J. C. ALEXANDER.

TUBE AND HEADER CONNECTION.

APPLICATION FILED DEC. 13, 1909.

973,610.

Patented Oct. 25, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

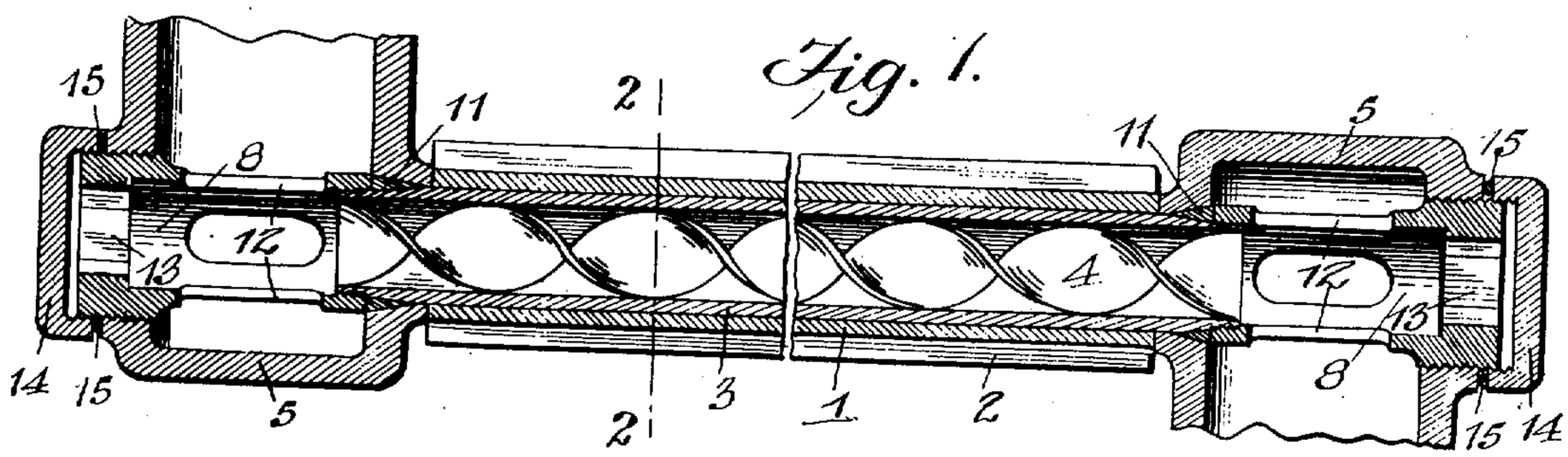


Fig. 2.

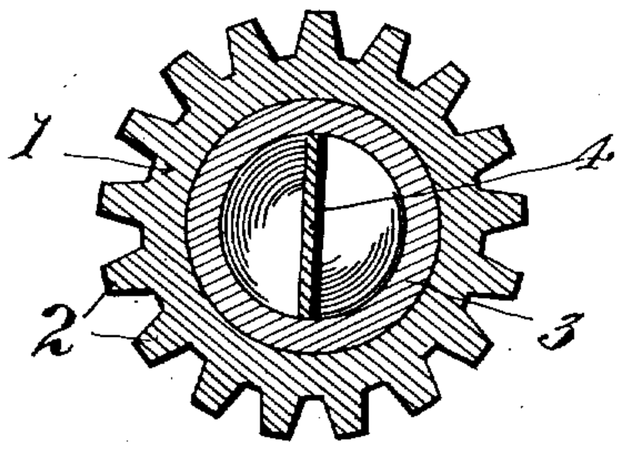


Fig. 3.

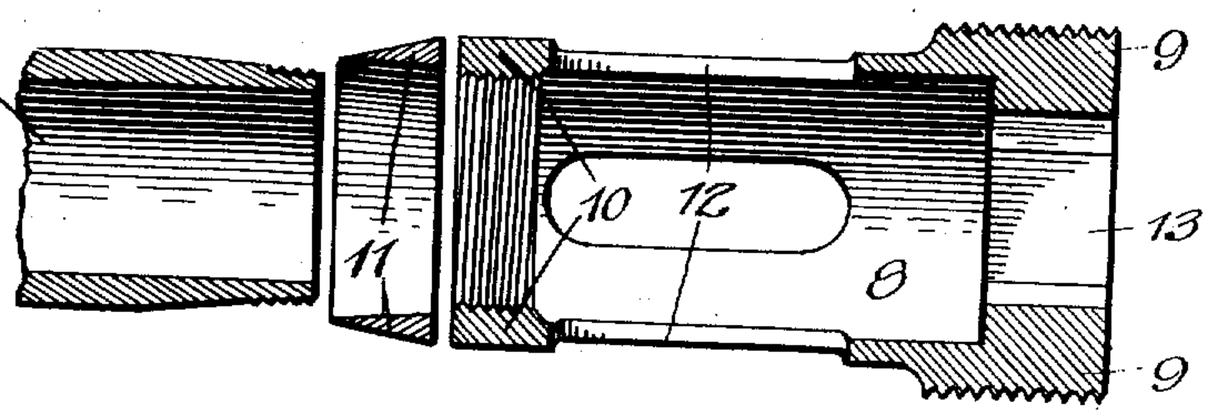
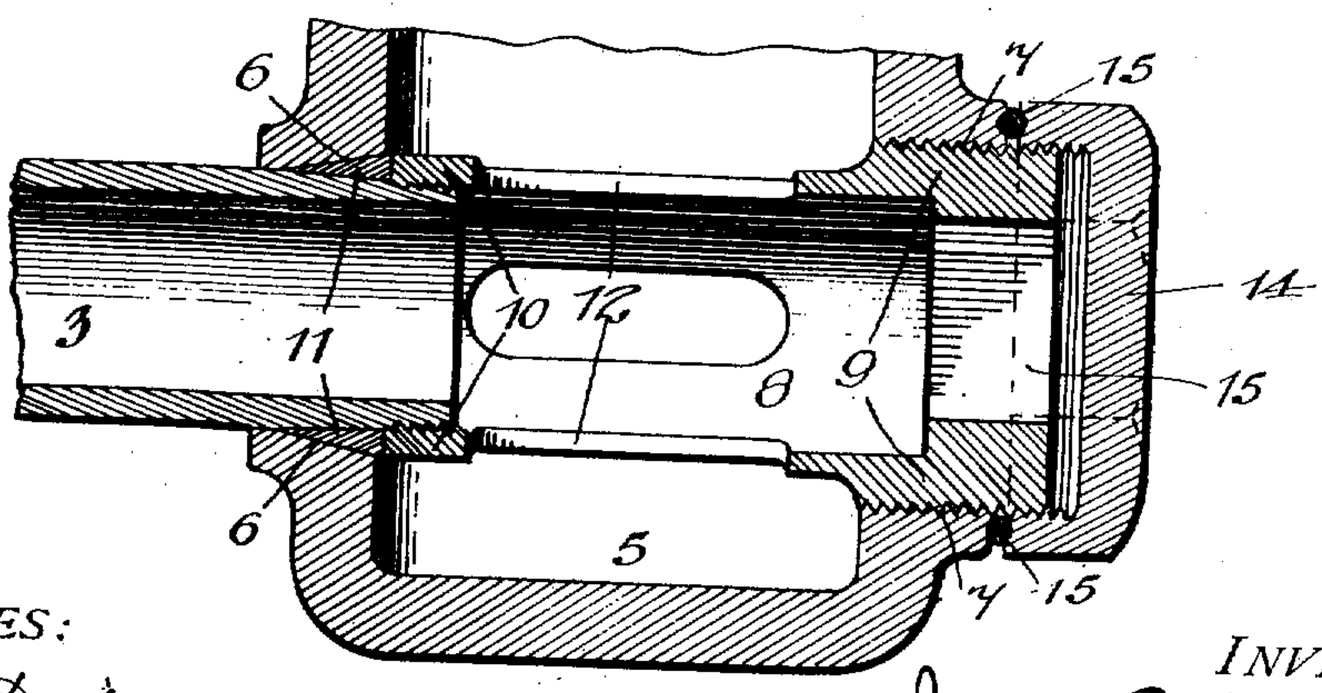


Fig. 4.



WITNESSES:

Chas. K. Davis.

Myron G. Clear

INVENTOR

James C. Alexander,

BY

P. L. Parker

Attorney

J. C. ALEXANDER.

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2 SHEETS—SHEET 2.

Fig. 5.

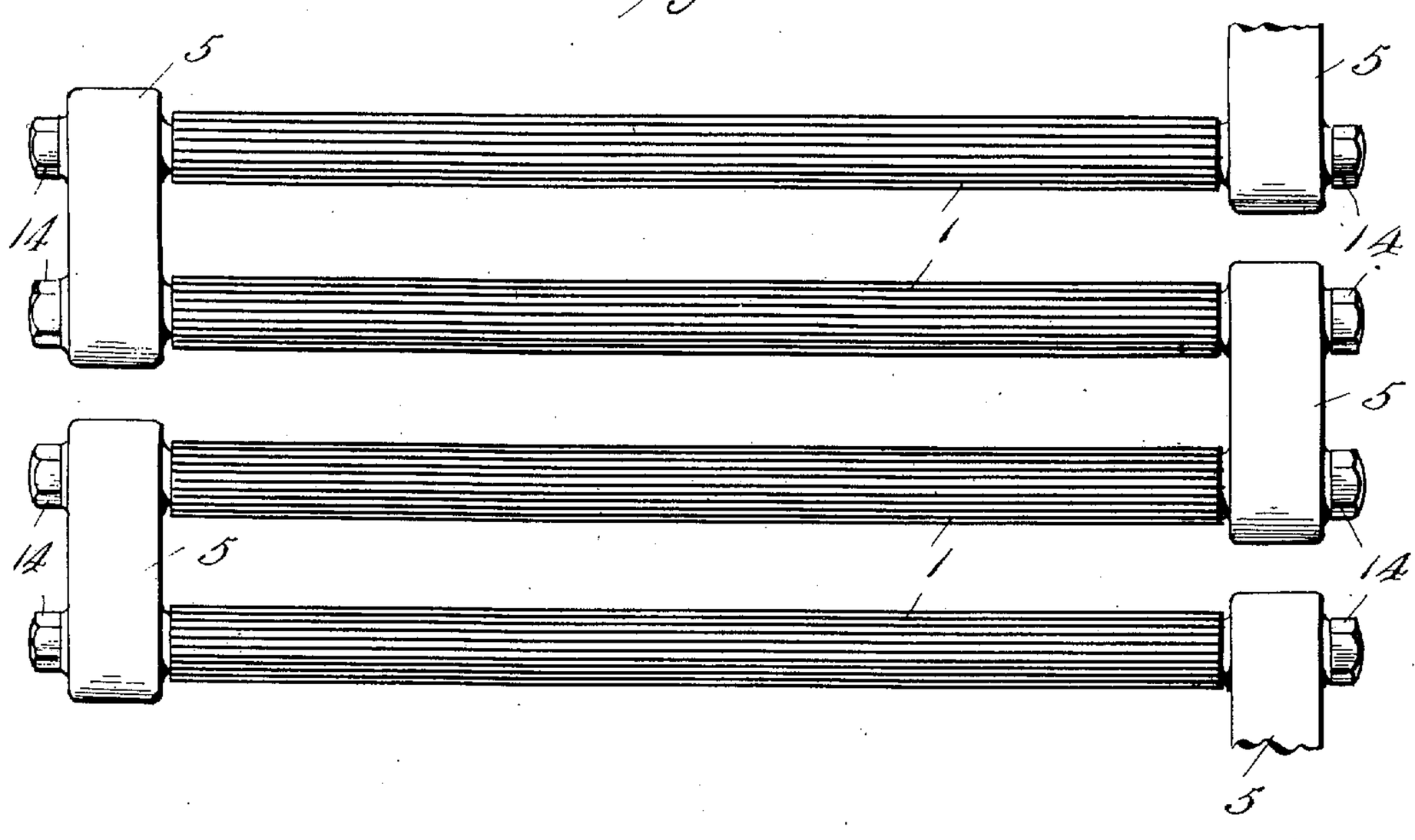


Fig. 6.

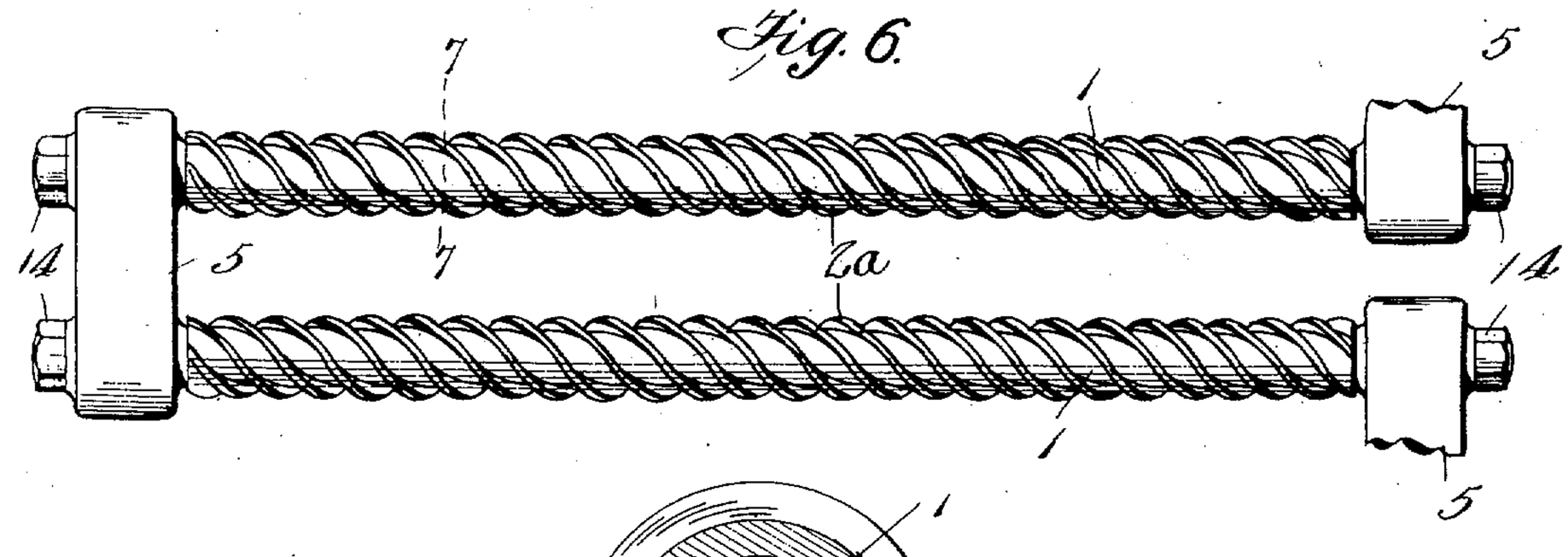
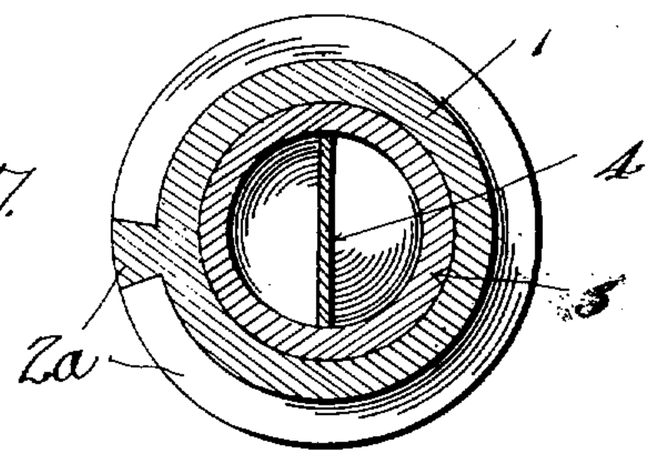


Fig. 7.



WITNESSES:

Chas. T. Davis

Myron T. Clear

INVENTOR

James C. Alexander,

BY

C. L. Parker

Attorney

UNITED STATES PATENT OFFICE.

JAMES C. ALEXANDER, OF ROSEBURG, OREGON.

TUBE AND HEADER CONNECTION.

973,610. Specification of Letters Patent. Patented Oct. 25, 1910.

Application filed December 13, 1909. Serial No. 532,955.

To all whom it may concern:

Be it known that I, JAMES C. ALEXANDER, a citizen of the United States, residing at Roseburg, in the county of Douglas and State of Oregon, have invented certain new and useful Improvements in Tube and Header Connections, of which the following is a specification.

This invention relates to new and useful improvements in circulating coil construction and connection in superheaters, condensers and the like and particularly appertains to improvements in the connections in the circulating pipes within their respective headers.

The invention aims as a primary object to provide a novel means for uniting the circulating pipe to the header whereby ready access may be had thereto for the purposes of repairs and for cleaning and removing the mantel pipes when needful, and thereby providing a stronger construction and doing away with the troublesome inside manhole.

The invention aims as a further object to provide a novel construction of circulating pipe having a special constructed coupling to act in the place of a stay-bolt and providing a construction which will be simple and inexpensive to manufacture and practical and efficient in use.

The detail construction will appear in the course of the following description in which reference is had to the accompanying drawings forming a part of these specifications, like numerals designating like parts throughout the several views, wherein,

Figure 1 is a central longitudinal section taken through a circulating pipe and illustrating my improved connection between headers. Fig. 2 is a transverse section on the line 2 2 of Fig. 1. Fig. 3 is a longitudinal sectional view illustrating the screw coupling, the double bevel packing ring, and a portion of the liner pipe, in detached relation. Fig. 4 is a fragmentary sectional view on an enlarged scale of my improved connection as illustrated in Fig. 1. Fig. 5 is a view illustrating the manner of connecting circulating pipes with headers according to my invention. Fig. 6 is a similar view showing a modified form of mantel pipe, and Fig. 7 is a transverse section on the line 7—7 of Fig. 6.

In the practical embodiment of my invention I employ a cast iron mantel pipe 1, which is provided with longitudinal corrugations 2, as shown in Figs. 1, 2 and 5, but which may be as readily formed with spiral corrugations 2^a as shown in Figs. 6 and 7, if desired, the function of these corrugations being to provide a greater absorbing service for the heat, and in this manner to serve as a storage or reservoir for the liner pipe 3 which is inclosed within said liner pipe 1. The liner pipe 3 is preferably of finished metal and provides a perfectly smooth inner surface which will afford the least resistance to the steam or air passing therethrough. For the purpose of increasing the heat area and co-mingling the steam or air a spiral casting 4 is disposed within said liner 3, the function thereof being to impart to the steam or air passing through said liner 3, an axial whirling movement. The ends of the mantel pipe 1 abut the headers 5 which are arranged at each end thereof, while the ends of the liner pipe 3 protrude from the said mantel pipe 1, for a short distance within said headers 5, being slightly beveled and threaded thereon. The header connections are duplicates in construction, so that the description of a single one will answer for the entire series.

The header 5 is formed in its inner wall with a tapered cylindrical opening 6, and in its outer wall with a threaded opening 7 alined with said opening 6. A cylindrical screw coupling 8 is provided with an enlarged threaded end 9, adapted to be screwed within the header opening 7, and with an internally threaded forward end 10 adapted to fit about and to be screwed upon the threaded end of the liner pipe 3 projecting within the header. Previous to the connection of the forward end 10 of the screw coupling 8 to the end of the liner pipe 3 a double bevel packing ring 11 is placed upon the said bevel end of said liner pipe, and is adapted to be forced tightly in position between said mantel pipe and the tapered opening 6 in the header by means of said screw coupling 8, thus taking the place of an inside man-hole.

It will be noted that the screw couplings 8 are provided with longitudinal openings 12 therein to permit the passage of the steam or air in circulation therethrough, and with internally squared outer ends 13 adapted for the reception of a suitable key for screwing the same within the header 5 upon the

liner pipe 3 to securely seat the double bevel packing ring 11 and bind the tube and header together.

In Figs. 5 and 6 I have illustrated the headers 5 secured to the pipes 1 and their associated parts in juxtaposed pairs at the ends thereof. This arrangement causes the headers 5 to have a relative staggered disposition whereby the circulating pipes afford a tortuous passage for the steam or air therethrough and whereby free expansion of said pipes is permitted. The enlarged end 9 of the screw coupling 8 is arranged to project slightly from the header 5 to receive an inclosing cap-nut 14 between which and the header 5 is preferably arranged a packing strip 15 to form a secure joint.

While the elements herein shown and described are illustrated in connection with a superheating coil, and are well adapted to serve the functions set forth, it is obvious that by minor changes which will at once suggest themselves to persons skilled in the art, the said elements may be embodied to serve their appointments equally as well within condensers and like structures employing continuously connected circulating pipes, that various other minor changes may be made in the proportion, shape and arrangement of the several parts without departing from the spirit and scope of the invention as defined in the appended claims.

Having thus fully described my invention I claim:

1. In a circulating pipe and header connection, the combination of a header provided with a tapered opening in one wall thereof and with a threaded opening in its opposite wall, a circulating pipe for attachment therein provided with a tapering threaded end, a double bevel packing ring associated on said pipe between the tapered portion thereof and said tapered opening in said header and a screw coupling having an internally threaded forward end adapted to engage the threaded end of said circulating pipe within the header to securely seat said packing ring and having a threaded outer end engaging within said alined threaded opening in said header substantially as described.

2. In a circulating pipe and header connection the combination of a header provided with a tapered opening in one wall thereof and a threaded opening in its opposite wall alined with said tapered opening, a circulating pipe for attachment therein provided with a tapering threaded end, a double beveled packing ring associated on said pipe between the tapered portion thereof and said tapered opening in said header, a screw coupling having an internally threaded forward end adapted to engage upon the threaded end of said circulating pipe within the header to securely seat said packing ring and having a threaded outer end engaging within said alined threaded opening in said header, and a cap-nut adapted to be screwed upon said outer threaded end of said coupling outside the header substantially as described.

3. In a circulating pipe and header connection the combination of a header provided with alined tapered and threaded openings, a circulating pipe having a tapering end projecting within said header, a packing ring having beveled inner and outer faces associated about said circulating pipe between the beveled portion thereof and said tapered opening, a screw coupling engaging within said threaded opening to force said packing ring securely in position, and a cap-nut adapted to be screwed upon said coupling outside the header to form a secure joint, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES C. ALEXANDER.

Witnesses:
L. A. SANCTUARY,
C. J. BURCHARD.