F. DUGAS & P. RICHARDS.

CLEANING DEVICE.

APPLICATION FILED JUNE 10, 1908.

905,158. Patented Dec. 1, 1908.

2 SHEETS—SHEET 1.

Fig. 3.

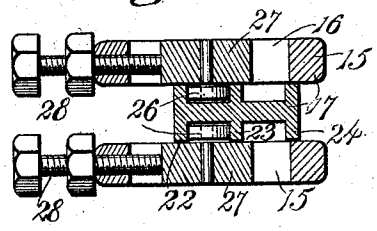


Fig. 1.

Fig. 4.

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2 SHEETS—SHEET 2.

Fig. 5.

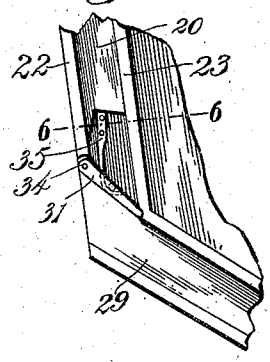


Fig. 6.

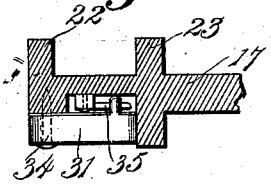


Fig. 2.

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UNITED STATES PATENT OFFICE.

FREDERIC DUGAS AND PHILIP RICHARDS, OF LIVERMORE FALLS, MAINE.

CLEANING DEVICE.

No. 905,158. Specification of Letters Patent. Patented Dec. 1, 1908.

Application filed June 10, 1908. Serial No. 437,802.

To all whom it may concern:

Be it known that we, FREDERIC DUGAS and PHILIP RICHARDS, citizens of the Dominion of Canada, residing at Livermore Falls, in the county of Androscoggin and State of Maine, have invented certain new and useful Improvements in Cleaning Devices, of which the following is a specification, reference being had to the accompanying drawings.

Our invention relates to a raking device for cleaning the racks or screens employed in the raceways or inlets of turbines to prevent leaves, drift wood and other trash from entering the turbines and injuring them.

The object of the invention is to provide a simple and practical mechanical raking device by means of which such protecting racks may be quickly and effectively cleaned.

With the above and other objects in view, the invention consists of the novel features of construction and the combination and arrangement of parts hereinafter fully described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of our improved cleaning device; Fig. 2 is a front elevation; Figs. 3 and 4 are detail sectional views taken, respectively, on the planes indicated by the lines 3—3, 4—4 in Fig. 1; Fig. 5 is an enlarged detail view; and Fig. 6 is a detail sectional view taken on the plane indicated by the line 6—6 in Fig. 5.

In the drawings 1 denotes a horizontal support or platform arranged above the water in a channel or raceway containing an ordinary clearing rack or screen 2. The latter is designed to prevent leaves, sticks, logs and other trash in the water, the level of which is indicated at 3, from passing to the turbines or other point to which the water passes. As illustrated, the rack or screen 2 is composed of parallel slats suitably spaced apart, but it will be understood that it may be of any form and construction.

4 denotes track rails arranged upon the support 1 and engaged by the supporting wheels 5 of a carriage 6 which carries our improved raking or cleaning device, the tracks being so disposed that the carriage may be shifted from point to point transversely across the rack 2. Arranged upon the front of the carriage is a trough or receptacle 7 to receive the trash elevated by the raking mechanism from the rack 2 and upon the rear portion of the carriage is a platform or bed 8 on which is arranged a rake support 9 and a hoisting mechanism 10 here shown in the form of a drum which may be operated by a steam engine, an electric motor, or any other suitable means.

The rake support 9 is in the form of an upwardly and forwardly inclined boom or bracket arm, the rear or base portion 10 of which is connected to the platform 8 so that the rake support may be adjusted in a forward and rearward direction. This adjustment is preferably effected by forming in the enlarged base portion 10 of the boom or support one or more longitudinal slots 11 to receive clamping bolts 12. The outer or forward end of the boom or support 9 is bifurcated, as shown at 13, to provide parallel arms 14, the outer extremities of which are enlarged to provide spaced parallel plates 15, which latter are vertically disposed and have adjacent to their lower ends arcuate slots 16.

17 denotes a vertically disposed rake bar or member arranged between the plates 15 for sliding and swinging movement and carrying at its lower end a rake head 18 consisting of a cross piece provided with a plurality of teeth 19 adapted to enter between the slats or bars of the rack 2. The rake bar 17 has upon its opposite sides longitudinal grooves or channels 20, 21 formed by longitudinally extending parallel ribs or flanges 22, 23, 24, which are formed on opposite sides of said rake bar. The forward guide channels or grooves 21 are adapted to receive anti-friction rollers 25 journaled upon the inner faces of the plates 15 adjacent to the upper ends of the latter. These rollers 25 serve to guide the rake bar in its vertical sliding movement and also serve as fulcrums for it in its forwardly and rearwardly swinging movement. 26 denotes similar rollers journaled upon adjustable bearing blocks 27 which are slidably arranged in the guide grooves 16 in the lower portions of the plates 15 and adapted to be held in an adjusted position by adjusting screws 28, as clearly shown in Figs. 1 and 3 of the drawings. Said rollers 26 are adapted to work in the rear guide channels or grooves 20 in the rake bar and to also move along the outer face of the rib or flange 22, as presently explained. The lower ends of the guide channels 20, 21 are provided with offset or downwardly inclined portions 29, 30 in which the rollers 26, 25 are adapted to

enter when the rake bar is elevated so that the rake head will be swung inwardly or rearwardly to discharge the trash upon it into the trough or receptacle 7. Said inclined or cam portions 29, 30 of the guideways are formed in an enlarged portion of the rake bar at the lower end of the latter and immediately above the rake head 18, as clearly illustrated in the drawings. The rollers 25, 26 are so disposed that the rake bar is substantially parallel with the rack 2 and since the guideways 20, 21 are parallel with each other the rake bar will travel in a plane substantially parallel with the rack 2 with the teeth 19 of the rake head projecting between the slats of the rack; but in order to throw the rake head outwardly away from the rack, when it is being lowered, we provide, at the lower end of the channel 20, a pivoted deflecting plate or member 31 which serves to throw the roller 26 out of the upper end of the channel 29 and consequently to throw the rake head outwardly or forwardly so that the roller 26 will engage the outer face of the rib or flange 22 when the rake bar moves downwardly. The upper end of the channel 20 is provided with an inlet 32 which is adapted to permit the roller 26 to return to said channel 20 and which is formed by slitting the flange or rib 22 and bending it outwardly to provide the inclined or cam portion 33. It will be seen that when the rake bar lowers and the incline 33 passes beneath the roller 26 the rake head will be permitted to swing inwardly against the rack and when the rake bar is again raised the roller 26 will pass through the inlet 32 and into the channel 20. The deflector plate 31 is pivoted at its upper end, as at 34, and is actuated by a spring 35 so that its lower end engages a recess or seat in the rib or flange 23, as seen in Fig. 5.

The rake is raised and lowered by a cable or the like 36 one end of which is attached to and wound upon the winding drum or windlass 10 and the other end of which is attached to the lower end of the rake bar. The intermediate portion of said cable passes over a guide pulley 37 journaled between the inner portions of the arms 14 and also over a guide roller 38 arranged in a guard plate 39 which is disposed immediately above the upper end of the rack 2 and is attached to the outer edge of the trough 7, as seen in Fig. 1.

40 denotes a spring arranged between the arms 14 and adapted to be compressed by the rake bar as the head of the latter is moved inwardly to discharge its contents into the trough 7 and also adapted to throw the rake head outwardly the instant the hoisting cable is released.

41 denotes a guard which prevents the carriage from tilting. It is in the form of a bracket attached to the platform 8 of the carriage and having its lower end projecting under the head of one of the track rails 4, as seen in Fig. 1.

In operation, when the carriage is placed upon the track the boom or rake support 9 is adjusted to properly position the plates 15 above the rake, and the bearing blocks 27 are then adjusted so that when the rollers 26 are in the guide channels 20 the rake bar will be substantially parallel with the rack. When the parts are in the position shown in Fig. 1 and the drum 10 is rotated to wind the cable thereon, the rake head will be moved vertically and the rake bar will travel in a plane parallel with the rack 2 until the rollers 26, 25 enter the portions 29, 30 of said guide channels, whereupon the rake head will be swung inwardly to throw the trash upon it into the trough 7. When the rake bar is thus swung it will compress the spring 40 so that the instant the cable is released said spring will swing the rake head outwardly and the rake bar will be permitted to drop by gravity. As the lower end of the rake bar swings outwardly the rollers 26 are deflected by the plates 31 out of the lower ends of the channels so that they will travel upon the outer faces of the flanges or ribs 22, thereby holding the rake head away from the rack until said rollers again enter the channels 20 at the upper ends of the latter. After one portion of the rack 2 has been cleaned the carriage may be adjusted to clean another portion of the same, but it will be understood that the cleaning device may be mounted stationary when the rake head can be made sufficiently broad to clean the entire rack at one operation.

Having thus described our invention what we claim is:

1. In a device of the character described, the combination with a rack or screen, of a support, guiding elements upon the latter, a rake bar carrying a rake head to co-act with the rack or screen and provided with guideways to receive said guiding elements, said guideways having offset or cam portions, whereby the rake bar will be swung toward and from the rack as it is reciprocated and means for reciprocating said rake bar, substantially as set forth.

2. In a device of the character described, the combination with a rack or screen, of a support, upper and lower pairs of oppositely disposed guiding elements arranged upon the support, a rake bar carrying a rake head to co-act with the rack or screen and provided upon its opposite sides with guide grooves or channels having offset or cam portions, said guide grooves or channels being adapted to receive said guiding elements and means for actuating said rake bar, substantially as set forth.

3. In a device of the character described, the combination with a rack or screen, of a

support, upper and lower pairs of oppositely disposed guiding elements arranged upon the support, a rake bar having a head to co-act with the rack or screen and provided upon its opposite sides with guide grooves or channels to receive said guiding elements, said guide grooves or channels having the offset portions whereby the rake bar will be swung toward and from the rack as it is reciprocated, means for reciprocating the rake bar and means for adjusting one pair of said guiding elements upon said support, substantially as and for the purpose set forth.

4. In a device of the character described, the combination with a rack or screen, of a support, upper and lower pairs of oppositely disposed guiding elements arranged upon the support, a rake bar having a rake head to co-act with the rack or screen and provided upon its opposite sides with guideways to receive said guiding elements, said guideways having offset or cam portions, a spring for actuating the rake bar, a winding drum and a cable between the latter and said rake bar for elevating said rake bar.

5. In a device of the character described, the combination with a rack or screen, of a support, two pairs of oppositely disposed rollers journaled upon said support, a rake bar having a rake head to co-act with the rack or screen and provided upon its opposite sides with guideways having offset or cam portions, the rollers of one pair being adapted to travel in one of said guideways and the rollers of the other pair being adapted to travel in the other of said guideways, means for directing the last mentioned rollers into and out of their guideways and means for operating the rake bar.

6. In a device of the character described, the combination with a rack or screen, of a support, a pair of spaced plates carried thereby, a rake bar having a rake head to co-act with the rack or screen and provided with guideways having offset or cam portions, rollers carried by said plates and engaged with certain of the guideways in the rake bar, other rollers adjustably mounted in said plates and engaged with other guideways in the rake bar, means for directing the last mentioned rollers into and out of their guideways, and means for operating the rake bar.

7. In a device of the character described, the combination with a rack or screen, of a support, a pair of spaced plates carried thereby, a rake bar having a rake head to co-act with the rack or screen and provided with guideways having offset or cam portions, rollers carried by said plates and engaged with certain of the guideways in the rake bar, other rollers adjustably mounted in said plates and engaged with other guideways in the rake bar, means for directing the last mentioned rollers into and out of their guideways, a spring for actuating the rake bar, a hoisting cable attached to the rake bar and a winding drum for said hoisting cable.

8. In a device of the character described, the combination with a rack or screen, of a movable carriage or support adjacent to the rack or screen and means upon said carriage for cleaning the rack or screen.

9. In a device of the character described, the combination with a rack or screen, of a movable carriage or support adjacent to the same, and a raking device to co-act with the rack or screen and carried by said carriage.

10. In a device of the character described, the combination with a rack or screen, of a track adjacent to the same, a carriage to travel on said track, a rake upon said carriage to co-act with the rack or screen and means upon the carriage for actuating said rake.

11. In a device of the character described, the combination with a rack or screen, of a carriage mounted for movement adjacent to the rack or screen, a receptacle upon the carriage, an adjustably mounted rake support upon the carriage, a rake bar having a rake head to co-act with the rack or screen and provided with guideways having offset or cam portions, means carried by the rake support to engage said guideways in the rake bar, and means for actuating the rake bar.

12. In a device of the character described, the combination with a rack or screen, of a carriage to travel adjacent to the same, a receptacle upon the carriage, a rake support upon the carriage, a rake bar carrying a rake head to co-act with the rack or screen and provided with guideways having offset or cam portions, means upon the rake support to engage the guideways upon the rake bar and means upon the carriage for actuating the rake bar.

13. In a device of the character described, the combination with a rack or screen, of a carriage to travel adjacent to the same, a receptacle upon the carriage, a rake support upon the carriage and adjustable toward and from said rack or screen, and a raking device upon said support to co-act with said rack or screen.

14. In a device of the character described, the combination with a rack or screen, of a support, upper and lower pairs of oppositely disposed guiding elements arranged upon said support, a rake bar carrying a rake head to co-act with the rack or screen and formed in its opposite sides with the guide channels 21 to receive the upper pair of guiding elements and also with the parallel guide channels 20 to receive the lower pair of guiding

elements, said guide channels 21, 20 having the offset portions 30, 29 at their lower ends, the deflector 31 in the lower portion of the guide channel 20, the deflector 33 at the upper end of the guide channel 20, and means for operating said rake bar, substantially as set forth.

In testimony whereof we hereunto affix our signatures in the presence of two witnesses.

FREDERIC DUGAS.
PHILIP RICHARDS.

Witnesses:
MILFORD N. CONRAD,
ISAAC B. CLARY.