T. T. FARNSWORTH.

Pipe-Coupling.

No. 205,069. Patented June 18, 1878.

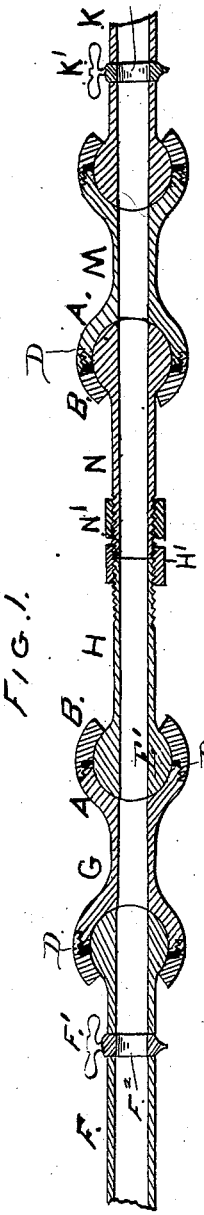

FIG. 1.

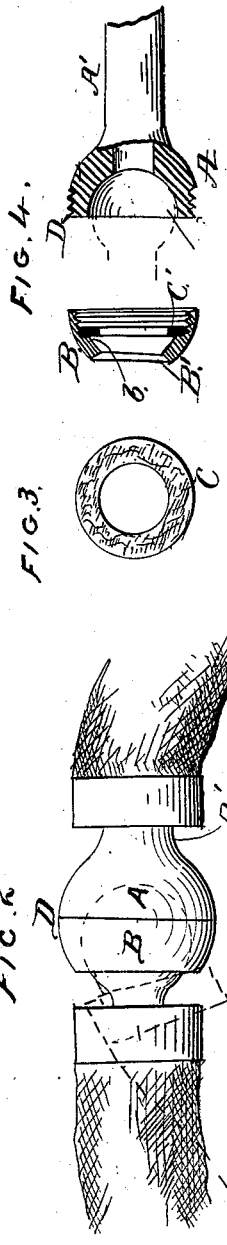

FIG. 2.

FIG. 3.

FIG. 4.

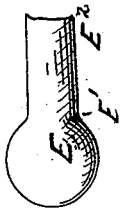

FIG. 6.

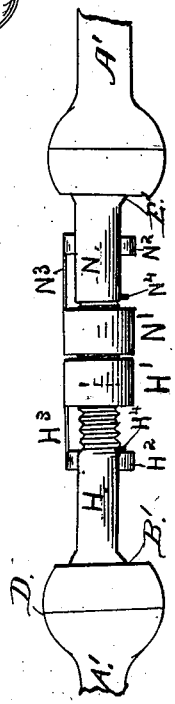

FIG. 5

WITNESSES

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TALCOTT T. FARNSWORTH, OF MANASSAS, VIRGINIA.

IMPROVEMENT IN PIPE-COUPLINGS.

Specification forming part of Letters Patent No. **205,069**, dated June 18, 1878; application filed May 4, 1878.

To all whom it may concern:

Be it known that I, TALCOTT T. FARNSWORTH, of Manassas, in the county of Prince William and State of Virginia, have invented certain new and useful Improvements in Pipe-Couplings; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The object of this invention is to provide a universal or ball-and-socket joint for coupling-pipes generally, and that will allow the different sections of the pipe thus coupled to turn at different angles with respect to each other and still preserve a close joint, and, if necessary, an air-tight joint. Also, the object is specially the connecting of air, steam, or smoke pipe with railway-cars, for heating the cars, for air-brakes, or for spark-arresters, &c., in such a manner that air, steam, or smoke shall be conveyed through a series of pipes without obstruction, while the pipes shall have the requisite flexibility, so as to yield to any irregularities in the motions of each car in reference to the motions of each of the contiguous cars.

To effect this latter object, I connect the main pipes with a series of short jointed sections of pipe at the adjacent ends of the cars, so constructed as to turn at their joints in adaptation to the cars remaining on curves, or from any change from a direct line either vertically or laterally in relation to each other.

My invention consists principally in the peculiarly-constructed ball-and-socket joint, which will hereinafter be more fully explained, but also consists in a series of short sections of pipe operating with said ball-and-socket joints.

It also consists in the central parts of said sections being connected by a screw-nut of one part screwing up to and overlapping the end of the next or connecting pipe, thus making a strong and air-tight joint, all of which will hereinafter be more fully set forth.

In the accompanying drawing, in which similar letters of reference indicate corresponding parts, Figure 1 is a sectional view. Fig. 2 represents a single ball-and-socket coupling. Fig. 3 is the flexible ring C. Fig. 4 are detached section views of the two hemispheres. Fig. 5 is a modified view of Fig. 1, showing bands and connecting-pieces H^2 H^3 and N^2 N^3. Fig. 6 shows the ball E^1 on pipe E.

I will first describe the peculiar construction of my ball-and-socket-joint for pipe-couplings, and then describe the application to some of its uses.

A is the smaller hemisphere of the globe, having a projection, A′, to be screwed into or otherwise secured to the main pipe or connecting-pipe. B is the larger hemisphere of the globe, having opening B^1 and shoulder *b* on the inner side of its sphere. Upon this shoulder and snugly fitting the inner side of the sphere is placed a ring of rubber or other suitable flexible material, C. Part B is screwed onto part A at D. The ring C is compressed between the end of part A and the shoulder *b*, so as to cause the inner side of the ring to project inside of the parts A and B.

E is the short section of pipe, having the enlarged spherical end E^1, which fits closely into the socket formed by the parts A B. The flexible ring C is compressed against the hollow sphere or ball E^1, and thus makes an air-tight joint or connection of the parts, but does not prevent the operation of the same in respect to each other.

In putting the above parts together, the part E^2 of pipe E is passed through the opening B^1 in part B; then part B is screwed onto part A at D, as above indicated. Part E^2 may connect with another main pipe or coupling-pipe, and thus complete my ball-and-socket joint for pipe-coupling.

The chief object for which my coupling is intended is for coupling the pipes of air-brakes, heating apparatus, &c., on cars.

I will now describe its application to that use, for which purpose let F represent the main pipe on the car, and having an ordinary stop-cock, F^1, which will entirely cut off the passage of the heat, compressed air, or steam, or regulate the supply of the same, according to the angle at which the opening F^2 in said stop-cock is placed in relation to the opening in the pipe F. The end of pipe F is connected

to a short section of pipe, G, by means of my ball-and-socket joint. Pipe G, in turn, is also coupled by the same means to pipe H, and this pipe H has screw-threads cut on its end to receive and carry the nut H^1. Exactly similar parts are on the adjacent ends of each contiguous car, as indicated by pipe K, stop-cock K′, pipe M, pipe N, with nut N^1. Now, to couple the pipe H and N together, it is only necessary to bring the ends of the same together; then either turn nut H^1 until it screws partly on and overlaps the end of pipe N, or turn nut N^1 until it screws partly on and overlaps the end of pipe H, thus making an air-tight joint and completing the coupling of the pipes on the respective cars. These nuts H^1 and N^1 may be provided with nut-bands H^2 and N^2, as shown in Fig. 5, said nuts being connected with the nut-bands by connecting parts H^3 and N^3, respectively, in which case pipes H and N are provided with small lugs H^4 and N^4, so that when nut H^1 is screwed on the pipe N sufficiently far, the band H^2 will bear against the lug H^4, and prevent the nut from being screwed off of pipe H too far, and the same in regard to nut N. The said lug also prevents the screw-nuts from being lost or stolen from the cars.

It is obvious that it makes no difference which ends of the cars are brought together, their respective pipes will couple, the same being alike on each car, so that either pipe H will couple with pipe N, or pipe N will couple with pipe H, as each always carries its respective nut.

It is obvious that the different sections of pipe with their joints, &c., form a coupling of greater length than the distance between the cars, thus allowing the coupling to sag down in its central parts, and thus allowing the cars to come into their closest proximity or recede from each other to the greatest distance allowed by their couplings, and also allow all other movements of the cars with respect to each other without interfering with the continuous opening in the respective pipes and joints, &c., or the continuous passage of the heat, compressed air, steam, &c.

It is readily seen that the above-described coupling without the stop-cock may be applied to the coupling of a spark-arrester, which said pipe being attached to the smoke-stack of a locomotive, and made to run back over the top of the cars and discharge the smoke and sparks in the rear of the train.

In the use of my device for any of the above purposes, the pipes, as well as the coupling, should be made of metal, so as to resist the greatest pressure or heat that may be brought upon them.

Another prominent object for which my ball-and-socket joint is used or intended is for hose-coupling, especially for fire-engines. In the manipulations of hose-pipe it often becomes twisted, and frequently seriously obstructs the passage of water, &c., and by the present arrangement the pipes can only be untwisted from one end. Thus serious difficulties arise, including the loss of time when time is valuable, as in the case of fire. By the use of my ball-and-socket joint, either when the pipe couples to the engine, or at any other point, it will be seen that the pipe could be untwisted from such points, thus avoiding the difficulties above referred to.

It is obvious that there are many other purposes besides those above mentioned to which my ball-and-socket joint may be applied. In all applications of my ball-and-socket joint the great advantage of the flexible ring C, as well as the peculiar construction of my ball and socket, secures a perfect air and liquid tight joint.

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

1. In a ball-and-socket joint for pipe-couplings, the flexible ring C, arranged to be compressed against shoulder *b*, in combination with ball E^1 and pipes H and N, as and for the purpose set forth.

2. In a ball-and-socket joint for pipe-couplings, the hemisphere B, with its shoulder *b*, in combination with hemisphere A, substantially as described, and for the purpose set forth.

3. In a pipe-coupling, the ball-and-socket joint composed of ball E^1 and hemispheres A and B, said hemisphere B having shoulder *b*, in combination with pipes H and N, having screw-nuts H^1 N^1, respectively, substantially as and for the purpose set forth.

4. In a ball-and-socket joint for pipe-coupling, the pipes H N, with their screw-nuts H^1 N^1 and bands H^2 N^2, and connecting-pieces H^3 N^3, all substantially as and for the purpose set forth.

5. In a ball-and-socket joint for pipe-couplings, the screw-nuts H^1 N^1, for connecting pipes H and N, in combination with bands H^2 N^2, connecting-pieces H^3 N^3, and small projections N^4, all substantially as described, and for the purpose set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

TALCOTT T. FARNSWORTH.

Witnesses:
W. T. JOHNSON,
WM. H. CHASE.