L. J. MARTEL.

FLUSHING APPARATUS FOR USE WITH PRESSURE FILTERS.

APPLICATION FILED MAR. 11, 1920.

1,370,469.

Patented Mar. 1, 1921.

Fig. 1.

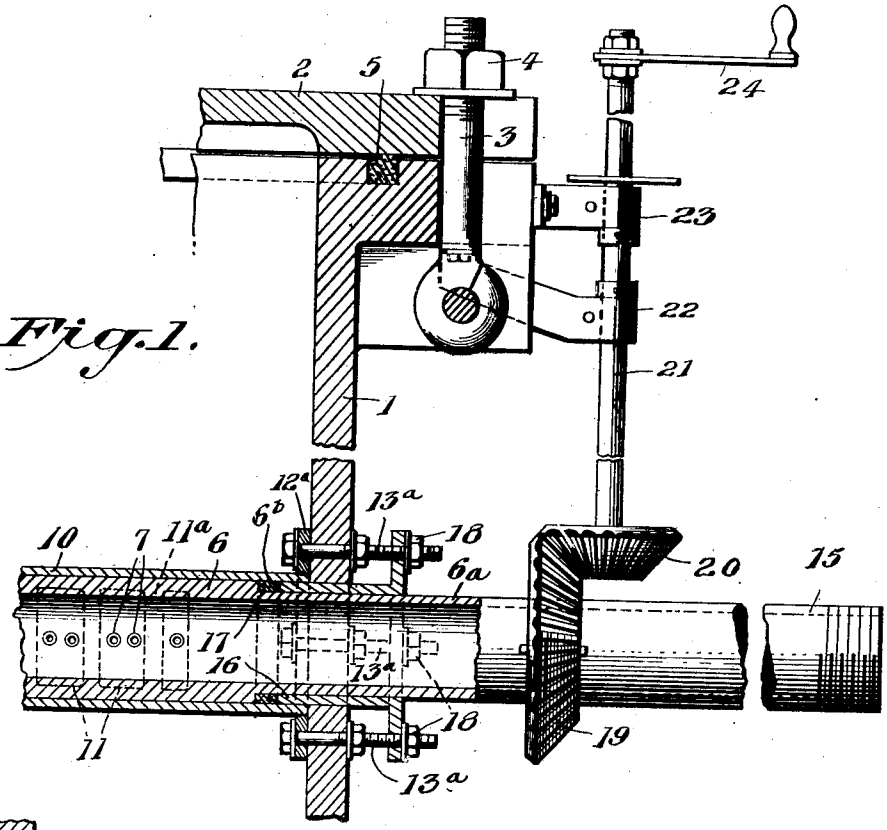

Fig. 1a

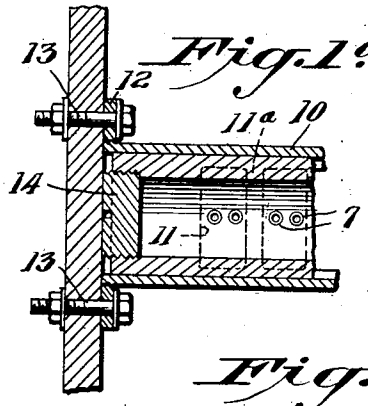

Fig. 2.

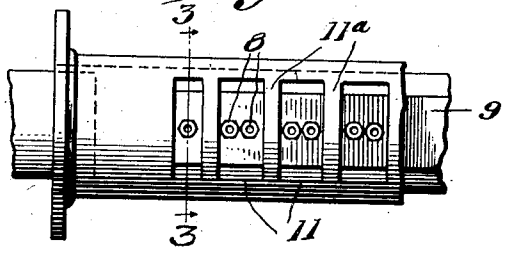

Fig. 3.

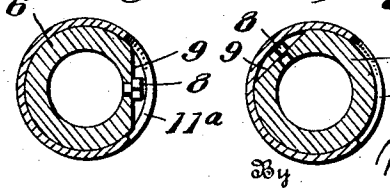

Fig. 4.

Inventor

L. J. Martel,

By Wilkinson & Giusta,

Attorneys

UNITED STATES PATENT OFFICE.

LOUIS J. MARTEL, OF NEW ORLEANS, LOUISIANA, ASSIGNOR TO MARTEL FILTER COMPANY, INC., OF NEW ORLEANS, LOUISIANA, A CORPORATION OF LOUISIANA.

FLUSHING APPARATUS FOR USE WITH PRESSURE-FILTERS.

1,370,469. Specification of Letters Patent. Patented Mar. 1, 1921.

Application filed March 11, 1920. Serial No. 364,949.

To all whom it may concern:

Be it known that I, LOUIS J. MARTEL, a citizen of the United States, residing at New Orleans, parish of Orleans, and State of Louisiana, have invented certain new and useful Improvements in Flushing Apparatus for Use with Pressure-Filters; 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 flushing apparatus for use with pressure filters, and especially for use with pressure filters employed in the separation of solid or gummy particles from saccharine solutions such as juice from sugar cane.

The juice from the cane, after being pressed out by the crusher and pressing rolls of the mill, contains particles of vegetable matter in the form of finely divided bagasse, together with considerable gum; and mud from the waxy powder which grows upon the stem of the stalk, and also from the more or less dirt which unavoidably adheres to the cane and is transported to the mill. Moreover, the cane juice contains a varying amount of albumen; and all these various products tend to form a gummy adherent mass which projects into and blocks the small pores of any apparatus of this kind, and which it is the purpose of any filtering apparatus to remove from the juice.

The solid or semi-solid impurities form on the cloth bags used for covering the apparatus described, and it is necessary to remove the particles so adhering. Various devices have been designed to wash the cloths off *in situ*, but all of these have proved more or less unsatisfactory, and the general practice has prevailed for many years past, and still prevails, of removing the filter frames inclosed in the cloths from the filter, and then removing the cloths for the purpose of washing the same, either replacing the old cloths after washing, or substituting new cloths on the frames.

I have discovered that one of the troubles experienced in the proper cleansing of the cloths was due to the clogging up of the minute orifices in the spray pipes used in the washing operation, designed to cleanse the cloths *in situ* while on the frames and in the filter, with the result that these spray pipes fail to operate satisfactorily.

If some of the spray holes become clogged it will be obvious that the corresponding portion of the filter cloth could not be washed, and the scale would remain adhering to the filter cloth while other portions of the cloth would be washed, causing an unequal and unsatisfactory operation of the filters.

I obviate these results by providing an apparatus in which the jets or spray holes are masked and completely protected from any contact with the saccharine solution, but which may be quickly unmasked and turned to the operative position whenever desired, as when the juice has been withdrawn from the filter, leaving the filter frames and cloths in place, the cake being preferably held in position on the cloths by compressed air.

The details of the construction of the preferred form of filters and filter frames are shown in my copending application Serial No. 330,361, filed October 13, 1919, and entitled Improvements in apparatus for filtering saccharine solutions, and in my other application of even date herewith, entitled Improvements in filter frames for use with pressure filters, filed March 11, 1920, Ser. No. 364,950.

My invention provides a special flushing arrangement for use with apparatus of the character described and will be more fully understood after reference to the accompanying drawings, in which like parts are indicated by similar reference symbols throughout the several views, and in which:

Figure 1 is a sectional elevation showing the arrangement for flushing the filter and washing off the mud adhering to the filter cloths, parts being shown in section.

Fig. 1ª shows the opposite end of the flush line pipe from that shown in Fig. 1, the parts being shown in section.

Fig. 2 is a detail showing part of the flush line pipe with the nozzles therein and with the sheath therefor.

Fig. 3 shows a section along the line 3—3, Fig. 2, and looking in the direction of the arrows, the nozzles being shown in the exposed or operative position; and

Fig. 4 is a similar view to Fig. 3, but shows the nozzles in the masked or protected position.

1 represents the main body of the filter

shell or casing having a top 2 secured thereon by means of the bolts 3 and nuts 4, the joint between the top and the casing being made tight by means of any suitable packing 5. 6 represents a revoluble pipe perforated as at 7, to register with the spaces between the filter frames, not shown, and provided with nozzles 8 to supply water from the interior of the pipe on the filter cloths and frames.

The perforated face of this pipe 6 is cut away or flattened as at 9, see Figs. 3 and 4, so that the pipe 6 may be rotated to a position to cause the nozzles to be masked by the outer slotted pipe or sheath 10, so that, when not in use, these nozzles are masked by said sheath and are not likely to become clogged up with the gummy or albuminous or solid material found in the liquid being filtered.

This pipe or sheath 10 is slotted transversely, and through a portion of its circumference only, as shown at 11 in Fig. 2, so as to provide a clear opening for the nozzles when they are turned to the unmasked position as shown in Fig. 2. The portions 11^a of the sheath 10 serve as strengthening ribs to prevent distortion of the sheath while the filter is under pressure.

The ends of this sheath 10 are screwed or otherwise secured in the rings 12 and 12^a which are secured to the end walls of the filter case in any convenient way, as by means of the short bolts 13 shown in Fig. 1^a and the longer bolts 13^a shown in Fig. 1.

One end of the pipe 6 is closed in any convenient way, as by means of the plug 14, and the outer end 6^a is connected to the flush line main 15.

In order to make a tight joint, the pipe 6 is shouldered as at 6^b, see Fig. 1, and the projecting end 6^a has a reduced diameter to permit the use of a gland 16 with packing 17.

This gland is set up by nuts 18 on the bolts 13^a.

In order to rotate the pipe 6, I provide a bevel gear 19 fast on the reduced portion 6^a of the said pipe, which bevel gear meshes with the bevel gear 20 on the shaft 21, which shaft is journaled in suitable bearings 22 and 23 carried by the filter casing, and the said shaft may be turned when desired by the hand lever 24.

As the filtering operation continues the layer of mud or solid particles on the filter cloths will increase in thickness, and after the filter has been operated for a length of time, which time will depend upon the nature of the juice being strained, the filter cloths will become so clogged up with dirt, mud, and other solid matter, that the filter will begin to operate slowly, and it is then desirable to wash out the same.

The juice is withdrawn from the filter and the sweetening water is let in, as fully described in my application Serial No. 330,361, aforesaid, and after the water contained in the filter has been drawn off, as described in said application, the outer surfaces of the filter cloths are washed clean by means of the flushing apparatus herein described and shown.

During the filtering operation the flushing pipe 6 is turned with the nozzles in the masked position shown in Fig. 4, and at which time the nozzles are completely screened from any contact with the liquid in the filter; now, when it is desired to wash off the filter cloths while still in the filter, the flush pipe 6 is turned by means of the hand lever 24 and the gearing shown, so that the nozzles 8 will be unmasked, being then in the position shown in Figs. 2 and 3. Water is now forced into the pipe 6 from the flushing main 15, and the pipe 6 is oscillated backward and forward through the requisite angle so as to cause the spray to spread out fan-like and thoroughly wash the sides of the filter frames. The water that is forced in under pressure finds a free exit through said nozzles.

I use in connection with this pipe 6 hot water under pressure, preferably 80 pounds of pressure, more or less, and by rocking the pipe 6 about its axis the fine sprays of hot water will be projected into the spaces between the filter cloths and will wash the solid impurities therefrom, leaving the cloths practically clean and ready for renewal of the operation of the filter without the removal of the top of the filter or any access to the interior thereof.

After the cloths are sprayed off in the manner stated, the supply of hot water is shut off from the pipe 6, then pipe 6 is turned to the position for masking the jets and the apparatus is ready to begin anew the cycle of operations just described.

It will be obvious that various modifications might be made in the construction, combination and arrangement of parts which can be used without departing from the spirit of my invention, and I do not mean to limit the invention to such details except as particularly pointed out in the claims.

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

1. Filtering apparatus adapted for use with pressure filters comprising an oscillatory spray pipe projecting into the body of the filter and provided with a plurality of nozzles, and a tubular sheath for said pipe normally masking said nozzles, but cut away along one side thereof to expose said nozzles when said pipe is turned to the proper position for spraying the filter cloths.

2. Filtering apparatus adapted for use with pressure filters comprising an oscillatory spray pipe projecting into the body of the filter and provided with a plurality of nozzles, and a tubular sheath for said pipe normally masking said nozzles, but cut away along one side thereof to expose said nozzles when said pipe is turned to the proper position for spraying the filter cloths, with means for rocking said pipe through the desired angle to mask or unmask said nozzles, as may be desired.

3. Filtering apparatus adapted for use with pressure filters comprising an oscillatory spray pipe projecting into the body of the filter and provided with a plurality of nozzles, and a tubular sheath for said pipe normally masking said nozzles, but provided with a series of radially disposed apertures, separated by ribs, along one side thereof to expose said nozzles when said pipe is turned to the proper position for spraying the filter cloths.

4. Filtering apparatus adapted for use with pressure filters comprising an oscillatory spray pipe projecting into the body of the filter and provided with a plurality of nozzles, and a tubular sheath for said pipe normally masking said nozzles, but provided with a series of radially disposed apertures, separated by ribs, along one side thereof to expose said nozzles when said pipe is turned to the proper position for spraying the filter cloths, with means for rocking said pipe through the desired angle to mask or unmask said nozzles, as may be desired.

5. Filtering apparatus adapted for use with pressure filters comprising an oscillatory spray pipe projecting into the body of the filter and provided with a plurality of nozzles, and a tubular sheath for said pipe normally masking said nozzles, but cut away along one side thereof to expose said nozzles when said pipe is turned to the proper position for spraying the filter cloths, with means for rocking said pipe through the desired angle to mask or unmask said nozzles, as may be desired, comprising a bevel gear fast to said pipe, a shaft journaled exterior to the filter and provided with a handle at one end and a bevel gear at the other meshing with the first mentioned bevel gear.

6. Filtering apparatus adapted for use with pressure filters comprising an oscillatory spray pipe projecting into the body of the filter and provided with a plurality of nozzles, and a tubular sheath for said pipe normally masking said nozzles, but provided with a series of radially disposed apertures, separated by ribs, along one side thereof to expose said nozzles when said pipe is turned to the proper position for spraying the filter cloths, with means for rocking said pipe through the desired angle to mask or unmask said nozzles, as may be desired, comprising a bevel gear fast to said pipe, a shaft journaled exterior to the filter and provided with a handle at one end and a bevel gear at the other meshing with the first mentioned bevel gear.

7. Filtering apparatus adapted for use with pressure filters comprising an oscillatory spray pipe projecting into the body of the filter and flattened longitudinally at one side, a plurality of nozzles secured in said flattened side and of less radial depth than the circumference of said pipe, and a tubular sheath for said pipe normally masking said nozzles, but cut away along one side thereof to expose said nozzles when said pipe is turned to the proper position for spraying the filter cloths.

8. Filtering apparatus adapted for use with pressure filters comprising an oscillatory spray pipe projecting into the body of the filter and flattened longitudinally at one side, a plurality of nozzles secured in said flattened side and of less radial depth than the circumference of said pipe, and a tubular sheath for said pipe normally masking said nozzles, but cut away along one side thereof to expose said nozzles when said pipe is turned to the proper position for spraying the filter cloths, with means for rocking said pipe through the desired angle to mask or unmask said nozzles, as may be desired.

9. Filtering apparatus adapted for use with pressure filters comprising an oscillatory spray pipe projecting into the body of the filter and flattened longitudinally at one side, a plurality of nozzles secured in said flattened side and of less radial depth than the circumference of said pipe, and a tubular sheath for said pipe normally masking said nozzles, but provided with a series of radially disposed apertures, separated by ribs, along one side thereof to expose said nozzles when said pipe is turned to the proper position for spraying the filter cloths.

10. Filtering apparatus adapted for use with pressure filters comprising an oscillatory spray pipe projecting into the body of the filter and flattened longitudinally at one side, a plurality of nozzles secured in said flattened side and of less radial depth than the circumference of said pipe, and a tubular sheath for said pipe normally masking said nozzles, but provided with a series of radially disposed apertures, separated by ribs, along one side thereof to expose said nozzles when said pipe is turned to the proper position for spraying the filter cloths, with means for rocking said pipe through the desired angle to mask or unmask said nozzles, as may be desired.

LOUIS J. MARTEL.