(No Model.) 2 Sheets—Sheet 1.

C. K. PICKLES.

ATTACHMENT FOR STEAM BOILERS.

No. 477,151. Patented June 14, 1892.

Fig. I.

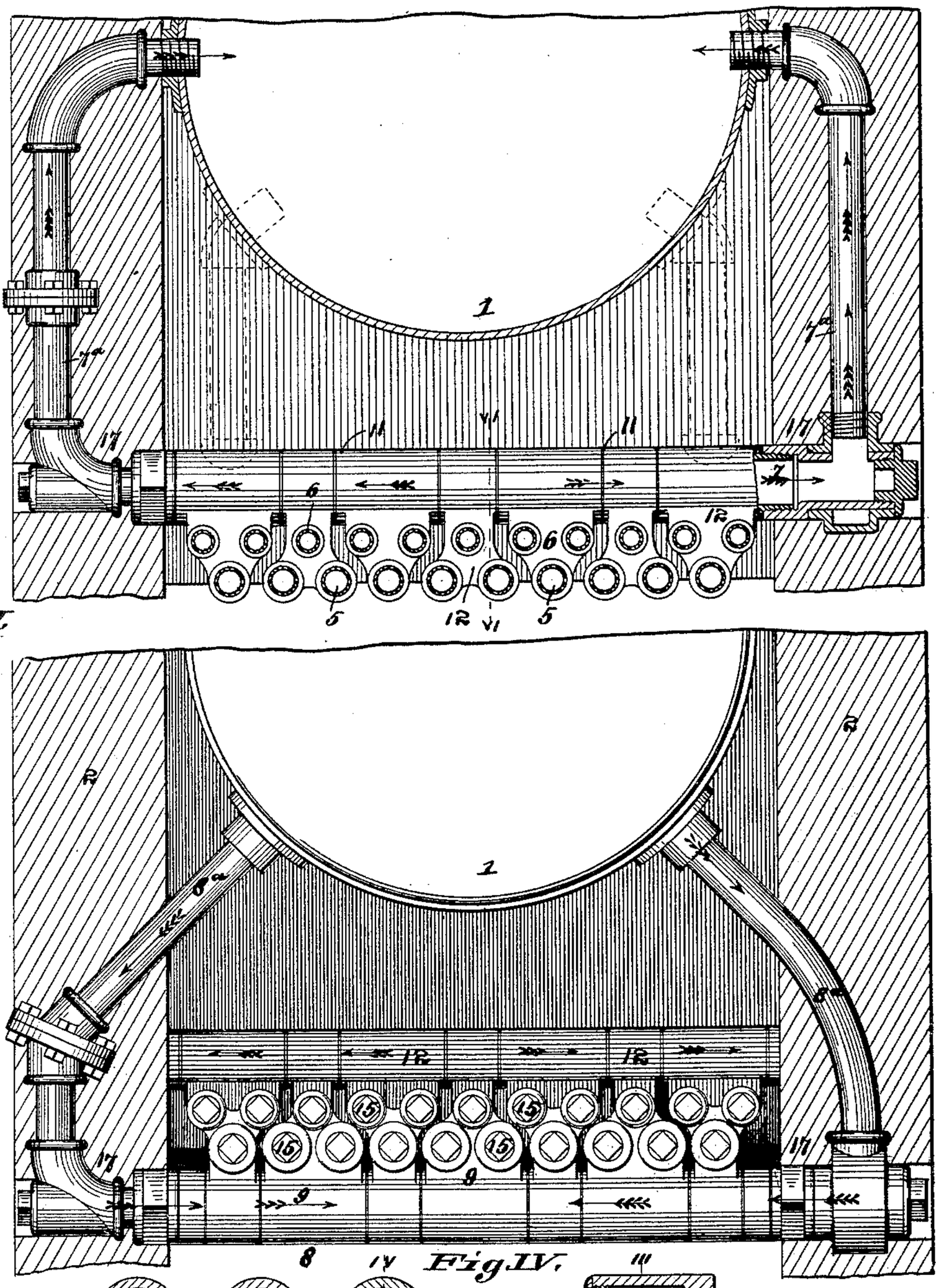


Fig. II.

Fig. III.

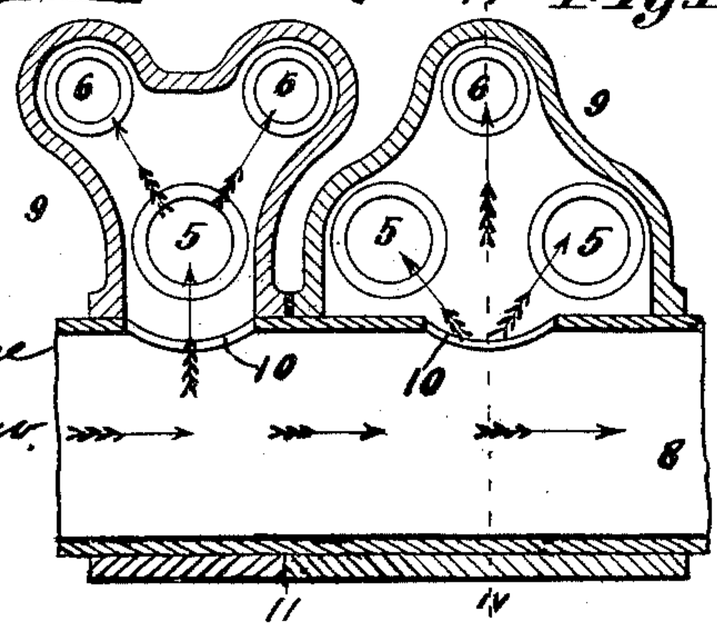
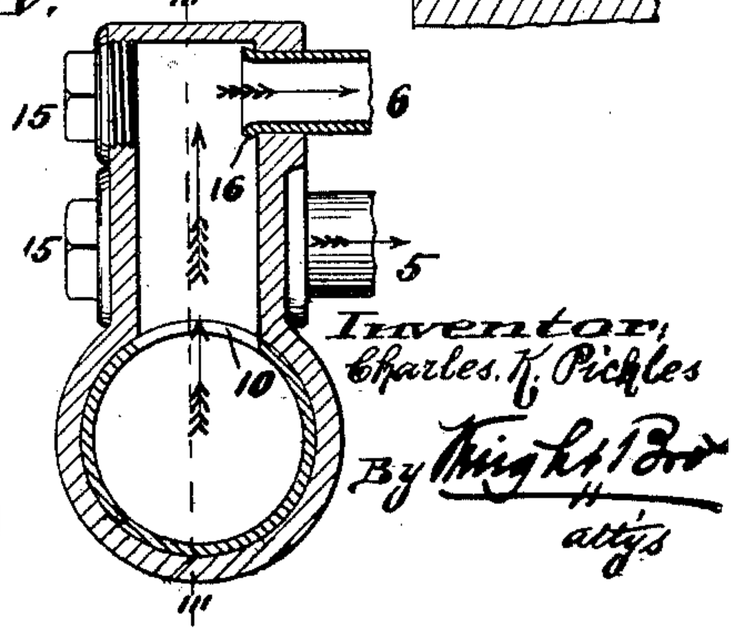


Fig. IV.



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(No Model.) 2 Sheets—Sheet 2.

C. K. PICKLES.

ATTACHMENT FOR STEAM BOILERS.

No. 477,151. Patented June 14, 1892.

Fig. V.

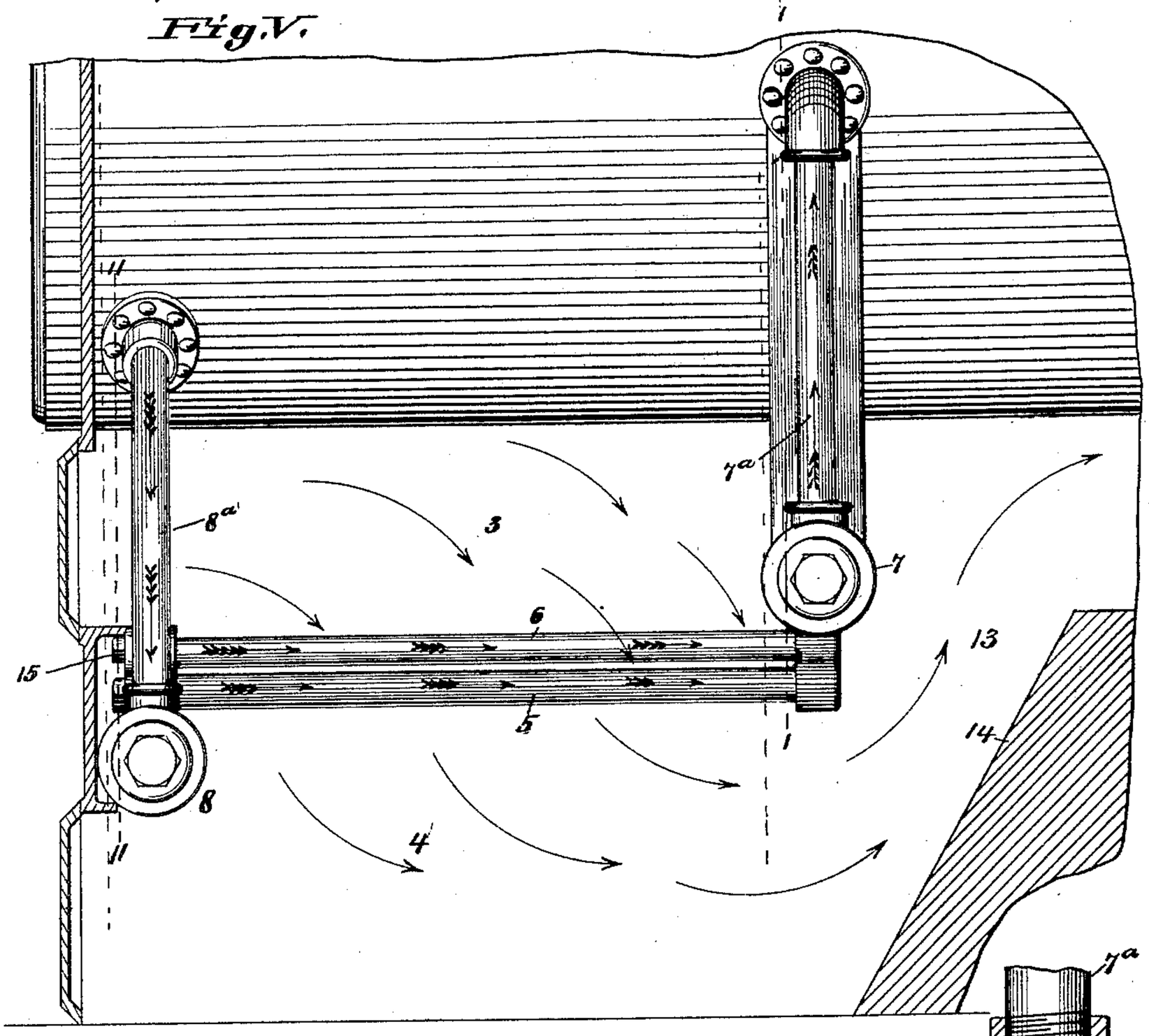


Fig. VI

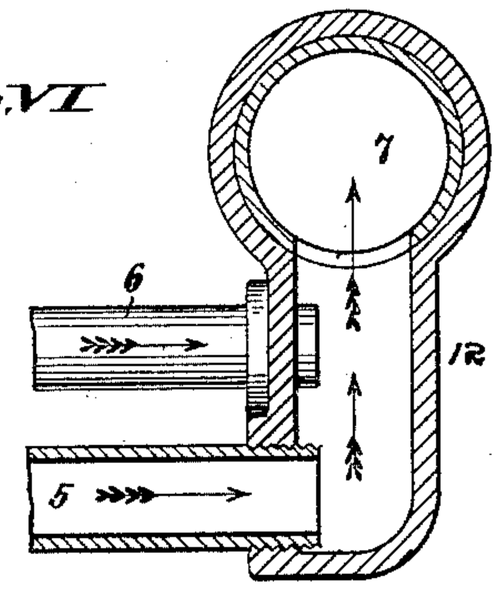


Fig. VII.

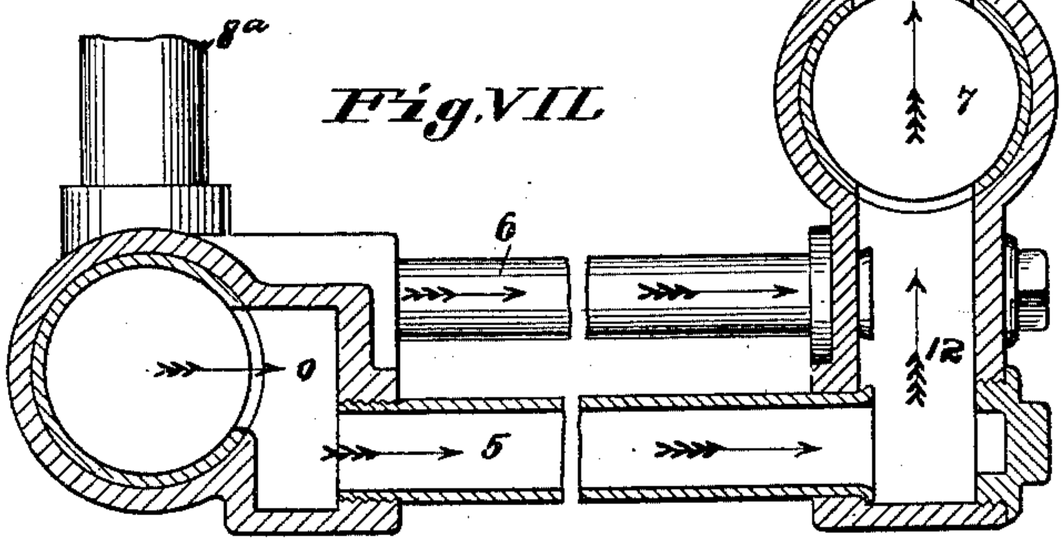
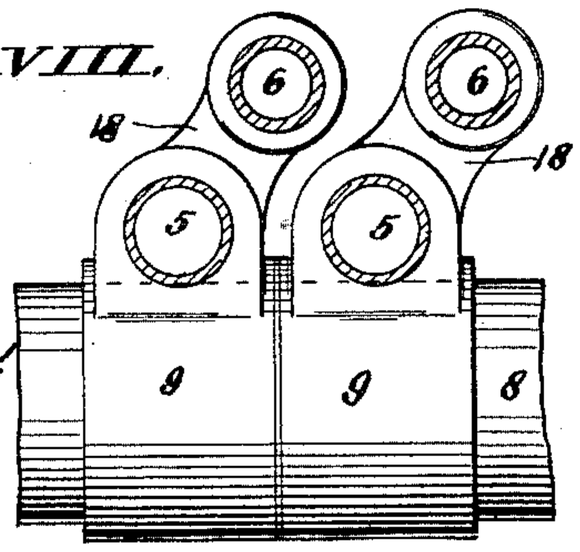


Fig. VIII.



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UNITED STATES PATENT OFFICE.

CHARLES K. PICKLES, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF TO JOHN O'BRIEN, OF SAME PLACE.

ATTACHMENT FOR STEAM-BOILERS.

SPECIFICATION forming part of Letters Patent No. 477,151, dated June 14, 1892.

Application filed January 15, 1892. Serial No. 418,143. (No model.)

To all whom it may concern:

Be it known that I, CHARLES K. PICKLES, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Attachments for Steam-Boilers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to certain features of novelty in that class of attachments for steam-boilers wherein a downdraft and a water-tube grate are combined, the object being to simplify the construction and facilitate the ease with which the attachment can be applied and repaired.

My invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

Figure I is an enlarged detail vertical transverse section taken on line I I, Fig. V. Fig. II is a similar view taken on line II II, Fig. V. Fig. III is a detail vertical section taken on line III III, Fig. IV. Fig. IV is a similar view taken on line IV IV, Fig. III. Fig. V is a detail vertical section through the setting of the boiler, showing part of the boiler and the attachment in elevation. Fig. VI is an enlarged vertical section taken on line VI VI, Fig. I. Figs. VII and VIII represent slight modifications in the manner of forming the water-tube sections and arranging the water-tubes therein.

Referring to the drawings, 1 represents the boiler, having the usual setting 2.

3 represents the fire-box, and 4 the ash-pit. The grate of the fire-box is composed of water-tubes—by preference a lower series of large tubes 5 and an upper series of small tubes 6 being used. These tubes communicate at their inner ends with a large connecting-pipe 7 and at their outer ends with a large connecting-pipe 8, the manifolds communicating with the boiler through vertical pipes 7^a and 8^a.

My invention relates particularly to the manner of connecting the pipes forming the grate to the manifolds.

9 represents hollow castings or sections fitted on the pipe 8 and communicating with the interior of the pipe through openings 10. (See Figs. III and IV.)

11 represents copper or other suitable gaskets located between the sections 9, so as to form tight joints between them to prevent the escape of water passing through the water-tubes of the grate and through the sections and manifolds. It will be observed that each section has a hub-like portion fitting the manifold, and from which there is an extension, into which the ends of the tubes 5 and 6 are fitted, and by preference the sections are so formed that each alternate one will receive two of the tubes 5 and one of the tubes 6, while the intermediate ones receive one of the tubes 5 and two of the pipes 6, as shown in Fig. III. Any suitable number of these sections are used, according to the width of the fire-box, there being a sufficient number of them employed to extend across the fire-box, as shown in Figs. I and II.

12 represents castings or sections located on the inner connecting-pipe 7 and into which the inner ends of the tubes 5 and 6 are fitted, as shown in Figs. I and VI. These sections 12 are the same and are arranged the same on their manifold, with which they communicate, as the sections 9; but by preference the extensions of these sections depend in a downwardly direction instead of projecting in an upwardly direction, as do the sections 9, the object being to provide for the pipe 7 being above the water-tubes, so as not to interfere with the draft of the furnace, which is downwardly through the grate and up through a space 14 between the manifold and the bridge-wall 14 of the furnace, as indicated by the arrows in Fig. V. The inner ends of the tubes 5 and 6 are screwed into the sections 12 after the sections are put in place on their connecting-pipe, the tubes being inserted through the sections 9, which have removable plugs 15 to permit the insertion of the tubes. After the tubes are screwed into the sections 12 their outer ends are expanded in the sections 9, as shown at 16, Fig. IV. It will thus be seen that when either of the tubes are burned out it can be easily and quickly removed and replaced by another, and in case one of the sections should burn out (there will be no dan-

ger of the connecting-pipes burning out, for the reason that they are covered and protected by the sections) one of the couplings 17, by which the manifolds are connected to the pipes 7^a and 8^a, can be removed and the connecting-pipe drawn out past the section which it is desired to replace, and when the new section is inserted, the connecting-pipe forced back to its normal position, and the couplings again applied, so that a construction of this kind affords the best facilities, not only for the first building up or construction of the attachment, but also for repairing it in any part which is likely to need repair.

In Fig. VII, I have shown the extensions of the sections 9 projecting in an inwardly instead of a downwardly direction, in which case the tubes would be screwed into the sections 9, the sections 12 being provided with the removable plugs to permit the insertion of the tubes, which would be flanged in the sections 12 after they are screwed into the sections 9.

In Fig. VIII, I have shown the sections provided each with a single lateral wing for supporting the tubes 6, and, if desired, the sections may be formed so as to receive only the tubes 5, the tubes 6 being omitted altogether. This would be accomplished by simply leaving off the latter extensions 18. (Shown in Fig. VIII.)

I claim as my invention—

1. In an attachment for steam-boilers, the combination of the manifolds consisting of connecting-pipes and independent sections mounted on said connecting-pipes, with the furnace-grate consisting of water-tubes secured to said sections and communicating between said manifolds, substantially as and for the purpose set forth.

2. In an attachment for steam-boilers, the combination of the manifolds consisting of the connecting-pipes, the removable independent sections mounted on said connecting-pipes, and openings 10 in said pipes, with the furnace-grate consisting of water-tubes connected to said sections and forming communication between the manifolds and suitable communications between the manifolds and the boiler, substantially as and for the purpose set forth.

3. In an attachment for steam-boilers, the combination of the connecting-pipes, a number of independent removable sections mounted on the pipes and communicating therewith to form manifolds, water-tubes forming the grate of the furnace and fitting into said sections, and vertical pipes forming communication between the manifolds and the boiler, the front manifold being located beneath the water-tubes and the inner manifold being located above the water-tubes, substantially as shown and described.

4. In an attachment for steam-boilers, the combination of the connecting-pipes, removable sections fitted on the connecting-pipes to form manifolds, vertical pipes jointed to the manifolds and forming a communication between the manifolds and the boiler, and water-tubes forming the grate of the furnace, said water-tubes being screwed into the sections of the inner manifold and expanded into the sections of the outer manifold, the sections of said outer manifold being provided with removable plugs, all substantially as and for the purpose set forth.

CHARLES K. PICKLES.

In presence of—
A. M. EBERSOLE,
E. S. KNIGHT.