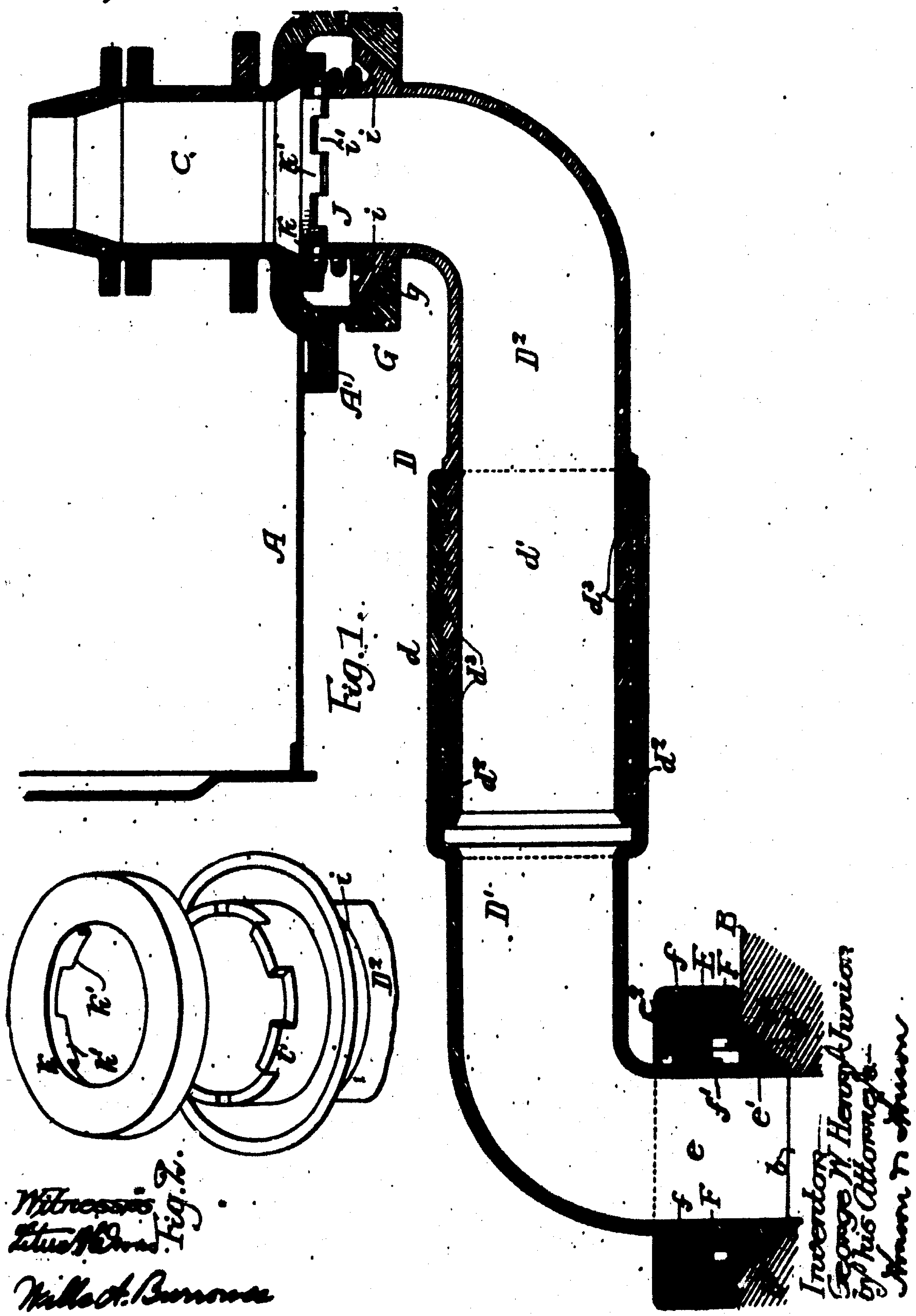
G. W. HENRY, Jr.

FLEXIBLE CONNECTING PIPE.

APPLICATION FILED JULY 11, 1909.

948,858. Patented Feb. 8, 1910.



UNITED STATES PATENT OFFICE.

GEORGE W. HENRY, JR., OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO BALDWIN LOCOMOTIVE WORKS, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

FLEXIBLE CONNECTING-PIPE.

948,858. Specification of Letters Patent. Patented Feb. 8, 1910.

Application filed July 11, 1908. Serial No. 443,067.

To all whom it may concern:

Be it known that I, GEORGE W. HENRY, Jr., a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Flexible Connecting-Pipes, of which the following is a specification.

The object of my invention is to make a flexible pipe connection which will be steam tight and yet allow freedom of movement of one part of the apparatus with respect to another.

My invention is particularly adapted for use as an exhaust pipe connecting the cylinders of the forward engine frame to the smoke box of an articulated locomotive, where there is an independent movement of the forward truck frame in respect to the locomotive boiler.

It will be understood that my invention can be used in other places where it is desirable to have a flexible pipe connection.

In the accompanying drawing:—Figure 1, is a longitudinal sectional view of my improved flexible exhaust pipe as adapted to an articulated compound locomotive; and Fig. 2, is a detached perspective view of a detail of the pipe connection.

Referring to the drawing, A is the casing of the smoke box of a locomotive, B is the cylinder casting having an exhaust port *b*. In this instance the cylinder casting is mounted on one frame of the locomotive and the boiler carrying the smoke box is mounted upon another frame pivoted to the first mentioned frame, so that in passing around curves the cylinder casting B has a lateral movement independent of the shell of the smoke box and, as the exhaust port *b* of the cylinder casting must communicate with the exhaust nozzle C within the smoke box, the connecting pipe must have sufficient flexibility to allow one part to move freely with respect to the other.

D is an exhaust pipe extending from the exhaust port *b* in the cylinder casting to the nozzle C in the smoke box. This exhaust pipe is made in two parts D′, D², the part D′ is enlarged at *d* and bored so as to receive the end *d*′ of the part D². In the end part to move longitudinally independent of the other. The section D′ of the pipe is turned at right angles, forming a neck *e* carrying at its lower end a flange *e*′, the periphery of this flange being the segment of a sphere so as to form a ball fitting in a rounded seat *b*′ which forms a socket. The two parts are ground so as to make a steam tight joint.

E is a cap suitably secured to the cylinder casting B and this cap has an internal flange *e*² and between this flange and the flange on the section D′ of the pipe is a coiled spring F which tends to force the section D′ down upon its seat.

In order to prevent chafing of the spring against the flange of the cap E, I preferably mount a flanged ring *f* between the spring and the flange *e*² of the cap E, and in order to allow the ring *f* to turn with the pipe section D′, I form projections *f*′ on the flange of the ring *f* which interlock with projections *e*³ on the flange *e*′ of the section D′ of the pipe, so that while the pipe section is free to move vertically in respect to the ring *f* the ring must turn with it.

The section D² is turned up in the present instance so as to aline with the exhaust nozzle C, the exhaust nozzle in this instance being secured to a ring A′ attached to the casing A of the smoke box, and attached to this ring is a cap G. The pipe section D² has a flange *i* the underside of this flange being in the form of a segment of a sphere and rests against a curved seat *g* in the cap G, and the two surfaces are ground so as to make a steam tight joint and yet allow one to have freedom of movement in the other.

In order to hold the flange *i* to its seat I place a coiled spring J between the flange *i* and the ring *k* which bears against the underside of the ring A′ secured to the casing of the smoke box; the spring resting in a groove formed in the flange *i* as well as in the groove formed in the ring *k* and said ring *k* has projections *k*′ which interlock with projections *i*′ on the end of the section D² of the exhaust pipe, so that the ring *k* must turn with the said section D² to prevent chafing of the spring J.

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itself to the movement of one part of the engine with respect to the other and yet the joints will be practically steam tight.

By my invention I am enabled to make a comparatively short couple between a cylinder exhaust passage and the nozzle, as the ball and socket joints are at the extreme ends of the pipe, thus making a much neater and practical connection than heretofore. Furthermore I dispense with any outside fittings which will interfere with the proper movement of the pipe, so that one end of the pipe can turn in a complete circle in respect to the other without any of the parts interfering with the movement.

While in an articulated locomotive a limited motion is only desired, still in other machines it may be desirable to increase the movement and, in some instances, an element may travel in a circular path around a fixed point.

I claim:—

1. The combination of a pipe having a flange near one end, a ring interlocking with the pipe so as to turn therewith, a spring mounted between the flange on the pipe and the ring, and means for causing the ring to compress the spring, the spring having no rotary motion independent of the pipe and ring.

2. The combination of a pipe having a flange at one end, one face of the flange being a segment of a sphere, the other face having projections, a ring also having projections interlocking with the projections on the flange, a coiled spring mounted between the ring and flange, and a cap encircling the pipe and retaining the ring in place.

3. The combination in a flexible connecting pipe, of a body portion having the ends turned, flanges on each end of the pipe, each flange being shaped in the segment of a sphere, a seat adapted to receive each end of the pipe, a cap, a flanged ring under the cap, and a spring mounted between the said ring and a flange on the pipe, the ring interlocking with the flange on the pipe so as to turn with it.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

GEO. W. HENRY, Jr.

Witnesses:
J. H. Kent,
Jas. H. M. Hayes.