No. 733,088. PATENTED JULY 7, 1903.

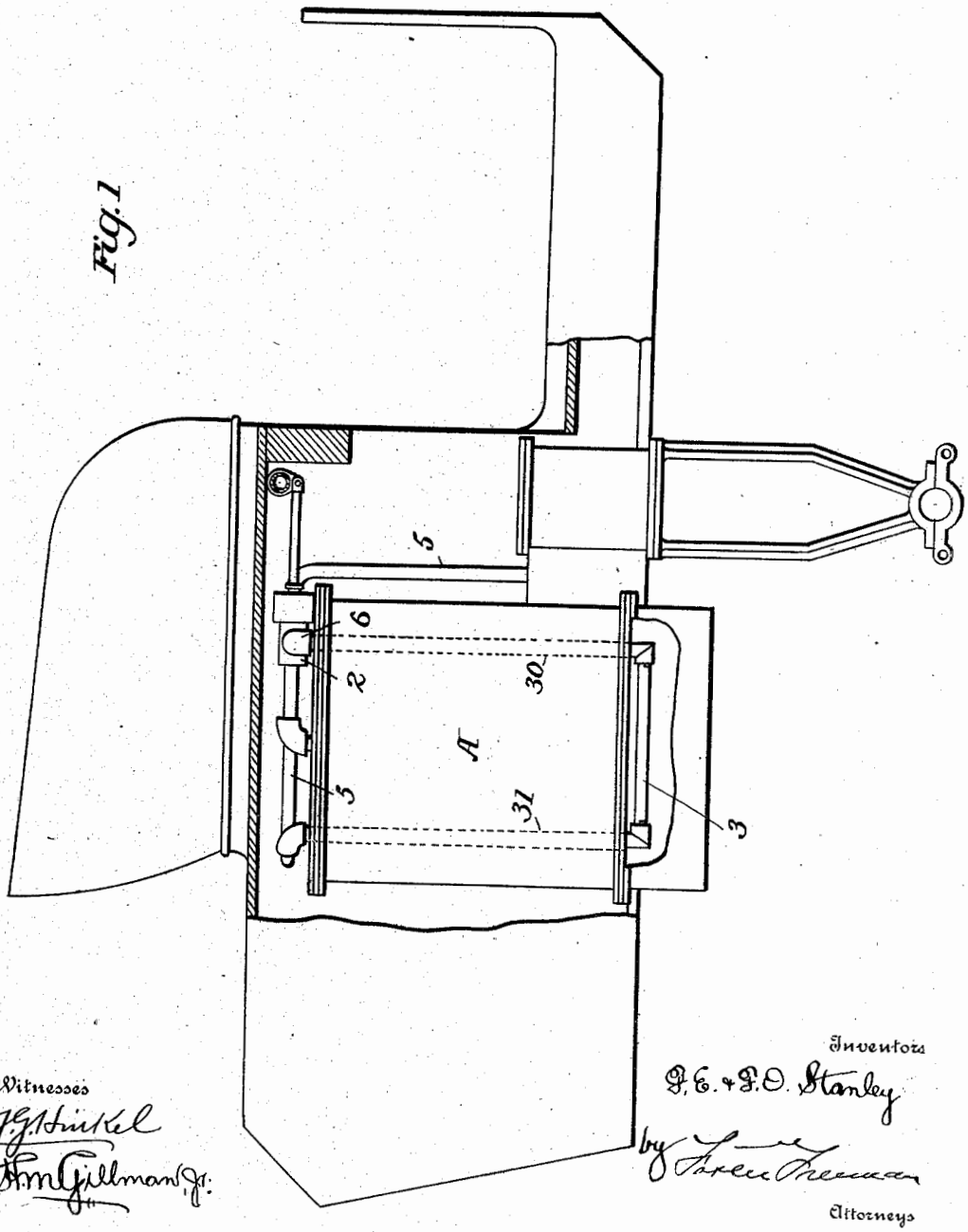
F. E. & F. O. STANLEY.

STEAM SUPERHEATER.

APPLICATION FILED OCT. 24, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1



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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 2.

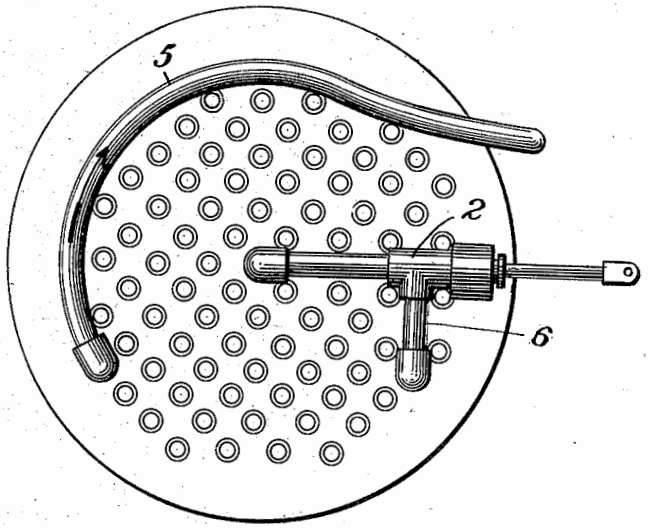


Fig. 3

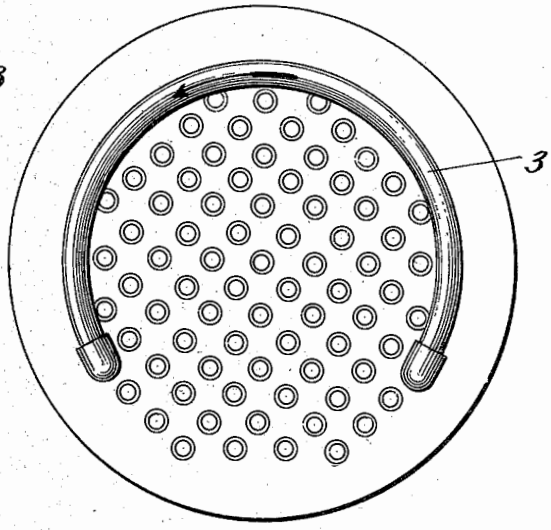
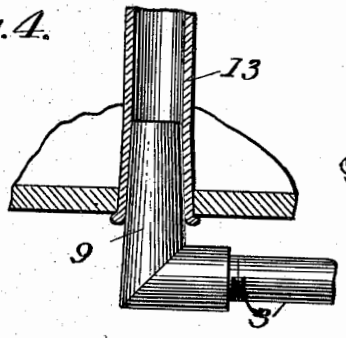


Fig. 4.



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No. 733,088. Patented July 7, 1903.

UNITED STATES PATENT OFFICE.

FRANCIS E. STANLEY AND FREELAN O. STANLEY, OF NEWTON, MASSACHUSETTS.

STEAM-SUPERHEATER.

SPECIFICATION forming part of Letters Patent No. 733,088, dated July 7, 1903.

Application filed October 24, 1902. Serial No. 128,648. (No model.)

To all whom it may concern:

Be it known that we, FRANCIS E. STANLEY and FREELAN O. STANLEY, both citizens of the United States, residing at Newton, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Steam-Superheaters, of which the following is a specification.

Our invention relates to steam-superheaters, and more especially to those adapted for and combined with motor-vehicles; and our invention consists in means for preventing the deleterious effects of superheated steam and in details of construction fully set forth hereinafter, and illustrated in the accompanying drawings, in which—

Figure 1 is a side view of sufficient of a motor-vehicle, boiler, and engine to illustrate our improvements. Fig. 2 is a plan of the boiler. Fig. 3 is an inverted plan of the boiler, and Fig. 4 is an enlarged section illustrating a mode of connecting the detachable tubular parts.

The boiler A is shown of the vertical fire-tube type, and the steam passes from the same through an opening near the center of the top into a pipe which connects with the throttle-valve casing 2. In order to superheat the steam, it is conducted toward the engine through a pipe 3, preferably curved and arranged below the bottom of the boiler, so as to be heated by the gases of the burner. It has been found, however, that steam taken directly from a pipe exposed to hot or burning gases will burn or carbonize the oil used for lubricating the piston; but we have found that by passing the steam after superheating through one or more pipes which are in contact with the water and steam of the boiler the superheated steam is so affected that it will not act deleteriously on the lubricant. Different arrangements may be employed to secure this result. As shown, a branch 6 from the throttle-valve casing communicates with a pipe 30, passing vertically through the boiler and leading to one end of the superheating-pipe 3, and from the other end of this pipe a pipe 31 passes upward through the boiler and may extend as a curved pipe 5 over the top to maintain the heat of the steam by the action of the gases passing from the boiler. The connection of the ends of the curved pipe-section 3 to the vertical sections by means of ordinary couplings is objectionable for obvious reasons, and to avoid these we provide each end of the detachable section with an L, into the threaded socket of which the end of the horizontal section is screwed, as usual, while the vertical end 9 of the L is relatively long and tapering, with a smooth exterior. This tapering end is driven forcibly into the end of the vertical boiler-tube 31 and not only serves to expand the latter in the opening of the boiler-head, but secures such a tight joint that the parts will remain in place even under the most excessive pressures. The removal of the L from the boiler-tube can, however, be readily effected by application of a proper tool. The same mode of attachment may be employed whenever pipes are to be applied to connect detachably with the boiler or other tubes.

Without limiting ourselves to the precise construction and arrangement of parts shown and described, we claim—

1. The combination with a steam-boiler and engine, of a superheating-pipe, and a tube extending through the boiler in contact with the contents thereof in line between the pipe and engine, substantially as set forth.

2. The combination with a steam-boiler and engine, of a curved superheating-pipe arranged below the boiler, and tubes extending through the boiler in contact with the contents thereof and connected with the ends of said pipe, substantially as set forth.

3. The combination of a boiler, a throttle above the same, a superheating-pipe below the boiler, the passage of steam to which is controlled by the throttle, and a tube leading from

said pipe through the boiler and to the engine and in contact with the contents of the boiler, substantially as set forth.

4. The combination with a boiler, of tubes communicating with the boiler to contain fluid under pressure, and a connecting-pipe having tapering L's at the ends fitting in the ends of said tubes and retained therein solely by friction, substantially as set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

FRANCIS E. STANLEY.
FREELAN O. STANLEY.

Witnesses:
J. W. BACON,
MARGARET L. HART.