Feb. 27, 1934. G. C. DUKES 1,948,963

SIPHON SYSTEM FOR SLASHERS

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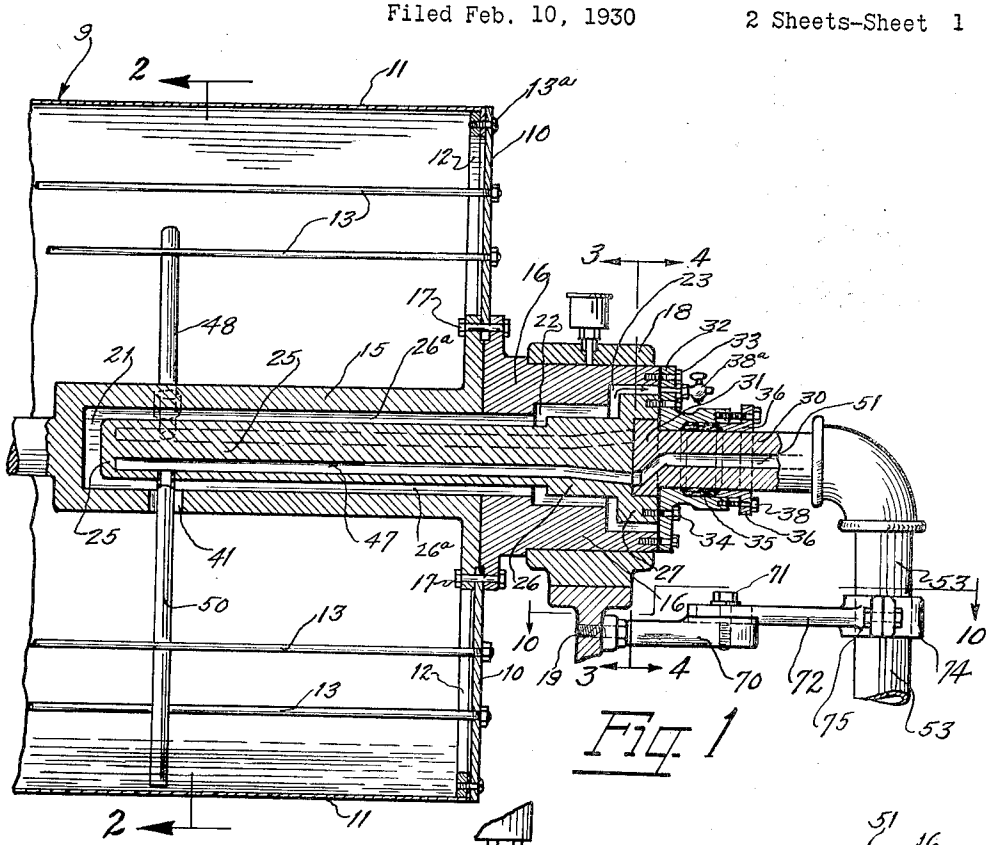


Fig. 1

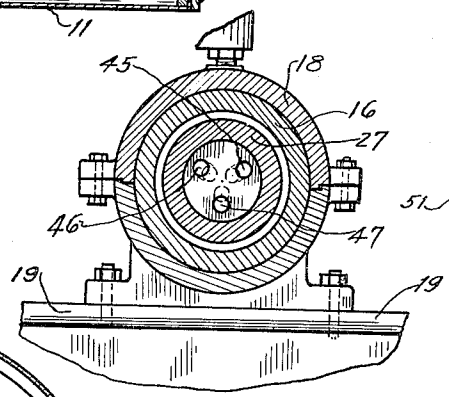


Fig. 3

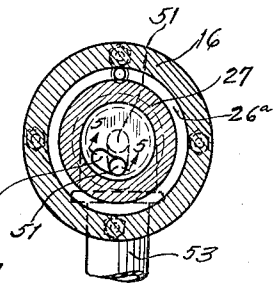


Fig. 4

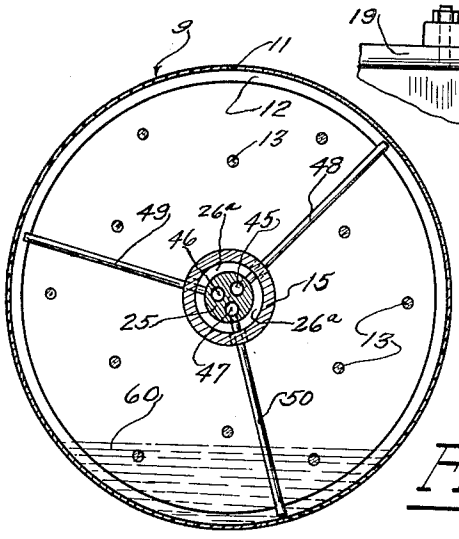


Fig. 2

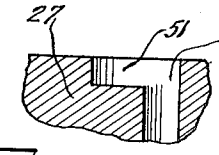


Fig. 5

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SIPHON SYSTEM FOR SLASHERS

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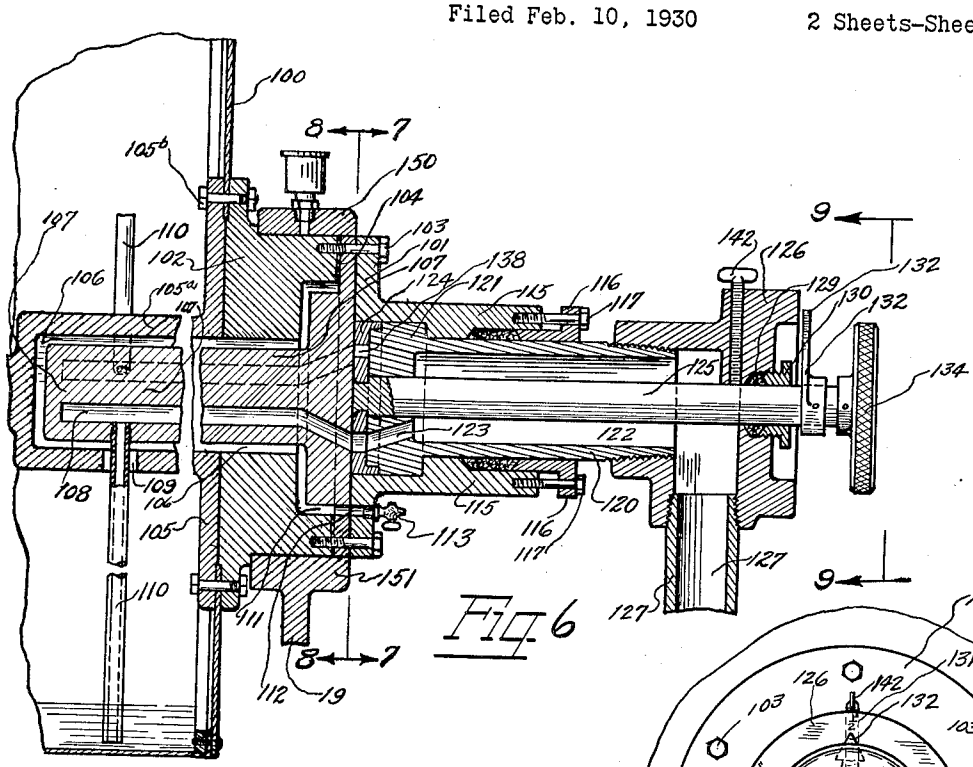


Fig. 6

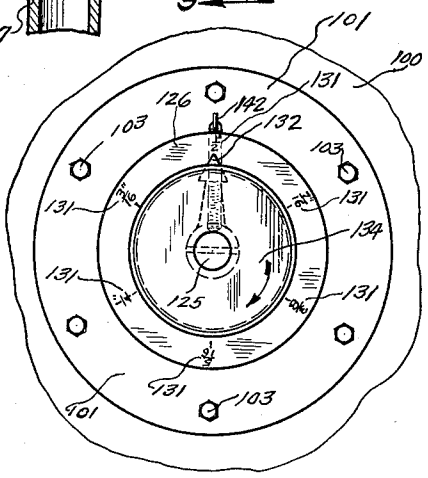


Fig. 9

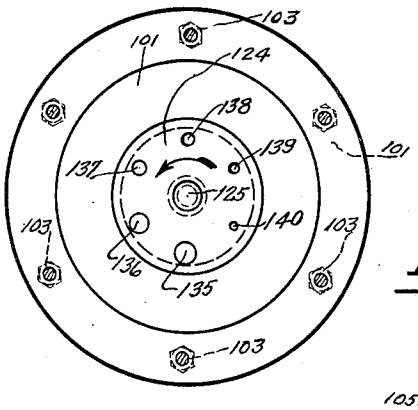


Fig. 7

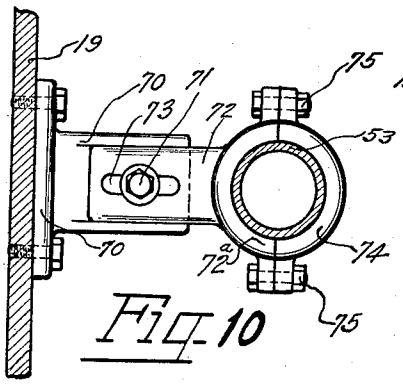


Fig. 10

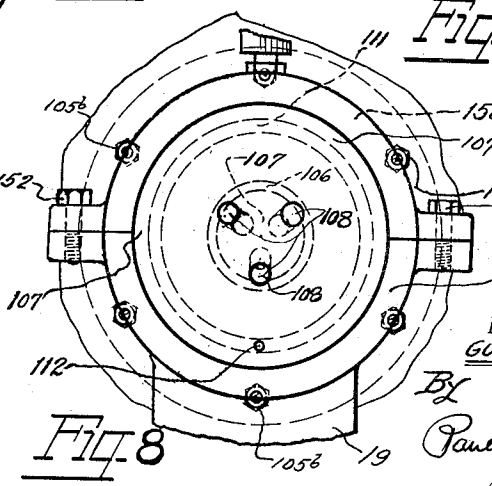


Fig. 8

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UNITED STATES PATENT OFFICE

1,948,963

SIPHON SYSTEM FOR SLASHERS

Guy C. Dukes, Kannapolis, N. C.

Application February 10, 1930. Serial No. 427,401

2 Claims. (Cl. 34—4)

This invention relates to improved means and improved apparatus for the drainage of condensed steam and the like from steam pressure drums in which steam is forced into the drum and as a result condensed steam, water, air and other non-condensable gases will form in the drum and it is an object of my invention to remove these undesirable elements from the steam drum, the invention being particularly applicable to steam chambers or drums, such as drying cylinders of slasher or other similar machines.

Another object of my invention is to provide means for exhausting by the steam pressure which is let into the drum, the condensed steam, water, air and other non-condensable gases without the undue loss of steam therefrom.

Another object of my invention is to provide an automatic exhaust for exhausting water, air and other non-condensable gases from steam drum which will at the same time prevent loss of steam from the drum.

Another object of my invention is to provide a peculiar means for exhausting the condensed steam, water, air and other non-condensable gases from steam drums which are used for heating and drying purposes, such as large rotary steam drying cylinders or drums for slasher machines, in which the end walls of the cylinders or drums are secured to each other by means of tie rods running from one end to the other to reinforce the same and to prevent the pressure in the drums from expanding or bursting the drums.

These tie rods have proved annoying as they prevented the use of stationary drain or exhaust pipes within the steam chamber and in many instances required the use of buckets or similar devices which will dip up the condensed steam or water as the cylinders are rotated. It is therefore evident that when steam is turned into the drum when the same is started in operation that a large amount of condensed steam may be in the drum and it will have to run an excessive amount of time before the buckets would dip up the water and exhaust the same from the steam chamber. These buckets will not furnish an escape for air and other undesirable non-condensable gases, and are unsatisfactory as the water, air and other non-condensable gases will decrease the heat at the base of the cylinder and prevents a uniform temperature from being present in the drum, and therefore will delay the operation of the same for an appreciable time before said condensed steam and other elements are exhausted from the drum. Furthermore, in all apparatus which has heretofore been devised to the best of my knowledge, there is no means provided for the cold air release from the drum. Heretofore in all apparatus of which I am aware it has been customary to introduce the steam into the drum, and this steam is condensed by the cold air in the drum, and then the means for removing the condensed steam will remove it from the drum, and I have provided means whereby when the steam is turned on in the drum that the cold air can be released from the drum, and when all cold air has been quickly expelled the cold air valve can be closed.

My invention overcomes the above-named difficulties by providing an elongated cylinder having a plurality of exhaust channels therein which project within the steam chamber and has pipes extending therefrom, and these are connected to a steam tight joint or out-let which is rotated with the cylinder or drum with a portion of said tight joint being stationary which permits the escape or exhaust of the condensed steam within the chamber intermittently when a registering takes place between certain of said channels and the pipes connected thereto, and the out-going channel as will appear in the description which will hereinafter follow.

Another object of my invention is to provide means for removing condensed steam and other undesirable elements from the interior of a steam heated drum, in which means are provided for regulating the flow of the condensed steam from the drum.

My machine can be stopped at a point where the operator will know that all the water will be exhausted so that when operations are resumed the cylinder will be free from water and the machine then can be more quickly started which will increase production.

My improvements can be installed in a conventional cylinder as shown without changing the construction of said cylinder.

Some of the objects of my invention having been stated other objects will appear as the description proceeds, when taken in connection with the accompanying drawings, in which—

Figure 1 is a transverse cross-sectional view of one end of a slasher drum with my invention applied thereto;

Figure 2 is a cross-sectional view taken through Figure 1 along the line 2—2;

Figure 3 is a cross-sectional view taken along the line 3—3 and looking in the direction indicated by the arrow;

Figure 4 is a view taken along the same line as

Figure 3 but looking in the direction of the arrows 4—4;

Figure 5 is an enlarged detailed cross-sectional view taken along the line 5—5 in Figure 4;

Figure 6 is a modified form of my invention;

Figure 7 is a view along the line 7—7 in Figure 6;

Figure 8 is a view along 8—8 in Figure 6;

Figure 9 is a view along the line 9—9 in Figure 6;

Figure 10 is a view along the line 10—10 in Figure 1.

Referring more particularly to the drawings the numeral 10 indicates one of the end portions of a slasher drum which has the covering 11 therearound, said covering 11 being circular in cross-section and the head member 10 being circular also. The members 10 and 11 are secured to each other by means of a circular ream 12 into which bolts 13*a* are passed after passing through the head member 10 and the flange on the end of the portion 11. These head members are secured to each other by means of tie rods 13 running from one head member to the other. A slide valve member 15 is provided and an additional bearing member 16, said members 15 and 16 being secured to each other by means of the bolts 17 which also secure the hub member and bearing member to the head members 10. This bearing member 16 is adapted to rotate in the bearing 18 which is mounted on the framework 19 of the slasher and this member 15 and also the bearing member 16 has the hollow channel 21 therein and at the outer end of this channel the enlarged circular channel 22 appears, and further outward in the bearing member 16 still larger circular channel portion 23 occurs, and in the channel portions 21, 22 and 23 the member 25 is mounted there being a space 26*a* between the interior of member 15 and the exterior of member 25. This member 25 has the enlarged portion 26 and the still further enlarged portion 27 all cast integral with portion 25, these portions 25, 26 and 27 leaving the space 26*a* therebetween and a space also occurs between the portion 26 and the enlarged circular portion 22, and also a still larger portion 23 has a space between the enlarged portion 27 and the side walls of the enlarged portion 23. The enlarged portion 27 has the circular cut-away portion in the end thereof into which the stationary member 30 is adapted to fit, said member 30 having the enlarged portion 31 which is adapted to fit into the circular cut-away portion in the outer end of the portion 27. A cap member 32 is adapted to be secured to the bearing member 16 by means of bolts 33 and this portion 32 is also adapted to be secured to the enlarged portion 27 by means of the bolts 34. This cap portion has the place for the packing 35 therein, and the circular member 36 fits snugly around the portion 30 and is adapted to press on the packing portion 35, and this member 36 is secured to the outer end of member 35 by means of bolts 38 penetrating the same and being threadably secured into the portion 32. A valve member 38*a* is secured in the member 32 and has a passageway leading therefrom adapted to register with the outer edge of the circular space 23 so that when steam is forced into the cylinder 9 the steam will go up through the hole 41 in the member 15, and out through the space 26*a* and between the enlarged portions 26 and 27 and the inside wall portions of the bearing block 16, and when the valve 38*a* is opened this forcing in of the steam will force the cold air out of the drum 9 and the valve 38*a* will be closed when dry steam starts coming out of the same.

This member 15 has the channels 45, 46 and 47 therein and connecting with the channels 45, 46 and 47 are the pipes 48, 49 and 50 which project outwardly through the holes 41 in the member 15. These channels 45, 46 and 47 lead all the way through the portions 25, 26 and 27 and one of the channels at a time is adapted to register with a hole 51 in the stationary enlarged portion 31 of the member 30. This hole 51 leads outwardly through the member 30, and downwardly and outwardly through the pipe 53, this being the exhaust pipe by means of which cold water and other undesirable elements may be removed from the drum. The pressure of the steam when it is admitted to the drum will force the water 60 upward through the pipe 50, 49 or 48 as the case may be, whichever may be in lowered position, which will allow the channel which is connected with said pipe to register with the hole 51 in the member 31. It is seen that only one of these channels register at a time with the hole 51, and attention is further called to the fact that the hole 51 is elongated so as to give a longer period of registration of the channels with the hole 51 to permit complete exhaustion of the water or condensed steam or other desirable elements from the drum.

Although I have shown only three pipes and three channels for removing the water and other elements from the drum I desire it to be understood that any number of pipes may be placed in the drum with a channel for each pipe in the member 25, and when I place a number of pipes greater than the number shown of course I would provide other similar holes to the holes 47, 46 and 45. It is of course understood that the pressure of the steam in the drum 9 will force the condensed steam or water up through the pipe which is pointing downward in the drum which at that moment will be registering with the passageway in the member 30.

In both forms of my invention I secure the brace member 70 to the beam 19 and this portion 70 has the bolt 71 threadably secured therein, and the other brace member 72 is slidably secured with relation to 70 by means of the slot 73, by means of which the length portions 70 and 72 can be adjusted, and the end of 72 is secured around the pipe 53 by means of the cuff 74 being secured to the cuff 72*a* on the member 72 by means of bolts 75.

In Figures 6 to 10 inclusive I have shown a modified form of my invention, in which I provide means for adjusting the size of the passageway through which the condensed steam is forced as it would happen in many instances that if the structure shown in Figures 1 to 5 inclusive, when all of the water is removed from the drum dry steam will be forced therethrough and in Figures 6 to 9 inclusive I have shown means whereby the size of the opening through which the condensed steam is forced may be regulated to suit operating conditions.

In this modified form of my invention the numeral 100 indicates the drum which has the bearing portion 101 and 102 secured to each other by means of the bolts 103 with packing 104 between the two portions 101 and 102, and a member 105 is secured on the inside of the drum by means of bolts 105*b* which has an extension 105*a* which has the cavity 106 therein, the parts 102 and 101 and 105 being adapted to rotate at all times with the drum 100. Also se-

cured integral with the parts 101 and 102 by means of the bolts 103 is the member 107 which extends into the cavity 106 and has a plurality of passageways 108 therein, and the portion 105a has holes 109 therein through which the pipes 110 project, and are threadably secured to the extension 107, so as to form communication between the interior of the drum and the channels 108. The extension of 107 leaving the space 106 allows uncondensible gases and cold air which may be in the drum at the time the steam is turned on to be forced outwardly through said space and through the space 111, between the member 102 and the member 107, and a hole 112 is provided through member 107 and the member 101, and a valve 113 is secured therein, so that when said valve 113 is opened the cold air and other uncondensible gases can be forced out through this valve 113.

The portion 101 has the extension 115 which projects outwardly and has the cuff 116 slidably mounted thereon, which cuff is threadably secured to the portion 115 by means of bolts 117. The member 120 is mounted in the extension 115 and has the enlarged head portion 121 thereon, and the cavity 122, and a channel 123 leads through the head portion 121, and the end of this head portion has rotatably mounted thereon the disk 124 which is fixedly secured on the shaft 125, which shaft projects outwardly through the elbow portion 126.

This portion 126 is threadably secured to the portion 120, and has the pipe member 127 threadably secured in the other end thereof, the cold air and the exhausted condensate from the drum being adapted to pass through the portion 122 and through the pipe 127. The shaft 125 projects through the portion 126 and has packing 129 therein, which is held in position by means of the packing nut 130, and the portion 126 has the indications 131 around the periphery thereof, and a needle 132 is secured on the shaft 125 to indicate what hole is in alinement with the channel 123. This shaft 125 has the wheel 134 thereon for turning the same. The disk 124 has therein a plurality of different sized holes 135, 136, 137, 138, 139 and 140, it being evident that the size of the hole which is placed over the channel 123 will regulate the amount of condensed steam which can be forced through this passageway, and thus the rate of the exhausting of the water from the drum can be regulated, it being evident that if hole 135 in the disk 124 was registering with 123, and the condensed steam was exhausted too fast thus allowing dry steam to pass out of the drum at the time the pipe 110 was in lowermost position, then all that would be necessary would be to turn the wheel 134 and cause holes 136 or 137 or any other hole to register with the channel 123 and thus restrict the capacity of this passageway to limit the amount of water which can be forced through the channel 123.

The set screw 142 is provided in the member 126 by means of which the shaft 125 can be adjusted and held securely in position by means of this set screw when it is turned to the desired position.

The bearing members 150 and 151 are secured around the bearing portion 102 by means of bolts 152.

In the drawings and specification I have set forth a preferred embodiment of my invention, and although specific terms are employed they are used in a generic and descriptive sense only, and not for purposes of limitation, the scope of the invention being set forth in the appended claims.

I claim:

1. Means for extracting condensate from a steam heated cylinder comprising a hollow axially disposed member mounted in the cylinder and having an open end communicating with the exterior of the cylinder, said hollow member having perforations therein, a hollow hub member secured to the exterior of the cylinder in axial alinement with the hollow member in the cylinder, an elongated member having a flanged outer portion secured over the outer end of said hub portion and extending within the hollow member in the cylinder, said elongated member having a plurality of longtudinally disposed bores therein, and also having a transverse bore communicating with each longitudinal bore, a pipe secured in each of said transverse bores and extending through said perforations, a flanged hollow member secured to said outer hub and also secured to said elongated member, a second flanged hollow member disposed within the first flanged hollow member, means for fixedly mounting said second flanged hollow member, a packing joint between the two flanged hollow members, a valve stem mounted in said second flanged member, a disk having a plurality of openings of different sizes therein fixed on said valve stem and being disposed on the inner end of said valve stem, the openings in said disk being disposed in radial alinement with the bores in said elongated member, said second flanged member having a hole in its inner end coinciding with the openings in the said disk and means on the valve stem for adjusting said disk to thereby regulate the rate of discharge of condensate from the cylinder.

2. Means for exhausting condensate from a steam heated cylinder comprising an axially disposed hollow member secured to the inside surface of one end of the cylinder, a hollow bearing member secured to the exterior surface of said end and having its hollow coinciding with the hollow in the axially disposed member, an elongated member secured over the outer end of said bearing and extending into the hollow in said axially disposed member and having a plurality of passageways therein, a hollow cap member secured to the outer end of said elongated member, a fixed hollow member around which said cap member is adapted to rotate, said fixed member having a passageway adapted to communicate one at a time with the passageways in said elongated member to allow condensate to flow into said hollow fixed member, the end of the passageway in the fixed member being larger than the passageways in said elongated member to allow unobstructed flow of the condensate from the cylinder while the cylinder is rotating thru a predetermined angle.

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