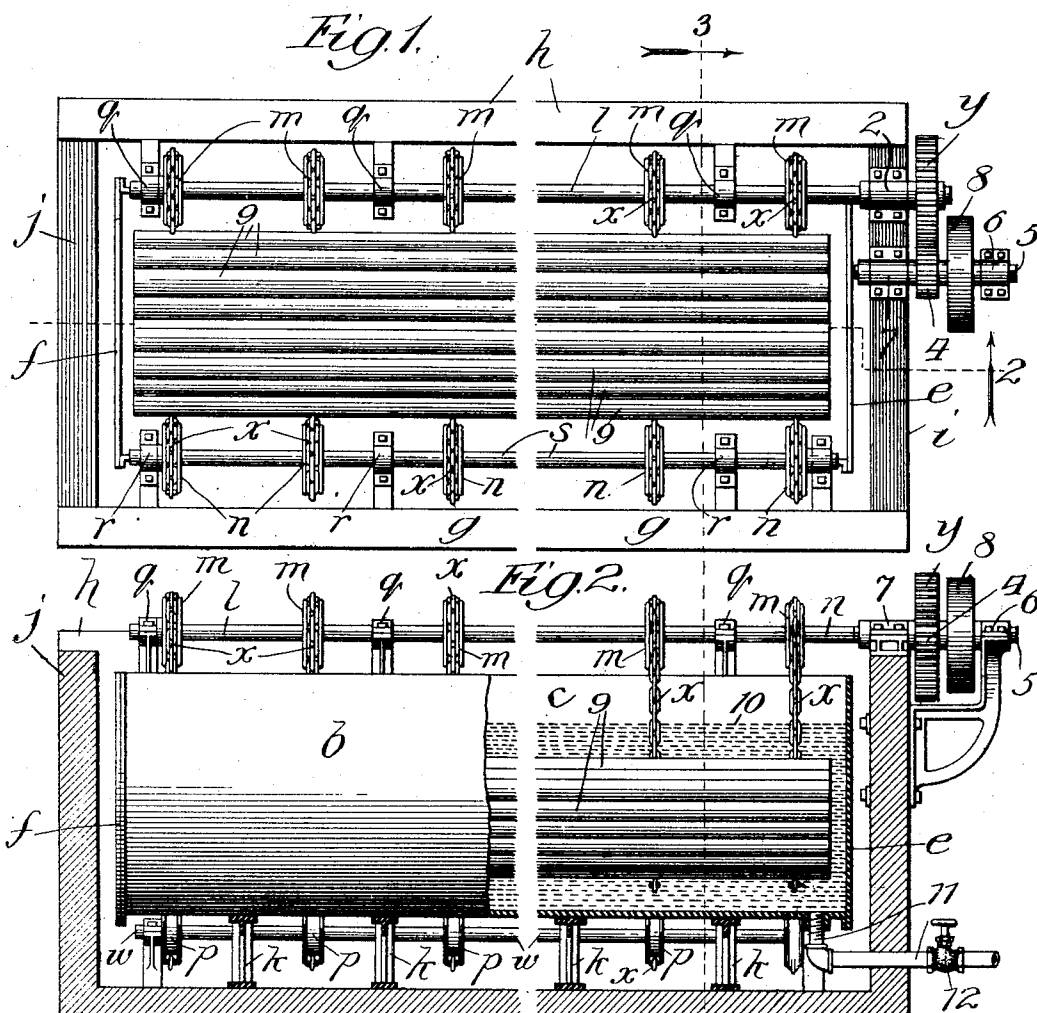
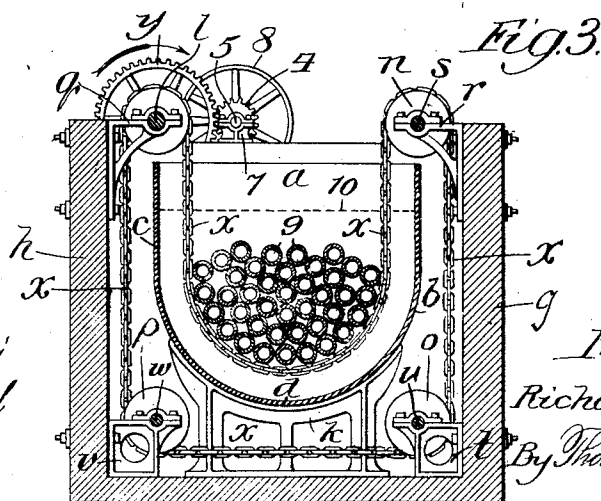


R. M. CROSBY.
FLUE RATTLER.
APPLICATION FILED APR. 29, 1904.



Witnesses:
Ed. Gaylord,
Harry T. Stott.

Inventor:
Richard M. Crosby
By Thomas F. Sheridan,
Atty.

UNITED STATES PATENT OFFICE.

RICHARD M. CROSBY, OF OELWEIN, IOWA, ASSIGNOR OF ONE-HALF TO
DAVID VAN ALSTYNE, OF ST. PAUL, MINNESOTA.

FLUE-RATTLER.

SPECIFICATION forming part of Letters Patent No. 779,468, dated January 10, 1905.

Application filed April 29, 1904. Serial No. 205,481.

To all whom it may concern:

Be it known that I, RICHARD M. CROSBY, a citizen of the United States, residing at Oelwein, in the county of Fayette and State of Iowa, have invented certain new and useful Improvements in Flue-Rattlers, of which the following is a specification.

My invention relates to that class of flue-rattlers comprising a tank and a plurality of chains, cables, or similar flexible elements movably mounted and extending into such tank for supporting and moving or rattling the boiler-flues to be operated upon and provided with means for operating such flexible elements or forming a connection with a suitable source of power.

The principal object of my invention is to provide a simple, economical, and efficient boiler-flue rattler.

A further object of the invention is to provide in a boiler-flue rattler a tank adapted to contain a suitable fluid and the flues to be operated upon, chains, cables, or similar flexible elements for supporting and operating upon the flues while immersed in the liquid, and suitable mechanism arranged outside of the tank for operating such flexible elements, whereby the immersed flues may be rattled and cleaned and the operating mechanisms kept outside of and substantially free from the liquid in which the flues are immersed.

Other and further objects of the invention will appear from an examination of the drawings and the following description and claims.

The invention consists in the features, combinations, and details of construction herein-after described and claimed.

In the accompanying drawings, Figure 1 is a plan view of an apparatus constructed in accordance with my improvements; Fig. 2, a longitudinal sectional elevation taken on line 2 of Fig. 1 looking in the direction of the arrow, and Fig. 3 a transverse sectional elevation taken on line 3 of Fig. 1 looking in the direction of the arrow.

In constructing a boiler-flue rattler in ac-

cordance with my improvements I provide a tank *a*, having side walls *b* and *c*, a preferably U-shaped bottom portion *d*, and end walls *e* and *f*, all forming a tank substantially U-shaped in cross-section and of sufficient length to contain the boiler-flues to be operated upon. I prefer to mount this tank in a suitable supporting-frame, comprising side frames *g* and *h*, end frames *i* and *j*, and supporting-saddles or center brackets *k*, the tank being firmly mounted upon the latter and inside of the framework. I prefer to make the supporting-frame as well as the tank water-tight. The supporting-brackets *k*, upon which the tank is mounted, are arranged at intervals along the center of the frame, so as to add to the rigidity and strength of the tank. A plurality of chains, cables, or similar flexible elements for supporting and operating the tubes or flues to be treated are arranged at the necessary intervals along the tank, so as to encircle it, each of such flexible elements being mounted upon a set of pulleys *m*, *n*, *o*, and *p*, the pulleys *m* being mounted upon and keyed to a suitable driving-shaft *l*, which extends longitudinally along preferably one of the upper edges of the tank and is rotatably mounted in suitable brackets *q* on the supporting-frame. The pulleys *n* are mounted over the opposite edge of the tank, where they are supported by a set of brackets *r* on the frame, being preferably keyed upon a rotatable shaft *s*, so that they will rotate together. The pulleys *o* are mounted in brackets *t* along the lower edge of the tank, being preferably keyed upon a rotatable shaft *u*, and the pulleys *p* are mounted upon similar brackets *v* along the opposite lower edge of the tank, being preferably keyed upon a rotatable shaft *w*.

All the pulleys above described are grooved when cables are used and are preferably made in the form of sprocket wheels or pulleys when chains are used.

A spur-gear *y* is mounted upon one end of the driving-shaft, which is journaled in the supporting-framework in suitable metallic

bearing portions 2, and a gear 4 in toothed engagement therewith is mounted upon a stub-shaft 5, which is journaled in bearings 6 and 7 and provided with a belt-pulley 8 or any ordinary and well-known means for connecting such driving-shaft and gear mechanism, and thereby the chains, with a suitable source of power.

Each of the chains or cables x is mounted in a set of pulleys, above described, so that their outer lap extends on the outside of the tank and around the pulleys, and its inner lap hangs from the upper pulleys in the form of a swing, which extends into the tank to within a short distance of the bottom and sides thereof, as shown in the drawings. Being arranged at suitable intervals in this manner, they form a set of supports or swings arranged at the desired intervals, so that boiler-flues 9 of the same or various lengths may be supported and operated upon thereby. The rotation of the main driving-shaft will cause the simultaneous movement of all of the chains in a corresponding direction, producing a constant rolling movement of the flues, which are immersed in a suitable liquid contained in the tank and sufficient in quantity to entirely cover them, as shown by the dotted line 10 in Fig. 3, which represents the top of the liquid.

A discharge-pipe 11 is arranged at the bottom of the tank for drawing off the liquid and extends out through the end wall of the outer frame, being provided with a suitable cock 12 for opening and closing the discharge-passage from such tank formed by such pipe.

I prefer to mount the chains so that their outer laps are on the outside of the liquid-containing tank, the driving and idler pulleys, with their shafts, being also on the outside of the tank which contains the liquid and the flues to be operated upon. The working parts are thus so far as possible free from the action of the liquid in which the tubes are immersed and are easy of access and in position to be readily removed, repaired, or replaced. This arrangement also enables the full capacity of the inner tank to be utilized and the largest possible number of boiler-flues to be operated upon with the minimum amount of liquid and with the smallest possible tank-space. In this connection, the construction of the tank in the form described—namely, U-shaped in cross-section—is of material advantage, as it corresponds closely to the position of the swinging portions of the chains in which the flues are suspended while being operated upon.

While I have described this invention as using a tank for the holding of liquids in which the flues to be rattled are suspended, it will be understood that I do not desire to limit myself strictly thereto or any further than is pointed out in the claims, for the rea-

son that the tank and fluid may be dispensed with and the flues rattled in a dry manner upon the chain mechanism.

I claim—

1. In mechanisms of the class described, the combination of a supporting-framework, a plurality of suspended chains extending transversely thereof, such chains being arranged and adapted to raise and tumble flues back upon each other in the looped portions of the chains for removing sediment from such flues, and means for supporting such chains, substantially as described.

2. In mechanisms of the class described, the combination of a tank, a plurality of chains extending into and across such tank transversely thereof upon which the boiler-flues are suspended, such chains being arranged and adapted to raise and tumble flues back upon each other in the looped portions of the chains for removing sediment from such flues, and means for operating such chains, substantially as described.

3. In mechanisms of the class described, the combination of a tank, a plurality of chains having their inner laps extending into and transversely across such tank forming swinging portions for suspending and moving the boiler-flues to be operated upon and having their outer laps arranged upon the outside of such tank, such chains being arranged and adapted to raise and tumble flues back upon each other in the looped portions of the chains for removing sediment from such flues, and means for operating such chains, substantially as described.

4. In a mechanism of the class described, the combination of a tank, a plurality of pulleys rotatably mounted adjacent to the upper edges of such tank, a plurality of chains mounted upon such pulleys and extending into and transversely of the tank, such chains being arranged and adapted to raise and tumble flues back upon each other in the looped portions of the chains for removing sediment from such flues, and means for operating such pulleys and chains, substantially as described.

5. In a mechanism of the class described, the combination of a tank, a plurality of pulleys rotatably mounted adjacent to the upper edges of such tank, a plurality of pulleys rotatably mounted near the bottom of the tank, a plurality of chains mounted upon such pulleys and extending into and transversely of the tank having swinging portions for supporting boiler-flues, such chains being arranged and adapted to raise and tumble flues back upon each other in the looped portions of the chains for removing sediment from such flues, and means for operating such pulleys and chains, substantially as described.

6. In a mechanism of the class described, the combination of a tank, a plurality of pul-

leys arranged adjacent to the upper edges of such tank, a plurality of pulleys mounted on the outside of the tank near the bottom thereof, and a plurality of chains mounted upon such pulleys encircling the tank and the pulleys upon which they are mounted and each having a downwardly-curved inner lap extending into and transversely across the tank, such chains being arranged and adapted to raise and tumble flues back upon each other in the looped portions of the chains for removing sediment from such flues, substantially as described.

7. In a mechanism of the class described, the combination of a tank, a main driving-shaft extending longitudinally thereof, a plurality of pulleys mounted upon such main driving-shaft, a plurality of idler-pulleys, and chain mechanism mounted on the main driving-shaft and extending into and transversely of the tank and over the idler-pulleys, such chains being arranged and adapted to raise and tumble flues back upon each other in the looped portions of the chains for removing sediment from such flues, substantially as described.

8. In a mechanism of the class described, the combination of a tank, a main driving-shaft extending longitudinally thereof, a plurality of shafts extending parallel with such main driving-shaft and provided with idler-pulleys mounted thereon, and chain mechanism mounted upon the main driving-shaft pulleys and extending into and transversely of the tank and over such idler-pulleys, such chains being arranged and adapted to raise and tumble flues back upon each other in the looped portions of the chains for removing sediment from such flues, substantially as described.

9. In a mechanism of the class described, the combination of a tank, a main driving-shaft, a plurality of pulleys mounted thereon, a plurality of shafts mounted upon the outside of such tank extending parallel with the main driving-shaft, idler-pulleys mounted upon such parallel shafts, and a plurality of chains extending around such tank and shafts and each having its inner lap extending into and transversely of the tank, such chains being arranged and adapted to raise and tumble flues back upon each other in the looped portions of the chains for removing sediment from such flues, substantially as described.

10. In a mechanism of the class described, the combination of a tank, a main driving-shaft, a plurality of pulleys mounted thereon, a plurality of shafts mounted upon the outside of such tank extending parallel with the main driving-shaft, idler-pulleys mounted upon such parallel shafts, a plurality of chains extending around such tank and shafts and each having its inner lap extending into and

transversely of the tank, such chains being arranged and adapted to raise and tumble flues back upon each other in the looped portions of the chains for removing sediment from such flues, and means for operating such driving-shaft and thereby the chain mechanism, substantially as described.

11. In a mechanism of the class described, the combination of a supporting-frame, a tank mounted therein, a driving-shaft provided with a plurality of pulleys mounted upon such supporting-frame outside of the tank, a plurality of idler-pulleys mounted upon such supporting-frame outside of the tank, and a plurality of chains each extending around a set of such pulleys and having its inner lap extending into and transversely of the tank, such chains being arranged and adapted to raise and tumble flues back upon each other in the looped portions of the chains for removing sediment from such flues, substantially as described.

12. In a mechanism of the class described, the combination of a supporting-framework, a substantially U-shaped tank mounted therein, a driving-shaft arranged longitudinally of such tank and provided with pulleys mounted thereon, bracket mechanism for supporting such driving-shaft, a plurality of idler-pulleys mounted on the outside of the tank, bracket mechanism for supporting such idler-pulleys, and a plurality of chains mounted upon such driving-shaft pulleys and idler-pulleys each encircling the tank and the pulleys upon which it is mounted and having a swinging portion extending into and transversely of the tank, such chains being arranged and adapted to raise and tumble flues back upon each other in the looped portions of the chains for removing sediment from such flues, substantially as described.

13. In a mechanism of the class described, the combination of a supporting-framework, a substantially U-shaped tank mounted therein, a driving-shaft arranged longitudinally of such tank and provided with pulleys mounted thereon, bracket mechanism for supporting such driving-shaft, a plurality of idler-pulleys mounted on the outside of such tank and upon the inside of the supporting-framework, bracket and shaft mechanism for supporting such idler-pulleys, chain mechanism extending on the outside of such driving-shaft and idler-pulleys and having a swinging portion extending into and transversely across the tank, such chains being arranged and adapted to raise and tumble flues back upon each other in the looped portions of the chains for removing sediment from such flues, and means for operating such driving-shaft and chain mechanism, substantially as described.

14. In a mechanism of the class described, the combination of a supporting-frame, a driv-

ing-shaft provided with a plurality of pulleys mounted upon such supporting-frame, a plurality of idler-pulleys mounted upon such supporting-frame, and a plurality of chains each
5 extending around a set of such pulleys and having its inner lap extending in the form of a swinging loop between the upper pulleys on which it is mounted, such chains being ar-

ranged and adapted to raise and tumble flues back upon each other in the looped portions 10 of the chains for removing sediment from such flues, substantially as described.

RICHARD M. CROSBY.

Witnesses:

S. L. JOHNSON,

A. R. COLLINS.