

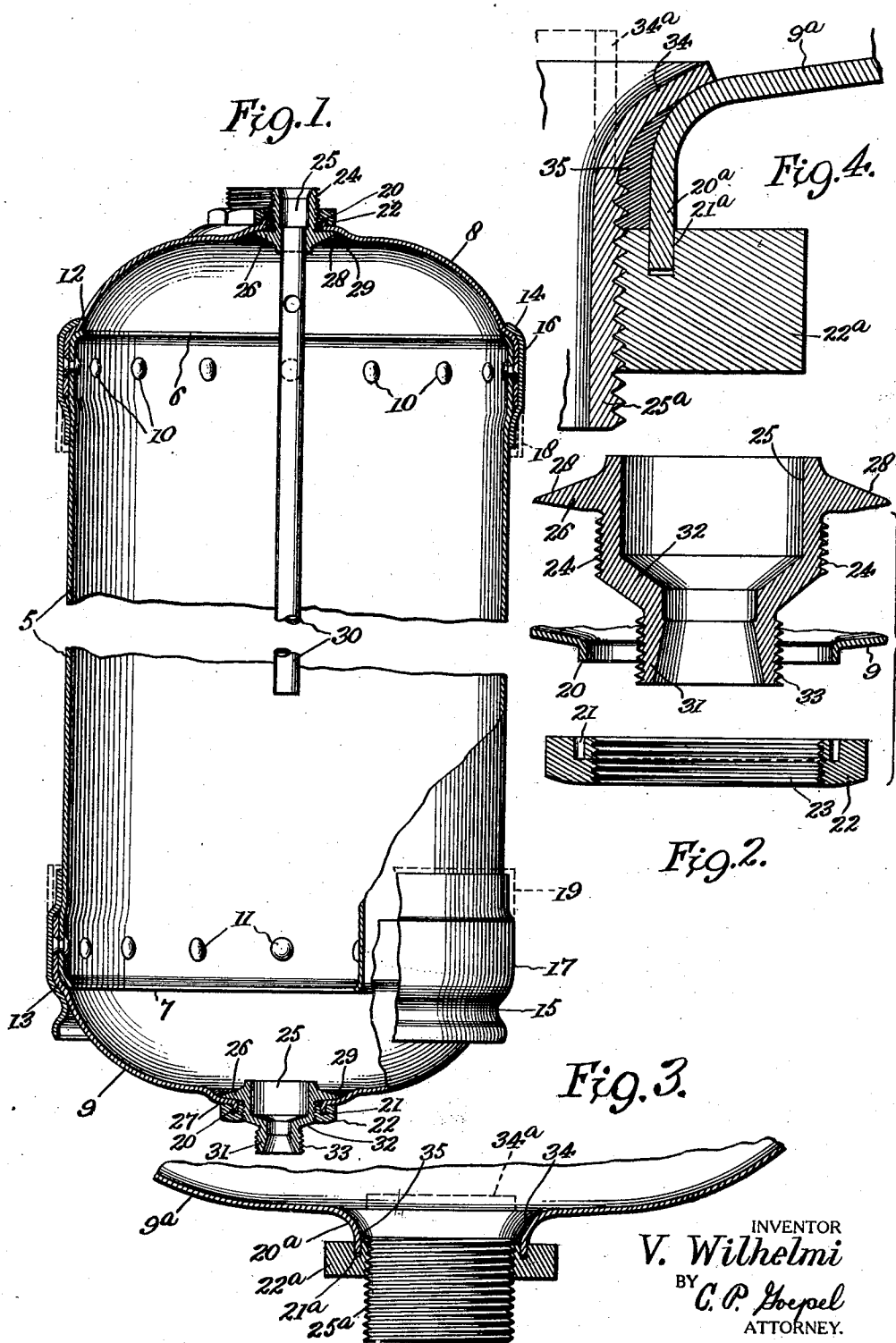
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BOILER CONNECTION

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BOILER CONNECTION

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The present invention relates to improvements in boiler connections, and has for an object to provide an improved boiler connection or spud in which a tight hold is obtained upon the boiler shell to sustain the spud in place and against leakage.

Further objects of the invention consist in providing a new construction greatly in simplification of the old forms; in reducing the expense of manufacture of the connections; in eliminating a great part of the labor and skill necessary to assemble the spuds in the shell; and to provide a more durable and stronger construction which will also cooperate to reinforce the adjacent areas of the boiler shell itself.

With the foregoing and other objects in view, the invention will be more fully described hereinafter, and will be more particularly pointed out in the claims appended hereto.

In the drawings, wherein like symbols refer to like or corresponding parts throughout the several views,

Figure 1 is a vertical section, with parts shown in elevation of a boiler of improved construction with the connections forming part of the present invention.

Figure 2 is an enlarged fragmentary sectional view through a portion of the boiler shell and connection with the parts in the disassembled condition.

Figure 3 is a fragmentary vertical section showing a slight modification, and

Figure 4 is also a sectional view greatly magnified and taken at one side of the joint, shown in Figure 3.

Referring more particularly to the drawings 5 designates the boiler shell of cylindrical or other form having the inwardly curving upper and lower ends 6 and 7 to cooperate with the overlapping end portions of the heads 8 and 9; rivets 10 and 11 being employed to pass through the overlapped parts for securing the heads to the boiler.

The heads are indented, as indicated at 12 and 13 concentrically of the rolled or curled ends 6 and 7 of the shell, and these indented or inwardly offset portions of the heads receive the outer inwardly bent ends

14 and 15 of the reinforcing bands 16 and 17, which are sweated or otherwise made to envelop the overlapped riveted parts. The bands 16 and 17 may be originally cylindrical, as indicated by the dotted lines 18 and 19, such ends being afterwards rolled, or otherwise bent against the shell wall 5 adjacent the ends of the heads 8 and 9.

By means of the above construction, it will be evident that I have succeeded in greatly reducing liability of mechanical failure in the connection between the boiler body or shell and the head thereof. Thus, the riveted connections 10 between the end of the shell and the surrounding edge of the boiler head constituting the primary mechanical connection between the parts are protected by the outer encircling band 16 coacting with said rivets to offer additional resistance to internal pressures. The wall of the head 8 being annularly pressed inwardly or indented beyond the edge of the boiler shell so that the edge of the shell lies substantially in the curvilinear plane of the inner surface of the head wall 8, the possibility of the internal pressure opening up the seam formed between the end edge of the boiler shell and the boiler head is reduced to a minimum while the inwardly turned edge portion 14 of the outer band 16 extending beyond the edge of the boiler shell materially reinforces the boiler head at this point so as to obviate opening of the connecting seam by externally applied pressures. Therefore, it will be apparent that there is direct coaction between the outer band 16 and the rivets 10 and due to the particular relationship of the curved edge portions of the end of the boiler shell and the band 16 with relation to the inner and outer faces of the wall of the head 8, the rivets are relieved of severe stresses due to high pressure within the boiler. Therefore, these several features mutually contribute to produce a structure possessing the requisite attributes of simplicity, great strength and practical immunity to mechanical failure in the ordinary use of the boiler.

The heads 8 and 9 are centrally perforated and provided with an out-turned flange

adapted to be received into the annular channels 21 in the inner sides of the nuts 22 provided with the internal screw threads 23 to cooperate with the external threads 24 upon the intermediate body portion of the spud or connection, indicated generally at 25. The spuds 25 are provided with the flanges 26 preferably of wedge form in cross section and having their outer free ends tapered to substantially an edge. Such flanges 26 are adapted to be received into the cavities provided by outwardly offsetting the central portions 27 of the heads about the openings through which the spuds pass; and the inclined inner walls 28 of the flanges 26 cooperate with the opposite mutually inclined walls of the depressions to provide substantial spaces for receiving a body of solder 29 useful to bind the spud to the boiler head and also to make a tight and leak-proof joint. The nut 22 will bind a portion of the head next the flange 20 against the flange 26 of the spud connection and will thus form a tight fit between these parts, and the engagement of the flange 20 itself in the groove 21 of the nut will further contribute to form a tight joint.

In Figure 1 the top spud is shown as carrying the internal pipe 30 while the spud also provides for receiving an external pipe connection. In this instance the body of the spud is made of substantially the same diameter and the intermediate threads 24 are continued upwardly to the end of the spud.

In the case of the lower spud, which is also more particularly illustrated in Figure 2, the inner portion of such spud is of greater diameter than the lower portion 31, there being an intermediate inverted frusto-conical connecting portion 32 having an outer blank wall.

The exterior wall of the outer reduced portion 31 is preferably threaded, as indicated at 33 to receive the binding nut for a pipe.

Referring more particularly to Figures 3 and 4, the boiler head is indicated at 9^a and is of slightly modified construction in that the depression 27 is omitted and the wall of the head is carried outwardly in a more or less sweeping curve to provide the flange 20^a, which extends about the opening through which the spud connection 25^a is inserted. The nut 22^a is of substantially the same construction having the channel 21^a to receive the outer annular end of the flange 20^a. The nut engages the external threads upon the spud 25^a. Such spud is also of modified construction in that its inner portion 34 is arranged to be bent against the adjacent portion of the head 9^a or flange 20^a. The original position of the end 34 is shown at 34^a in dotted lines.

After assembly, and when a body of solder 35 has been flowed into the cavity between the

spud connection and the flange 20^a, the inner end 34 of the spud is bent over, as by rolling to the position, shown in full lines, whereupon the body of solder is shoved tightly between the parts referred to and downwardly against the nut face and also possibly into the channel 21^a, thus forming a tight joint between the threads and between the channeled and flanged parts. Provision is made for holding a substantial body of the solder in order to add strength to the construction. In assembling the parts, the work done upon the spud joint as to assembling it is accomplished before the heads 8 and 9 are put upon the boiler whereby the solder may be flowed into the depression 27 when the depression is uppermost for this purpose and when access can be easily had to the same. After the spud connections are in place the heads may be united with the boiler and the reinforcing bands 16 and 17 sweated or otherwise put in place. The boiler is then ready for use and when installed the pipe connections will be fitted thereto in the usual manner.

The heads of the rivets 11 are inside of the boiler and make a very solid connection between the boiler and the bands 16 and 17, preventing the leakage of live steam in the boiler to the outside thereof.

I have illustrated and described a preferred and satisfactory embodiment of my invention, but it is obvious that changes may be made therein within the spirit and scope thereof as defined in the appended claims.

What is claimed is:—

1. A boiler construction comprising a shell having ends with inturned edges, heads overlapping the ends of the shell, said heads being circumferentially indented adjacent the inturned edges of the shell, securing means passing through the shell and the heads and comprising rivets having their heads inside the boiler and their opposite ends engaging said boiler heads and reinforcing bands at the ends of the boiler tightly encircling same and covering said rivets; the edges of said bands being rolled against the sides of the boiler over the edges of the heads and against the heads beyond the end of said shell.

2. In a boiler construction, a shell, a head for one end of said shell having an end portion encircling the shell wall, mechanical devices rigidly fastening said end portion of the head to the shell wall inwardly of the end edge of the latter, a reinforcing band encircling said end portion of the head and secured thereto independently of the fastening means between said head and the shell wall, said band extending beyond the end of the shell, and the end edge of the shell wall together with the corresponding edge of said reinforcing band and the part of the head engaged thereby being inwardly curved, and

said curved edge of the shell wall terminating substantially in the plane of the inner surface of the head wall which extends beyond the end of the shell.

5 In testimony that I claim the foregoing as my invention, and have signed my name hereto.

VALENTIN WILHELMI.

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