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PATENTED DEC. 20, 1904.

J. B. BARNES.
VALVE MECHANISM FOR LOCOMOTIVES.

APPLICATION FILED AUG. 2, 1904.

NO MODEL.

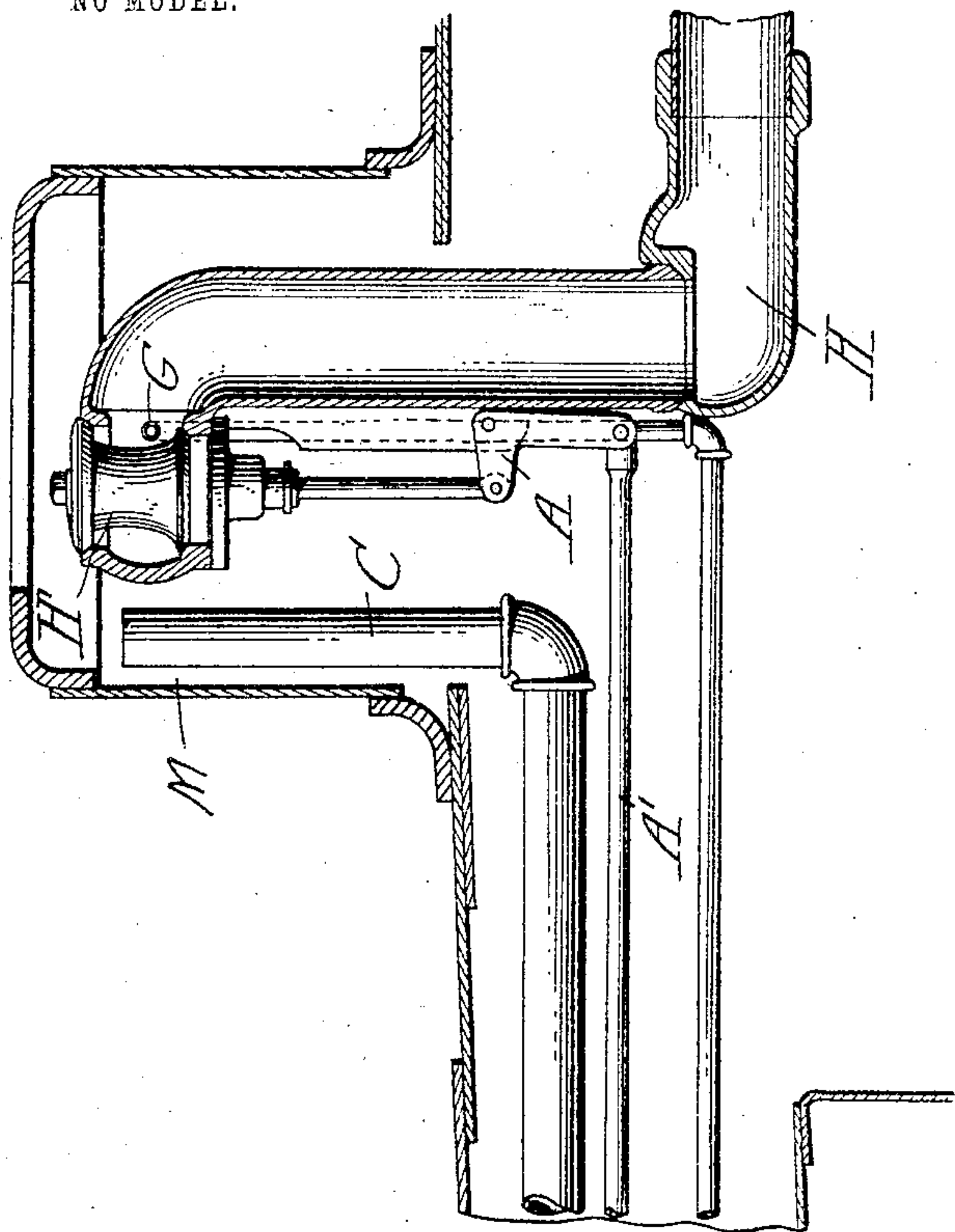


Fig. 1

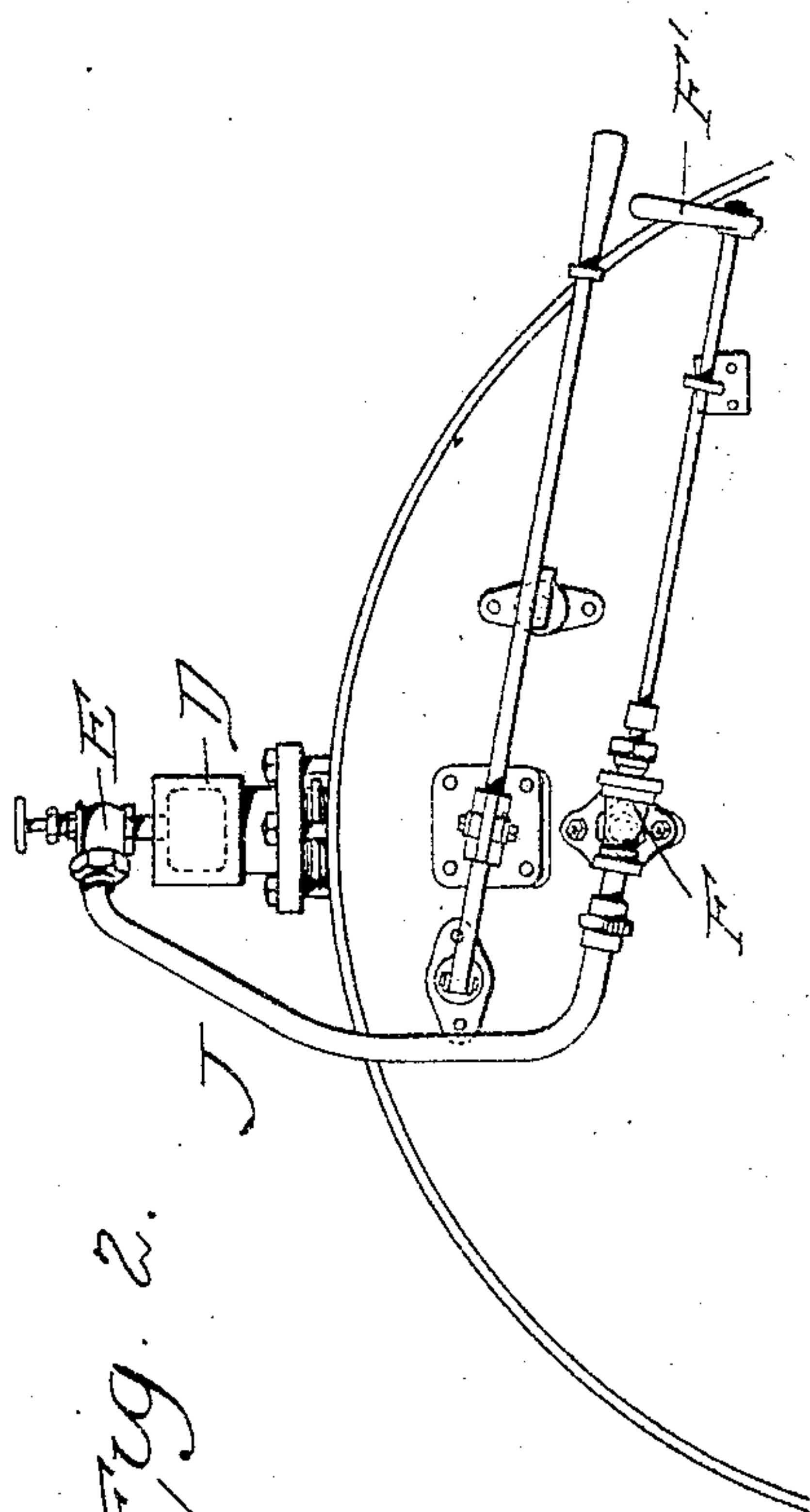
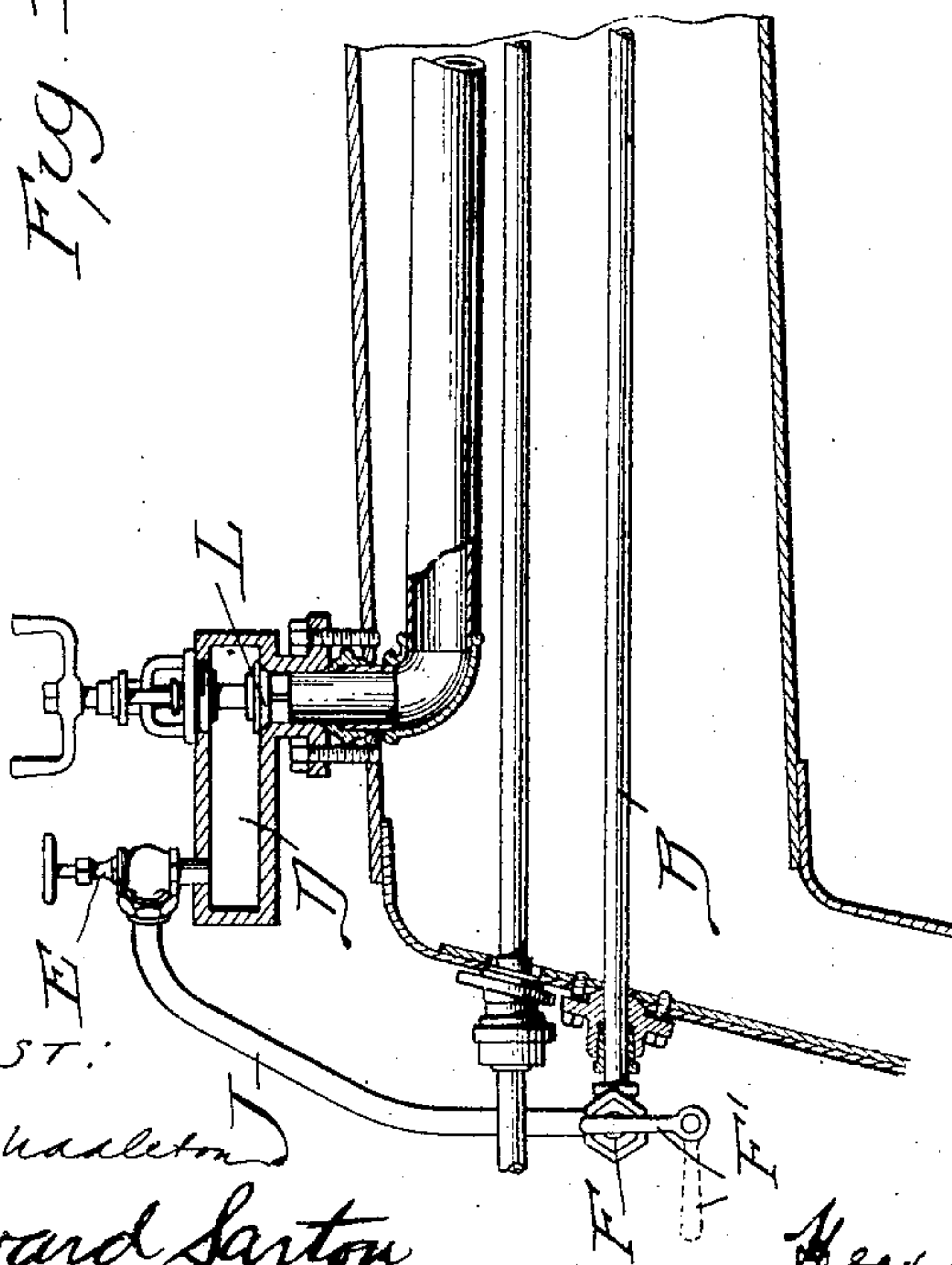


Fig. 2.

ATTEST:

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UNITED STATES PATENT OFFICE.

JOSHUA BARTLETT BARNES, OF SPRINGFIELD, ILLINOIS.

VALVE MECHANISM FOR LOCOMOTIVES.

SPECIFICATION forming part of Letters Patent No. 777,933, dated December 20, 1904.

Application filed August 2, 1904. Serial No. 219,235.

To all whom it may concern:

Be it known that I, JOSHUA BARTLETT BARNES, a citizen of the United States, residing at Springfield, Illinois, have invented certain new and useful Improvements in Valve Mechanism for Locomotives, of which the following is a specification.

My invention relates to improvements in valve mechanism for locomotives.

One of the objects of the invention is to provide a device which will prevent the forming of a vacuum in the cylinders when the throttle-valve is closed to cut off the steam and the engine is drifting, thus eliminating the retarding effect on the pistons and the resulting wear and tear on the machinery.

A further object is to relieve the vacuum in the dry pipe, thus preventing the collapse thereof.

A further object is to provide for the maintaining of the normal thermal condition of the cylinders and passages and the reduction of condensation.

Other objects are to prevent induction of smoke, cinders, and hot gases through the exhaust-pipe and to render unnecessary the application of overpass and relief valves.

With these objects in view the invention includes the features of construction and arrangement of parts hereinafter described, and particularly pointed out in the claims.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 shows a part longitudinal vertical section of a locomotive boiler, and Fig. 2 a part rear elevation.

In the drawings, M designates the ordinary steam-dome, from the upper portion of which the dry pipe H conveys the steam to the cylinders in the ordinary manner, the passage of the steam being controlled by a throttle-valve H', operated through suitable connections, such as bell-crank lever A and rod A'. A pipe C also leads from the upper part of the dome rearward through the upper portion of the boiler, where it connects with a steam-fountain D, a valve L being provided by which the passage of steam from the pipe C to the steam-fountain or auxiliary dome may be controlled. From the steam-fountain D

a pipe J leads downward into a convenient position for the engineer, where it connects with the pipe B, which extends forward through the boiler and up into the dry pipe H at the point indicated at G. At the point where the pipes J and B join a cut-off valve F may be operated by a suitable handle F', and an additional controlling-valve may be provided, as shown at E.

In the operation of the arrangement above described it will be seen that steam will enter the pipe C from the dome M and pass through the valve L into the fountain D. The valve E is open sufficiently to admit the proper amount of steam to the pipe J. After the engine is started the valve F is opened and left in its open position until the engine is stopped for any considerable length of time. Steam thus passes through the valve F, pipe B, and connection G into the pipe H, and thence to the cylinders in the usual manner. The result of this is that when the throttle-valve is closed and the engine is drifting a small amount of steam is admitted to the cylinders, the amount of which may of course be regulated by the valve E. This prevents a vacuum in the cylinders and eliminates the consequent retarding effect on the pistons and the resultant wear and tear on the machinery. It relieves the vacuum in the dry pipe, thus preventing all danger of the collapse thereof. It maintains the normal thermal condition of the cylinders and passages and reduces condensation. It prevents the induction of smoke, cinders, and hot gases through the exhaust-pipe, thereby reducing the wear on the valves and cylinders and protecting the lubrication. It renders unnecessary the application of overpass and relief valves, thereby saving expense of application and maintenance and preventing the entrance of cold air to the cylinders, and, finally, it provides means by which the engine may be moved in case of accident to the throttle valve or connections, as by opening the valve E wide sufficient steam can be admitted to the cylinders to move the engine.

Though I have described it as desirable to take steam from the steam-fountain on top of boiler by the valve marked E, I do not

limit myself to this particular arrangement. This valve can be tapped into the boiler at any other point where dry steam can be procured independently altogether of the fountain D and its dry-pipe connections C C running to the dome. The fountain and this pipe are merely for convenience, as any connection can be made that will furnish dry steam to the valve E from the dome.

10 Having thus described my invention, what I claim is—

1. In an engine, the combination with the throttle-valve and dry pipe, of means for preventing the formation of a vacuum in the dry-
15 pipe and cylinders, consisting of an independent valve having means for holding the same in any desired position, substantially as described.

2. In an engine, the combination with the
20 steam-dome dry pipe and throttle-valve and steam-fountain connected to the steam-dome,

of a pipe connection between the steam-fountain and dry pipe, and a valve having operating means within reach of the engineer for controlling the passage of steam through said
25 valve, substantially as described.

3. In an engine, the combination with the steam-dome dry pipe and throttle-valve and the steam-fountain connected to the steam-dome, of a pipe connection from the steam-
30 fountain to the dry pipe, a regulating-valve controlling the passage of steam from steam-fountain to said pipe connection, and a cut-off valve in said pipe connection operated by
35 connection located within reach of the engineer, substantially as described.

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

JOSHUA BARTLETT BARNES.

Witnesses:

ALONZO B. MARS,
E. R. JEFFERY.