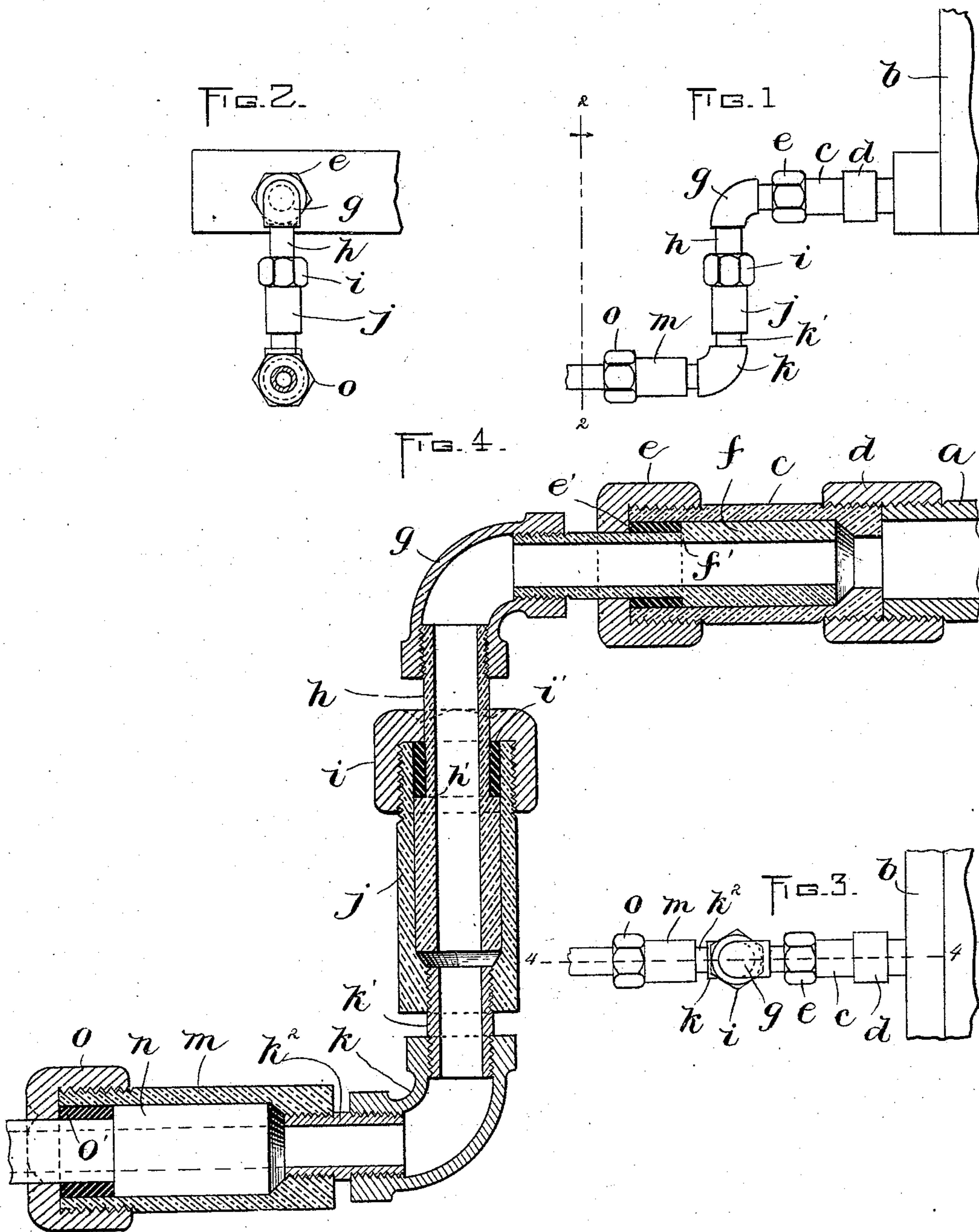


(No Model.)

M. P. McLAUGHLIN.
FLEXIBLE STEAM CONDUIT.

No. 575,831.

Patented Jan. 26, 1897.



WITNESSES:
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FLEXIBLE STEAM-CONDUIT.

SPECIFICATION forming part of Letters Patent No. 575,831, dated January 26, 1897.

Application filed April 16, 1896. Serial No. 587,774. (No model.)

To all whom it may concern:

Be it known that I, MILTON P. McLAUGHLIN, of Somerville, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Flexible Steam-Conduits, of which the following is a specification.

This invention relates to conductors for steam taken from a locomotive-engine to the cars for heating purposes; and it has for its object to provide a metallic conductor constructed to neutralize the independent motions of the tender and the car to which it is connected and adapted to be kept tight by the steam-pressure in the conduit.

The invention consists in the improved construction which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a side elevation of a portion of a locomotive-tender and my improved flexible conductor connected therewith. Fig. 2 represents a section on line 2 2 of Fig. 1, looking toward the right. Fig. 3 represents a top view of the construction shown in Figs. 1 and 2. Fig. 4 represents a section on line 4 4 of Fig. 3.

The same letters of reference indicate the same parts in all the figures.

In the drawings, *a* represents a fixed pipe-section attached to a locomotive-tender *b* and suitably connected with a source of steam-supply.

c represents a socket rigidly secured by a coupling *d* to the section *a* and having at its outer end a flanged packing-nut *e*, which holds an annular packing *e'* within the socket *c*.

f represents a pipe-section fitted to turn and move endwise in the socket *c*, said section fitting closely the interior of the socket for a portion of its length and being reduced at *f'* to form a chamber for the packing *e'* and a shoulder to bear against one end thereof, the smaller end of the section *f* projecting from the nut *e*.

g represents an elbow affixed rigidly to the outer end of the section *f* and connecting the same rigidly with a vertical section *h*, which passes through a packing-nut *i*, secured upon the upper end of a vertical socket *j*. The section *h* is reduced in diameter at its upper por-

tion, where it passes through the packing-nut, and is enlarged at *h'*, the reduced portion forming a chamber within the packing-nut for an annular packing *i'*. The larger lower end of the section *h* closely fits the interior of the socket *j*, said socket being adapted to turn and move endwise upon the section *h*.

k represents an elbow rigidly secured to the lower end of the socket *j* by a nipple *k'*. To the elbow *k* is secured, by means of a nipple *k''*, a socket *m*, in which is fitted to turn and move endwise a pipe-section *n*, which is held in said section by means of a packing-nut *o* and a packing *o'*, confined by said nut in an annular chamber formed between the reduced portion of the section *n* and the interior of the socket *m*. The section *n* may be connected in any suitable way with a pipe or conduit on the forward car of the train.

It will be seen that the described flexible conduit provides for the following motions of the socket *n*, namely, first, an oscillating motion, of which the socket *c* and section *f* are the center, said motion being in a vertical plane, as indicated in Fig. 2, and, secondly, an oscillating motion, of which the section *h* and socket *j* are the center, the last-mentioned motion being in a horizontal plane, as indicated in Fig. 3. These two movements are sufficient to compensate for all the independent movements of the tender and the adjacent car. The packing-nuts *e* and *i* and the packings inclosed thereby are arranged to maintain tight joints at the centers of oscillation.

The packings *e'*, *i'*, and *o'* are of non-expandible material, such as hard rubber, and therefore there is no lateral expansion thereof against the inner walls of the inclosing sockets. As a result there is little resistance to the swiveling motion of the parts, and consequently no wear of the packings except at their ends, where they are squared off to abut against the shoulders and packing-nuts. Therefore the original thickness of the packings is preserved until they are practically worn out.

It will also be seen that the sections *f* and *h* and elbow *g* constitute an L-shaped or angular conduit-section having an oscillating movement on a horizontal axis, and that the

sockets *j m* and the connecting devices *k k' k''* constitute another L-shaped or angular section having an oscillating movement on a vertical axis, the two angular sections constituting a simple, durable, and flexible or jointed conduit.

It will also be seen that the conduit is composed of a series of telescopic portions, the members of one being the socket *c* and pipe *f*, the members of another being the socket *j* and pipe *h*, while the members of the third are the socket *m* and pipe *o*. The flange of the packing-nut constitutes a packing-abutment on one member, while the shoulder on the internal member constitutes another packing-abutment. The freedom of the pipe-sections *f*, *h*, and *o* to move endwise in the sockets *c*, *j*, and *m* and the said packing-abutments bearing on the ends of the packings or gaskets *e'*, *i'*, and *o'* enable the steam-pressure to set the joints and keep them tight, said pressure acting continuously to elongate the said telescopic portions and exert endwise compressive pressure on the said packings, so that the joints are kept tight wholly by steam-pressure until said packings are worn out. Hence they require no attention or adjustment while they are in use.

The construction described also prevents undue strain at the joints when the car and tender move relatively to each other without the necessity heretofore existing of a great number of joints and horizontal lateral sections. The two horizontal telescopic portions of the conduit permit of or take up motion of the car and tender directly toward each other, while the single straight intermediate telescopic portion allows one of the connected parts to move relatively to the other in a vertical direction, and the oscillatory or lateral

movement of one of the connected parts relatively to the other is permitted by the swivel connections above described.

I claim--

1. A flexible steam-conduit composed of a series of telescopic portions, and elbows connecting the same in an angular series, each telescopic portion comprising an external socket member having a packing-abutment, an internal pipe member having a packing-abutment, one member being rotatable and movable endwise relatively to the other, and a non-expansible packing-ring interposed between said abutments and sustaining the endwise pressure exerted by the steam in the conduit.

2. A flexible steam-conduit comprising two telescopic end portions extending substantially parallel with each other, one of said portions being out of alinement with the other, an intermediate telescopic portion extending at an angle with said end portions and directly connecting them, and elbows connecting the said intermediate and end portions, each telescopic portion comprising an external member or socket having a packing-nut at one end, an internal or pipe member fitted to turn and move endwise in said external member and provided with a shoulder, and a non-expansible packing-ring interposed between the said nut and shoulder.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 9th day of April, A. D. 1896.

MILTON P. McLAUGHLIN.

Witnesses:

JOHN HUNNEWELL,
ARTHUR I. PLAISTED.