from which it flows into the tank F', while when the bucket M is down in the position shown in Fig. 1 the hood D' will be rocked to the left and the pipe D will open into the green-syrup trough E, which flows into the tank F. Thus it will be seen that the apparatus will automatically weigh the amount of water to be sprayed into each centrifugal and will automatically shift the flow of syrup or molasses from the wash-syrup tank to the green-syrup tank, or vice versa.

It will be obvious that the amount of water delivered at each operation from the bucket M will be constant so long as the position of the weight L remains the same; but by moving this weight along the scale h' the weight of water allowed to escape from the bucket during each operation of the apparatus may be varied at will.

It will be seen that I provide an apparatus in which a predetermined quantity of washing fluid may be automatically weighed for each centrifugal and in which the act of weighing the washing fluid automatically shifts the troughs for carrying off the syrup or molasses from the centrifugal.

It will be obvious that various modifications of the herein-described apparatus might be made which could be used without departing from the spirit of my invention.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. An automatic attachment for use with centrifugals, comprising mechanism for regulating the quantity of washing fluid automatically operated by the weight of said fluid, and means automatically operated by said mechanism for shifting the conduit for the escape of syrup or molasses from the centrifugal, substantially as described.

2. An automatic attachment of the character described, a scale-beam with a bucket, and a counterpoise-weight suspended therefrom, a delivery hose and nozzle for said bucket, a fluid-pipe, a cock therein normally shutting off the flow of fluid, and permitting the flow of fluid when in the median position, mechanism operated by the weight of said nozzle for bringing said cock to the median position, and means automatically operated by the scale-beam for turning said cock to the closed position when the bucket descends due to the increased weight of its contents, substantially as described.

3. An automatic attachment of the character described, comprising a scale-beam with a bucket and a counterpoise-weight suspended therefrom, a delivery hose and nozzle for said bucket, a fluid-pipe, a cock therein normally shutting off the flow of fluid, and permitting the flow of fluid when in the median position, a slotted rod connected to said scale-beam and operated by the weight of said nozzle for bringing said cock to the median position, and automatically operated by the scale-beam for turning said cock to the closed position when the bucket descends due to the increased weight of its contents, substantially as described.

4. An automatic attachment for use with centrifugals, comprising a scale-beam with a receptacle for fluid and a counterpoise-weight suspended therefrom, a fluid-pipe, a cock therein normally shutting off the flow of fluid, and permitting the flow of fluid when in the median position, a weight and mechanism operated thereby for bringing said cock to the median position, and means automatically operated by the scale-beam for turning said cock to the closed position when the bucket descends due to the increased weight of its contents, a conduit from the centrifugals, and mechanism automatically operated by said scale-beam for shifting said conduit, substantially as described.

5. An automatic attachment for use with centrifugals, comprising a scale-beam with a bucket and a counterpoise-weight suspended therefrom, a delivery hose and nozzle for said bucket, a fluid-pipe, a cock therein normally shutting off the flow of fluid, and permitting the flow of fluid when in the median position, mechanism operated by the weight of said nozzle for bringing said cock to the median position, and means automatically operated by the scale-beam for turning said cock to the closed position when the bucket descends due to the increased weight of its contents, a conduit from the centrifugals, and mechanism automatically operated by said scale-beam for shifting said conduit, substantially as described.

6. An automatic attachment for use with centrifugals, comprising a scale-beam with a bucket and a counterpoise-weight suspended therefrom, a fluid-pipe, a cock therein normally shutting off the flow of fluid, and permitting the flow of fluid when in the median position, a weight, a slotted rod connected to the scale-beam and operated by said weight for bringing said cock to the median position, and automatically operated by the scale-beam for turning said cock further and to the closed position when the bucket descends due to the increased weight of its contents, a conduit from the centrifugals, and mechanism automatically operated by said scale-beam for shifting said conduit, substantially as described.

7. An automatic attachment for use with centrifugals, comprising a scale-beam with a bucket and a counterpoise-weight suspended therefrom, a delivery hose and nozzle for said bucket, a fluid-pipe, a cock therein normally shutting off the flow of fluid, and permitting the flow of fluid when in the median position, a slotted rod connecting said scale-beam and operated by the weight of said nozzle for bringing said cock to the median position, and automatically operated by the scale-beam for turning said cock to the closed position when the bucket descends due to the increased weight of its contents, a conduit from the centrifugals, and mechanism automatically operated by said scale-beam for shifting said conduit, substantially as described.

8. An automatic attachment for use with centrifugals, comprising a scale-beam with a receptacle for fluid and a counterpoise-weight suspended therefrom, a fluid-pipe, a cock therein normally shutting off the flow of fluid, and permitting the flow of fluid when in the median position, a weight and mechanism operated thereby for bringing said cock to the median position, and means automatically operated by the scale-beam for turning said cock to the closed position when the bucket descends due to the increased weight of its contents, a conduit for the centrifugals, and a connecting-rod and rocking arm connected to said conduit and automatically operated by said scale-beam for shifting said conduit, substantially as described.

9. An automatic attachment for use with centrifugals, a scale-beam with a bucket and a counterpoise-weight suspended therefrom, a delivery hose and nozzle for said bucket, a fluid-pipe, a cock therein normally shutting off the flow of fluid, and permitting the flow of fluid when in the median position, mechanism operated by the weight of said nozzle for bringing said cock to the median position, and means automatically operated by

the scale-beam for turning said cock to the closed position when the bucket descends due to the increased weight of its contents, a conduit from the centrifugals, and a connecting-rod and rocking arm connected to said conduit and automatically operated by said scale-beam for shifting said conduit, substantially as described.

10. An automatic attachment for use with centrifugals, comprising a scale-beam with a bucket and a counterpose-weight suspended therefrom, a fluid-pipe, a cock therein normally shutting off the flow of fluid, and permitting the flow of fluid when in the median position, a weight, a slotted rod connected to the scale-beam and operated by said weight for bringing said cock to the median position, and automatically operated by the scale-beam for turning said cock further and to the closed position when the bucket descends due to the increased weight of its contents, a conduit from the centrifugals, and a connecting-rod and rocking arm connected to said conduit and automatically operated by said scale-beam for shifting said conduit, substantially as described.

11. An automatic attachment for use with centrifugals, comprising a scale-beam with a bucket and a counterpoise-weight suspended therefrom, a delivery hose and nozzle for said bucket, a fluid-pipe, a cock therein normally shutting off the flow of fluid, and permitting the flow of fluid when in the median position, a slotted rod connecting said scale-beam and operated by the weight of said nozzle for bringing said cock to the median position, and automatically operated by the scale-beam for turning said cock to the closed position when the bucket descends due to the increased weight of its contents, a conduit from the centrifugals, and a connecting-rod and rocking arm connected to said conduit and automatically operated by said scale-beam for shifting said conduit, substantially as described.

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

HARRISON S. ROLLINS.

Witnesses:
F. A. WILGUS, Jr.,
A. W. WOODS.