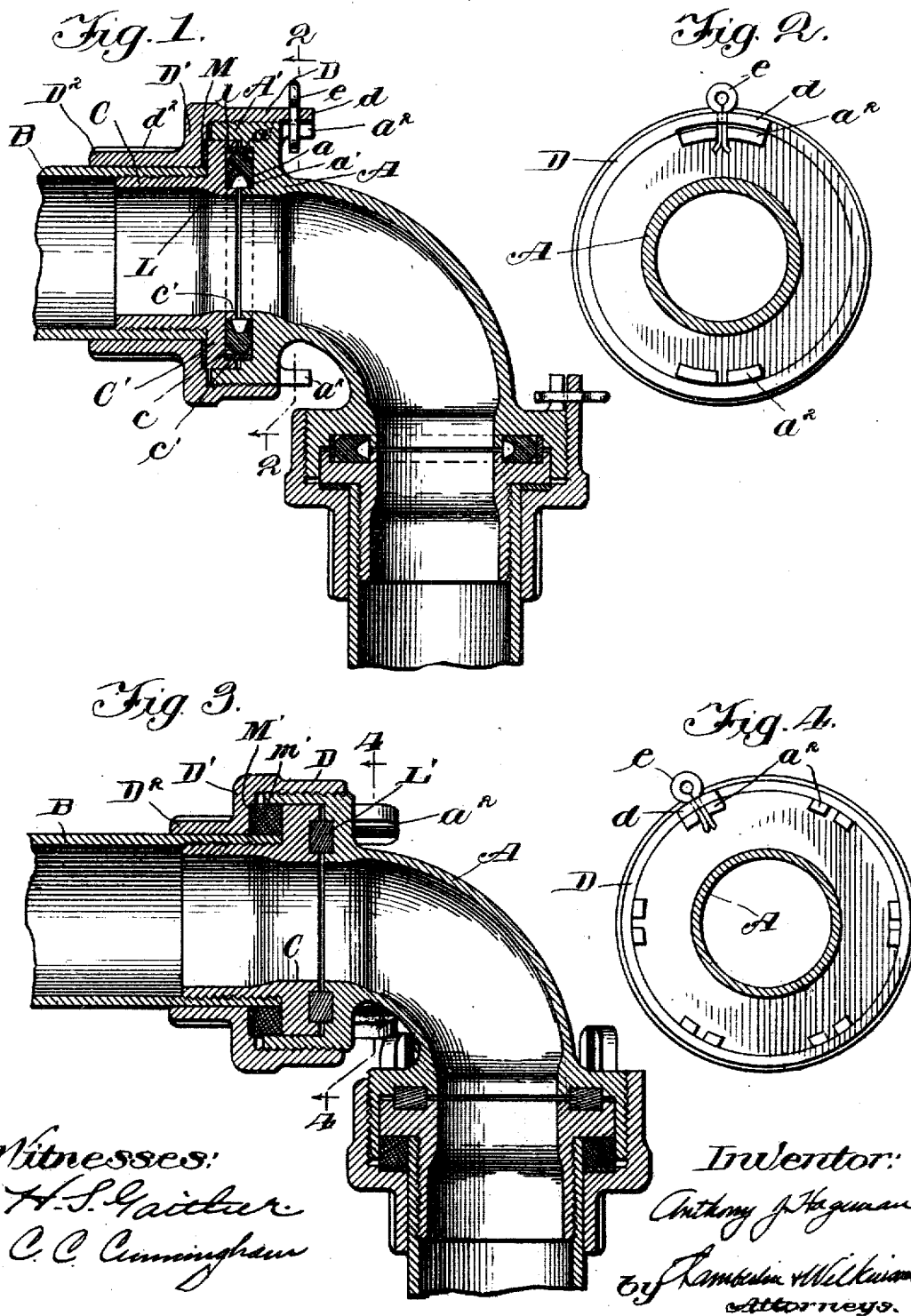


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A. J. HAGEMAN.  
SWIVEL PIPE COUPLING.  
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# UNITED STATES PATENT OFFICE.

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## SWIVEL PIPE-COUPLING.

SPECIFICATION forming part of Letters Patent No. 794,499, dated July 11, 1905.

Application filed February 9, 1903. Serial No. 142,643.

*To all whom it may concern:*

Be it known that I, ANTHONY J. HAGEMAN, a citizen of the United States, residing at Chicago, county of Cook, State of Illinois, have invented a certain new and useful Improvement in Swivel Pipe-Couplings; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates in general to pipe-couplings, and more particularly to swivel-couplings for uniting sections of train-pipes.

It is usual to provide the ends of brake, signal, and steam pipes under railway-cars with hose the flexibility of which prevents the relative movements between the ends of adjoining cars in the train from disconnecting the train-pipes or destroying their air-tight condition. The use of hose is, however, objectionable, as it deteriorates in a comparatively short time, which results in leaks, and consequently necessitates frequent renewal. It has been heretofore proposed to substitute for the hose at the ends of the train-pipes under railway-cars metallic pipe-sections united by swivel-joints and thereby rendered flexible. While such flexible metallic pipes are durable and avoid the objection to hose, their use has not been satisfactory, owing to the impossibility of preventing leakage at the swivel-joints between the sections of the pipe.

The primary object of my invention is to provide a swivel-joint for metallic pipe-sections which while permitting the necessary relative movement between the adjacent sections will be air-tight, and thereby obviate the objection now existing to the use of flexible metallic pipes for connecting the train-pipes under adjacent cars of a train.

A further object of my invention is to provide an air-tight swivel-joint for uniting the ends of pipe-sections which will be simple in construction, inexpensive in manufacture, and efficient in operation.

My invention, generally described, consists in an annular seat formed in the end of one

of the pipe-sections and surrounded by an exteriorly-screw-threaded flange, a sleeve secured within the end of the other pipe-section and having an annular seat corresponding to the seat formed in the end of the first pipe-section and having a flange extending within and surrounded by the flange on the first pipe-section, a differential sleeve a portion of which surrounds and is secured to the screw-threaded flange on the first pipe-section, while a portion of less diameter movably surrounds the exterior surface of the end of the second pipe-section, and suitable packing located in said annular seats and between the vertical faces on the sleeves secured to the respective pipe-sections.

My invention will be more fully described hereinafter with reference to the accompanying drawings, in which the same is illustrated as embodied in two convenient and practical forms, and in which--

Figure 1 is a central section through pipe-sections united by my improved swivel-joint; Fig. 2, a sectional view on line 2-2, Fig. 1; Fig. 3, a view, similar to Fig. 1, of a modification; and Fig. 4 a sectional view on line 4-4, Fig. 3.

Similar reference characters are used to designate similar parts in the several figures of the drawings.

In Figs. 1 and 2 I have illustrated an embodiment of my improvement applied between the opposite ends of an elbow-joint and the adjacent ends of pipe-sections. It will be of course understood that my improvement is adapted to be used in uniting any two adjoining pipe-sections regardless of whether the pipe-sections are straight or curved. As the swivel-joints at each end of the curved pipe-section A are the same, it will only be necessary to describe one of them in detail.

A indicates one pipe-section, which is provided with an annular seat *a* and with an exteriorly-screw-threaded circular flange A'. Shoulders *a'* are formed at either side of the annular seat *a*.

B indicates the second pipe-section, the end of which is interiorly screw-threaded to receive the exteriorly-screw-threaded portion of a sleeve C. The sleeve C is provided with a

radially-projecting flange C', in which is formed an annular seat c, located between shoulders c'. The annular seat c corresponds to the annular seat a in the first pipe-section A, while the shoulders a' and c' are aligned with each other.

A differential sleeve D surrounds and engages the screw-threaded flange A' of the first pipe-section A, while a portion D' of the sleeve D movably surrounds the end of the second pipe-section B. A vertical surface D' is formed between the portions of the sleeve D of different diameters and closely engages the vertical surfaces on the flanges A' and C'.

Located within the annular seats a and c is a gasket cup-shaped in cross-section and preferably made of rubber or leather. A ring l, also preferably made of rubber or leather, surrounds the gasket L and engages the inner surfaces of the outer shoulders a' and c'.

The vertical surface D' is provided with an annular recess in which is seated a washer M, formed of any suitable material—as, for instance, fiber.

The wear upon the gasket L and ring l, due to the relative movement between the united sections of pipe, may be taken up by turning the sleeve D about the screw-threaded flange A', thereby bringing the aligned shoulders a' and c' closer together. The sleeve D may be turned by any desired means—such, for instance, as a wrench adapted to engage grooves d', formed in the exterior surface of the reduced portion D' thereof. The sleeve D may be locked against rotary movement with respect to the flange A' by means of a cotter-pin e, extending through a perforation in a lug d and through a slot formed in a lug a', projecting from the flange A'. A second slotted lug a'' may be provided at one hundred and eighty degrees from the first, so that the sleeve D may be given a half-turn about the flange A' and then locked in such adjusted position.

The parts of the coupling are assembled as follows: The outer sleeve D is first located around the end of the pipe-section B, after which the inner sleeve C is screwed within the end of the pipe-section B. The end of the pipe-section A is then brought to a position adjacent to the end of the inner sleeve C, with the flange A' surrounding the flange C' and with the gasket L and ring l interposed between the seats c and a. The outer sleeve D is then rotated and the screw-threads on the interior of the enlarged portion thereof engaged with the screw-threads on the exterior of the flange A'. The rotation of the outer sleeve D is continued until the parts are drawn together, so as to form an air-tight joint, after which the cotter-pin e is inserted through the hole in the lug d and also through the slot in one of the lugs a'.

It is evident that when the pipe-sections A and B are relatively rotated the inner sleeve moves with the section B, while the outer

sleeve moves with the section A. Consequently the interior surface of the reduced portion D' of the outer sleeve moves around the exterior surface of the end of the pipe-section B, while the surfaces of the flange C' move relatively to the surrounding surfaces on the portion D' of the outer sleeve and the inner surface on the flange A'. The compressed air or other fluid which passes through the united pipes flows through the opening between the inner shoulders c' and a' and forces the cup-shaped gasket into close contact with the seats a and c, thereby preventing the air passing between the flanges A' and C'. Should any air, however, pass the gasket L, it would engage the inner surface of the ring l and force the same tightly over the outer shoulders a' and c', thereby forming an additional means for preventing the air from passing between the flanges A' and C'. The washer M also serves to form an air-tight packing between the adjacent faces on the flange C' and the portion D' of the outer sleeve.

In Figs. 3 and 4 I have illustrated a modified embodiment of my invention especially adapted for use in connecting sections of pipe constituting a conduit for steam or other fluid the action of which would deteriorate the material forming the gasket and ring employed in the embodiment of my invention shown in Fig. 1.

In lieu of the gasket L and ring l a mineral gasket L' is used, which does not deteriorate by contact of steam therewith. An asbestos gasket m' is also inserted between the surfaces of the flange C' on the inner sleeve and the fiber washer seated in the vertical surface of the intermediate portion D' of the outer sleeve.

In order that slight wear upon the gasket and washer may be taken up, a series of slotted lugs a' are provided on the flange A' of the pipe-section A, thereby permitting the outer sleeve D being locked with respect to the pipe-section A at any one of a number of positions by means of the cotter-pin e passing through the hole in the lug d and engaging the slot in one of the lugs a'.

The manner of assembling the parts in the modification shown in Fig. 3 is in all respects the same as that above described with reference to the embodiment of my invention illustrated in Fig. 1. When the united sections of pipe are relatively rotated, the mineral gasket L', the asbestos gasket m', and the fiber washer M effectively prevent the escape of steam or other fluid flowing through the united pipe-sections.

From the foregoing description it will be observed that I have invented an improved swivel pipe-coupling whereby two united sections of pipe may be relatively rotated and at the same time the fluid which flows through the united pipe-sections is prevented from escaping.

While I have described more or less pre-

cisely the details of construction, I do not wish to be understood as limiting myself thereto, as I contemplate changes in form, the proportion of parts, and the substitution of equivalents as circumstances may suggest or render expedient without departing from the spirit of my invention.

Having now fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a section of pipe having an integral outwardly-projecting radial flange at its end and a circular flange located at the outer periphery of said radial flange, of a second section of pipe, an inner sleeve secured within the end of said second section of pipe and having a radial flange located adjacent to the radial flange on the first pipe-section and surrounded by said circular flange on the first pipe-section, a gasket interposed between the radial flange on the first pipe-section and the radial flange on said inner sleeve, an outer sleeve rotatively surrounding the end of the second pipe-section and having a radial flange engaging the outer surface of the radial flange on the inner sleeve, and a circular flange formed integrally with said outer sleeve extending from the outer periphery of the radial flange thereof, said circular flange surrounding and being in screw-threaded engagement with the circular flange on the first pipe-section.

2. The combination with a section of pipe having an integral outwardly-projecting radial flange at its end and a circular flange located at the outer periphery of said radial flange, of a second section of pipe, an inner sleeve secured within the end of said second section of pipe and having a radial flange located adjacent to the radial flange on the first pipe-section and surrounded by said circular flange on the first pipe-section, an outer sleeve rotatively surrounding the end of the second pipe-section and having a radial flange rotatively engaging the radial flange on the inner sleeve, a washer interposed between the adjacent surfaces of the radial flanges on the inner and outer sleeves, and a circular flange formed integrally with said outer sleeve extending around and in screw-threaded engagement with the circular flange on the first pipe-section.

3. A swivel-joint for uniting the ends of two pipes comprising a sleeve fixed to the end of one pipe and having an annular seat therein adapted to align with a similar annular seat formed in the end of the other pipe, a gasket U-shaped in cross-section located in said aligned annular seats, a ring surrounding said gasket and also located within said aligned seats, and means for drawing said annular seats together.

4. The combination with a section of pipe having an outwardly-projecting radial flange at its end and a circular flange located at the

outer periphery of said radial flange, of a second section of pipe having a radial flange at its end located adjacent to the radial flange on the first pipe-section and surrounded by said circular flange on the first pipe-section, a gasket interposed between the radial flanges on the first and second pipe-sections, a sleeve rotatively surrounding the end of the second pipe-section and having a radial flange located adjacent the outer surface of the radial flange thereon, and a circular flange extending from the outer periphery of the radial flange of said sleeve, said circular flange surrounding and secured to the circular flange on the first pipe-section.

5. The combination with a section of pipe having an outwardly-projecting radial flange at its end and a circular flange located at the outer periphery of said radial flange, of a second section of pipe having a radial flange located adjacent to the radial flange on the first pipe-section and surrounded by said circular flange on the first pipe-section, a sleeve rotatively surrounding the end of the second pipe-section and having a radial flange located adjacent the radial flange on the second pipe-section, a washer interposed between the adjacent surfaces of the radial flanges on said second pipe-section and said sleeve, and a circular flange formed integrally with said sleeve extending around and secured to the circular flange on the first pipe-section.

6. The combination with a section of pipe having an annular seat formed in its end and also having a flange extending around said seat, of a second section of pipe, an inner sleeve secured within the end of said second section of pipe having a radial flange located within the flange on the first section of pipe and also having an annular seat corresponding to and in alignment with the seat formed in the end of the first section of pipe, an outer sleeve surrounding and engaging the flange on the first section of pipe and movably surrounding the end of said second section of pipe, a gasket located within said aligned annular seats, a ring surrounding said gasket and also located within said aligned annular seats, and a washer interposed between the radial flange on said inner sleeve and the adjacent surface of the outer sleeve.

7. The combination with a section of pipe having an annular seat formed in its end and also having a flange extending around said seat, of a second section of pipe, an inner sleeve secured within the end of said second section of pipe having a radial flange located within the flange on the first section of pipe and also having an annular seat corresponding to and in alignment with the seat formed in the end of the first section of pipe, an outer sleeve surrounding and engaging the flange on the first section of pipe and movably surrounding the end of said second section of pipe, a gasket located within said aligned annular seats, means

for moving said outer sleeve relatively to said flange on the first pipe-section and thereby taking up the wear on said gasket, a lug projecting from said outer sleeve, and a lug projecting from said first pipe-section in a plane adjacent to said first lug, and means for locking said lugs together.

8. The combination with a section of pipe having an annular seat formed in its end and also having a flange extending around said seat, of a second section of pipe, an inner sleeve secured within the end of said second section of pipe having a radial flange located within the flange on the first section of pipe and also having an annular seat corresponding to and in alinement with the seat formed in the end of the first section of pipe, an outer sleeve surrounding and engaging the flange on the first section of pipe and movably surrounding the

end of said second section of pipe, a gasket located within said alined annular seats, means for moving said outer sleeve relatively to said flange on the first pipe-section and thereby taking up the wear on said gasket, a lug having a hole therethrough projecting from said outer sleeve, a plurality of slotted lugs projecting from said first pipe-section and adapted to successively register with said first lug, and a cotter-pin adapted to pass through the hole in said first lug and through the slot in one of said plurality of lugs.

In testimony whereof I sign this specification in the presence of two witnesses.

ANTHONY J. HAGEMAN.

Witnesses:

GEO. L. WILKINSON,  
C. C. CUNNINGHAM.