

No. 840,108.

PATENTED JAN. 1, 1907.

R. BURNS.

FEED WATER HEATER FOR LOCOMOTIVES.

APPLICATION FILED FEB. 21, 1906.

2 SHEETS—SHEET 1.

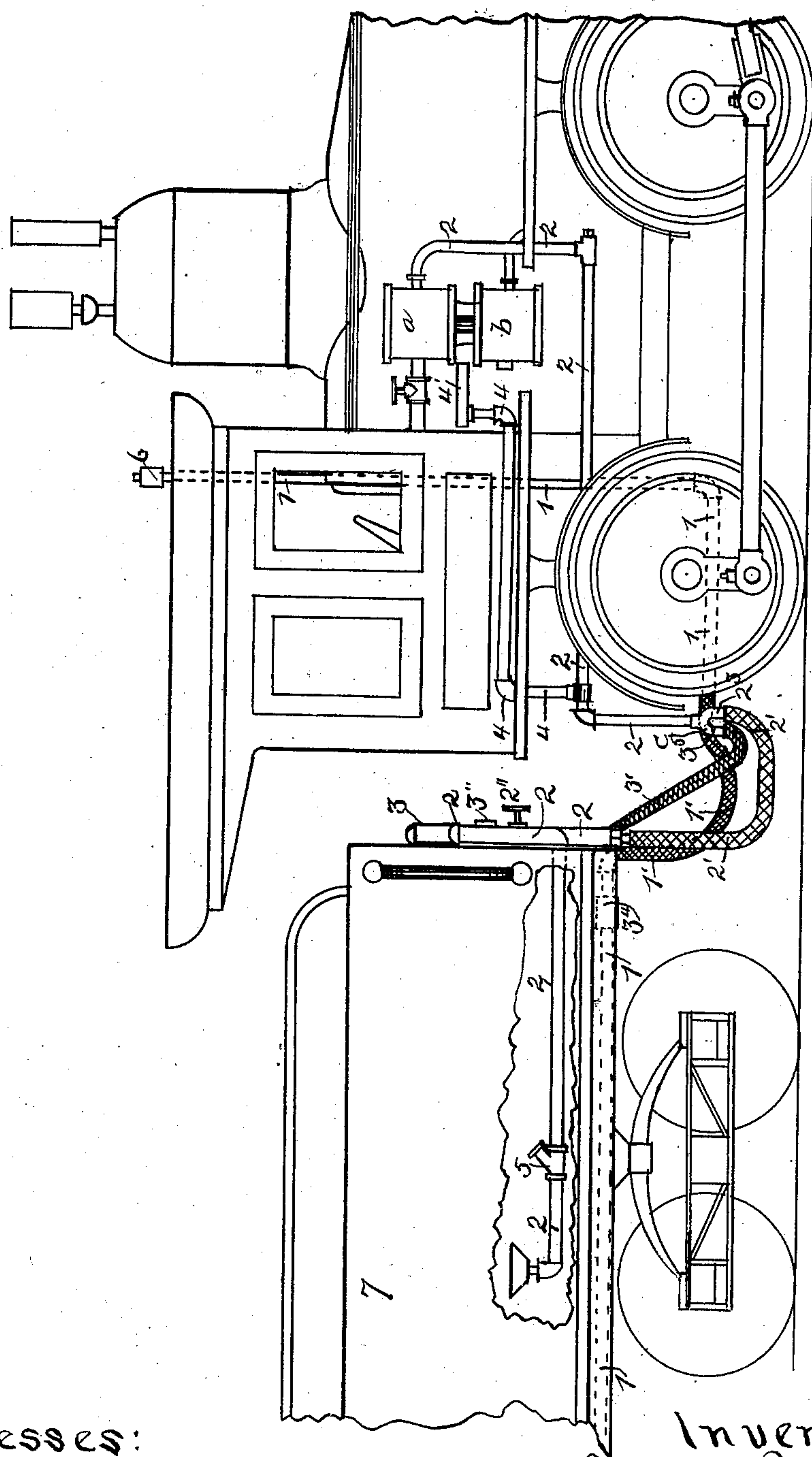


Fig. 1

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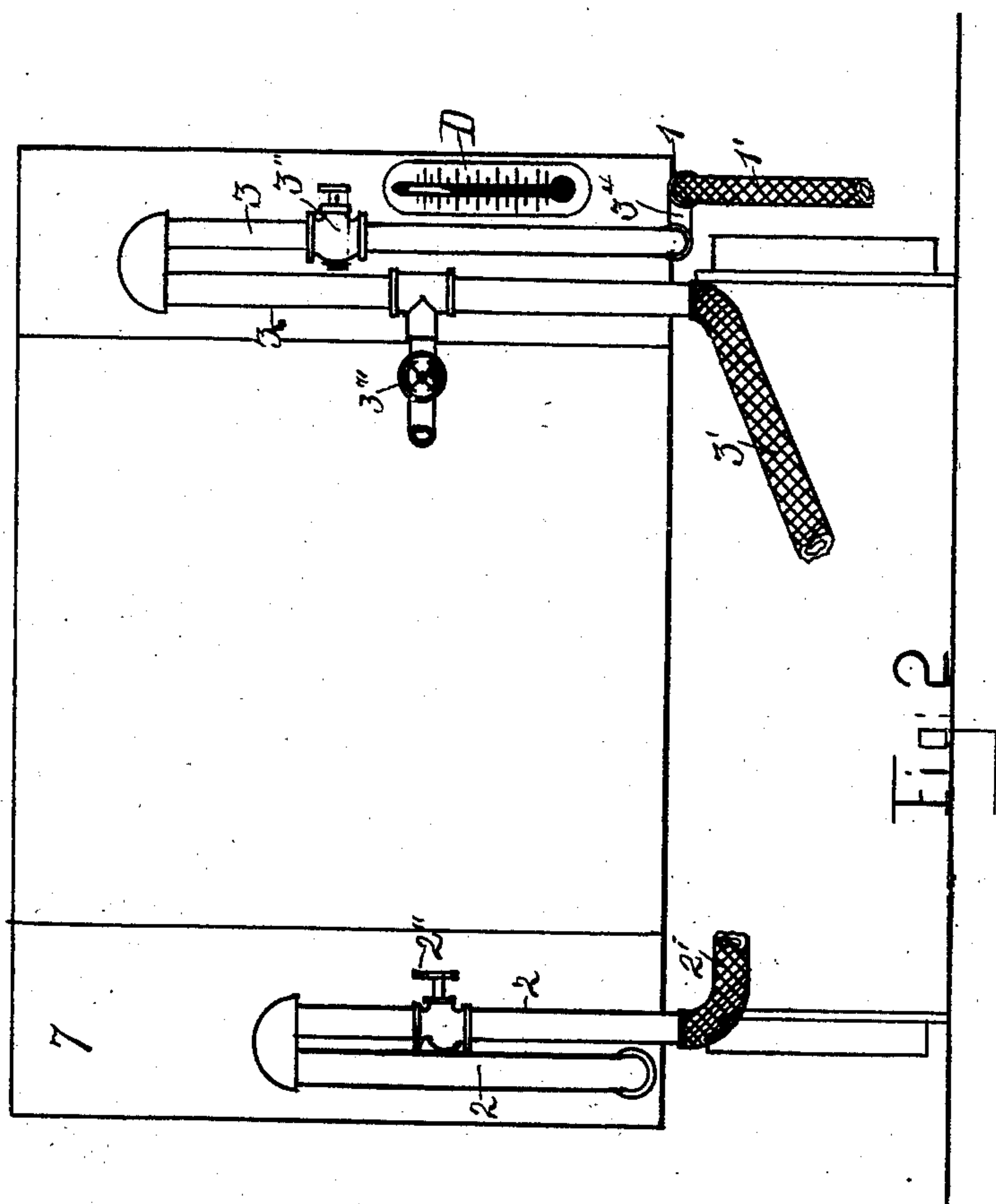
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UNITED STATES PATENT OFFICE.

ROBERT BURNS, OF RENSSELAER, NEW YORK.

FEED-WATER HEATER FOR LOCOMOTIVES.

No. 840,108.

Specification of Letters Patent.

Patented Jan. 1, 1907.

Application filed February 21, 1906. Serial No. 302,229.

To all whom it may concern:

Be it known that I, ROBERT BURNS, a citizen of the United States, residing at Rensselaer, in the county of Rensselaer and State of New York, have invented new and useful Improvements in Feed-Water Heaters for Locomotives, of which the following is a specification, reference being had to the accompanying drawings, forming part thereof.

The object of my invention is to provide a new and improved manner of heating the feed-water of a locomotive and warming the injector in cold weather.

Figure 1 shows a portion of a locomotive in side elevation with a portion of the tender in similar elevation, and Fig. 2 an end view of the front end of the tender.

The numeral 1 shows the steam-pipe for the live steam used direct from the boiler to heat the train of coaches composing the railway-train, and at 6 is shown the pop-valve usually set at twenty pounds to control the pressure of the steam therein, and 1' the rubber connecting-hose connecting the system of heating-pipes on the locomotive with the pipes of the train-heating service.

At 3⁴ is a connection from which proceeds a pipe running under the tender and rising at the end, as seen at 3, and having a valve 3'', the pipe 3 being connected with the rubber hose 3' to the U-shaped connection *c*. It will be seen that the steam-heating-service pipes are therefore in operative connection with the exhaust-steam pipe 2, leading from the air-pump steam-cylinder *a* to the interior of the water-tank or tender, for by opening valve 3'' the live steam from pipe 1 will flow through connection 3⁴ into pipe 3, down hose-pipe 3', up leg 3⁵ of the U-shaped connection, and down leg 2³ thereof into hose 2' and through pipe 2 into the water-tank 7, and by this arrangement the steam-heating system may be made to assist the air-pump system in heating the feed-water at any time required, although for ordinary occasions the exhaust-steam from the air-pump steam-cylinder will be sufficient.

At 4' will be seen a cylinder inside of which is the injector or boiler-feeder. The pipe 4 is connected with pipe 2, and therefore receives some of the exhaust-steam from the cylinder *a* and keeps the injector from freezing in cold weather.

At D will be seen a thermometer set in an opening in the end of the tender, indicating the temperature of the water in the tender.

At 3''' will be seen a valve the opening of which lets the steam to the open air and acts as a blow-off.

If desired, by closing valve 2'' the steam from cylinder *a* may be made to flow down leg 3⁵ of the U-shaped connection *c* and up hose 3' into pipe 3, through connection 3⁴, and into pipe 1 and assist in warming the train-coaches.

By viewing Fig. 2 it will be seen the pipe 2 rises on the outside of the tender 7 and should rise to at least the height of the normal water-line in the tender and that it bends or has a return-bend at its top and passes down again to the bottom of the tender and enters the same near its bottom, the up-leg of the pipe having a valve 2'', the discharge of pipe 2 in the tender being also near the bottom of the tender. This arrangement of the piping prevents any flow of water backward through pipes from the tender, and while the mere pressure of the steam in the pipes will cause any water in them to be pushed forward and discharged in the tender any steam or heated water will be discharged under the water in the tender and must rise through it, thus heating it to the best advantage.

Having described my invention so that those skilled in the art may know how to make and use the same, what I claim, and desire to secure by Letters Patent, is—

1. In a feed-water-heating system for locomotives steam-piping leading from the exhaust-steam chamber of the air-pump of a locomotive to the interior of the feed-water tender, said piping having a multiple-pass connection, one passage-way at least being in operative connection with said piping and said tender and having a valve therein, one passage-way at least of said multiple-pass connection being in operative connection with the steam-heating pipes of the train steam-heating system the steam therein being also valve-controlled, all arranged and operating so that the steam from the steam-heating pipes of the car-heating system and that from the air-pump exhaust-steam chamber may be together or separately carried into the water-tender, the pipe discharging into the tender rising outside thereof to a point at least as high as the water-level in the tender and having a valve in said pipe, said pipe dropping and entering said tender at a point near the bottom of the tender and discharging its contents near said bottom substantially as described.

2. In connection with a locomotive a system of steam-pipes leading from the exhaust-chamber of the steam-cylinder of the air-pump to the interior of the tender, said system of piping having a multiple-passage-way connection therein one passage-way at least in operative connection with the interior of the tender, the discharge end of the piping rising to at least the height of the normal water-line in said tender said pipe entering said tender near its bottom and discharging its contents near its bottom and having a valve in its discharge end outside the tender, one passage-way at least of the multiple-passage-way connection being in operative connection

with the train-heating piping and having a valve therein all arranged and operating so that the steam from the steam-exhaust chamber of the air-pump and the steam from the train steam-heating piping may be conducted to the tender separately or together substantially as described.

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

ROBERT BURNS.

Witnesses:

W. M. BROWN,
C. A. JEWELL.