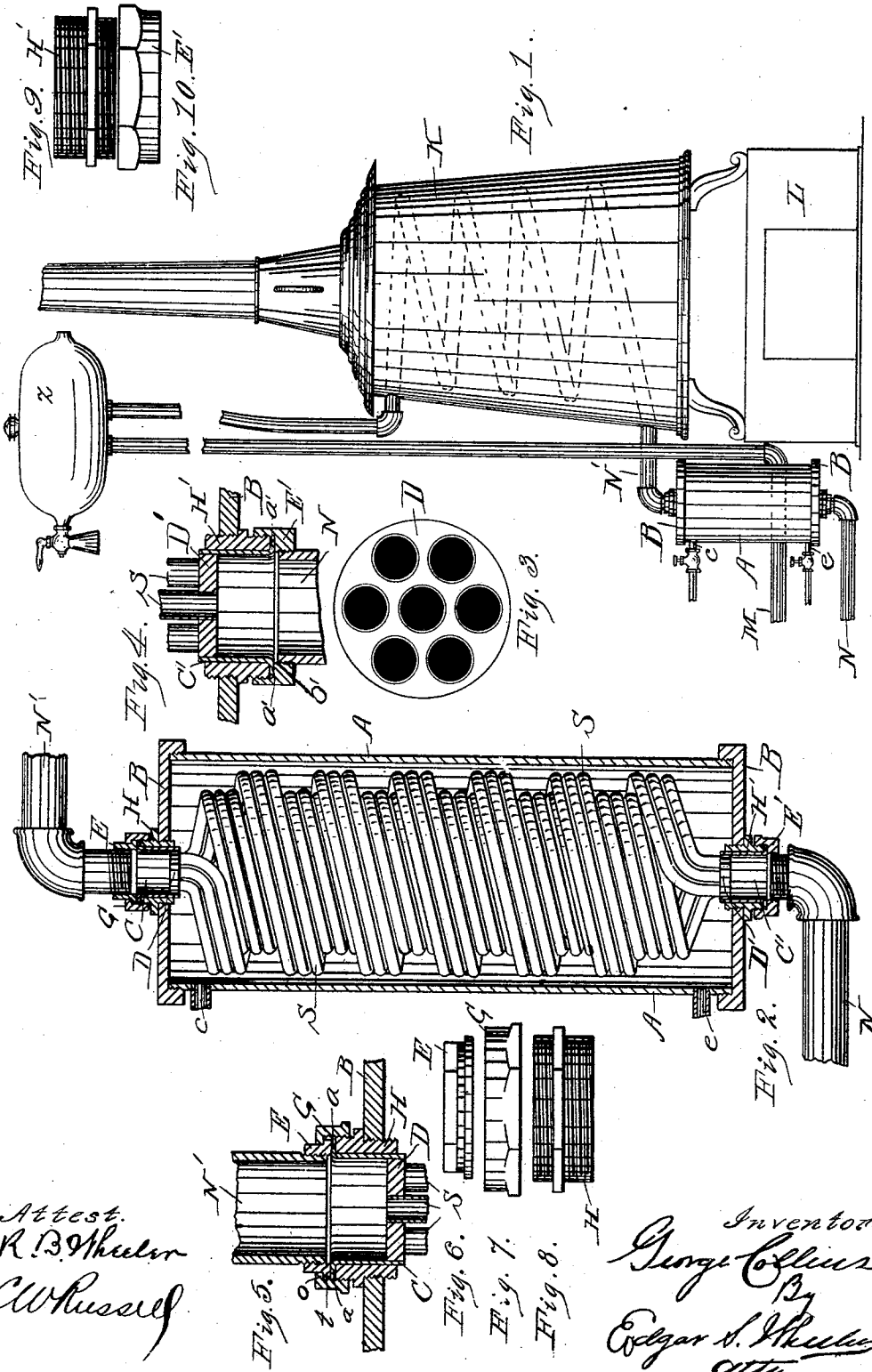


(No Model.)

G. COLLINS.  
CAR HEATING APPARATUS.

No. 489,524.

Patented Jan. 10, 1893.



Attest.  
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# UNITED STATES PATENT OFFICE.

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## CAR-HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 489,524, dated January 10, 1893.

Application filed April 11, 1889. Serial No. 306,810. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE COLLINS, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Car-Heating Apparatus; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to car-heating apparatus, in which a current of hot-water is maintained in circulation through the pipes of a car-heating system, and consists particularly in diverting the cold return water into a multiple of small coiled pipes located in a steam-heating cylinder, in which live steam is applied to the exterior of said coiled pipes direct from the boiler of the locomotive, being maintained therein under pressure, and not allowed to escape from the cylinder until condensed. This arrangement greatly augments the heating surface by dividing the volume of water and carrying it through the heating cylinder in a number of small coils, whereby the water in said coils is quickly and perfectly heated, requiring but little steam, and making practicable the application of steam direct from the boiler of the locomotive for maintaining a circulation of hot-water through the pipes of a car-heating system. The aggregate circulating capacity of the coiled pipes within the steam cylinder is greater than that of the water circulating agent communicating therewith, whereby ample provision is made for expansion within the heating coils of the cylinder. All of which will be fully hereinafter set forth, and the essential features of the device pointed out particularly in the claims.

In the accompanying drawings forming a part of the specification. Figure 1 is a view of the steam-heating cylinder as arranged with an auxiliary heater, showing also expansion-drum, and the pipes connecting with the car-heating system. Fig. 2 is an enlarged view of the steam-heating cylinder, the cylinder, and top and bottom couplings being in section, the multiple of coiled pipes in said

cylinder being in elevation. Fig. 3 is a plan view of the plug or diaphragm which is perforated and in which the ends of the coils are secured. Fig. 4 is a detail section of the coupling in the lower cylinder-head. Fig. 5 is a detail section of the coupling in the upper cylinder-head. Figs. 6, 7, 8, 9 and 10 are details of the coupling joints drawn apart.

As indicated in the drawings, A represents the steam-heating cylinder having heads B B, S represents a multiple of coiled pipes located in said cylinder and communicating with an induct and educt common to all.

K represents an auxiliary heater, L a coal-bunker under said heater, Z the expansion-drum, M the hot-feed, and N the cold-return pipes, said pipes form the water circulating agent leading from and returning to the cylinder.

The auxiliary heater, coal-bunker, expansion-drum, and feed, and return pipes are such as are in common use and will therefore require no special mention.

This device is used in connection with a hot-water car-heating system, the pipes of said system being filled with water the steam is turned onto the coils S in the heating-cylinder A through the steam-pipe *c*, the water in said coils becoming heated will pass out at the pipe N' through the coil in the auxiliary heater K to the expansion-drum Z, thence down the feed pipe M through the pipes in the car and back through the return-pipe N into the coils S in the cylinder A when it is reheated, and so the circulation continues.

The steam-heating cylinder A is provided with the heads B B, steam supply pipe *c*, and drip-cock *e* (see Fig. 1).

Located in the cylinder A is a multiple of independently coiled pipes S, (see Fig. 2) the upper end of said coiled pipes terminate and are secured in the perforated plug D which is brazed in the lower end of the tube C, said tube forming a chamber between the ends of the coiled pipes, and the discharge N'. said tube being environed by the nipple H which is screwed into the cylinder-head B, (see Figs. 2 and 5) the upper end of the tube C is flanged over the end of the nipple H as shown at *a* in Fig. 5, the lower face of the sleeve E in which is screwed the pipe N' rests on the flanged over portion *a* of the tube C, and as the nut

G is screwed down onto the nipple H the inner annular flange *o* of said nut engaging with the outer annular shoulder *t* of the sleeve E forces said sleeve down onto the flange *a* of the tube C forming a joint, and making continuous the passage from the coils S through the pipe N'. The lower ends of the coiled pipes S terminate and are secured in the perforated plug D' which is brazed in the tube C', said tube forming a chamber between the ends of the coiled pipes, and the induct N. the lower end of said tube is flanged over the end of the nipple H', and the joint is made by screwing the cap E' onto said nipple and forcing the annular shoulder *o'* of said cap against the flanged over portion *a'* of the tube C', as clearly shown in Figs. 4 and 2, the cap E' being tapped to receive the return pipe N'.

It will be observed from the drawings and the foregoing description, that the column of water flowing through the return pipe N will be divided on reaching the perforated plug D' and carried through the steam-heating cylinder in the multiple of coiled pipes S, the application of steam to the exterior of said coils within said cylinder quickly and intensely heats the column of water within said coils, as by them the water is divided into a multiple of small parts effecting a great saving in time and in the use of steam for rapidly heating the volume of water as it passes through the steam heating cylinder.

The auxiliary heater K will be used only in case of accident, or when steam from the boiler cannot be had, in such cases a fire may be built in said heater and the circulation of hot-water through the pipes maintained.

By locating the chambers C, C', between the ends of the multiple of coiled pipes, and the water circulating agent outside of the cylinder, I am able to obtain a direct passage for the water, from the multiple of pipes into the single pipe leading from the cylinder, as well as from the single return pipe into the multiple of coiled pipes within the cylinder, thereby avoiding a fluctuation or undulation of the current or volume of water as it passes from one set of pipes to the other. This is an important feature of the apparatus, as the circulation is to be maintained by the action of the heated water unaided by other means.

Having thus fully set forth my invention what I claim as new and desire to secure by Letters Patent is,—

1. In a hot-water circulating and heating system, the combination of the closed steam heated cylinder having an outside water circulating agent leading from it, and returning thereto, a chamber at each end and a steam inlet and a condensation outlet, of the multiple of coiled pipes located in said cylinder, said coiled pipes having communication with the water circulating agent outside of said cylinder, substantially as set forth.

2. In a hot-water circulating and heating system, the combination of the closed steam-heating cylinder having outside water circulating pipes communicating therewith, a steam inlet pipe and a condensation discharge pipe, the chambers, the perforated diaphragms located in said cylinder, and a multiple of coiled pipes located in said cylinder which pipes pass through the perforated diaphragms communicating with the water circulating pipes, as and for the purposes set forth.

3. In a hot-water circulating and heating system, the combination of the closed cylinder having an outside water circulating agent leading from it, and returning thereto, and a steam inlet and a condensation outlet, of a multiple of water circulating pipes located in said cylinder, and a chamber located between the ends of the multiple of pipes, and the water circulating agent outside of said cylinder, substantially as set forth.

4. In a hot-water circulating system, the combination of the closed cylinder having a steam inlet and a condensation outlet, the water circulating agent outside of said cylinder leading from it and returning thereto, the multiple of coiled pipes located in said cylinder, the aggregating circulating capacity of said pipes being not less than that of the circulating agent outside of the cylinder, and the perforated diaphragms, and chambers, located between the ends of the multiple of pipes, and the ends of the outside circulating agent, substantially as specified.

5. In a hot-water circulating system, the combination of the steam heated cylinder, having a steam inlet and a condensation outlet, of a water circulating agent outside of the cylinder leading from it and returning thereto, a multiple of pipes located in said cylinder, the aggregate circulating capacity of which is greater than that of the water circulating agent outside of the cylinder, the chamber located between the ends of the multiple of pipes, and the water circulating agent outside of the cylinder, substantially as set forth.

6. The combination of the closed steam heated cylinder, having a steam inlet and a condensation outlet, the water circulating agent outside of said cylinder leading from it and returning thereto, the multiple of coiled pipes located in the cylinder, the aggregate circulating capacity of said multiple of pipes being greater than that of the outside circulating agent, the perforated diaphragms, the tubes located between said diaphragms and the ends of the outside water circulating agent, substantially as and for the purposes specified.

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

GEORGE COLLINS.

Witnesses:

E. S. WHEELER,  
R. B. WHEELER.