E. E. HAUER.

TUBE CLEANER.

APPLICATION FILED APR. 21, 1910.

999,993.

Patented Aug. 8, 1911.

Fig. 1.

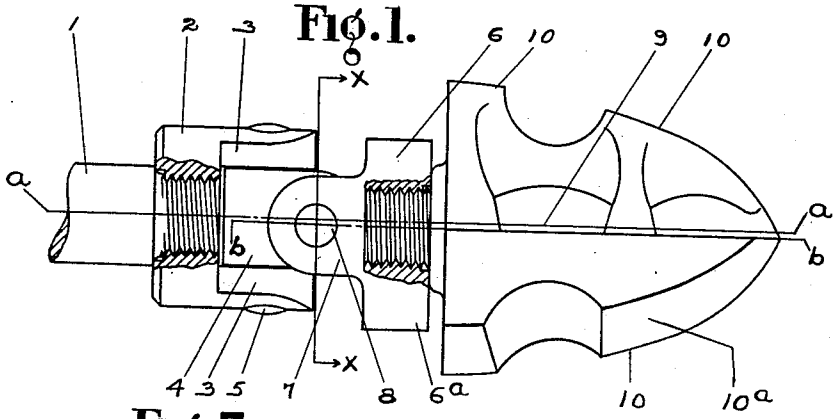


Fig. 2.

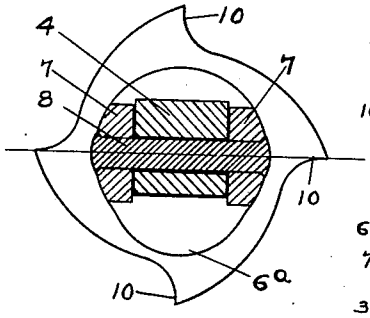


Fig. 6.

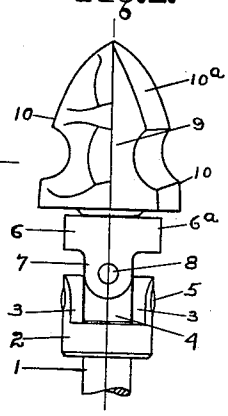


Fig. 3.

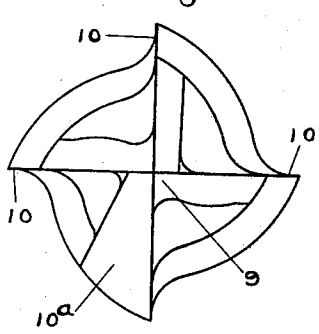


Fig. 4.

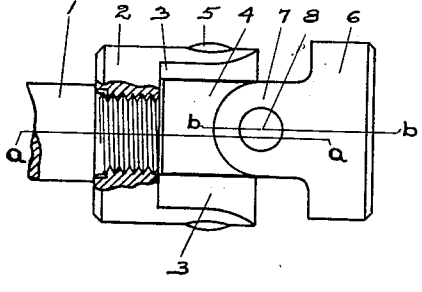
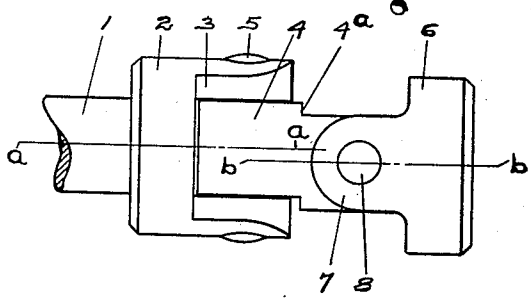


Fig. 5.



Witnesses

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UNITED STATES PATENT OFFICE.

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TUBE-CLEANER.

999,993. Specification of Letters Patent. Patented Aug. 8, 1911.

Application filed April 21, 1910. Serial No. 556,858.

To all whom it may concern:

Be it known that I, ELMER E. HAUER, a citizen of the United States, residing at Springfield, in the county of Clark and 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 tube cleaners for removing scale and other deposits from tubes. In cleaners for this purpose, where a universal coupling is employed between the driving shaft and cleaner head, I have found that by throwing the cleaner head out of balance it will strike the scale with greater force and increase the efficiency of the device. To accomplish this I employ a universal coupling having a pivoted joint arranged at one side of the axis of the driving shaft; and the strength of the blow may be still further increased by weighting the swinging end of the coupling, or the cleaner head, or both, it of course being understood that the weight shall be placed on the same side of the axis as said pivoted joint; or if the conditions are such as to make it desirable, the weight or weights may be alone employed with the pivoted joint arranged axially.

In the accompanying drawings Figure 1 is a side view partly in section of the tube cleaner embodying my invention, Fig. 2 is a cross-section on the line X—X of Fig. 1; Fig. 3 is an end view of same and Figs. 4, 5, and 6 are modifications.

Like numerals represent the same parts in the several views.

In the drawings 1 represents a driving shaft to be rotated at a high speed by any suitable motive power. A universal coupling having its inner end 2 screw-threaded to the shaft 1 is provided with ears 3 pivoted to a block 4 by a pin 5. The outer end 6 of said coupling is provided with ears 7 pivoted to the block 4 by a pin 8. Said pins 5 and 8 are arranged at right angles to each other as shown. Any suitable cleaner head may be secured to the outer end 6 of said coupling. I have shown a head 9, such as is shown and described in Letters-Patent No. 850,701, granted to Henry F. Weinland April 16th, 1907, said head being screw-threaded to the outer end 6 of said coupling and having picking or cutting teeth or blades 10.

To throw the head 9 out of balance so that it will, in its rotating and swinging movement, strike with greater force, either one of the pins 5 or 8 that pivot the ends of the coupling to the block 4 may be arranged at one side of the axis of the driving shaft.

In Fig. 1 I have shown the center of the pin 8 in the axial line *b* of the outer end of the coupling and cleaner head and to one side of the axial line *a* of the block 4, the inner end of the coupling and the driving shaft, so that the cleaner head will vibrate and strike with greater force. This vibration or force will be increased by weighting the outer end 6 of the coupling as shown at 6^a; or by weighting the cleaner head as shown by enlarging one of the teeth or blades 10 as shown at 10^a; or by weighting both the outer end of the coupling and the cleaner head. These weights may be secured in any suitable way; but are preferably formed with the parts in the manner shown.

In Fig. 4 I have shown the center of the pin 8 in the axial line *b* of the block 4 and the outer end of the coupling; but as will be seen said block is so arranged that its axial line *b* is at one side of the axial line *a* of the inner end of the coupling and driving shaft which will throw the free end of the coupling out of balance. In Fig. 5 I accomplish the same purpose by arranging the block 4 and inner end of the coupling with the axial line *a* in the center of the block; but I provide the block with an off-set 4^a and the center line of the pin 8 is in the axial line *b* of said off-set and outer end of the coupling.

In Fig. 6 I have shown the driving shaft, coupling and cleaner head in the same axial line with the center of the pins 5 and 8 in said line; and to throw the head out of balance the outer end of the coupling is enlarged at 6^a on one side of the axis and the head is weighted on the same side of the axis by enlarging a tooth or blade 10 as shown at 10^a, it being understood that either one or both said weights may be used as desired.

Having thus described my invention, I claim:

1. In a rotary tube cleaner, the combination with a driving shaft and a universal coupling, one end of which is secured to and

rotates with said shaft, of a cleaner head secured to and freely swinging from the other end of said coupling, said coupling having a pivoted joint arranged at one side of the axis of said shaft, substantially as described.

2. In a rotary tube cleaner the combination with a driving shaft and cleaner head of a universal coupling uniting said shaft and cleaner head, said coupling having a block with the respective ends of the coupling pivoted to said block and one of said pivots being arranged at one side of the axis of said shaft, substantially as described.

3. In a rotary tube cleaner the combination with a driving shaft and cleaner head of a universal coupling uniting said shaft and head, said coupling being weighted on one side of its axis, substantially as described.

4. In a rotary tube cleaner the combination with a driving shaft and cleaner head of a universal coupling uniting said shaft and head, a pivoted joint in said coupling arranged at one side of the axis of said shaft and the swinging end of the coupling and said head each being weighted on the same side of the axis of the shaft as said pivoted joint, substantially as described.

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

ELMER E. HAUER.

Witnesses:
M. M. SELLERS,
O. H. HAUSE.