(No Model.)

H. V. CLYNICK.

BOILER TUBE SCRAPER.

No. 454,032. Patented June 16, 1891.

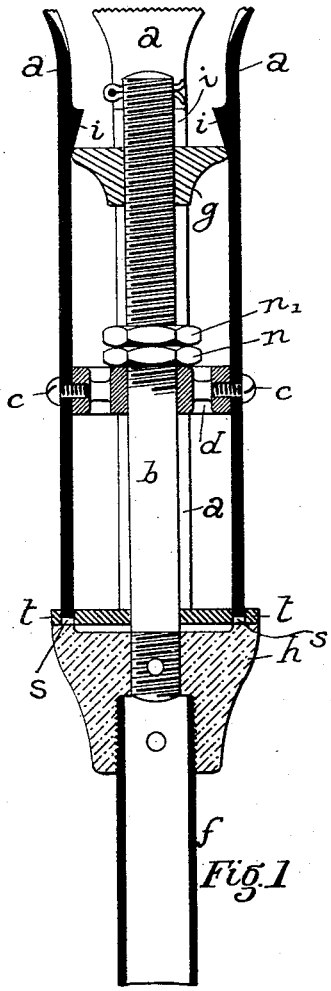

Fig. 1

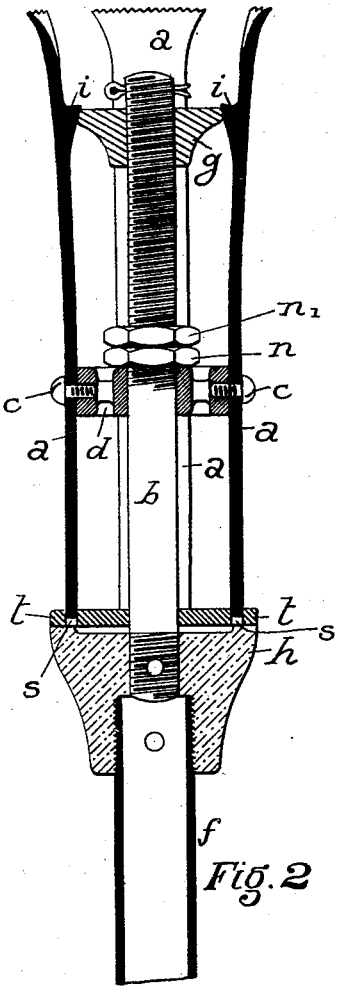

Fig. 2

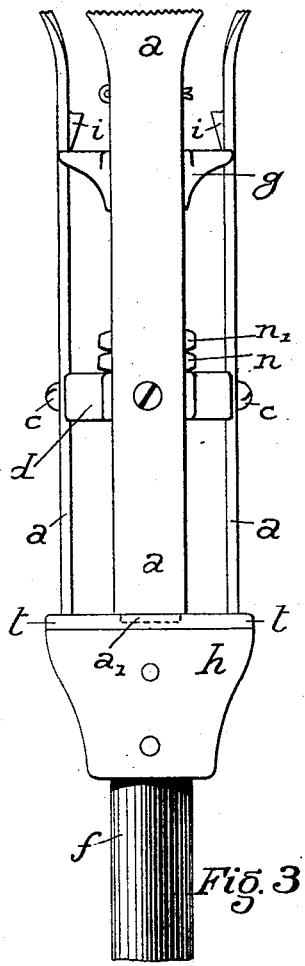

Fig. 3

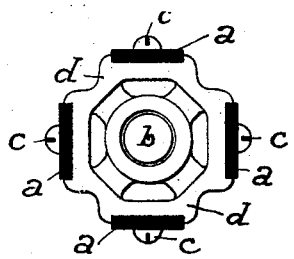

Fig. 4

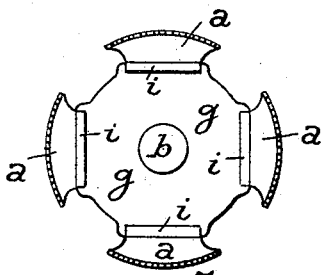

Fig. 5

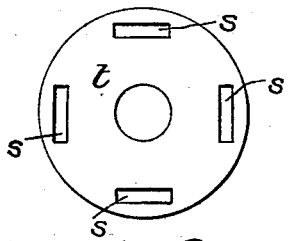

Fig. 6

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Fig. 7

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UNITED STATES PATENT OFFICE.

HORACE V. CLYNICK, OF NEW YORK, N. Y.

BOILER-TUBE SCRAPER.

SPECIFICATION forming part of Letters Patent No. 454,032, dated June 16, 1891.

Application filed September 11, 1890. Serial No. 364,594. (No model.)

To all whom it may concern:

Be it known that I, HORACE V. CLYNICK, a citizen of Great Britain, and a resident of the city, county, and State of New York, have invented certain new and useful Improvements in Boiler-Tube Scrapers, of which the following is a complete description, reference being had to the accompanying drawings, forming part of this specification.

While my improved scraper may be used to advantage to clean out "fire-tubes" and remove therefrom soot, ashes, and kindred deposits of combustion, it is intended and designed more particularly for the purpose of cleaning out externally-fired "water-tubes" and removing therefrom scale, sediment, and other deposits formed therein by the feed-water.

The objects of my invention are to produce in a tube-scraper, first, a range of positive adjustment, making the scraper adaptable both to various sizes of tubes and to the removal of scale in one tube by successive cuts following successive adjustments of the cutting-edges; second, to support the cutting-blades at all stages of adjustment, and thereby avoid the jumping of these blades over and past lumps or uneven accumulations of scale, which frequently happens when only a spring-adjustment or the spring of the blades themselves is relied upon to hold the cutting-edges up to their work; third, to provide means for the easy and rapid withdrawal of the scraper from the tubes.

In the accompanying drawings, where similar parts are designated by similar letters of reference, Figure 1 is a longitudinal section of my scraper with the cutting-blades drawn in. Fig. 2 is a similar view with the blades spread out. Fig. 3 is an outside view with the blades drawn in. Fig. 4 is a plan of the binding-washer *d*, with the cutting-blades shown in section. Fig. 5 is a plan of the adjusting-nut *g*, with an end view of the cutting-blades spread-out. Fig. 6 is a plan of the thrust-collar *t*, and Fig. 7 illustrates the shape of the lower end or heel of the cutting-blade.

The following is a description of my scraper:

h is the shank of the scraper secured concentrically in any suitable manner on a handle *f* of suitable size and length. (Shown in this case in the form of a hollow rod or pipe screwed into the shank *h* and pinned thereto.)

b is a rod or spindle permanently secured on the shank *h* and concentrically therewith. It is illustrated as held by means of thread and cross-pin, but may be formed or secured in any suitable manner.

t is a washer, which slips loosely over the spindle *b* and rests upon the shank *h*. This washer *t* is a washer which is intended to receive the thrust of the cutting-strokes of the tool and is provided near its periphery with recesses or perforations *s*, matching in position, shape, size, and number the heels or teats *a'* of the cutting-blade *a*.

d is the binding-washer or distance-piece which serves to hold in position the cutting-blades *a*. This washer *d* slips loosely over the spindle *b*, and is kept from moving upward thereon by the nut *n* and jam-nut *n'* on said spindle. The cutting-blades *a* are held in place on the washer *d* by means of screws *c*, which are tapped through the blades *a* into the washer *d*, the edge of which, as shown in Fig. 4, is shaped so as to form shoulders on each side of each blade *a*, and thereby insure still greater rigidity.

g is the adjusting-nut, threaded on the spindle *b*, and kept thereon by a linchpin or split key. This adjusting-nut *g* has on its edge or periphery projections which straddle the cutting-blades *a*, thereby preventing the nut *g* from revolving on the spindle *b*, but allowing a longitudinal travel of the nut on the spindle when the latter is rotated.

a are the cutting-blades, of which four are shown in this case, although any desired number may be used. Their upper or cutting edge is made slightly flaring and is serrated so as to increase its cutting efficiency. The lower end heel is in the shape of a shouldering teat *a'*, intended to engage in the recesses *s* on the washer *t*. Each one of the cutting-blades *a* is provided on its inner face (toward the center of tool) with a raised wedge-shaped projection *i*, the high part of which is nearest the end of the blade.

I will now explain the action and operation of my cutter. To put it together, the blades *a* are secured to the washer *d*. Their heels *a'* are made to engage in the recesses *s* of the thrust-nut *t*, and the nut *n* and jam-nut *n'*

are adjusted on the spindle *b*, so as to prevent the blades *a* from getting released from the recesses *s*. Thus the blades *d*, the nut *n*, and thrust-washer *t* constitute, as it were, a structure which rives loosely on the spindle *b*, but is confined longitudinally thereon between the shank *h* and nuts *n* and *n'*. With the adjusting-nut *g* in the position shown in Fig. 1, the scraper is adjusted to its extreme of smallness. To spread the blades, the operator holds the blades with one hand, so as to keep them from rotating and screw up the main handle *f*. This causes the nut *g* to move upward against the projections *i* and spreads the blades as in Fig. 2, where they are shown very near their extreme expansion. When the cutter is engaged in a tube and binding (more or less) on the scale, this keeps the blades from revolving, and the screwing in or out of the handle and spindle *b* (fast therewith) will spread or contract the blades. In this manner can the scraper be readily withdrawn from a tube, as whatever tension there may have been put on the blades to do the cutting may be removed by backing the nut *g* and allowing blades *a* to collapse.

My scraper is operated by striking blows with it. If the scale is thick the cutters are only spread slightly, so as to take a first light cut on the scale. Then the blades are spread a little farther and a new cut taken, and so on till all scale is removed.

A very important feature of my scraper is that the nut *g* supports the blades *a* close to the cutting-edges, and therefore the cuts taken by the scraper at different stages of adjustment are positive and independent of any spring in the blades.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A boiler-scraper having longitudinal blades with end cutting-edges susceptible of adjustment radially to the tool itself, a thrust-washer with which the lower ends of the blades are removably engaged, said adjustment being effected by means of a nut *g* on a central spindle *b*, engaging inclines on the blades, and the relative position of the nut *g* to the blades *a* being such that the spring of the blades is between this nut *g* and the heels of the blades, substantially as specified.

2. In a boiler-tube scraper, in combination with a shank *h*, a spindle *b*, and adjusting-nut *g*, the blades *a*, having offsets *i*, the binding-nut *d*, and thrust-washer *t*, said structure being slipped loosely and free to revolve on the spindle *b*, while it is confined longitudinally thereon by means of the shank *h* and nuts *n*, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HORACE V. CLYNICK.

Witnesses:

E. M. HUGHTOBLER,

ANDREW ZANE.