(No Model.)

A. BALL.

SWIVEL JOINT.

No. 457,503. Patented Aug. 11, 1891.

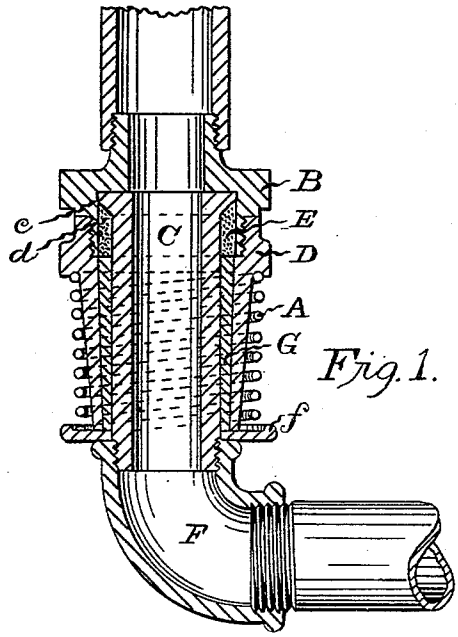

Fig. 1.

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UNITED STATES PATENT OFFICE.

ALBERT BALL, OF CLAREMONT, NEW HAMPSHIRE, ASSIGNOR TO THE SULLIVAN MACHINE COMPANY, OF SAME PLACE.

SWIVEL-JOINT.

SPECIFICATION forming part of Letters Patent No. 457,503, dated August 11, 1891.

Application filed September 19, 1889. Serial No. 324,394. (No model.)

To all whom it may concern:

Be it known that I, ALBERT BALL, a citizen of the United States, residing at Claremont, in the county of Sullivan and State of New Hampshire, have invented certain new and useful Improvements in Swivel-Joints; and I do hereby declare the following to be a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to various new and useful improvements in swivel-joints for steam-conducting pipes.

I have for my object the production of a swivel-joint in which all wear caused by rotation of the moving parts is taken up by a separate bearing-piece without disturbing the steam-tight character of the joint, so that my improved swivel-joint may be used without any attention until the bearing-piece is entirely worn out, when it can be removed and replaced by another.

I have for a further object the production of the swivel-joint, in which there can be no possibility of a leak occurring, for the reason that the perfection of the joint proper depends in a measure upon the steam-pressure, all as I will describe hereinafter.

For a better comprehension of my invention attention is invited to the accompanying drawing, in which the figure shows a sectional view, partly in elevation, of my invention.

C represents the journal-piece, provided at its lower end with a screw-threaded portion, with which the extension F of the pipe engages. I have shown this extension as being an elbow, but it will be evident that it may be a straight piece of pipe. The top of the journal-piece is provided with an integral flange, having an inclined bearing-face *c* on its outside. I have found by practice that the proper incline for this bearing-face should be forty-five degrees, but this may be varied at will. Directly beneath this incline I place a packing E, which may be introduced on the journal-piece over its lower end. This packing is also provided with an incline bearing-face *d*, made with an incline corresponding to that of the face *c*. The packing E is of a semi-yielding character, and can be made of almost any of the so-called "soft metals" now on the market, or any equivalent material. Directly beneath the bearing-piece *d* is a sleeve G, made, preferably, of Babbitt metal. Over this sleeve I place a jacket-piece D, made with its interior diameter to correspond to the sleeve-piece. The upper part of this jacket-piece D is internally screw-threaded and engages with the lower portion of a cover B, having a shoulder which bears on the upper end of the journal-piece C. This cover-piece is screw-threaded at its upper end and engages with the main portion of the pipe. At the lower end of the jacket D, I place a flanged washer *f*, which is held in place against the top of the piece F. Encircling the jacket D is a spiral spring A, which bears on its lower end against the washer *f* and at its upper end against a shoulder on the jacket-piece. This spring, by its tension, will therefore tend to separate the washer and the jacket, and this will cause the sleeve G to be forced up against the packing E, and the two inclined shoulders *c* and *d* will be brought together so as to form a joint at that portion. It will now be seen that the journal-piece can be rotated within the sleeve G and the packing-piece E and that endwise all wear will be taken up by said packing. It will be further seen that as the packing is worn the spiral spring A will advance the jacket-piece and sleeve and cause the packing to be kept continually against the shoulder *c* of the journal; and it will be further seen that as the packing-piece is worn and the shoulder of the cover B is retreated from the upper end of the journal the steam in pressing between these two portions will assist the spring in holding the bearing-piece against the shoulder, so that as the steam-pressure within the pipe is increased the pressure of the bearing-piece on the incline will be proportionately greater, so that no leak can occur at that point.

I have found that by making the upper portion of the journal inclined, as I have shown, the bearing-piece in being forced against the same is caused to expand slightly, so as to force itself tightly against the lateral wall of the cover portion, and by this means there can be no possibility whatever of the steam leaking past the bearing-piece. When the bearing-piece is entirely worn, it can be

removed by unscrewing the portion F from the journal and then removing the jacket-piece and the sleeve.

I am aware that each section of a hose-coupling has been provided with an interior thimble having a flange with an inclined wall and a packing-ring bearing against said incline, the two sections being provided with springs intended to take up the wear of the rings, and such matter I do not claim. In such construction there is no pipe, thimble, or the like surrounding the joint of the packing-ring, and it is liable to leak, nor can the steam co-operate with the springs without opening said joint. In my construction the coupling consists, essentially, of two members, as C and B D, one of which enters the other and is provided with an exterior flange adapted to bear on one end of the interposed packing and constituting a stop therefor. A corresponding bearing or stop, preferably a sleeve G, is provided in the space between said members and at the end of the packing opposite said flange. The said members of the coupling are capable of endwise motion one upon the other to press said bearing or stops upon the packing, and the spring is adapted to produce such motion and pressure. Further, if said members be moved lengthwise, the joint at the end of the inner member adjacent to the packing is opened, whereby steam co-operates with the spring. The escape of steam is effectually guarded against by these devices.

I am also aware that a spring, a washer, and a stuffing-piece have been interposed between the parts of a coupling, the arrangement being such that the spring tended to move the said parts longitudinally one upon the other and to compress the packing. In my construction the spring is located on the outside of the coupling, and all of the chamber between the members of the coupling not occupied by the packing is filled with a sleeve of Babbitt metal, so that no empty space is left for the entrance or escape of steam. This sleeve also receives the circumferential wear and can be replaced when worn. Without such interposed sleeve adapted to receive the wear the action of friction upon the packing, which is kept hot in use, is to cause it to "ruck" and wear out quickly. The sleeve-wall being made gradually thinner toward the end opposite the packing insures a tight joint, the jacket being interiorly fashioned to fit it closely.

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

1. A coupling having two members movable endwise one within the other and provided with a closed annular space between them, a packing and a sleeve in said space and filling the same, and a spring bearing on the exterior of each member and tending to compress the packing, the wall of said sleeve being made gradually thinner toward the end opposite the packing and fitted by the exterior member of the coupling, substantially as set forth.

2. In a swivel-joint for steam-pipes, the combination of a journal-piece C, provided with an inclined shoulder *c*, a cover portion B, surrounding the same, a soft-metal packing E beneath the said shoulder and within said covered piece, and a spiral spring for pressing said packing against the incline of the journal and the interior of the cover, substantially as set forth.

3. In a swivel-joint for steam-pipes, the combination of the journal-piece C, having an incline *c* thereon, a cover B, surrounding the same, a soft-metal packing E, bearing against said incline and within the cover B, a sleeve G beneath the packing and surrounding the journal-piece, a jacket D, engaging with the cover B, surrounding said sleeve, a washer *f* below said jacket, and a spiral spring surrounding said jacket, bearing against a shoulder thereon and against said washer, all substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ALBERT BALL.

Witnesses:
GEO. O. BALL,
ARTHUR I. GOODELL.