

No. 667,502.

Patented Feb. 5, 1901.

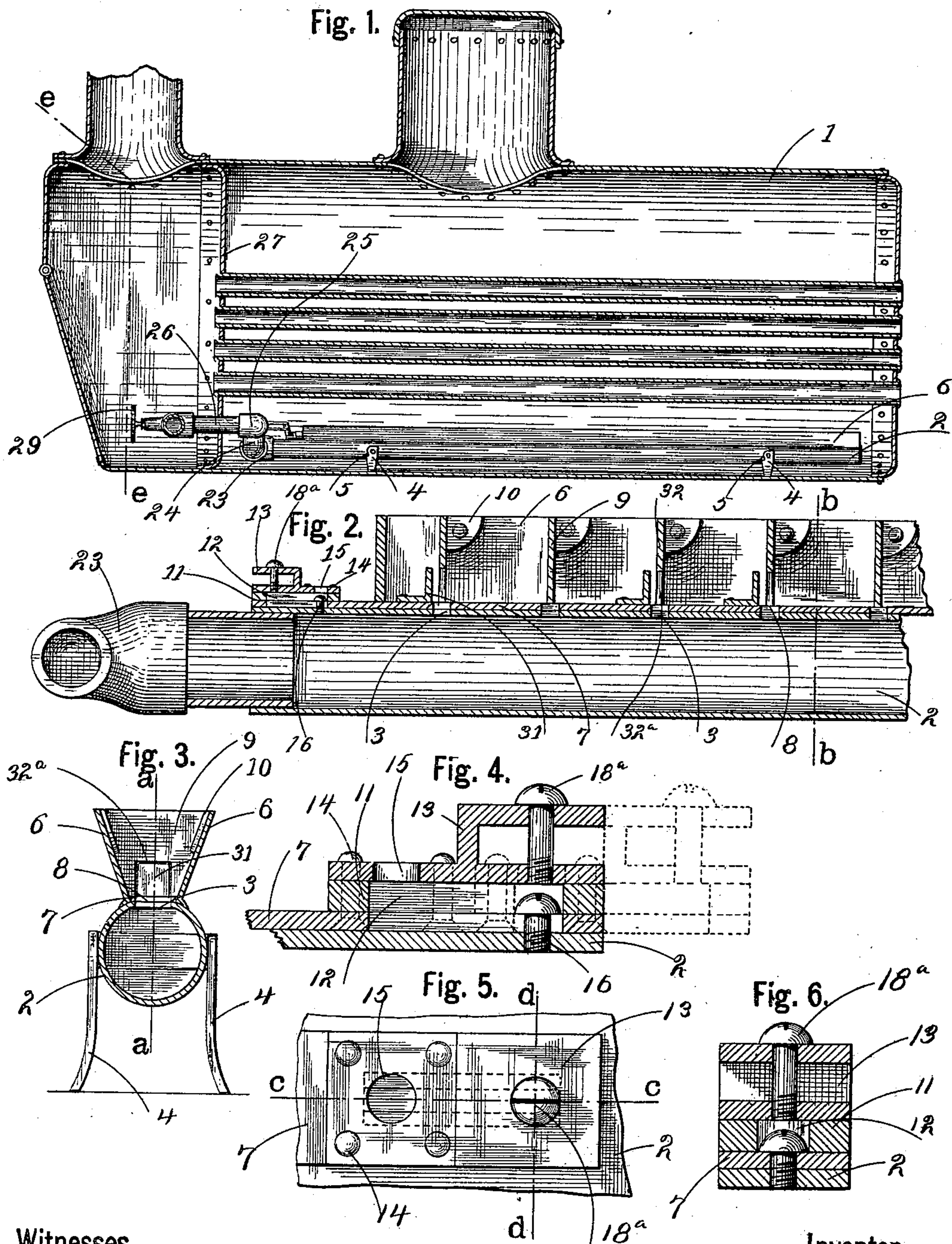
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SEDIMENT COLLECTOR FOR STEAM BOILERS.

(Application filed Oct. 8, 1900.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses.

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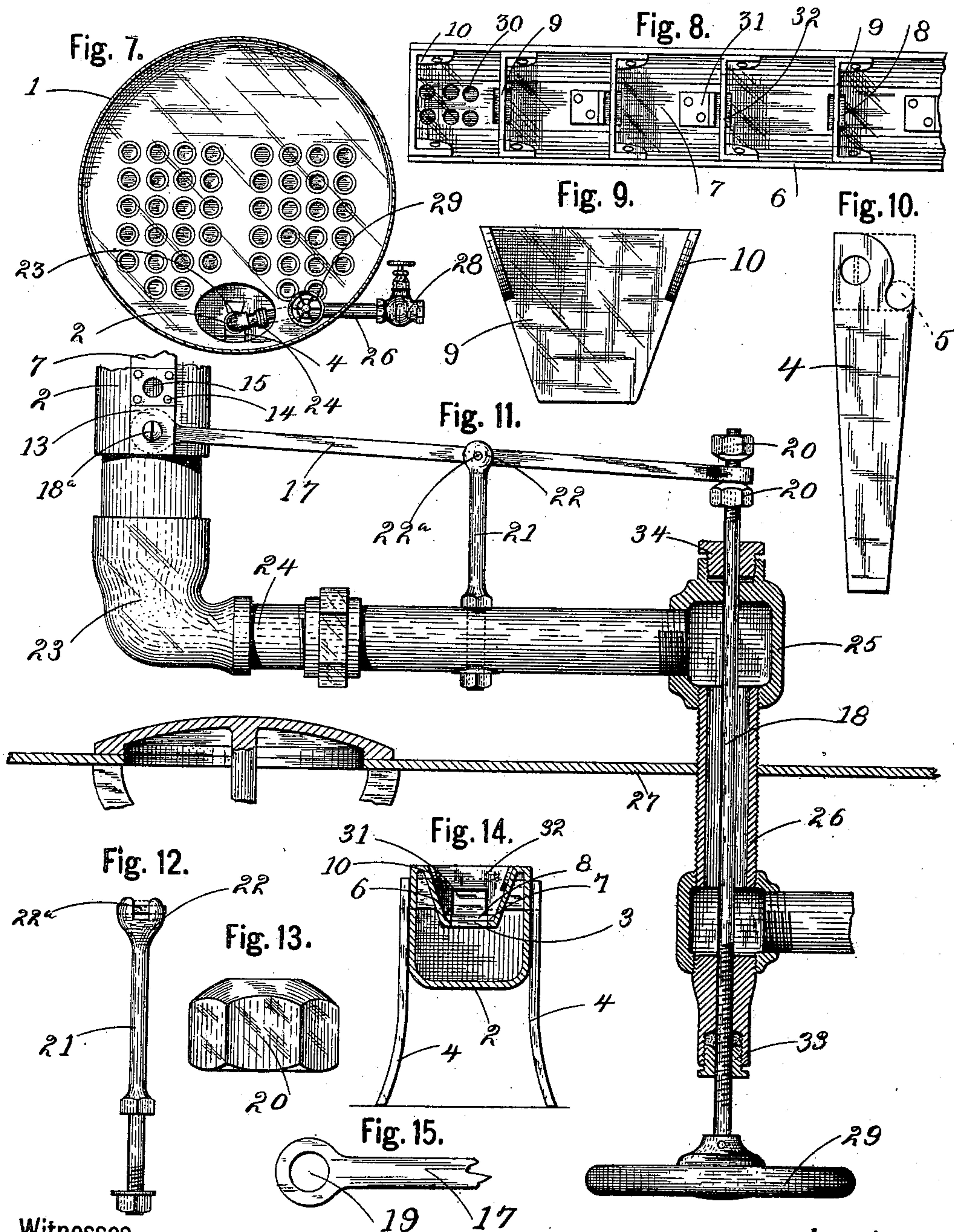
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# UNITED STATES PATENT OFFICE.

HENRY R. CHURCHILL, OF BUFFALO, NEW YORK.

## SEDIMENT-COLLECTOR FOR STEAM-BOILERS.

SPECIFICATION forming part of Letters Patent No. 667,502, dated February 5, 1901.

Application filed October 8, 1900. Serial No. 32,361. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY R. CHURCHILL, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Sediment-Collectors for Steam-Boilers, of which the following is a specification.

My invention relates to a sediment-collector for steam-boilers; and the object of the invention is to provide a simple, cheap, and easily-managed device of this character.

It also relates to certain details of construction.

Figure 1 is a vertical section through a boiler equipped with my improved sediment-collector. Fig. 2 is an enlarged fragmentary section on line *a a*, Fig. 3, through the preferred construction of the sediment-collector. Fig. 3 is a transverse vertical section on line *b b*, Fig. 2. Fig. 4 is an enlarged fragmentary section on line *c c*, Fig. 5, showing the slide end in one position in full lines and in another position in dotted lines. Fig. 5 is a top plan view of the fragment shown in Fig. 4. Fig. 6 is a transverse vertical section on line *d d*, Fig. 5. Fig. 7 is a transverse vertical section on line *e e*, Fig. 1. Fig. 8 is a top plan view of a fragment of the collector. Fig. 9 is an enlarged detached view of one of the slide-holding plates. Fig. 10 is an enlarged detached view of one of the folding legs. Fig. 11 is an enlarged fragmentary view, partially in section, of the boiler, the slide end, the blow-off pipe, and the slide-operating mechanism. Fig. 12 is an enlarged detached view of the lever-fulcrum. Fig. 13 is an enlarged detached view of one of the beveled nuts. Fig. 14 is a transverse vertical section through a modified form. Fig. 15 is an enlarged side view of a fragment of the lever.

In referring to the drawings for the details of construction like numerals designate like parts.

1 represents a steam-boiler, which may be of any well-known construction.

The sediment-collector preferably consists of a long pipe or tube 2, having a series of openings 3, arranged in a longitudinal row in its top, a trough device on said pipe or tube, means for closing the openings in the

pipe or tube, and means for cleaning or washing out the pipe or tube. The pipe or tube 2 is preferably a wrought or cast iron boiler-flue of nearly the length of the boiler in which it is to be placed. Legs 4 are provided to support the tube 2 slightly above the bottom of the boiler, which can be folded against the tube in order that the collector may be inserted through a small manhole. These legs are limited in their movements in one direction by the stops 5. Two wings or sides 6 extend upwardly from the tube and form a collecting-trough, and a long narrow rectangular-shaped slide 7 is mounted between these wings or sides and above the tube and has a series of openings 8 corresponding in form, number, and arrangement to the openings 3 in the tube. The slide forms the bottom of the trough and is held in place by the transverse plates 9, which have lateral ears or lugs 10 bolted to the sides or wings 6. A series of the plates 9 are employed, which are arranged at equal distances apart, and the slide has a limited longitudinal movement sufficient to cover and to uncover the openings in the tube. A metal strip 11, having a longitudinal slot 12, is mounted upon the forward end of the slide, and a forked portion 13 is mounted upon said strip 11, the slide, metal strip, and forked portion being rigidly fastened together by rivets or bolts 14. The forked portion has a circular opening 15, which is large enough to permit the passage of a screw 16 and its head. The longitudinal slot in the metal strip is countersunk sufficiently to receive the head of the screw 16, (see Figs. 4 and 6,) and the lower end of the screw is screwed into the tube 2.

The slide is operated by a lever 17, which in turn is moved by a rod 18, extending to the exterior of the boiler within convenient reach of the operator. The lever 17 is pivoted at one end between the forks of the forked portion by a pin 18<sup>a</sup> and has an eye 19 at the opposite end, which fits upon the inner end of the rod 18 and is held in place thereon by the nuts 20, which have beveled edges to permit lateral movement of the lever on the rod end. The lever is supported by a fulcrum, which is in the form of a bar 21, having a forked end 22, in which the lever is pivoted by the pin 22<sup>a</sup>.



An elbow 23 is screwed upon or otherwise fastened to the outer end of the tube or pipe 2, and a short section of pipe 24 is screwed upon said elbow. To the end of the pipe 24 is secured a T 25, and a pipe 26 extends from said T 25 through the boiler-head 27. The pipe 26 is provided on the exterior of the boiler with a blow-out valve 28. The rod preferably passes through the pipe 26 and has an operating hand-wheel 29 at its outer end.

A plurality of holes or openings 30 are drilled or punched in the top of the inner end of the tube 2, through which the water enters the tube to clean or wash it out. To insure sufficient volume of water, the holes should in combined area exceed the diametrical area of the blow-off pipe at the opposite end; but none of the holes should be sufficiently large to permit the passage of scale fragments or other hard particles of sufficient size to enter and clog the blow-off pipe or valve.

To break up the scale which may collect in the trough, a series of angle-irons 31 are fastened to the top of the slide and a series of transverse partitions 32 are arranged between the walls or wings of the trough, which are provided with openings 32<sup>a</sup> of sufficient area to permit the passage of the vertical portion of the angle-irons. The angle-irons 31 and the transverse partitions 32 are arranged between the transverse plates 9 and at a sufficient distance to permit the necessary longitudinal movement of the slide.

A stuffing-box 33 is provided at the outer end of the blow-off pipe 26 and a bushing 34 for the rod 18 at the inner end.

In the modification shown in Fig. 14 a longitudinal depression is formed in the top of the tube or pipe 2, thus forming the sides or wings of the trough integral therewith.

The operation of the device is as follows: The rod being moved by means of the hand-wheel, the lever is turned and the slide is moved to close the openings in the tube or pipe 2. The blow-off valve is opened and the boiler-pressure forces water through the tube, thereby cleaning it out.

It is obvious that the arrangement of the pipes extending through the boiler-head may be modified or changed to adapt the collector to the style of boiler in which it may be used and that various changes in the form, proportion, and general construction may be made within the scope of my invention without departing therefrom.

I claim as my invention—

1. A sediment-collector for steam-boilers, comprising a settling-tube having a series of openings, in its upper surface, a collecting-trough above said tube having bottom openings and means for closing the openings in the tube and trough.

2. A sediment-collector for steam-boilers comprising a settling-tube having a series of openings, a collecting-trough above said tube, a slide having a corresponding series of open-

ings arranged upon said tube, transverse plates in the trough for maintaining the slide in position and means for moving said slide to cover and to uncover the openings in the tube.

3. A sediment-collector for steam-boilers comprising a settling-tube having a series of openings, a collecting-trough above said tube, a slide having a corresponding series of openings arranged upon said tube, transverse plates arranged at intervals in the trough for maintaining the slide in position, means for moving said slide to cover and to uncover the openings in the tube, and means for cleaning out said tube.

4. A sediment-collector for steam-boilers comprising a settling-tube having a series of openings, a collecting-trough above said tube, a slide having a corresponding series of openings arranged upon said tube, means for moving said slide to cover and to uncover the openings in the tube, mechanism for limiting the movement of said slide, and means for cleaning out said tube.

5. A sediment-collector for steam-boilers comprising a settling-tube having a series of openings, a collecting-trough above said tube, a blow-out pipe extending from said settling-tube through the boiler, a valve in said blow-out pipe, a slide for closing the openings in the settling-tube forming the bottom of the collecting-trough, an operating-rod extending through the blow-out pipe and a lever connected to the slide and rod, substantially as set forth.

6. A sediment-collector for steam-boilers, having a settling-tube provided with folding legs.

7. A sediment-collector for steam-boilers, having a settling-tube provided with folding legs and means for limiting the movement of said legs in one direction.

8. A sediment-collector for steam-boilers, having a settling-tube provided with folding legs and pins extending horizontally from the tube sides and adapted to strike against the legs for limiting the movement of said legs in one direction.

9. A sediment-collector for steam-boilers comprising a settling-tube having a series of openings, a collecting-trough above said tube, a slide having a corresponding series of openings arranged upon said tube, scale-breaking devices secured to the slide and slidable with said slide, immovable scale-breaking devices secured to the trough, means for moving said slide to cover and to uncover the openings in the tube and move the scale-breaking devices on the slide relatively to the scale-breaking devices secured to the trough, and means for cleaning out said tube.

10. A sediment-collector for steam-boilers comprising a settling-tube having a series of openings, a collecting-trough above said tube, a slide having a corresponding series of openings arranged upon said tube, angle-irons fastened to the slide, transverse partitions fas-



tened to the trough and forming scale-breaking devices in conjunction with the angle-irons, means for moving said slide to cover and to uncover the openings in the tube and means for cleaning out said tube.

11. A sediment-collector for steam-boilers comprising a settling-tube having a series of openings, a collecting-trough above said tube, a slide having a corresponding series of openings arranged upon said tube, transverse plates arranged at intervals in the trough for maintaining the slide in position, means for moving said slide to cover and to uncover the openings in the tube, a blow-out pipe extending from the settling-tube to the boiler, an operating-rod extending through the blow-out pipe and a lever connected to the slide and rod, as set forth.

12. A sediment-collector for steam-boilers comprising a settling-tube having a series of openings, a collecting-trough above said tube, a slide having a corresponding series of open-

ings arranged upon said tube, and forming the bottom of the trough and means for moving said slide to cover and to uncover the openings in the tube.

13. A sediment-collector for steam-boilers having a settling-tube provided with top openings and a collecting-trough having a slidable bottom provided with openings; said sliding bottom being adapted to be moved to cover and to uncover the openings in the settling-tube.

14. A sediment-collector for steam-boilers having a settling-tube provided with top openings and a collecting-trough having a movable portion adapted to be moved to cover and to uncover the openings in the settling-tube.

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