

C. P. WADLEY.
 COUPLING DEVICE FOR WATER HEATERS, &c.
 APPLICATION FILED MAR. 27, 1920.

1,398,985.

Patented Dec. 6. 1921.

Fig. 1.

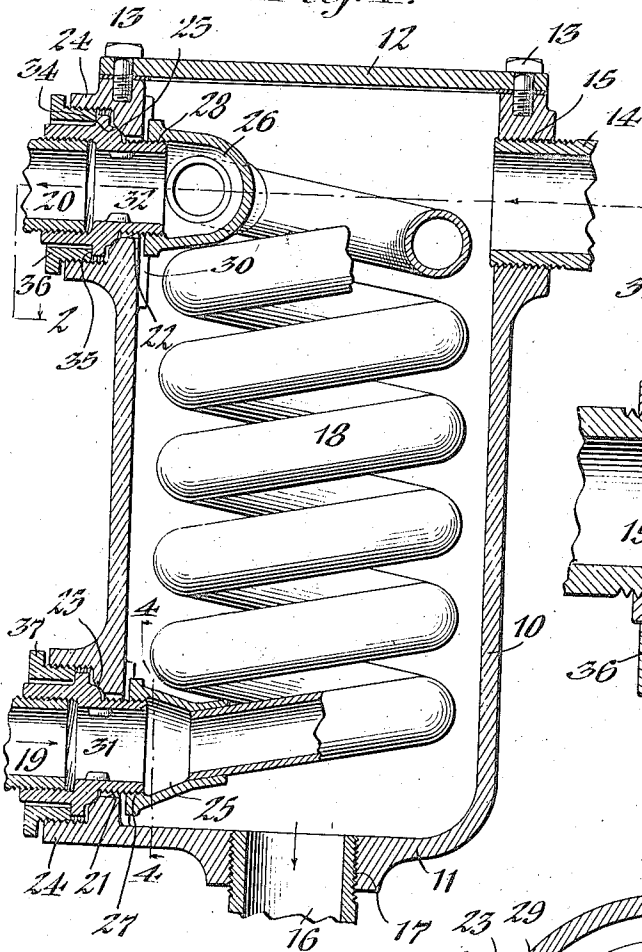


Fig. 3.

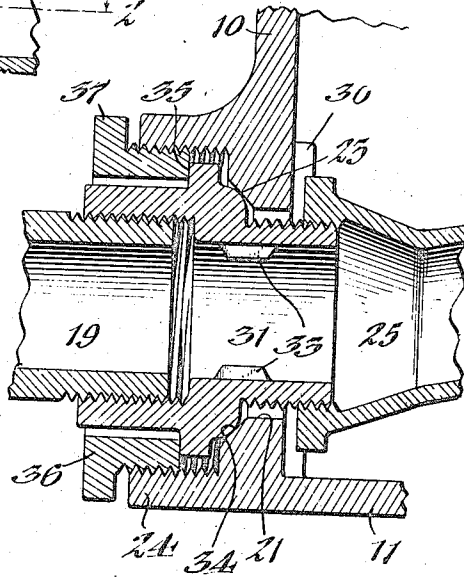


Fig. 2.

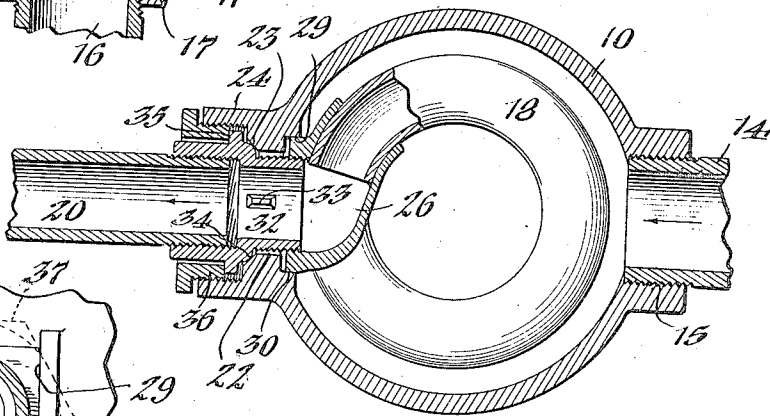
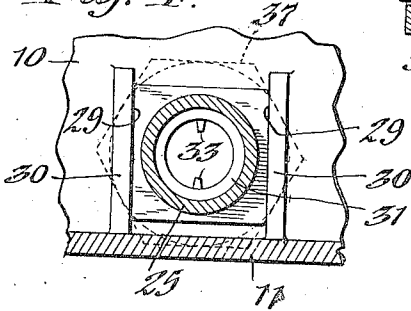


Fig. 4.



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CALVIN P. WADLEY, OF BUFFALO, NEW YORK.

COUPLING DEVICE FOR WATER-HEATERS, &c.

1,398,985.

Specification of Letters Patent.

Patented Dec. 6, 1921.

Application filed March 27, 1920. Serial No. 369,176.

To all whom it may concern:

Be it known that I, CALVIN P. WADLEY, a citizen of the United States, residing in Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Coupling Device for Water-Heaters, &c., of which the following is a specification.

This invention relates to a coupling which is more particularly designed for use in a heat exchanging device, although the same may also be used to advantage in other installations where a pipe or a coil within a chamber is connected with a pipe or conduit outside of the chamber.

The object of this invention is to produce a coupling of this character which permits of performing the coupling operation wholly from the outside of the chamber and in such a way that the joint between the chamber and the pipe is perfectly tight and leak proof and capable of being taken up or tightened when necessary without involving any undue expense in the cost of manufacture.

In the accompanying drawings:

Figure 1 is a vertical section showing my invention embodied in a heat exchanging device into which the heat of the steam or hot water, or other heat medium, is transmitted indirectly to another fluid, such as the water of a domestic water supply. Fig. 2 is a horizontal section taken on line 2-2, Fig. 1. Fig. 3 is a vertical section, on an enlarged scale, showing my improved coupling. Fig. 4 is a fragmentary section taken on line 4-4, Fig. 1.

Similar characters of reference refer to like parts throughout the several views.

The heat exchanging apparatus embodying my invention as shown in the drawings comprises a heating chamber which has an upright cylindrical body 10, the bottom 11 of which is formed integrally therewith, while the top 12 thereof, is made detachable from the body and preferably secured thereto by means of bolts 13, so as to render the interior of the body accessible when required.

This particular organization is designed to utilize the heat from a steam or hot water boiler for indirectly heating the water which is used in a household for domestic purposes, but it is to be understood that any

other heating medium may be employed, and in some cases it may also be desirable to circulate a cooling medium through the chamber instead of a heating medium.

When the steam or hot water from a boiler is employed as a heating medium the same is conducted from the boiler by means of a pipe 14 into an inlet opening 15 formed on one side of the upper part of the cylindrical wall of the chamber and this medium, after it has spent itself, is returned to the boiler or conducted elsewhere by an outlet pipe 16 communicating with an outlet opening 17 in the bottom of the chamber.

Within the chamber is arranged a heat exchanging coil 18, the lower and upper ends of which are adapted to be connected with the lower and upper pipes 19, 20 forming parts of the water conduit of the house or other establishment. In this particular instance, the lower pipe 19 may be regarded as a water supply pipe which receives a supply of fresh water from any suitable source while the upper pipe 20 serves as the delivery pipe for conducting the water to the various fixtures in the house which require hot water.

In the operation of this apparatus the downward course of the steam in the chamber 10 causes the water passing upwardly through the coil to be heated, thereby indirectly transmitting the heat from the boiler to the water which is to be used for domestic or other purposes without varying the supply of the water in the boiler or affecting its operation in any other way.

The connection between the lower and upper ends of the coil and the lower and upper pipes 19, 20 of the water supply service conduit is effected by coupling devices which embody my improvements and are constructed as follows:

21, 22 represent openings or passages formed in the lower and upper parts of the side wall of the body 10. Around the outer side of each of these openings is arranged an annular seat 23, preferably of inwardly tapering conical form. Projecting laterally from the outer side of the wall around each of the openings 21, 22 is an annular collar or rim 24 which is provided with an internal screw thread of larger diameter than the adjacent seat 23.

At its upper and lower ends the coil 18 is

provided with hollow coupling heads 25, 26, which are arranged adjacent to the inner side of the lower and upper openings 21, 22 of the chamber and are provided with internally screw threaded openings 27, 28, which are arranged axially in line or substantially so, with said wall openings. Each of these coupling heads is preferably held against turning relatively to the adjacent wall opening of the chamber by providing the outer part of each of these coupling heads on its diametrically opposite sides with vertical retaining or guiding faces 29 which engage with the inner vertical retaining or guiding faces of two ribs or lugs 10 arranged on the adjacent part of the inner side of the chamber wall on opposite sides of the respective coupling head, as best shown in Figs. 2 and 4.

31 and 32 represent lower and upper coupling sleeves which are arranged respectively in the lower and upper openings 21, 22 of the chamber body and serve to connect the lower and upper sections 19, 20 of the service pipe or conduit with the lower and upper ends of the coil 18. Each of these coupling sleeves is provided at its inner end with an external screw thread which engages with the internally screw threaded opening in the outer end of the coupling head on the respective end of the coil, while its outer end is provided with an internal screw thread which engages with an external screw thread on the adjacent end of the respective service pipe section. The turning of the sleeves 31, 32 for effecting the screw connection between the same and the coupling heads of the coil is preferably effected by providing these sleeves with internal wrench lugs 33 which are adapted to receive a wrench of appropriate construction for this purpose so that these sleeves may be connected with the coupling heads from the exterior of the heating chamber. On the central or intermediate part of each of these coupling sleeves the same is provided externally with an inwardly facing bearing shoulder 34 which engages with the conical seat 23 around the adjacent opening in the chamber wall. This shoulder 34 is preferably of rounded form so that, in effect, it produces a section of a ball which upon engaging with the seat 23 permits the sleeve to rock upon the seat in the manner of a ball and socket joint and thus enables the sleeve to rock and adjust itself while in its seat and adapt the sleeve to the parts with which the same is associated.

On the intermediate or central part of the sleeve the same is also provided externally, outside of the shoulder 34, with an outwardly facing abrupt shoulder 35. The latter is engaged by the inner end of a clamping sleeve 36 having an external screw thread which engages with the internal thread of

the collar 24. The outer end of this clamping ring is provided with an external flange 37, the periphery of which is preferably made of hexagonal form as shown by dotted lines in Fig. 4, or of other suitable formation, so as to permit of applying a wrench thereto for turning this ring for loosening or tightening the same. Upon tightening the clamping ring fully so that its inner end engages with outwardly facing shoulder of the coupling sleeve, the inner shoulder 34 of the latter is caused to bear firmly against the seat 23 of the chamber wall and thereby produce a leak-proof joint between the coupling sleeve and the chamber wall. The uncoupling of the connection between the external pipes 19 and 20 and the coil 18 may be effected by unscrewing the clamping ring 36.

Both the operations of coupling and uncoupling the service pipe sections and the coil can therefore be effected from the exterior of the chamber very easily and conveniently and in a manner which does not involve an undue number of parts and insures a perfectly tight joint between the chamber and the coupling device.

I claim as my invention:

1. A chamber having its wall provided with an opening and an outer seat around the outer side of the opening, a coupling head arranged within the chamber, a coupling sleeve having a screw connection between its inner end and said head and provided with an inwardly facing shoulder engaging said seat, and an outwardly facing shoulder, and a clamping ring engaging said outwardly facing shoulder and having a screw connection with said wall.

2. A chamber having its wall provided with an opening, an annular seat around the outer side of said opening and an internally screw threaded collar around said seat, a coupling head arranged within said chamber and having an internally screw threaded opening, a coupling sleeve provided between its ends with an annular external inwardly facing rounded shoulder which engages with said seat on the chamber wall, an external screw thread on its inner end engaging with the internal thread of said coupling head and an outwardly facing shoulder on its outer part, and adapted to be connected at its outer end with a pipe, and a clamping ring engaging its inner end with said outer shoulder of the coupling sleeve and having an external screw thread engaging with the internal screw thread of said collar.

3. A chamber having an inlet and an outlet, upper and lower openings in the upper and lower parts of its side wall and seats around the outer side of said openings, a coil arranged in said chamber and provided with upper and lower coupling heads ar-

ranged opposite said openings, respectively, a coupling sleeve arranged in each of said openings and having its inner end connected by a screw joint with the adjacent head of the coil and adapted to be connected at its outer end with a pipe, and its intermediate part being provided with an inwardly facing external shoulder engaging said seat and with an outwardly facing shoulder and a clamping ring engaging its inner end with said outer shoulder and having a screw connection with said wall.

CALVIN P. WADLEY.