June 14, 1938. F. E. KEY 2,120,498

RETURN BEND

Filed March 20, 1936

Fig. 1.

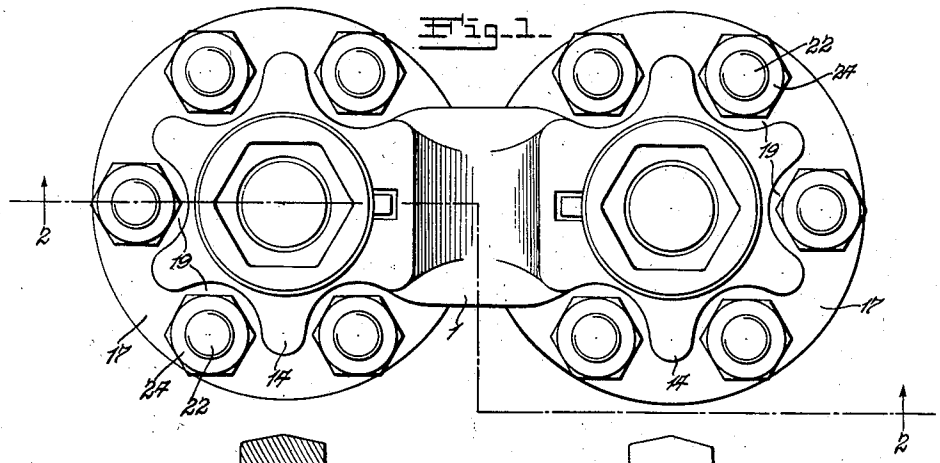


Fig. 2.

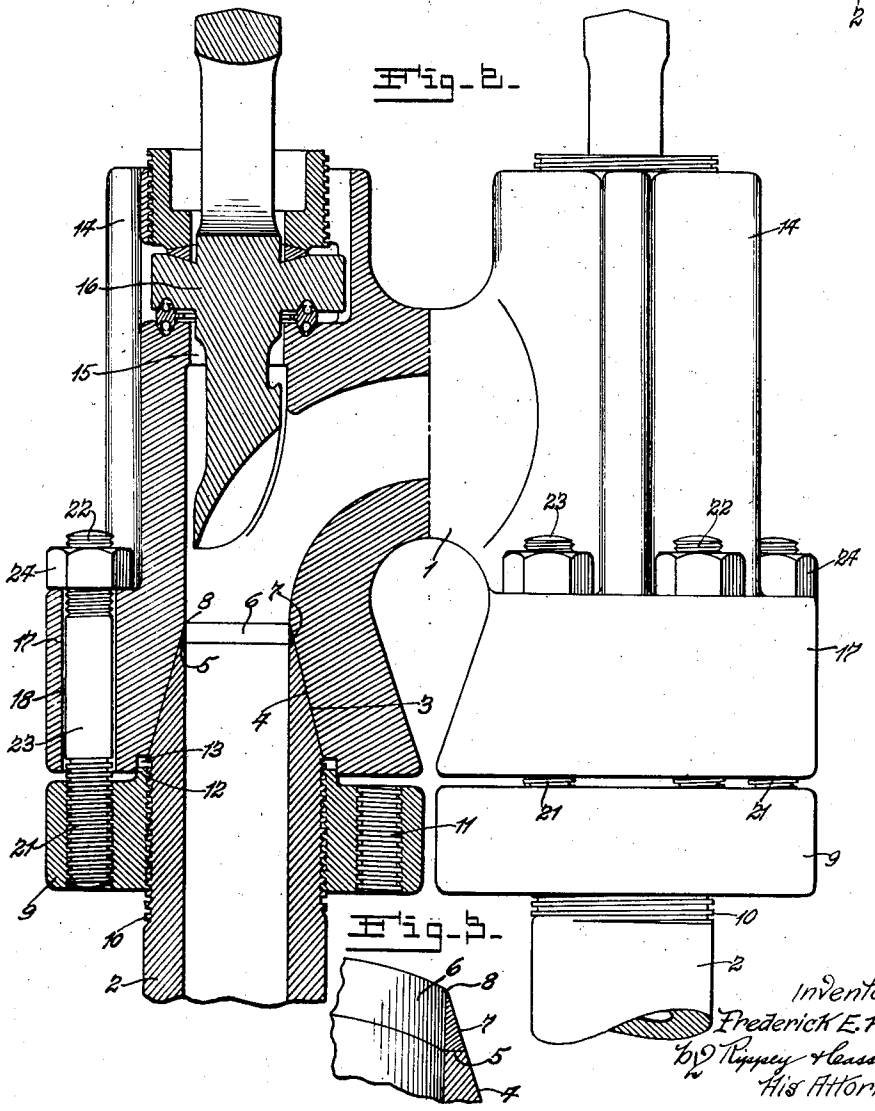


Fig. 5.

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Patented June 14, 1938 2,120,498

UNITED STATES PATENT OFFICE

2,120,498

RETURN BEND

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Application March 20, 1936, Serial No. 69,799

2 Claims. (Cl. 285—20)

This invention relates to return bends forming passages between the ends of tubes in oil stills which are subjected to high temperatures and high pressures.

An object of the invention is to provide a return bend of novel construction and formation, in combination with novel means for attaching the same to tubes so that the return bends may be mounted in close assembly in oil stills, and may be conveniently detached from the tubes when occasion arises to detach them.

Another object of the invention is to provide novel attaching means for the return bends whereby they may be conveniently attached to the tubes or detached from the tubes without damaging the attaching means.

Another object of the invention is to provide improved means for attaching return bends to tubes including collars adjustably mounted on the tubes and provided with a plurality of threaded holes adapted to receive the ends of bolts provided with Acme threads on their inner ends and with conventional or S. A. E. threads on their outer ends, which extend through holes in the return bend structure and have nuts screwed on said conventional or S. A. E. threads rigidly securing the return bends on the tubes. Thus, when the nuts freeze to the bolts, they become in effect bolt heads adapted to receive socket wrenches whereby the Acme threaded end of the bolt may be screwed out of the holes in the collars and the return bend detached.

Other objects of the invention will be apparent from the following description, reference being made to the annexed drawing, in which—

Fig. 1 is an outer end elevation of the invention.

Fig. 2 is a view partly in side elevation and partly in section.

Fig. 3 is a perspective view of a portion of the telescoping end of one of the tubes.

As shown, the return bend 1 telescopes on the ends of the two tubes 2 and forms communication between them. The ends of the return bend have tapered sockets 3 and the end portions of the tube have tapered walls 4 seating closely against the walls of the sockets 3 and cooperating therewith to form a leak-proof joint. The walls of the sockets and the walls 4 of the tubes may be ground to assure close fit. The tubes end at an abrupt wall 5 (Fig. 3) to which is rigidly attached a ring 6 of stainless steel that will not erode or wear when in use and which has an outer inclined wall 7 in continuation of the wall 4 and intersecting the inner wall of said ring at the outer end thereof to form an approximately sharp edge 8.

A collar 9 is screwed on threads 10 of the Acme type formed on each tube 2 inwardly beyond the beveled wall 4. Each collar has therethrough, parallel with the axis of the tube on which it is mounted, an annular series of holes 11 having threads of the Acme type. The outer end of each collar has an annular flange 12 projecting therefrom and engaging in a socket 13 in the adjacent end of the return bend.

The return bend has outward extensions 14 provided with openings 15 in axial alinement with the tubes and which openings, when the return bend is in use, are closed by removable and replaceable plugs 16, for well understood purposes. The inner ends of the return bend have radially extended portions 17 provided with holes 18 which may be brought into axial alinement with certain of the holes 11. Since this device is provided specially for close assembly, I have formed channels 19 in the outwardly extended portions 14 inward radially from the holes 18.

The attaching devices comprise bolts, each having on its inner end Acme threads 21 and on its outer end conventional or S. A. E. threads 22 between which two threads is an unthreaded portion 23.

In mounting the return bend on the tubes, the collars 9 are first screwed onto the tubes beyond the tapered walls 4. The Acme threads 21 of a bolt are then screwed into each of the holes 11 with the exception of the hole 11 that is toward the other tube or collar. Then the return bend is placed in position, the bolts passing through the holes 18 freely and the walls of the socket 3 seating closely against the inclined walls 4 and 7 of the tube end portions. The outer threaded ends of the bolts extend beyond the extended portions 17 of the return bend within the grooves 19. The nuts 24 are then screwed on the outer ends of the bolts by means of a socket wrench which may be operated within the grooves 19. The nuts are screwed into the clamping engagement with the extensions 17, thereby rigidly securing the return bend in connection with the tubes and forming leak-proof joints. When it is desired to detach the return bend, it is unnecessary to destroy the bolts since they may be removed even if the nuts 24 have become frozen to the bolts, since the Acme threads 21 will screw along the Acme threads in the holes 11 with which they are engaged. After the bolts have been removed, the nuts 24 may be detached

therefrom by known practices without damaging the bolts, thus permitting the bolts to be used repeatedly, which cannot be done in any other modern U-bend structures with which I am familiar.

A feature of the invention consists of the fact that there is at least one hole 11 more than the holes 18 in the adjacent ends of the U-bend. This permits more accurate adjustment of the parts and, in the specific form shown, it is necessary only to turn the collar 9 one-sixth of a revolution in order to aline the holes 11 with the holes 18.

It is now clear that the invention attains all of its objects and purposes in a highly satisfactory manner. The construction, arrangement and relationship of the parts may be varied within the scope of equivalent limits without departure from the nature and principle of the invention.

I claim:—

1. A return bend for connecting two tubes and having tapered sockets in its ends adapted to receive tapered ends of said tubes, tapered rings attached to the ends of said tubes within said tapered sockets and cooperating with the walls of said sockets to form leak-proof joints, and means for attaching said return bend to said tubes to form leak-proof joints by engagement of the walls of said tapered ends and said rings with the walls of said sockets.

2. A return bend for connecting two tubes having tapered sockets in its ends adapted to receive tapered end portions of said tubes, non-erodible tapered rings attached to the ends of said tubes within said tapered sockets and cooperating with the walls of said sockets to form leak-proof joints, threads formed on said tubes inwardly beyond said tapered end portions, collars screwed on said tubes and terminating inwardly beyond said tapered end portions, means for attaching said return bend to said tubes to form leak-proof joints by engagement of the walls of said tapered end portions and said rings with the walls of said sockets, and flanges on the outer ends of said collars engaging the ends of said return bend.

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