Sept. 8, 1936. C. RINGEL ET AL 2,053,443

SUPERHEATER ELEMENT

Filed Oct. 18, 1935

Fig. 1.

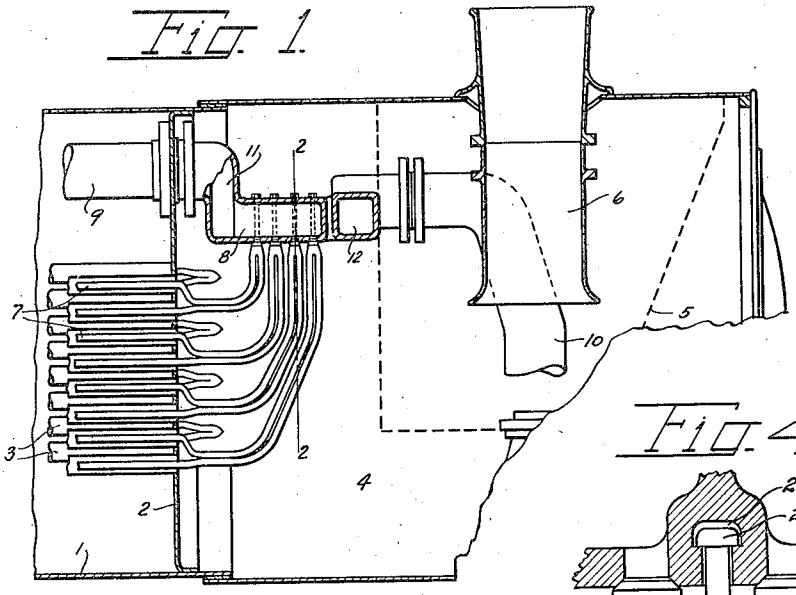


Fig. 4.

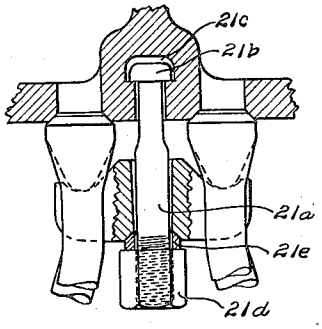


Fig. 2.

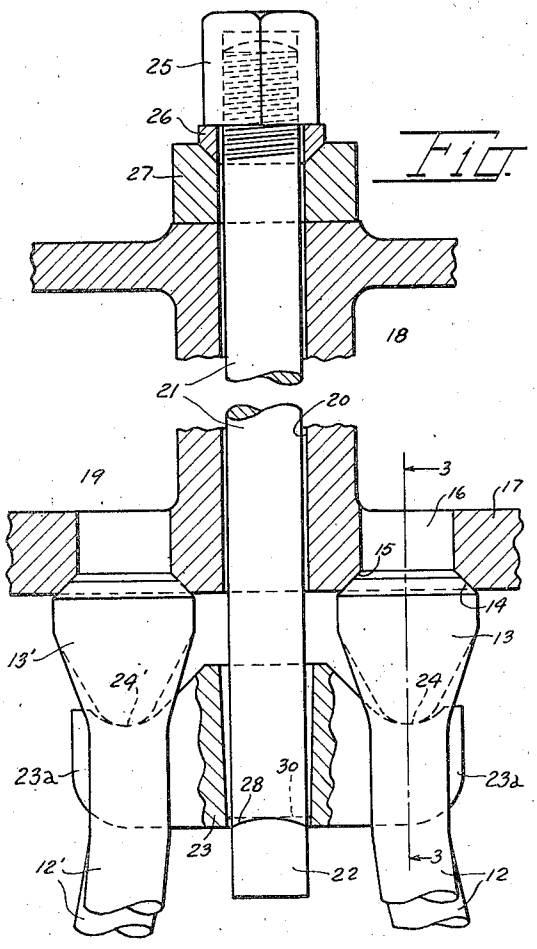
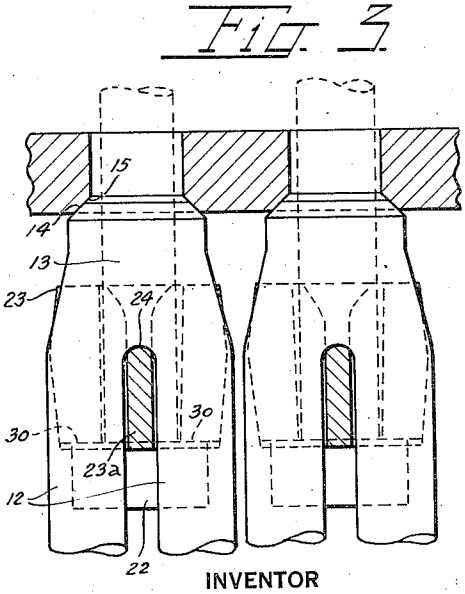


Fig. 3.



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SUPERHEATER ELEMENT

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Application October 18, 1935, Serial No. 45,540

4 Claims. (Cl. 122—462)

The present invention relates to locomotive superheaters of the type comprising a header or steam collector located in the smoke box and a set of tubular superheater elements connected with their ends to said header and looping into the flues of the locomotive from the smoke-box end. The object of the invention is to provide a new form of such tubular elements and means for securing the ends of the elements or units in a readily detachable manner to the header.

The invention is illustrated in the drawing accompanying this application where Fig. 1 shows a vertical central longitudinal section of the front end of a locomotive boiler with a superheater embodying our invention; Fig. 2 is a fragmentary enlarged view taken on line 2—2 of Fig. 1 illustrating a portion of the header and two element ends secured to it; Fig. 3 is a section on line 3—3 of Fig. 2; and Fig. 4 is a fragmentary sectional view showing a modification.

Referring first to Fig. 1 which illustrates the general location and arrangement of the parts with which the invention is concerned, the body of the boiler appears at 1, the front flue sheet at 2 and the flues at 3. These flues carry hot gases from the furnace (not shown) to the smoke box 4 from which these gases escape through the netting 5 and out of the stack 6. Within the flues 3 are located the superheater elements or units 7 which are connected with their ends to the header 8. This header receives its steam from the boiler through the dry pipe 9 and delivers it in superheated condition to the steam pipes 10 (only one shown).

The header 8 is preferably of the usual well known construction in which sets of interlaced or alternating subsidiary headers or fingers are connected to the transverse inlet chamber 11 and the outlet chamber 12 respectively. Those fingers which communicate with inlet chamber 11 do not communicate with outlet chamber 12, and vice versa those fingers which open into outlet chamber 12 do not communicate with inlet chamber 11. Communication between these two sets of fingers is afforded by way of the superheater elements 7, one end of each element being secured to a finger communicating with inlet chamber 11 and the other end being secured to a finger communicating with outlet chamber 12. All of this is in accordance with the usual practice with which those familiar with the art are well acquainted.

It has been common practice for some years to bifurcate the tubular elements. Such an element is then made up of a single-tube inlet end secured to a finger communicating with the inlet chamber of the header followed by two tube lengths which are in parallel and which loop into the flues and in turn are connected to a single-tube outlet end secured to a finger delivering steam to the outlet chamber of the header. The single-tube inlet and outlet ends have, under the regular practice, enlarged ends which are held in engagement with the header by means of clamps and bolts.

Our invention varies from this usual practice and will now be described in detail.

Instead of there being single-tube ends of some length terminating in enlarged heads as just briefly described above, we carry the tubes making up the elements to points in close proximity to the header and there unite them in pairs by Y's. These Y's are preferably fabricated directly out of the material of the pipes themselves. This may most conveniently be done in accordance with practice disclosed in a number of prior patents, for example United States Patent 1,169,209 granted on January 25, 1916, to C. H. True et al. Two such pipe ends are shown in Figs. 2 and 3 at 12—12. The are connected to the Y 13. The opposite ends of the pipes 12—12 are similarly connected. They may, for example, be the two ends shown at 12'—12' (Fig. 2) connected to the Y 13'.

The extremity of the Y 13 is formed into a seat 14 which is held against a corresponding seat 15 in the header. This seat 15 of the header is formed at the outer end of the passage 16 extending through the lower wall 17 of the header. 18 is one of the fingers communicating with one of the two chambers 11 and 12 and 19 is a finger communicating with one of the fingers of the set communicating with the other of said two chambers. The two fingers are separated by a space 20 through which extends the bolt 21. This bolt has at its lower end a head 22 which extends through a clamp 23. This clamp has flat vertical end portions 23*a*—23*a* extending through the crotches of the two Y's 13 and 13' and engaging the bottom of the crotches at 24 and 24' respectively. The upper end of the bolt 21 carries a nut 25 which bears on a pair of washers 26 and 27 interposed between it and the upper surface of the header. The engaging surfaces of the two washers are preferably rounded to permit adjustment in all directions. By pulling up on the nut 25, the pair of element ends are evidently pressed against their seats in the lower face of the header. It will be noted that where it engages the crotches at the points 24 and 24' the

clamp 23 is rounded so that if one of the Y's is a little longer than the other, the clamp will still properly engage both Y's at these points. For the same purpose the head 22 of the bolt 21 is rounded at 28 so that its engagement with the lower surface 30 of the clamp 23 will also permit of variations in the height of the Y's.

While only one pair of element ends has been fully described in the above, it will be understood that all of the element ends are formed in this way.

Instead of extending entirely through the header, the bolts may have their heads in a T-shaped groove as shown in Fig. 4. The bolt 21*a* extends through the clamp 23, as in the form first described, and has its head 21*b* in the T-slot 21*c*. At its lower end it is equipped with the nut 21*d* between which and clamp 21*a* there is the washer 21*e*. This engages the clamp with a ball-joint. The pipe ends are bifurcated and engaged by the clamp in the same manner as in the first form.

It will be clear that further variations may be made without departing from the spirit of the invention. Such variations are to be considered as falling within the appended claims.

What we claim is:

1. In apparatus of the class described comprising a superheater header equipped with openings in its lower face, said openings terminating in seats at their outer ends, the header being positioned in a locomotive smoke box and tubular superheater elements looping into the locomotive flues from the smoke box end, the combination of Y's each integral with and joining the ends of a pair of superheater tubes, the open end of each Y being formed to a seat adapted to engage a header seat, and means to hold the seats of the Y's in engagement with the header seats, said means comprising clamps each engaging two Y's between their two branches.

2. The combination according to claim 1, and further comprising bolts each extending through the header and carrying a nut on their upper ends to draw the heads of the bolts against the clamps.

3. The combination according to claim 1, the bolts each extending through the header and carrying a nut on their upper ends to draw the heads of the bolts against the Y's, a pair of washers being interposed between the header and the nut, the mutually engaging surfaces of the two washers forming a ball and socket joint.

4. The combination according to claim 1, the bolts each extending through a clamp and having their heads in grooves in the lower side of the header, and nuts on the lower ends of the bolts to pull the clamps against the Y's.

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