No. 812,642. PATENTED FEB. 13, 1906.

H. S. CROMBIE.

UNION COUPLING.

APPLICATION FILED OCT. 6, 1904.

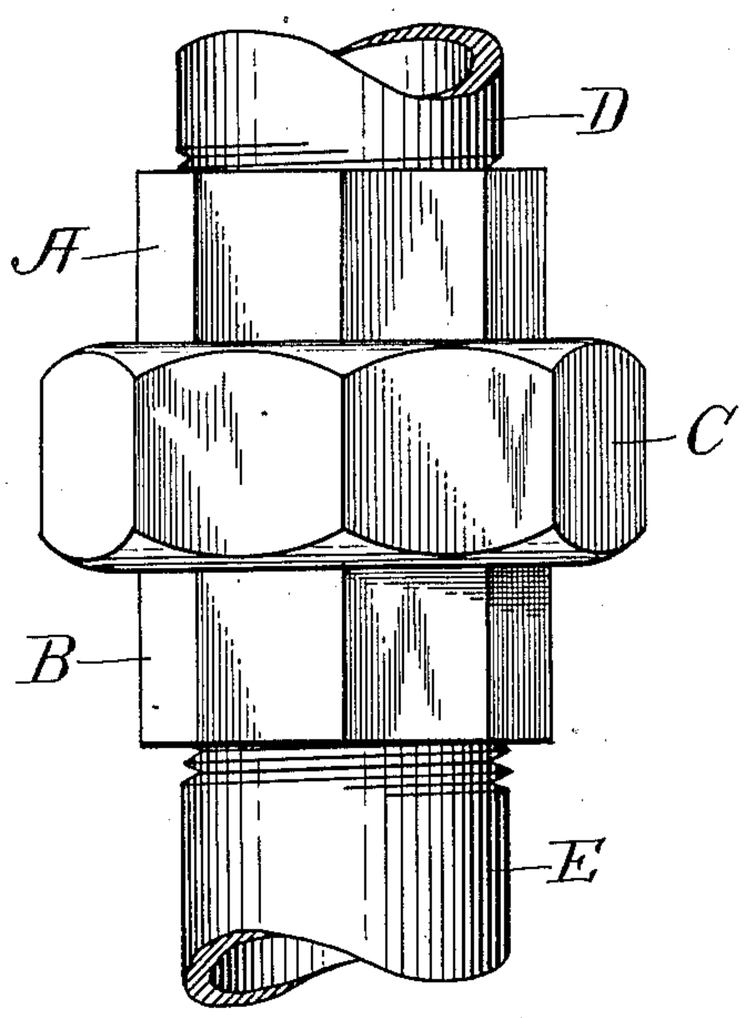

Fig. 1.

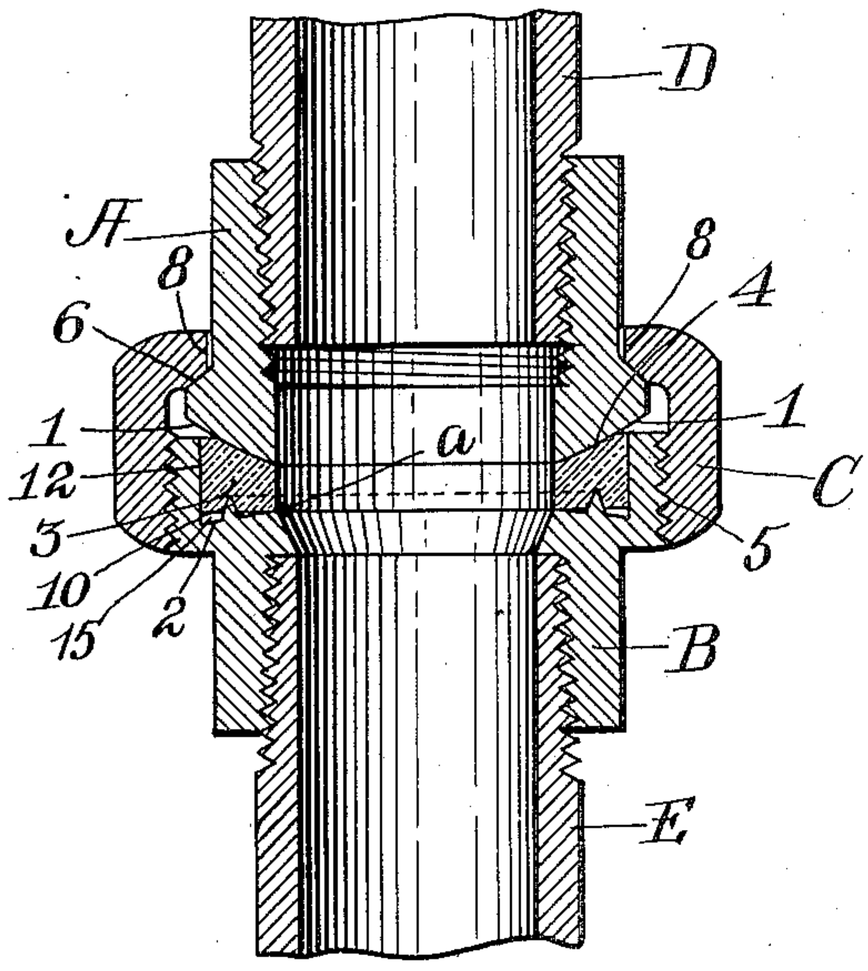

Fig. 2.

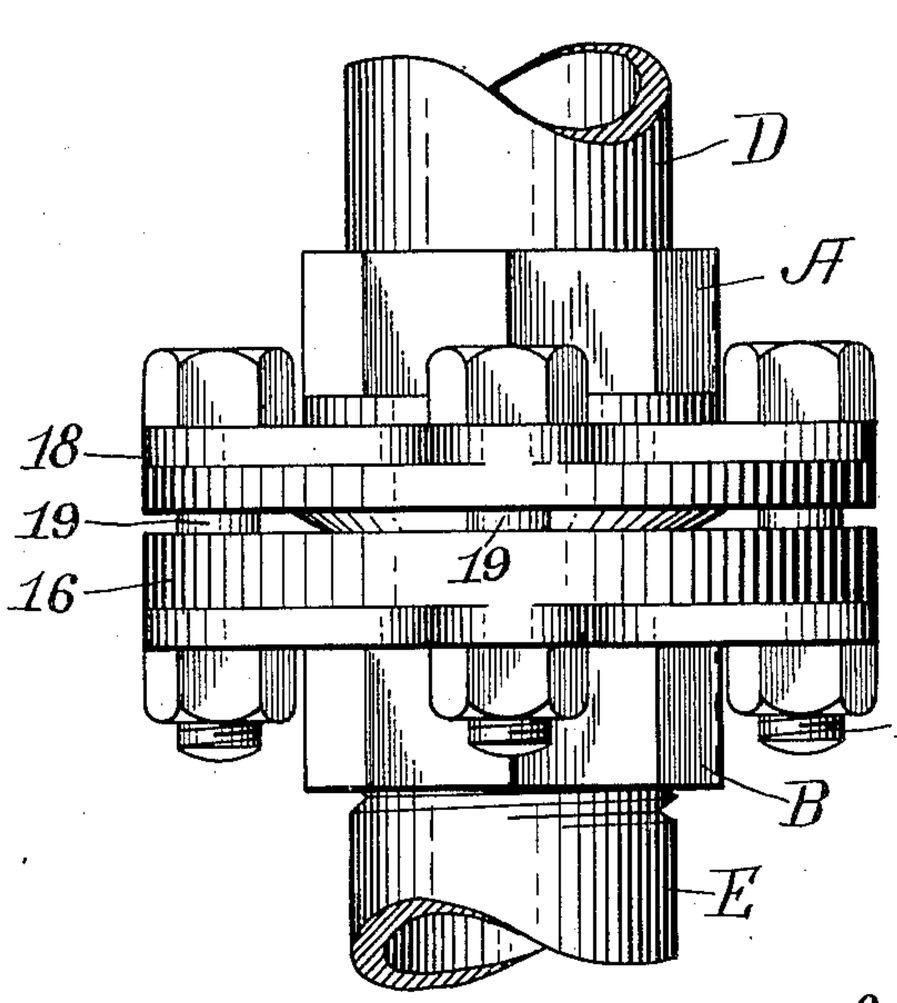

Fig. 3.

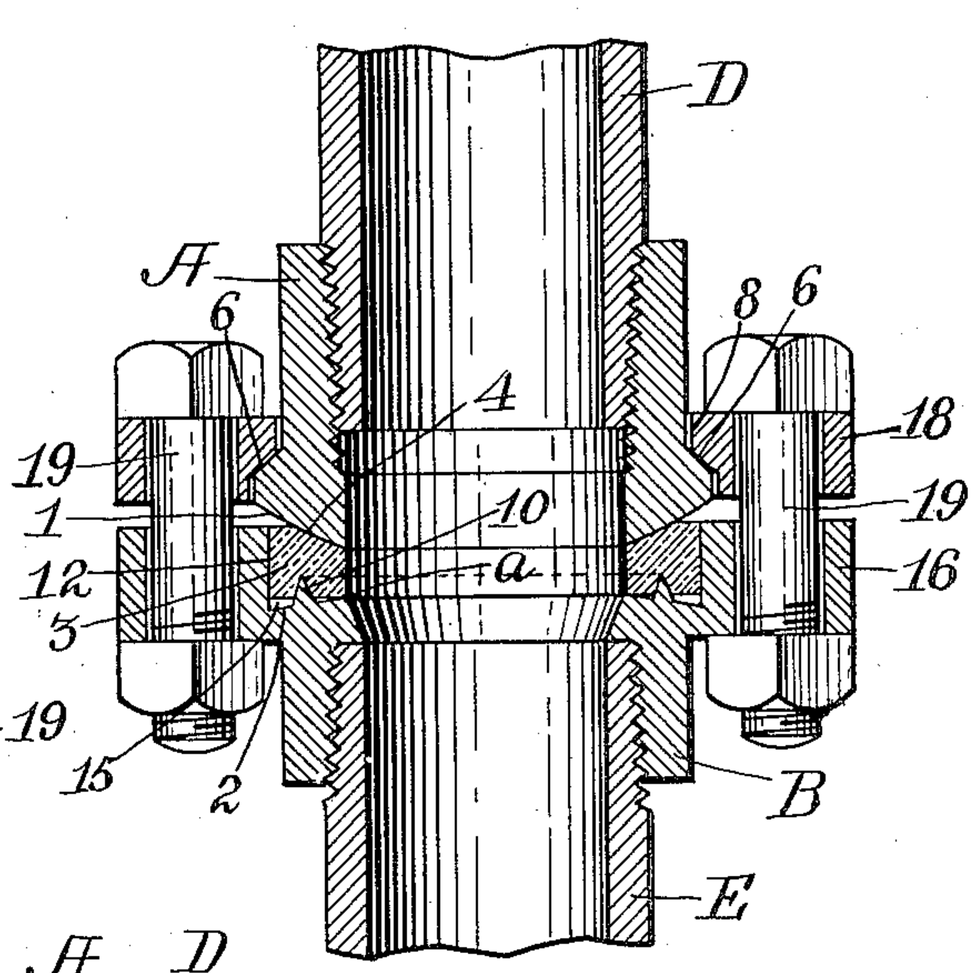

Fig. 4.

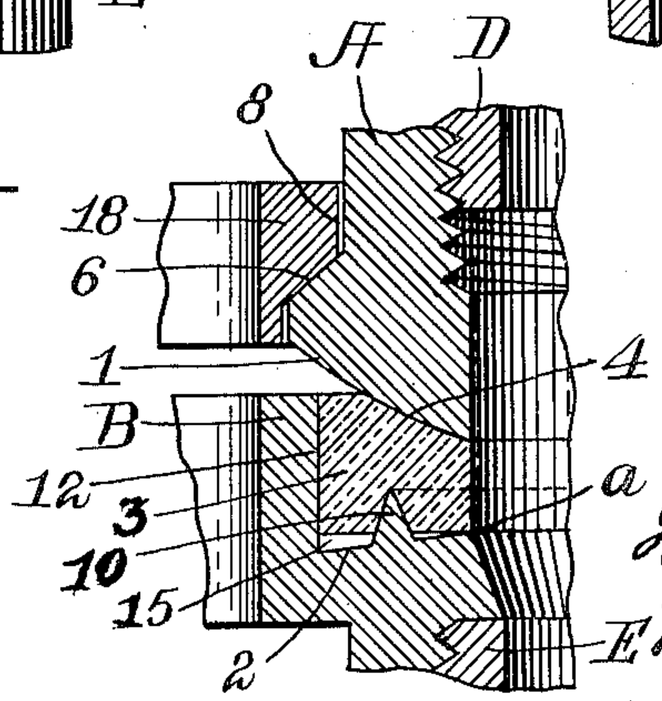

Fig. 5.

WITNESSES.

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UNITED STATES PATENT OFFICE.

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UNION-COUPLING.

No. 812,642. Specification of Letters Patent. Patented Feb. 13, 1906.

Application filed October 6, 1904. Serial No. 227,479.

To all whom it may concern:

Be it known that I, HERBERT S. CROMBIE, a citizen of the United States, residing at Woburn, in the county of Middlesex and State of Massachusetts, have invented an Improvement in Union-Couplings, of which the following is a specification.

The ordinary union-coupling is defective on account of its liability to leak by reason of the metal packing-ring becoming loose in its seat, said ring being only held in place by contact with the bottom and outer wall of the seat or chamber in which it is placed, and when the packing-ring thus becomes loosened the steam, gas, or liquid will escape by passing around it into the open air. To stop this leakage by tightening the coupling has not been found practicable owing to the impossibility of spreading the packing in its seat or chamber to close the space through which the leakage occurs. To overcome this difficulty and provide means whereby the packing-ring may be securely and tightly held in place within its seat in such manner that it cannot become loose, thereby preventing any possibility of leakage, is the object of my invention, which consists in providing the annular seat or chamber which receives the backing-ring with an inverted-V-shaped rib or wedge-shaped projection extending around its bottom, the softer metal packing-ring resting on the sharp edge of this projection, which is forced into the packing-ring and serves to spread the same laterally, so that it will tightly fit the seat or chamber in which it is placed, the entrance of the sharp edge of the rib into the packing-ring causing it to be tightly wedged between the outer side of said projection and the outer wall of the seat or chamber in which the packing is placed, the joint at this point being thus rendered absolutely and permanently steam and gas tight, any further tightening of the coupling tending to still further spread the packing and hold the same in place with additional security, as hereinafter more fully set forth.

In the accompanying drawings, Figure 1 is a side elevation of my improved union-coupling. Fig. 2 is a longitudinal vertical section of the same. Fig. 3 is a side elevation illustrating the application of my invention to a modified form of coupling. Fig. 4 is a longitudinal vertical section of the same. Fig. 5 is an enlarged sectional detail of the packing-ring seat or chamber, the packing-ring, and parts adjacent thereto.

In Figs. 1 and 2 of the accompanying drawings, A represents the male member of the coupling, which is provided with a convex face 1, and B represents the female member within the opposing face of which is formed an annular chamber or seat 2, in which is placed the metallic packing-ring 3, preferably composed of bronze or brass, said ring having a concave face 4, against which bears the convex face 1 of the member A, said members A and B being interiorly threaded to receive the correspondingly-threaded ends of the pipes D E, which are connected by means of the coupling.

C is the coupling-nut, which is interiorly threaded, as usual, at 5, the female member being correspondingly threaded to engage the threaded portion of the nut, while the male member is provided with a shoulder 6, having an outer convex or beveled surface against which bears the correspondingly curved or concaved interior surface of the inwardly-projecting flange 8 of the coupling-nut C, which thus holds the two members A and B together in such manner as to permit of a movement of one upon the other in the arc of a circle without any liability of leakage in case the pipes which are connected by said coupling should be thrown or moved out of alinement by accident or design or if it should be found necessary to couple two pipes together which are not in a perfectly straight line.

At about the center of the bottom of the packing-ring chamber or seat 2 is formed a wedge-shaped rib or projection 10, which extends around said chamber and upon which the softer metal packing-ring 3 is forced, as shown in Figs. 2, 4, and 5, the sharp edge of the projection 10 entering the packing-ring and spreading it laterally in opposite directions, the metal of the ring taking a bearing against the outer side of the wedge 10 and against the opposite outer wall 12 of the chamber 2, against which it is tightly forced by the wedging action of the projection 10, said ring also taking a bearing against the inner side of the wedge and the bottom of the chamber at its inner corner *a*, said several bearings or points of contact of the packing-ring with its seat forming a perfect steam and gas tight joint, the packing-ring being thus held immovably in place by its friction against

the wall 12 of the chamber 2 and the outer side of the wedge-shaped rib without any possibility of becoming loosened, and consequently all liability of leakage is absolutely avoided, as it will be impossible for steam, gas, or water to be forced beneath and around the packing-ring under excessive high pressure.

The bottom of the chamber 2 is preferably inclined downward and outward, as shown, thereby leaving a space 15, which affords an opportunity for the packing-ring to be forced still farther down into its seat if it should become necessary to render the packing still tighter.

Figs. 3, 4, and 5 illustrate my invention as applied to a coupling in which the two members are connected by means of external flanges 16 18, spaced apart, and bolts 19, the flange 16 being formed integral with the member B, while the flange 18 consists of an independent annulus or ring loosely slipped over the outer end of the member A and taking a bearing against its shoulder 6, the surface of which is convex and forms a seat for the correspondingly concave inner periphery of the ring-shaped flange 18. No portion of the packing-ring 3 extends into the space between the flanges which are spaced apart when held by the bolts 19, and consequently the packing-ring does not in any manner interfere with the free movement in the arc of a circle of one member upon the other.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A pipe-coupling comprising two opposing members, one of which is provided with an annular packing seat or chamber formed in the end thereof adjacent to said other member and opening into the interior bore thereof, said chamber having at the bottom thereof an annular wedge-shaped rib, a metal packing-ring located in said chamber, its inner periphery forming a portion of the interior bore of said coupling, and means for coupling said members together, whereby said packing-ring is forced into said chamber and against said rib.

2. A pipe-coupling comprising two opposing members, and means for coupling said members together, whereby they are permitted to move independently of each other in the arc of a circle, one of said members provided with an annular packing seat or chamber formed in the end thereof adjacent to said other member and opening into the interior bore thereof, said chamber having at the bottom thereof an annular wedge-shaped rib, a metal packing-ring located in said chamber, its inner periphery forming a portion of the interior bore of said coupling, and means for coupling said members together, whereby said packing-ring is forced into said chamber and against said rib.

3. A pipe-coupling comprising two opposing members, one of which is provided with an annular seat or chamber formed in the end thereof adjacent to said other member and opening into the interior bore thereof, said chamber having at the bottom thereof an annular wedge-shaped rib, having a sharp cutting edge, a packing-ring formed of softer metal than said rib, located in said chamber, its periphery forming a portion of the interior bore of said coupling, and means for coupling said members together, whereby said packing-ring is forced into said chamber and said rib is forced into said packing-ring.

Witness my hand this 4th day of October, A. D. 1904.

HERBERT S. CROMBIE.

In presence of—

P. E. TESCHEMACHER,

J. E. MALONEY.