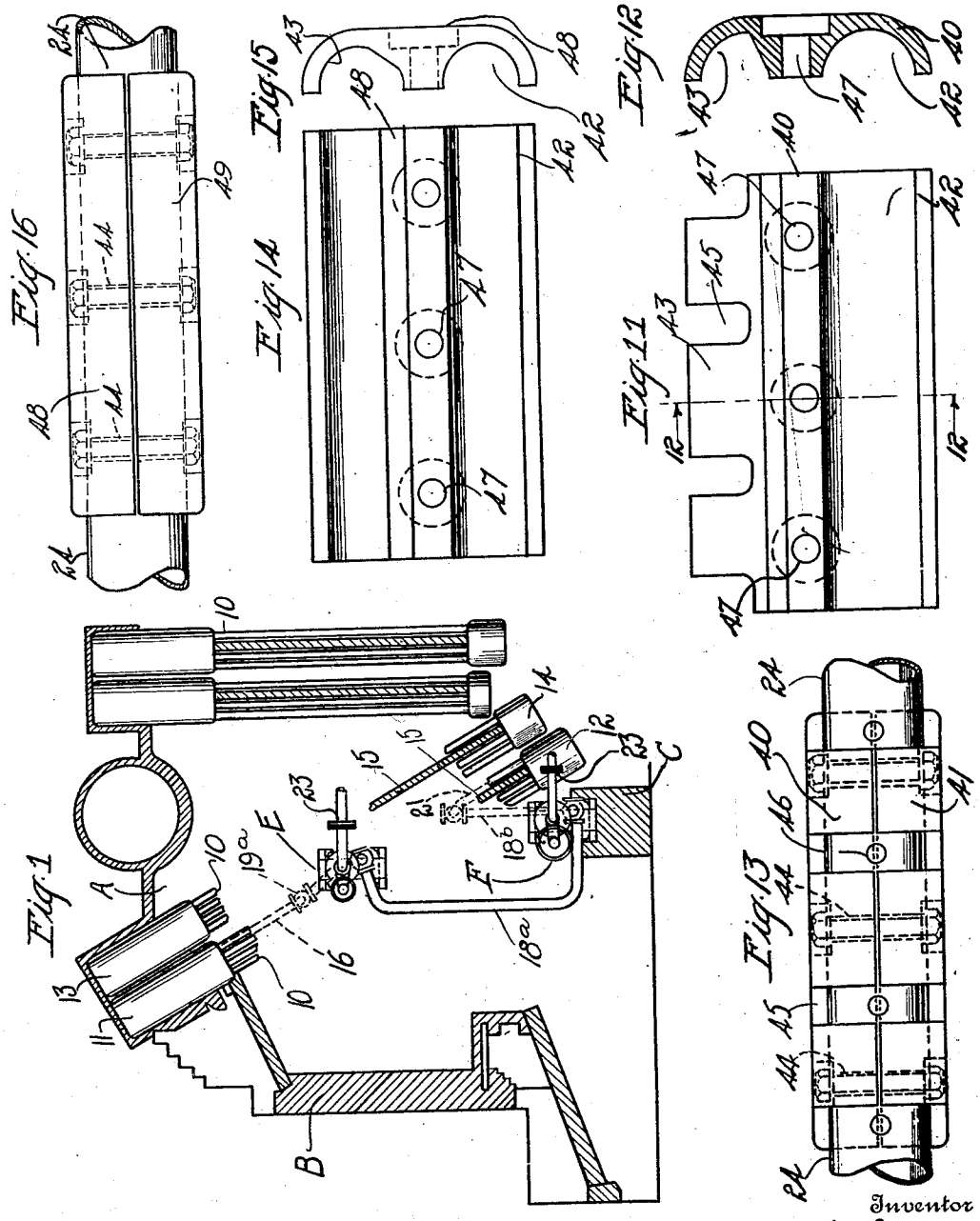
April 28, 1931. N. L. SNOW 1,802,583

BOILER CLEANER

Filed March 23, 1925 5 Sheets-Sheet 1



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BOILER CLEANER

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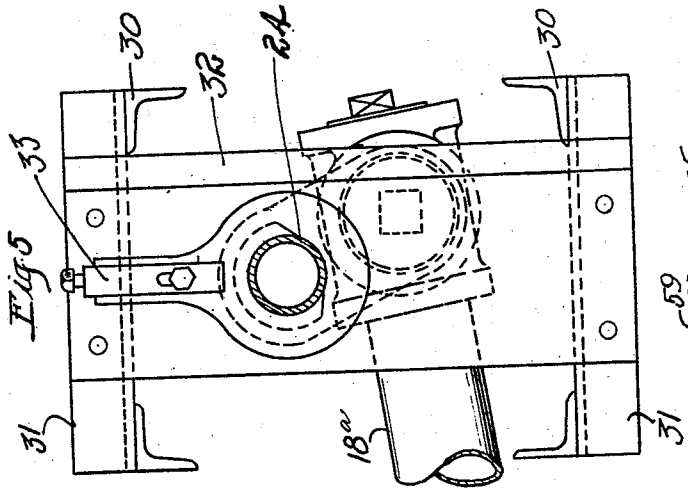


Fig. 5

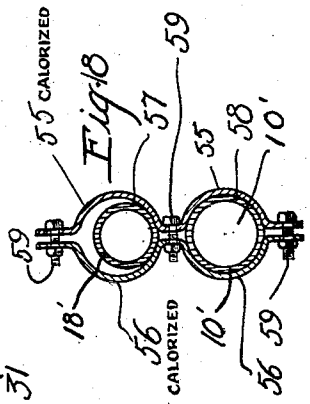


Fig. 18

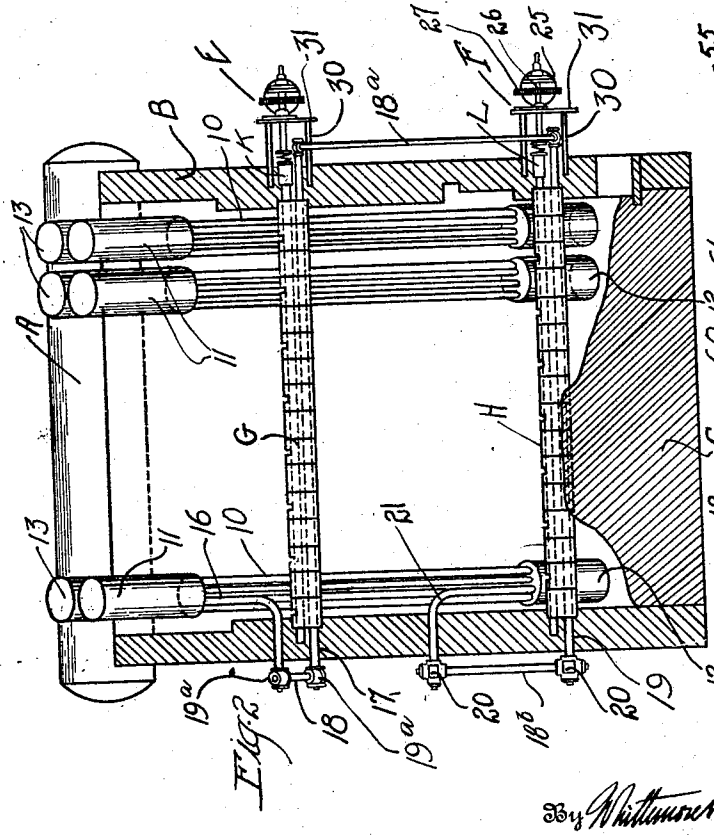


Fig. 2

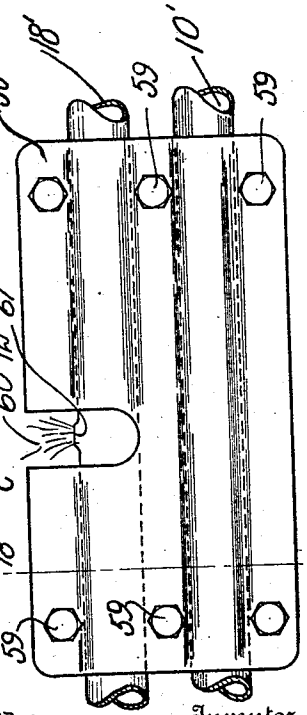


Fig. 17

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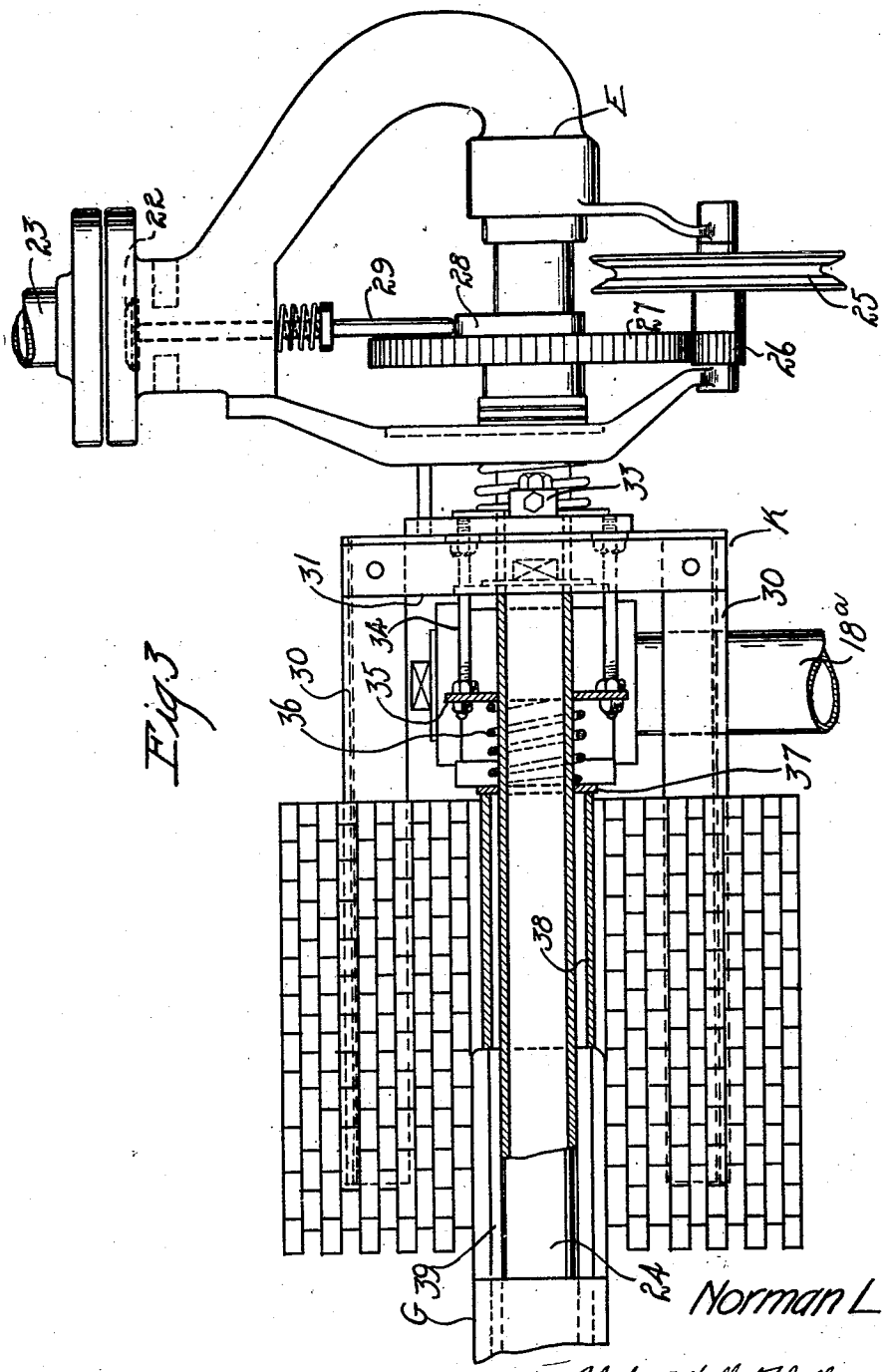
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BOILER CLEANER

Filed March 25, 1925 5 Sheets-Sheet 3



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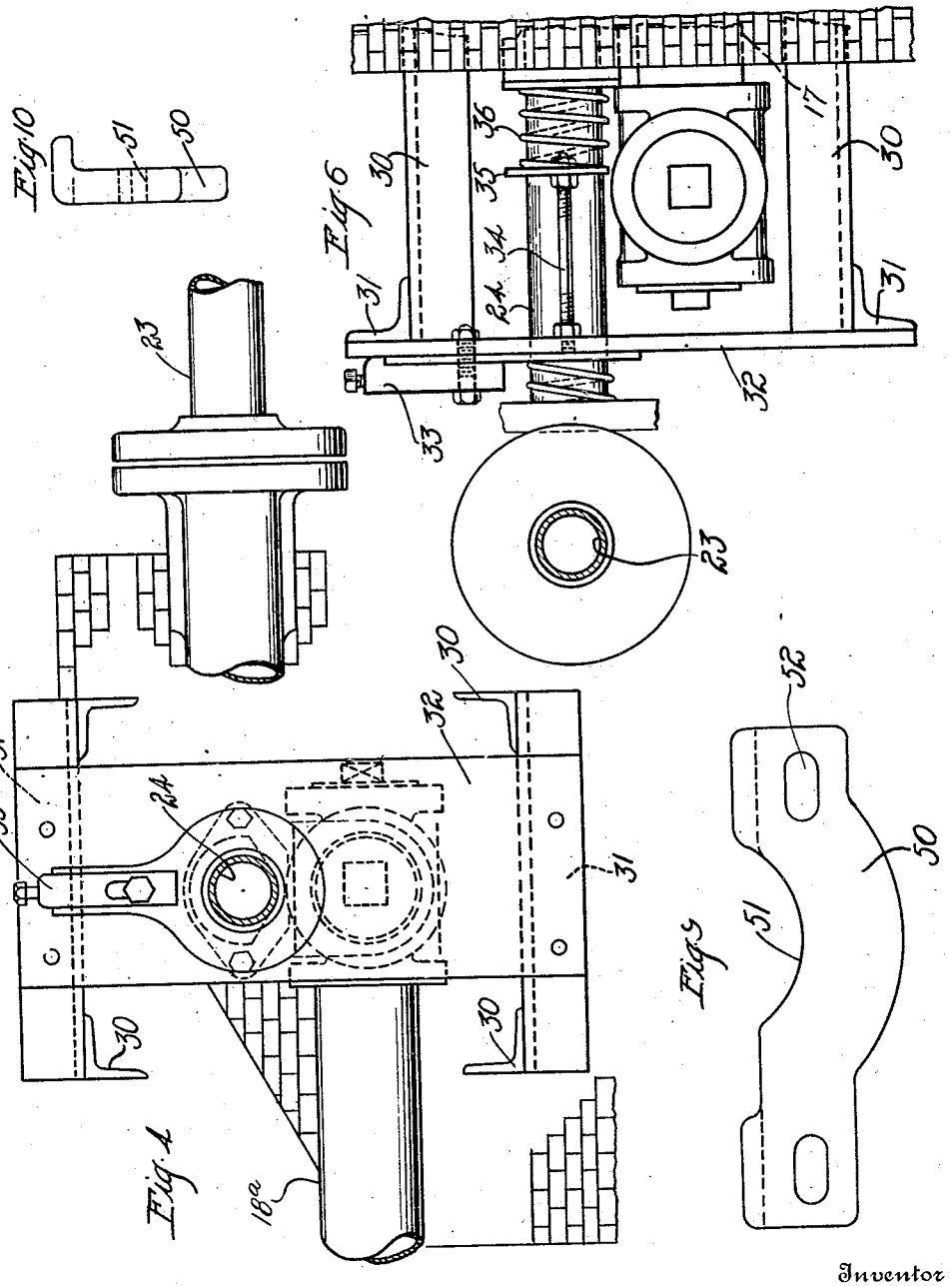
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April 28, 1931. N. L. SNOW 1,802,583

BOILER CLEANER

Filed March 23, 1925 5 Sheets-Sheet 4



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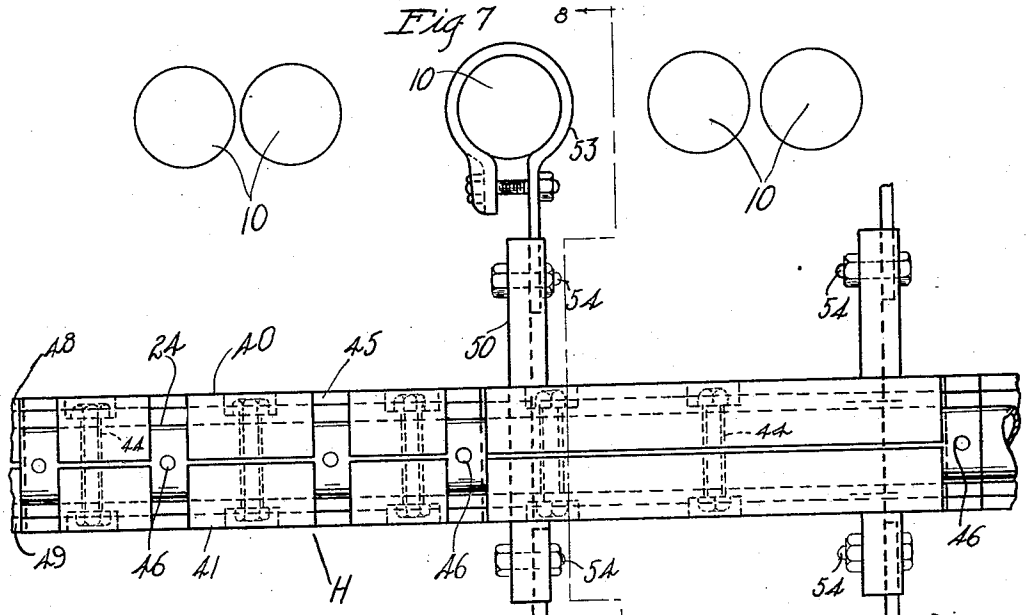
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BOILER CLEANER

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Fig 7



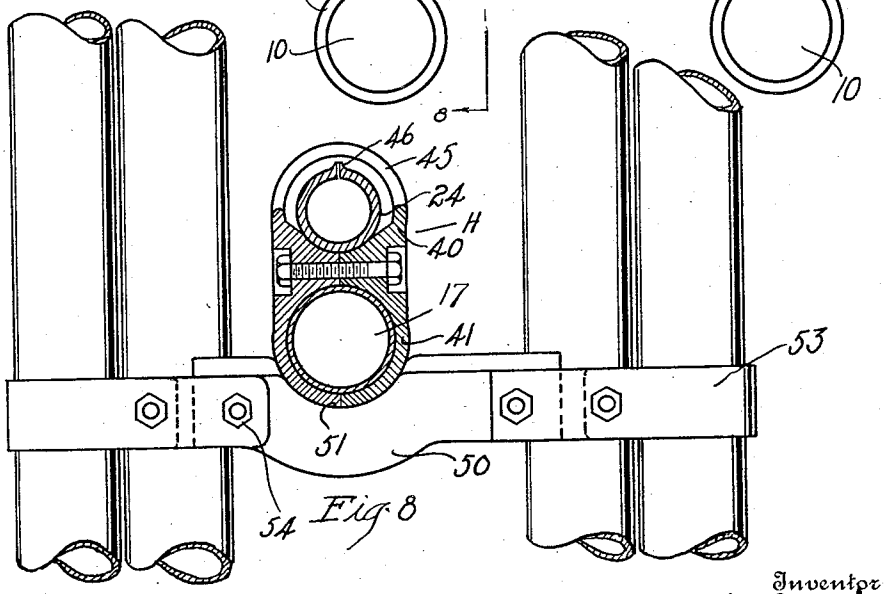


Fig 8

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Patented Apr. 28, 1931

1,802,583

UNITED STATES PATENT OFFICE

NORMAN L. SNOW, OF DETROIT, MICHIGAN, ASSIGNOR TO DIAMOND POWER SPECIALTY CORPORATION, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN

BOILER CLEANER

Application filed March 23, 1925. Serial No. 17,770.

The invention relates to boiler cleaners and refers more particularly to a barrier construction and a support for the same. The invention has among its objects the provision of a novel arrangement of parts constituting the boiler cleaner device and the provision of a novel barrier construction and support for the barrier and blower element.

Referring to the drawings:—

Figure 1 is a sectional elevation through a boiler showing my invention applied thereto;

Figure 2 is a sectional elevation of the same taken at right angles with the view shown in Figure 1;

Figure 3 is a detail plan view showing the mounting of a blower unit assembly constructed in accordance with my invention on the boiler wall;

Figure 4 is a detail front elevation showing the wall box mounting of one of the lower blower unit assemblies as shown in Figure 1;

Figure 5 is a corresponding view of the upper blower unit assembly shown in Figure 1;

Figure 6 is a side elevation showing the wall box construction for the blower units;

Figure 7 is a plan view of the upper blower unit assembly showing the manner of supporting the same from the boiler tubes;

Figure 8 is a sectional elevation along 8—8 of Figure 7;

Figure 9 is a detail view in elevation showing the bearing bracket shown in Figure 7;

Figure 10 is an end view thereof;

Figure 11 is a plan view of a barrier section showing the slots for accommodating the steam jets;

Figure 12 is a section view along 12—12 of Figure 11;

Figure 13 is a side elevation showing the barrier sections assembled;

Figure 14 is a plan view of a barrier section for the portion of the blower element which is free of discharge nozzles;

Figure 15 is an end view of the same;

Figure 16 is a side elevation of the assembled barrier sections shown in Figures 14 and 15;

Figure 17 is a fragmentary elevation view of a sheet metal barrier forming a modification of my invention, and

Figure 18 is a view along 18—18 of Figure 17.

In the drawings, reference character A indicates a boiler shown mounted in setting B, the boiler comprising tubes 10 shown extending at an angle with the vertical between headers 11 and 12 and 13 and 14, baffles 15 being provided at suitable points. C indicates a bridge wall. All of the foregoing parts are of the usual or preferred construction, any type of boiler being adapted for use in connection with my invention, which boiler preferably is of the vertical tube type but may embody other types as will presently be apparent.

Barrier constructions for boiler cleaner units are ordinarily mounted on the water tubes of the boiler; however, where the tubes extend vertically, or at an angle, difficulty is experienced in installing such barrier units. My invention includes the addition of a special water tube suitably located to support the barrier units, the water tube being connected at its ends with the headers to form a closed circuit. Thus, between headers 11 and 12 is provided a special water tube circulating system. Beginning at header 11, this consists of a pipe 16, connected by a pipe 18 and fittings 19^a to a pipe 17 extending horizontally across the boiler. The connector coupling members 19^a for the pipes are preferably located outside the boiler setting as shown. The pipe 17 preferably extends to a point adjacent a blower unit E. Through a connecting pipe 18^a the system is extended to connect with a pipe 19 extending back across the boiler, the pipe 19 being located adjacent a second blower unit F. Pipe 19 extends to a point outside the boiler setting where it is connected by a short length of pipe 18^b and coupling members 20 with pipe 21 communicating with the header 12. Thus the said system comprises a closed circuit including any number of blower units and barrier supporting units or assemblies, the latter being indicated at G and H.

The blower units may be of any type desired, that illustrated being of the type in-

cluding a valve 22 adapted to be automatically unseated by the cam 28 acting to move the valve stem 29 to supply cleaning fluid from a supply pipe 23 to the rotatable blower pipe or element 24 at times when the blower pipe is rotated or oscillated through a predetermined arc by the chain sheave 25 operably connected with the blower pipe through pinion 26 and gear 27.

The blower units E and F are supported adjacent the boiler wall by wall boxes K and L respectively, as best shown in Figures 3 to 6. Each wall box comprises the supporting members 30 anchored in the boiler wall and the cross members 31, the latter being connected by a plate 32, this plate serving to carry the floating support 33 for the blower unit. Attached to the plate 32 and extending inwardly therefrom are bolts 34 supporting a plate 35 surrounding the blower pipe. A spring 36 bears against this plate and urges a seal plate 37 against a sleeve 38 whereby air is excluded from passing through the boiler wall. 39 indicates a barrier member projecting into the boiler wall.

In detail, the barrier elements are constructed as shown in Figures 11 to 16. In Figures 11, 12 and 13, the barrier elements are formed of two complementary sections 40 and 41, each section being formed with the semi-circular opening 42 to accommodate the special pipe section 17 or the pipe section 19 and the opening 43 for accommodating the rotatable blower pipe 24. The barrier sections are adapted to be clamped together by bolts 44 entering bolt holes 47. Slots 45 are provided for allowing the jets of cleaning fluid from the discharge nozzles 46 of the blower pipe to sweep through the desired arc as the blower pipe is rotated.

In Figures 14, 15 and 16, the barrier sections 48 and 49 are identical with 40 and 41 except that there are no slots corresponding with the slots 45, the barrier unit shown in these figures being adapted for use at points along the blower tube where there are no discharge nozzles.

The barrier supporting unit or assembly H for the blower unit F is shown in Figure 1 as being supported by the bridge wall C. However, the barrier unit or assembly G is not so supported and it may be desirable to support the same at points intermediate its length. Such supporting means is shown in Figures 7 to 10 and comprises a cradle support 50 recessed at 51 to receive the barrier assembly, the support 50 being bolted at 54, through the slots 52 to the clamping members 53 which are clamped to convenient tubes of the boiler.

It will thus be noted that the invention includes a barrier assembly which houses and protects the blower pipe from the heat of the combustion chamber of the boiler; also the provision of a special water tube extending transversely or in other convenient directions relative to the boiler tubes whereby the barrier assembly is supported, the assembly and blower pipe being cooled by the proximity of the special barrier supporting water tube.

In Figures 17 and 18 I have illustrated a modification of my invention in which the complementary barrier sections 55, 56 are formed as sheet metal stampings or sheet metal rolled or otherwise formed between suitable dies. The sections 55 and 56 are formed with the substantially semi-circular openings 57, 58 for respectively accommodating the blower pipe 18′ and the boiler tube 10′, the sections being clamped by bolts 59 to the boiler tube for supporting the assembly. Suitable slots or openings 60 will be provided for permitting discharge of the cleaning fluid from the nozzles 61. The boiler tube 10′ may be in the nature of a special water tube corresponding with the tube 17 or else, a usual boiler tube. The sheet metal barrier sections are preferably calorized in the usual manner by coating with aluminum, with or without subsequent baking, in order to prevent burning out of the relatively thin metal in the nature of stamped sheet metal. Barriers formed of sheet metal stampings may be quickly and cheaply manufactured.

What I claim as my invention is:—

1. In combination with a boiler comprising a header and a plurality of inclined boiler tubes connected with said header, a pipe connected with said header and extending substantially horizontally and transversely of said boiler tubes, a barrier, a blower element rotatable relative to said barrier, said barrier substantially enclosing the blower element and having means engageable with said pipe for supporting the said barrier.

2. In combination with a boiler comprising a header and a plurality of boiler tubes connected with said header, a pipe connected with said header, portions of said pipe extending adjacent said boiler tubes, a barrier, a blower element, said barrier embracing said pipe and supported thereby, and provided with means for protecting said blower element from the heat of the boiler combustion chamber.

3. In combination with a boiler comprising a header and a plurality of boiler tubes connected with said header, a pipe connected with said header and extending at an angle with the said boiler tubes, a blower element extending parallel with said pipe and a barrier cooled by said pipe and formed to protect the blower element from the heat of the combustion chamber.

4. In combination with a boiler comprising a header and a plurality of boiler tubes connected with said header, a pipe connected with said header and extending at an angle

with the said boiler tubes, a blower element extending parallel with said pipe and a barrier supported by said pipe and formed to substantially house the pipe and blower element.

5. In combination with a boiler comprising a header and a plurality of boiler tubes extending substantially vertically from said header, a pipe communicating with said header and extending substantially horizontally transversely with said boiler tubes, a barrier supported by said pipe, a blower element extending parallel with said pipe, and said barrier being formed to protect the blower element from the heat of the combustion chamber.

6. In combination with a boiler comprising a plurality of headers and inclined boiler tubes connected at their opposite ends with said headers, a pipe connected at its opposite ends with said headers and provided with a portion intermediate its ends extending substantially horizontally and also transversely to said boiler tubes, a barrier assembly supported by said pipe, a blower element, said barrier means being adapted to protect said blower element from the heat of the combustion chamber.

7. In combination with a boiler comprising a plurality of headers and inclined boiler tubes connected at their opposite ends with said headers, a pipe connected at its opposite ends with said headers and provided with a portion intermediate its ends extending substantially horizontally and also transversely to said boiler tubes, a barrier assembly supported by said pipe, a rotatable blower element provided with a plurality of discharge nozzles, means for rotating said blower element, said barrier means being adapted to protect said blower element from the heat of the combustion chamber.

8. In combination with a boiler comprising a plurality of headers and boiler tubes connected at their opposite ends with said headers, a pipe connected at its opposite ends with said headers and provided with a plurality of intermediate portions each extending transversely of the boiler tubes, a plurality of blower units supported exteriorly of the boiler wall, each including a blower element extending adjacent and parallel with said transversely extending portions of said pipe and a plurality of barrier assemblies supported by said pipe portions respectively and embracing said blower elements.

9. In combination with a boiler comprising a header and a plurality of parallel tubes connected with said header, a pipe connected with said header and having a portion extending from a point outside the boiler wall transversely of said boiler tubes to a point within the boiler, a wall box secured to the boiler wall adjacent the said pipe, a blower assembly supported by said wall box including a blower element extending through the boiler wall and transversely of the boiler tubes in a direction parallel with said pipe, and a barrier assembly embracing the pipe and blower element.

10. In combination with a boiler provided with a header, a plurality of boiler tubes and a boiler wall, a blower unit, supporting means for the unit carried by the wall, a pipe connected with said header and having a portion extending through the boiler wall transversely of said boiler tubes and in nested relation therewith, a blower element forming a part of the blower unit and extending parallel with said pipe, and a barrier assembly cooled by said pipe and formed to protect said blower element from the heat of the combustion chamber.

11. In combination with a boiler comprising a header and a plurality of parallel tubes connected with said header, a pipe connected with said header and having a portion extending from a point outside the boiler wall transversely of said boiler tubes to a point within the boiler, a wall box secured to the boiler wall adjacent the said pipe, a blower unit supported by said wall box including a blower element extending through the boiler wall and transversely of the boiler tubes in a direction parallel with said pipe, and a barrier assembly embracing the pipe and blower element, and means carried by the wall box for yieldingly supporting the blower unit therefrom.

12. In combination with a boiler having a plurality of boiler tubes and a header, a supporting member embracing a pair of said tubes, a barrier assembly extending transversely of said tubes and supported intermediate its length by said supporting member, a blower element extending transversely of said boiler tubes, a pipe connected with the header and having a portion extending parallel with the blower element, said barrier assembly embracing said pipe and having a portion adapted to protect said blower element from the heat of the combustion chamber.

13. In a boiler cleaner, the combination with a boiler having a header, and a plurality of inclined boiler tubes, of a blower element extending adjacent said tubes, a substantially horizontally arranged pipe communicating with said header, a barrier for said blower element comprising a part engageable with said pipe and a part engageable with said blower element.

14. In combination with a boiler, a water pipe, a blower element extending adjacent and parallel with said water pipe and a barrier embracing the water pipe and supporting the blower element.

15. In a boiler cleaner, a pipe, means for circulating a fluid through said pipe, a boiler cleaner element extending parallel with said

pipe, and a barrier embracing the pipe and element.

16. In a boiler cleaner, a pipe, a boiler cleaner element extending parallel with said pipe, and a barrier embracing the pipe and supporting the said element.

17. In a boiler cleaner, a pipe, a boiler cleaner element extending parallel with said pipe, a barrier comprising complementary sections, each section provided with a plurality of substantially semi-circular openings adapted to respectively accommodate the pipe and blower element, and means for clamping said sections together.

18. In a boiler cleaner, a pipe, a boiler cleaner element provided with a plurality of spaced discharge nozzles, said boiler cleaner element extending parallel with said pipe, a barrier comprising complementary sections each section provided with a plurality of substantially semi-circular openings adapted to respectively accommodate the pipe and blower element, means for clamping said sections together, one of said sections provided with slots adjacent the said nozzles providing unrestricted discharge of cleaning fluid from said nozzles.

19. In combination, a boiler cleaner element, a barrier therefor adapted to protect the element from the heat of the combustion chamber, a pipe extending in heat conducting relation to said barrier in a direction parallel with said elment, and means for circulating a fluid through said pipe to cool said barrier.

20. In combination with a boiler including a boiler wall, a pipe extending transversely of said boiler wall, means for circulating a fluid through said pipe, and a blower unit supported on the outside of said wall and provided with a blower element extending parallel with the said pipe through the wall in heat-conducting relation to the pipe and adapted to be cooled thereby.

21. A barrier for a boiler cleaner element, said barrier being formed of a pair of sections, each of which is formed of sheet metal stamped to provide a recess adapted to accommodate the blower element, and calorized to resist the heat of the boiler combustion chamber.

22. In combination with a boiler cleaner unit, and a fluid circulating pipe extending parallel adjacent thereto, a barrier formed of a pair of complementary sections, each of which is formed of sheet metal stamped to provide substantially semi-circular openings for respectively receiving the blower element and the said pipe, and means for clamping said sections together.

23. In combination with a boiler cleaner unit, and a fluid circulating pipe extending parallel adjacent thereto, a barrier formed of a pair of complementary sections, each of which is formed of sheet metal stamped to provide substantially semi-circular openings for respectively receiving the blower element and the said pipe and calorized to resist the heat of the boiler combustion chamber.

24. A barrier for a boiler cleaner element, said barrier being formed of sheet metal stamped and shaped to accommodate the said blower element for protecting the same from the heat of the combustion chamber and calorized to resist the heat of the boiler combustion chamber.

25. In a boiler cleaner in combination a cleaner element, a support adjacent thereto adapted to be maintained substantially cool relative to the temperature of the boiler furnace and means embracing said support and said cleaner element, said means forming a barrier for said cleaner element and supporting said cleaner element from said support.

26. In a boiler cleaner in combination a cleaner element, a water cooled pipe adjacent said element and a barrier forming a housing for said pipe and said cleaner element, whereby the element is maintained relatively cool by the temperature of the pipe.

27. In a boiler cleaner, a cleaner element, a member adjacent thereto adapted to be maintained substantially cool relative to the temperature of the boiler furnace, and a barrier embracing said member and said cleaner element adapted to absorb the heat from the boiler furnace adjacent said blower element and to transmit the same to said member, whereby a relatively cool zone is maintained adjacent said blower element.

In testimony whereof I affix my signature.

NORMAN L. SNOW.