

H. F. WEINLAND.
TUBE CLEANER.
APPLICATION FILED AUG. 11, 1909.

1,000,060.

Patented Aug. 8, 1911.
2 SHEETS—SHEET 1.

FIG. 3.

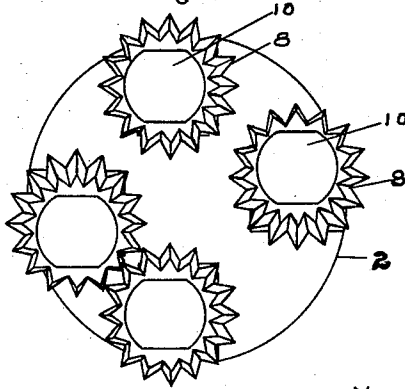


FIG. 1.

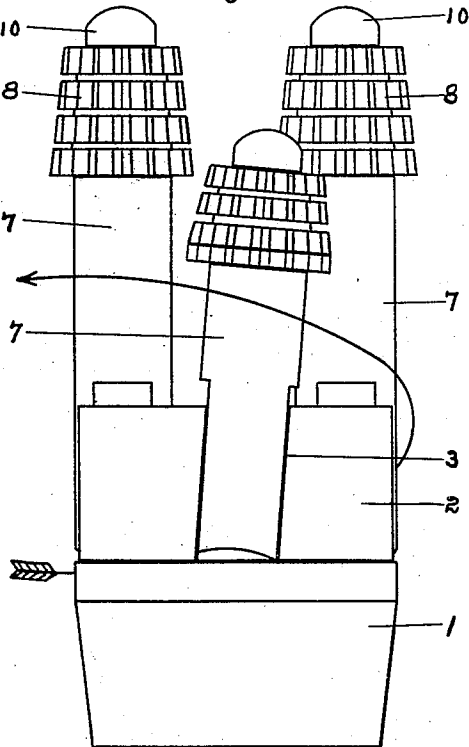
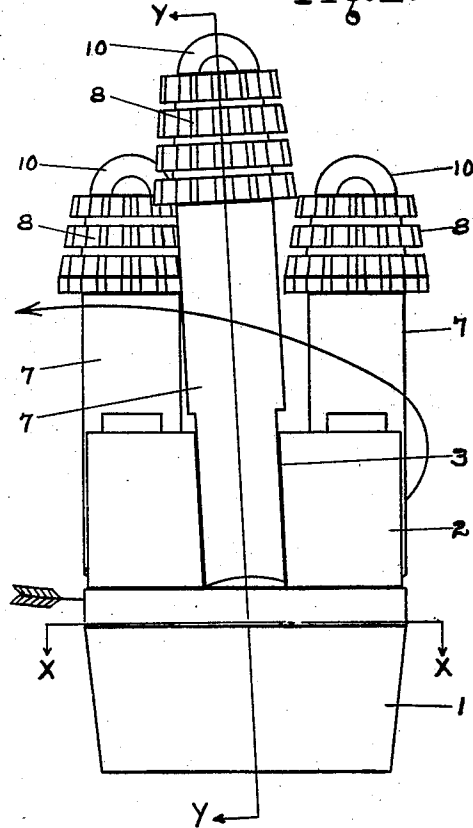


FIG. 2.



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FIG. 4.

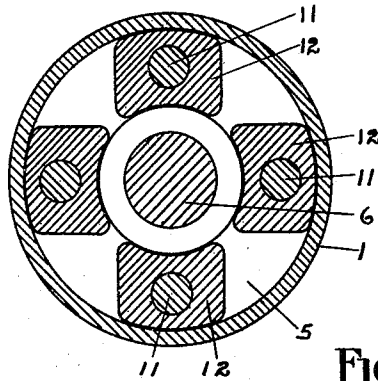


FIG. 5.

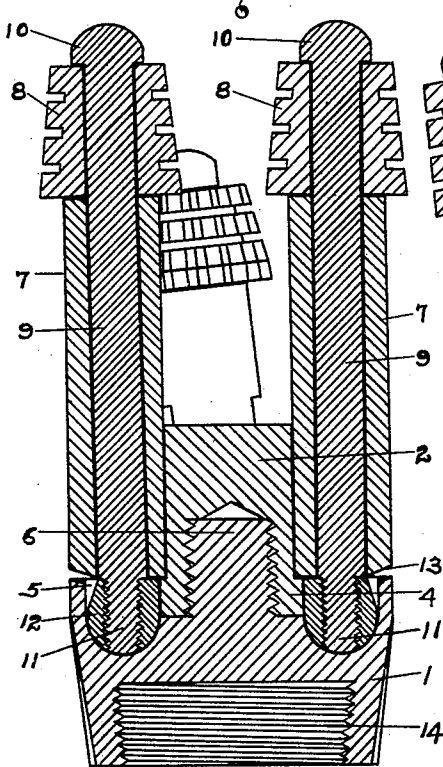
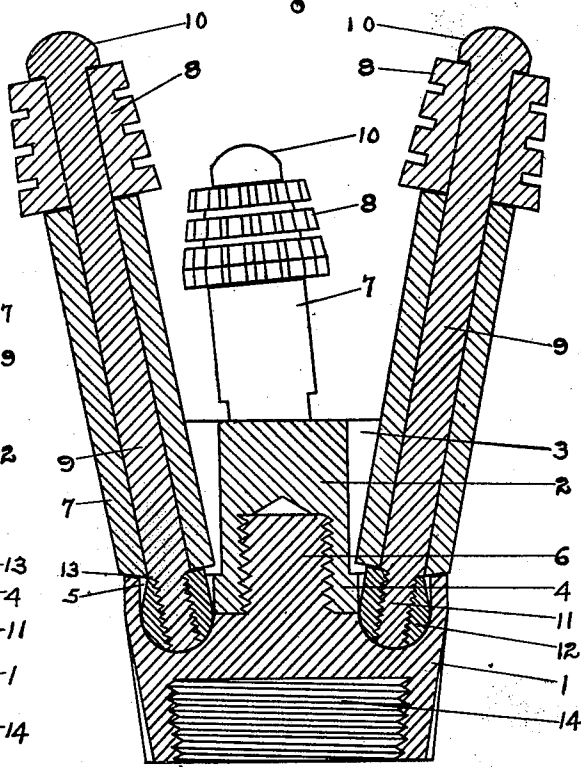


FIG. 6.



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UNITED STATES PATENT OFFICE.

HENRY F. WEINLAND, OF SPRINGFIELD, OHIO, ASSIGNOR TO THE LAGONDA MANUFACTURING COMPANY, OF SPRINGFIELD, OHIO, A CORPORATION OF OHIO.

TUBE-CLEANER.

1,000,060.

Specification of Letters Patent.

Patented Aug. 8, 1911.

Application filed August 11, 1909. Serial No. 512,443.

To all whom it may concern:

Be it known that I, HENRY F. WEINLAND, a citizen of the United States, residing at Springfield, in the county of Clark, State of Ohio, have invented certain new and useful Improvements in Tube-Cleaners, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to tube cleaners and more particularly to tools of this class that are rotated at a high speed to remove the scale from water tubes of steam boilers.

The object of my invention is to provide a cleaner with cutter carrying arms swinging in planes that will be most effective in their knocking and picking action, and further, so arranged that by their action will tend to advance the cleaner in its work and avoid tracking. This I accomplish by providing a head with forwardly projecting arms swinging throughout their length in planes inclined to the axis of the head, and I preferably incline one or more of the arms in the direction of rotation of the cleaner and the other arms in the opposite direction, whereby the cutters are given a tendency to draw the cleaner in opposite directions and prevents the tracking of the cutters and they work with much greater efficiency; and further, the trailing arms, that is, those arms that are inclined in an opposite direction to the rotation of the cleaner, are given a greater angle of inclination to overcome the action of the cutters on the other arms, and tend to work the cleaner forward into the scale.

A further object is to provide a cleaner of few parts, simple, durable and strong, that can be easily and quickly assembled and taken apart; and especially, in view of the short life of rivets, which is a source of considerable trouble in tools of this character, I have devised a novel construction without employing rivets, the spindles which secure the cutters on the arms being otherwise held in place.

With these and other objects in view, my invention consists of the combinations and constructions hereinafter described and set forth in the claims.

In the accompanying drawings Figure 1 is a side elevation of a cleaner embodying my invention. Fig. 2 is a like view taken

at right angles to Fig. 1. Fig. 3 is an end view. Fig. 4 is a transverse section on the line $x-x$ of Fig. 2. Fig. 5 is a longitudinal section on the line $y-y$ of Fig. 2, showing the arms at the limit of their inner movement; and Fig. 6 is a like section showing the arms at the limit of their outer movement.

Like numerals represent the same parts in the several views.

In the drawings a head is transversely divided into a rear portion 1 and front portion 2. The front portion 2 is provided with longitudinal slots 3 and an annular rearwardly extending projection 4; and the rear portion has in its front face an annular recess 5 and a central forwardly extending projection 6, screw-threaded into a recess in the front portion to secure the two portions of the head together.

Forwardly projecting arms 7, adapted to fit, swing in and be guided by the slots 3, have cutters 8 on their front ends held in place by spindles 9 having heads 10, said spindles extending through longitudinal openings in the arms, with reduced portions 11 extending beyond the rear ends of the arms screw-threaded into perforations in removable segmental heads 12. Said heads are adapted to fit and turn or rock in the recess 5; and further they are of greater length than the thickness of the arms 7 and of the width of the slots 3, so that their projecting ends engage the rear face of the front portion 2 of the head by which they are held in place and form a pivot upon which the arms 7 swing, said arms being guided in their swinging movement by the slots 3 through which they project. The rear ends of the arms 7 are beveled or cut away as shown at 13 to permit the outward swing of the arms, the movement being limited by contact of said beveled portions with the rear portion of the head.

A screw-threaded recess 14 in the rear end of the head is provided to attach a motor shaft to drive the cleaner.

It will be seen that by unscrewing and taking the two portions of the head apart the arms are released; and that by unscrewing the segmental heads the spindles and cutters are released from the arms.

To make the cutters more effective in their action I form the slots 3 at an inclination

to the axis of the cleaner so as to guide the arms 7 in their swinging movement at a like inclination. To prevent the tracking of the cutters I preferably incline one or more of the arms in the direction of the rotation of the cleaner and the balance in the opposite direction; and further, to give a tendency to advance the cleaner, I preferably incline the arms in the direction of rotation at a less angle than those that are inclined in the opposite direction. In Fig. 2 one of the arms is shown inclined in the direction of rotation, and in Fig. 1 one of the arms is shown inclined in the opposite direction at a greater angle of inclination than the arm inclined in the direction of rotation. The reduced portion 11 of each of the spindles 9 is screw-threaded into the perforation in the segmental head at the same inclination as the slot 3 in which the arm is to move.

Two short and two long arms are shown, with the cutters on the long arms in advance of the cutters on the short arms. This arrangement gives room for the play of the arms without the cutters interfering with each other and assists in preventing the cutters from tracking in their action on the scale.

It is further pointed out that new cutters can be mounted on the arms without taking the head apart, it being only necessary to unscrew the spindles from the removable heads on said spindles and screw them back in place.

Having thus described my invention, I claim:

1. A rotary tube cleaner having a supporting head with pivoting heads seated therein, swinging arms, cutters and means to carry said cutters at the free ends of said arms, said means being immediately secured to said pivoting heads and removable therefrom without disturbing said pivoting heads from their position in said supporting head, substantially as described.

2. A rotary tube cleaner having a supporting head with radial slots formed therein at an inclination to the axis thereof, pivoting heads seated in said supporting head, swinging arms projecting through and guided by said slots, cutters and means to carry said cutters at the free ends of said arms, said means being immediately secured to said pivoting heads and removable therefrom without disturbing said pivoting heads from their position in said supporting head, substantially as described.

3. A rotary tube cleaner having cutters and forwardly projecting freely swinging arms with means to pivot same at their rear ends and carry said cutters at their free ends, the planes of movement of the arms being at an inclination to the axis of the cleaner, the inclination of one or more of the arms being in the direction of the ro-

tation of the cleaner and the other arms being inclined in the opposite direction, substantially as described.

4. A rotary tube cleaner having forwardly projecting freely swinging arms pivoted at their rear ends and having cutters at their free ends, the planes of movement of the arms being at an inclination to the axis of the cleaner, the inclination of one or more of the arms being in the direction of the rotation of the cleaner and the other arms being inclined in the opposite direction at a different angle to the axis of the cleaner, substantially as described.

5. A rotary tube cleaner having a head with slots formed at an inclination to the axis of the head, cutters, arms with means to pivot same at their rear ends and carry said cutters at their free ends, said arms projecting forwardly through said slots and being guided thereby in their swinging movement, substantially as described.

6. A rotary tube cleaner having a head with slots formed at an inclination to the axis of the head, arms pivoted at their rear ends and having cutters on their free ends, said arms projecting forwardly through said slots and being guided thereby in their swinging movement, one or more of the slots being inclined in the direction of the rotation of the head and the other slots being inclined in the opposite direction, substantially as described.

7. A rotary tube cleaner having a head with slots formed at an inclination to the axis of the head, cutters, arms with means to pivot the same at their rear ends and carry said cutters at their free ends, said arms projecting forwardly through said slots and being guided thereby in their swinging movement, one or more of the slots being inclined in the direction of the rotation of the head and the other slots being inclined in the opposite direction at a different angle to the axis of the head, substantially as described.

8. A rotary tube cleaner having a transversely divided supporting head adapted to be secured together, with pivoting heads seated between the respective portions of said supporting head, cutters and means to carry said cutters at the free ends of said arms, said means being immediately secured to said pivoting heads and removable therefrom without disturbing said pivoting heads from their position in said supporting head, substantially as described.

9. A rotary tube cleaner having a transversely divided head, the rear portion being provided with a recess in its forward face, and the front portion with slots, arms having longitudinal perforations with spindles extending therethrough, said spindles having heads on their front ends, and means on their rear ends pivoted in said recess on

which said arms swing in said slots, cutters held on said arms by said spindles, and means to secure the respective portions of the head together, substantially as described.

5 10. A rotary tube cleaner having a transversely divided head, the rear portion being provided with a recess in its forward face and the front portion with slots, said rear portion further having a central forwardly
10 extending projection screw-threaded into a recess in the front portion, arms having longitudinal perforations with spindles extending therethrough, said spindles having integral heads on their front ends and removable heads on their rear ends pivoted in
15 said recess on which said arms are adapted to swing in said slots, and cutters secured on said arms by said spindles, substantially as described.

20 11. A rotary tube cleaner having a transversely divided head, the rear portion being provided with a recess in its forward face, and the front portion with slots formed at an inclination to the axis of the head, said
25 rear portion further having a central forwardly extending projection screw-threaded into a recess in the front portion, forwardly projecting arms extending through said slots and having longitudinal openings
30 with spindles extending therethrough, said spindles having integral heads on their front ends and removable heads screw-threaded on their rear ends and pivoted in said recess in which said arms are adapted to swing, and
35 cutters removably secured on said arms by said spindles, substantially as described.

40 12. A rotary tube cleaner having a head with a plurality of slots at an inclination to the axis thereof, one or more inclining forwardly in the direction of rotation and the others in the opposite direction, arms pivoted to swing in said slots, cutters with

means to secure the same at the free ends of said arms, one or more of said arms being shorter than the others.

45 13. A rotary tube cleaner having a transversely divided head, the rear portion being provided in its forward face with an annular recess, and the front portion with slots
50 formed at an inclination to the axis of the cleaner, and an annular rearwardly extending projection, said rear portion further having a forwardly-extending projection screw-threaded into a recess in the front portion of said head, forwardly projecting
55 arms extending through said slots and having longitudinal openings with spindles extending therethrough, said spindles having integral heads on their front ends and removable segmental heads on their rear ends
60 pivoted in said annular recess on which said arms are adapted to swing, cutters secured in said arms by said spindles, the cutters on one arm being in advance of the cutters on the other, substantially as described.

65 14. A rotary tube cleaner having a divided head with means to removably secure the respective portions together, a pivoted arm having a longitudinal opening with a spindle extending therethrough, said spindle having
70 an integral head on its free end, and a removable head on the other end forming a pivot on which the arm is adapted to swing, a cutter on said spindle between the integral head and the arm, the spindle being removable
75 without taking the cleaner head apart, substantially as described.

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

HENRY F. WEINLAND.

Witnesses:

GROVER ILGEN,
CARL CASSEY.