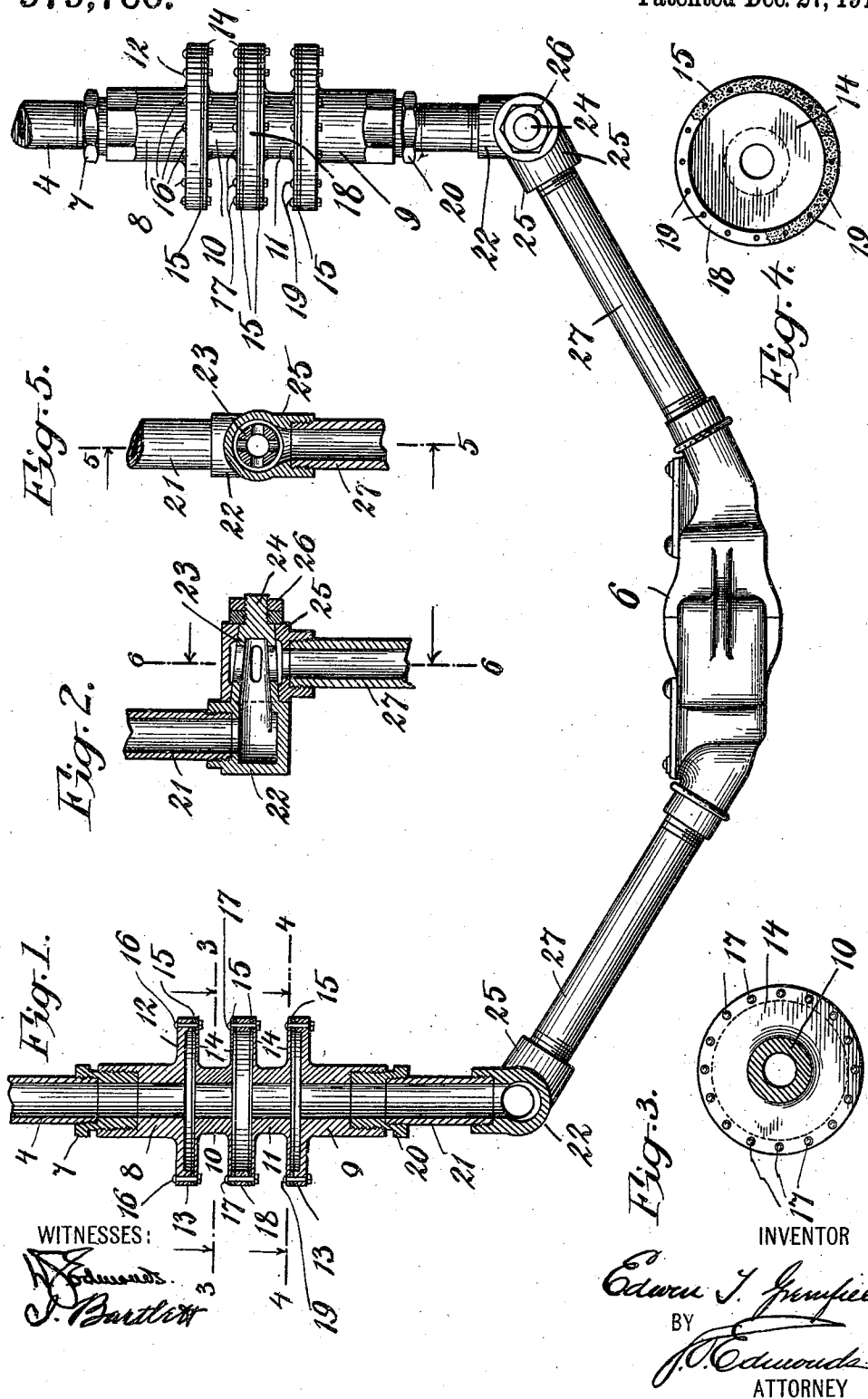


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HOSE.
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UNITED STATES PATENT OFFICE.

EDWIN T. GREENFIELD, OF KIAMESHA, NEW YORK.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, EDWIN T. GREENFIELD, a citizen of the United States, residing at Kiamesha, in the county of Sullivan and State of New York, have invented certain new and useful Improvements in Hose, of which the following is a specification.

This invention relates to flexible metallic hose adapted particularly for use in carrying steam and compressed air.

The invention is of special utility in flexible end-connectors for joining the ends of the pipes for carrying steam and compressed air on the several cars of a railway train, the hose being made flexible in order to allow for relative movement of the cars when rounding curves and when the springs of the draft rigging are compressed or extended.

The object of the invention is to provide a hose which may be used for this purpose and which possesses the requisite amount of flexibility, which is constructed of metal so that it will not deteriorate rapidly when in use as do the forms of hose now commonly employed for this purpose, and which may be manufactured at small cost and readily installed in place.

I have illustrated the preferred embodiment of my invention in the accompanying drawings in which—

Figure 1 is a sectional elevation of the end-connectors, Fig. 2 is a section on line 5—5 of Fig. 5, Figs. 3 and 4 are sectional views on the lines 3—3 and 4—4, respectively, of Fig. 1, and Fig. 5 is a sectional view of the pivotal connection of the two parts of the end-connector, the section line being the line 6—6 of Fig. 5.

Referring to these drawings, 4, 4 indicate the downwardly turned ends of the train-pipes on two adjacent cars of a railway train. These ends are connected together by flexible end-connectors 5, each of which is connected to a pipe 4 at one end and has fixed thereto at the other end a coupling member 6 whereby the free ends of the two end-connectors are detachably joined so as to complete the passage for the steam or compressed air from the pipe 4 on one car to that on the other. The end-connectors 5 are made of metal so that they will be well able to resist the action and strain thereon of the steam or compressed air passing through them, and these connectors are so constructed as to provide the resiliency

necessary for maintaining the passage for the steam or air throughout the relative movements of the two cars of the train.

Each end-connector consists of a flexible vertically-disposed portion connected at its upper end to the end of pipe 4 and having its lower end pivotally connected to a tubular member extending horizontally, or substantially horizontally, and having the detachable coupling member 6 secured to its end. Thus when the distance between the two cars is increased or diminished the tubular member of each end connector will turn on its pivot relative to the vertically-disposed member and the latter will flex in the proper direction. The pipe 4 is turned downwardly at its end and this end is threaded to receive an interiorly- and exteriorly-threaded sleeve 7. This sleeve effects the connection between the tube 4 and the flexible portion of the end-connector, the latter consisting of tubular end members 8 and 9 and one or more tubular members 10 and 11, all of these being secured together to form a continuous passage for steam or air therethrough. The tubular member 8 is interiorly threaded at one end to coact with the sleeve 7 and at the other end has an annular portion 12 integral therewith and provided with a flange 13 at its edge. The portion 12 is disposed in a plane transverse to the axis of the tubular member and the flange 13 extends from the outer edge of this portion parallel to that axis. Each of the members 10 and 11 consists of a metallic sleeve having rigidly secured to each end thereof an annulus 14 of thin metal, the exterior diameter of which is substantially the same as that of the flange 13. A washer 15 of leather or other suitable material is inserted between the edge of flange 13 and the face of the annulus 14 on the member 10 adjacent to the outer edge of the latter and these two parts are secured together by means of a plurality of bolts 16 extending through openings in the flange 13 and the annulus 14. The tubular members 10 and 11 are similarly secured together by bolts 17 passing through openings at the outer edges of the annuli 14 and through openings in a spacing ring 18, washers 15 being provided on either side of this ring 18. The tubular member 9 is similar in all respects to the member 8 and is secured by bolts 19 in the manner above described to the lower end of the tubular member 11. At

its lower end member 9 is connected by an interiorly- and exteriorly-threaded sleeve 20 with a tube 21 the end of which is threaded and connected by means of this thread with a pivotal coupling member 22 (Figs. 2 and 5). This coupling member is provided with a hollow tapered extension 23 having a plurality of openings through the wall thereof and a threaded boss 24 beyond this tapered extension. The coaxing coupling member 25 fits on the tapered extension 23 and is held thereon by a nut 26 threaded on the boss 24. This member 25 is threaded to receive one end of a tube 27 to the other end of which the detachable coupling 6 is connected.

The end-connector at the right of Fig. 1 is constructed in all respects like that on the left as above described. The end-connectors are of such size that when the cars of a train are at the normal distance apart the tubes 27 of the end-connectors are disposed at somewhat of an angle to the horizontal, as shown in Fig. 1. Then when the two cars move relatively, the tubes 27 will turn relatively to the vertically-disposed portions of the end-connectors either toward a horizontal or vertical position to partially compensate for the increased or decreased distance between the two cars. This compensation is also effected by the flexing of the vertically-disposed portions of the end-connectors, this flexing being provided for by the metallic annuli 14 which, for this

purpose, are made of thin metal, such that while possessing ample strength they may be flexed in any direction. It will further be seen that since this hose is constructed of metal, it will not be injuriously affected by the fluid passing therethrough. All of the parts of the end-connector can be readily manufactured and quickly assembled so that the end-connectors may be produced at comparatively low cost.

Having described my invention what I claim as new therein and desire to secure by Letters Patent of the United States is:

A flexible end-connector for a train-pipe consisting of a tubular metallic member adapted to be connected to and to extend downwardly from the end of the train-pipe and having in its wall a plurality of substantially flat annuli of thin metal disposed in a plane substantially transverse to the axis of the member, said annuli being adapted to flex to permit bending of the member but normally holding the member against flexure, a rigid tube pivotally connected at one end to the lower end of said member and adapted to extend laterally therefrom, and a detachable coupling on the free end of said tube, substantially as set forth.

This specification signed and witnessed this 14th day of Jan., 1908.

EDWIN T. GREENFIELD.

Witnesses:

WM. T. RUETO,
CHAS. E. WILSON.