(No Model.)

V. H. & G. T. CRISMAN.

FLUME RACK CLEANER.

No. 332,790. Patented Dec. 22, 1885.

Fig. 2.

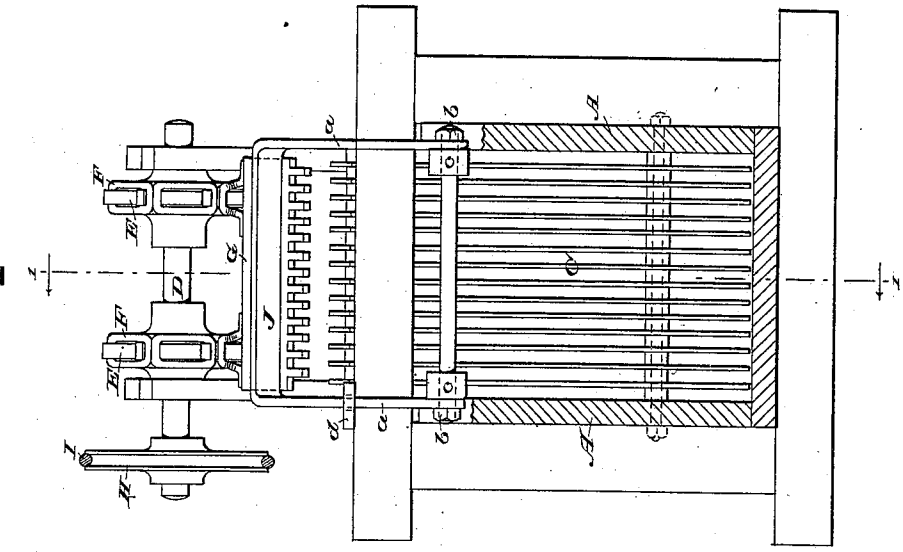
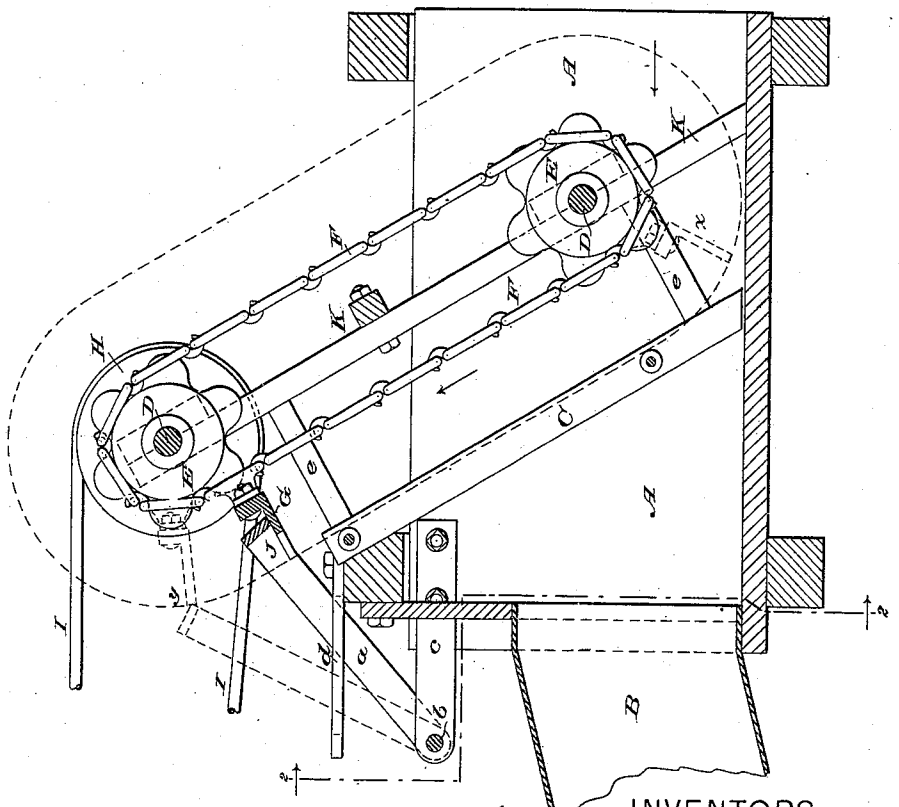


Fig. 1.



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UNITED STATES PATENT OFFICE.

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FLUME-RACK CLEANER.

SPECIFICATION forming part of Letters Patent No. 332,790, dated December 22, 1885.

Application filed March 2, 1885. Serial No. 157,581. (No model.)

To all whom it may concern:

Be it known that we, VIRGIL H. CRISMAN and GEORGE T. CRISMAN, both citizens of the United States, and residents of Branchville, Sussex county, New Jersey, have jointly invented an Improved Flume-Rack Cleaner, of which the following is a specification.

Flumes which lead the water to mill-wheels, and especially to the various kinds of turbine wheels, are provided with racks at or near the point where the penstock is connected with the flume for the purpose of stopping and collecting floating leaves and other bodies, which would otherwise pass on into the wheel and perhaps clog or injure it. If a floating stick of tough wood should get into the rapidly-revolving turbine wheel, it would inevitably do considerable damage. The rack placed in the flume stops all such floating matter, but the matter collects on the rack, and at some seasons of the year, in autumn, especially, it will accumulate in a short time in amount sufficient to nearly stop the flow of water. It is necessary to keep the rack free from this accumulation, and it is ordinarily effected by hand with the aid of rakes.

The object of our invention is to provide a continuously-operating rack-cleaner to be driven by power, and provided with a comb or rake that is drawn over the face of the inclined rack at regular intervals, from bottom to top, and the accumulated floating matter dumped outside of the flume.

Our invention will be fully described hereinafter, and its novel features carefully defined in the claims.

In the drawings which serve to illustrate our invention, Figure 1 is a longitudinal vertical section of our improved apparatus, taken in the plane of the longitudinal axis of the flume. The plane of the section is indicated by line 1 1 in Fig. 2. Fig. 2 is a rear end elevation of our apparatus, the flume being in section in the plane indicated by the line 2 2 in Fig. 1.

Let A represent a part of an ordinary flume, open at the top, and B a part of the penstock, which leads the water from the flume to the water-wheel. C is the rack, which is usually set inclined at about the angle seen in Fig. 1. This rack is usually made of metal bars properly spaced and secured together by rods. The particular construction of the rack and its angle of inclination are not material to our invention. We have shown the rack as commonly constructed and arranged.

Our apparatus or device comprises as its essentials two shafts, D D, mounted in suitable bearings, sprocket-wheels E E, mounted two on each shaft, as shown, two endless chains, F F, mounted on the sprocket-wheels, and a rake or comb, G, secured to the endless chains. This rake is in the form of a toothed bar, which extends across from chain to chain. On the upper one of the shafts D is fixed a driving sheave or pulley, H, and over this passes a wire rope or driving-belt, I, whereby the pulley H is driven from the mill. The apparatus may, however, be driven from any convenient source. The lower or working sides of the chains F are arranged substantially parallel with the inclined rack, and move upward, as indicated by the arrow. The position of the rake G just as it is starting on its upward movement is indicated by dotted lines at *x* in Fig. 1. Its teeth enter between the bars of the rack, near the bottom of the flume, and as it is drawn upward it gathers the accumulation of leaves, &c., from the rack. As soon as it clears the upper end of the rack, it is caused to discharge its load by a stripper, J. This stripper may be merely an iron bar bent back at the ends to form pivoting-arms *a a*, which are pivoted at *b* to brackets *c* on the flume, or to some other part.

The rake G is shown by the full lines in the drawings to have just engaged the stripper J, and in the dotted lines at *y* in Fig. 1 the rake is shown as just clearing the stripper after the latter has finished its work. The relative movements of the rake and stripper are such that they recede from each other, and the stripper is thus caused to draw off the rubbish from the rake and allow it to fall outside of the flume. The stripper then falls back to its place by force of gravity. We usually arrange one arm of the stripper to play in a slot in a plate, *d*, to limit its movement; but this we do not think essential.

We usually mount the shafts D D in a stout wooden frame, K, one end of which rests on the bottom of the flume, and provide this frame with legs *e e*, which rest upon the rack.

The weight of the apparatus will usually

be sufficient to keep it in place while in operation without the necessity of fastenings of any kind, and this construction renders it easy to raise the apparatus up out of the water during freezing weather, at which time it will be least needed, as the water is then freed from leaves, &c.

One or more rakes G may be used; but one will suffice, even though the chains run slowly, as the accumulation of leaves is usually quite slow relatively. As the rake and chains must be arranged in front of the rack—that is, on the upstream side—we prefer to use but two chains, arranged near the sides of the flume, and but one or two rakes. Otherwise the chains, and rakes would form an obstacle to the flow of the débris to the rack.

In endless-chain cleaners for sewers and drains numerous endless chains placed so close together as to form a seive-like apron, and provided with rows of teeth at every joint, have been proposed. These are very expensive, and serve as racks to collect the débris, as well as cleaners. These of course run in the opposite direction from our device, and a comb is used as a stripper. This we do not claim.

It will be seen that our bar-like rake, supported at its ends on the two chains which stand close to the sides of the flume, provides a construction that will not offer any appreciable obstacle to the flow of the débris to the rack where it is collected.

Other equivalent forms of strippers might be employed with our apparatus, and we do not limit ourselves to that shown. The kind of stripper we show, however, is inexpensive, and enables the apparatus to do its work more thoroughly.

Means may be employed to tighten up the endless chains, if desired, and sliding boxes with adjusting-screws for the bearings of the upper shaft would serve. These are so well known as to require no description.

The ordinary coarse or open rack now employed at the head of the flume will prevent large and heavy floating bodies from getting into the flume down to our cleaning device or apparatus. This we have not deemed it necessary to show.

Our apparatus may be readily applied to any ordinary flume and rack, and the shafts D may be mounted in or on the flume itself or in a separate frame, as shown. As the speed with which the shafts revolve, and the uniformity of the speed are not very essential, the apparatus might be driven by a small wind-wheel, and this might be of advantage where the apparatus is situated at a considerable distance from the mill, or at much higher level than the mill. For the driving-gear H any of the well-known forms of driving-gear may be substituted—as toothed gears, for example, or a crank.

We do not broadly claim a mechanism for removing débris from flumes and races composed of endless chains with teeth; nor do we claim, broadly, the employment, in connection with such a machine, of a device for stripping the débris from the teeth—as such have been proposed before.

Having thus described our invention, we claim—

1. A flume-rack cleaner comprising a frame to support the moving parts, the sprocket-wheels and their shafts, mounted in said frame, the two endless chains arranged at the sides of the flume, so as to leave a free passage between them for the floating débris, the bar-like rake extending across from chain to chain and secured at its ends to the chains, and a stripper arranged to strip the débris from the rake, all constructed and arranged to operate substantially as set forth.

2. A flume-rack cleaner comprising the frame K, with legs *e e* to rest on the rack, the sprocket-wheels and their shafts, the two endless chains arranged near the sides of the flume, the rake mounted on said endless chains, and the stripper, constructed and arranged to operate substantially as described, whereby the said cleaner may be set on the rack in proper relation therewith, and be readily removed from the flume, for the reasons set forth.

3. The combination, with the inclined rack of a flume, of the hinged stripper arranged to operate as shown, and a rack-cleaner comprising the sprocket-wheels and their driving-gear, the endless chains on said sprocket-wheels, and the rake secured to said chains, the chains being mounted in the frame, substantially as set forth, with their under working sides substantially parallel with the rack, and the hinged stripper arranged with respect to the chains substantially as set forth.

4. The combination, with the rack C of a flume and the hinged stripper I, of the removable rack-cleaner comprising the frame K, with legs *e e* to set on the rack, the shafts and their sprocket-wheels, mounted in said frame, the two endless chains F F, arranged near the sides of the flume, and the rake G, mounted on the chains, substantially as set forth.

In witness whereof we have hereunto signed our names in the presence of two subscribing witnesses.

VIRGIL H. CRISMAN.
GEORGE T. CRISMAN.

Witnesses:
HENRY HUSTON,
CHAS. M. WOODRUFF.