

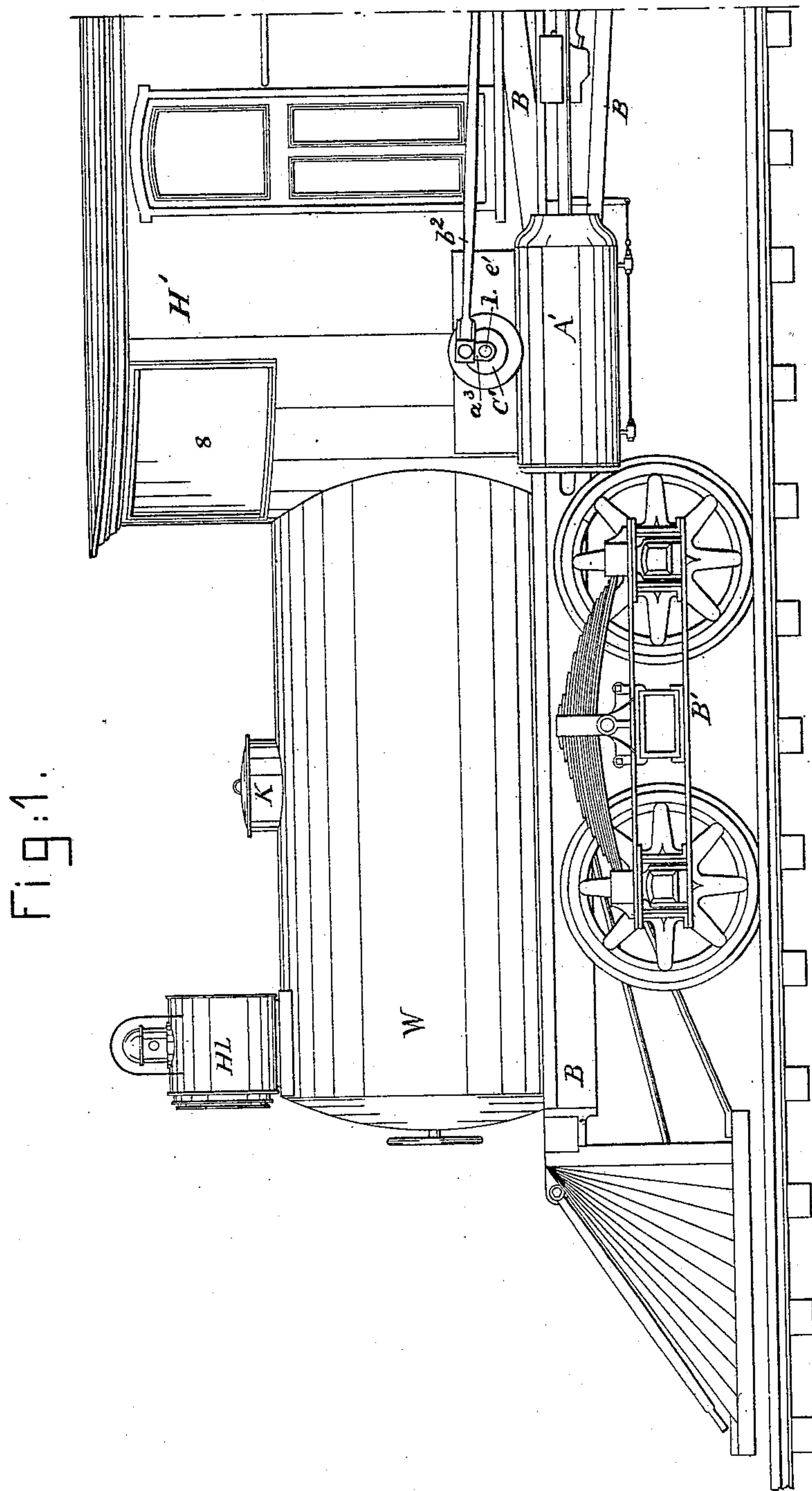
(No Model.)

5 Sheets—Sheet 1.

F. M. STEVENS.
LOCOMOTIVE ENGINE.

No. 246,235.

Patented Aug. 23, 1881.



Witnesses.
Arthur Reynolds.
Bernice J. Hayes.

Inventor.
Frank M. Stevens
by *Henry Gregory* Atty.

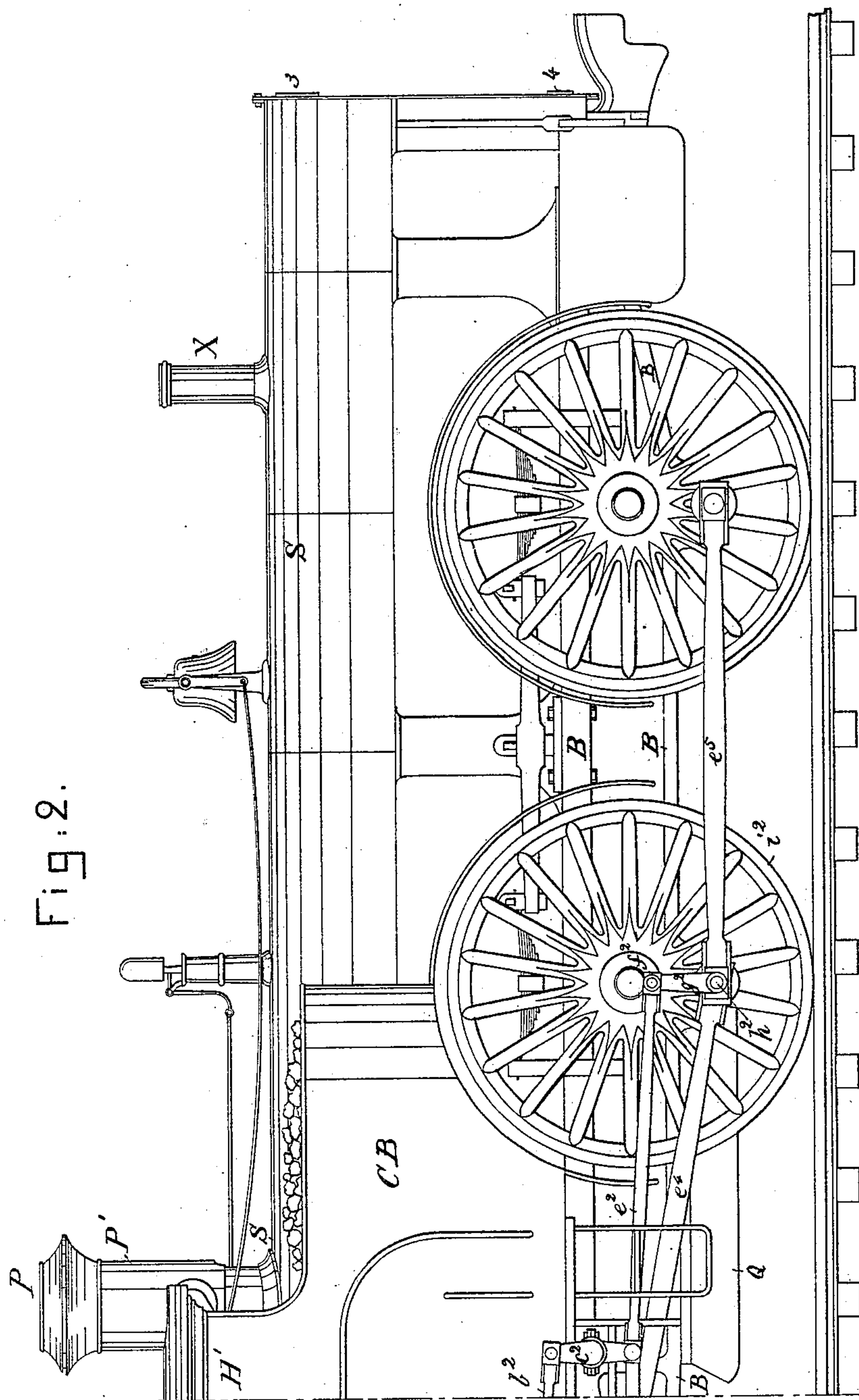
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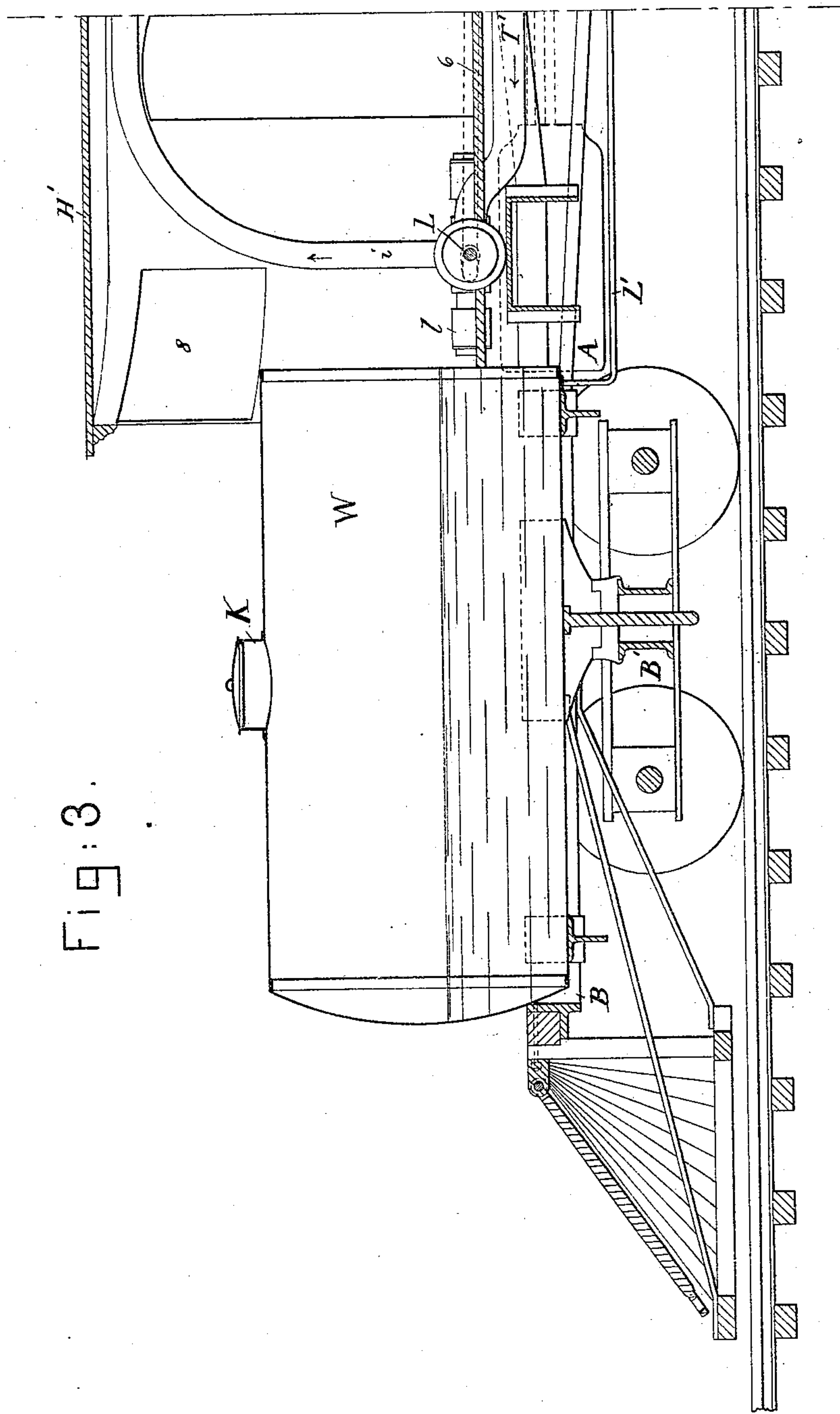
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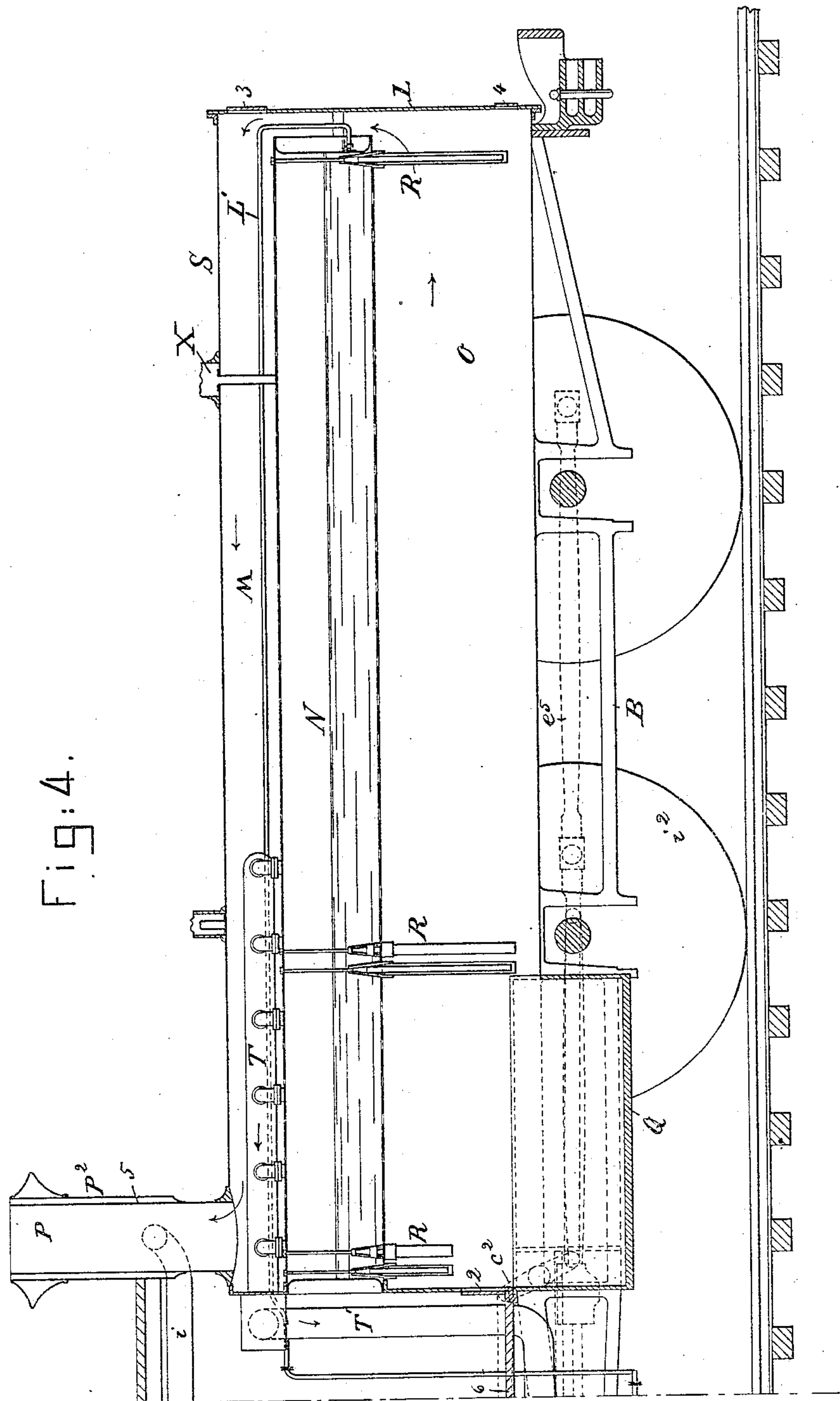
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5 Sheets—Sheet 5.

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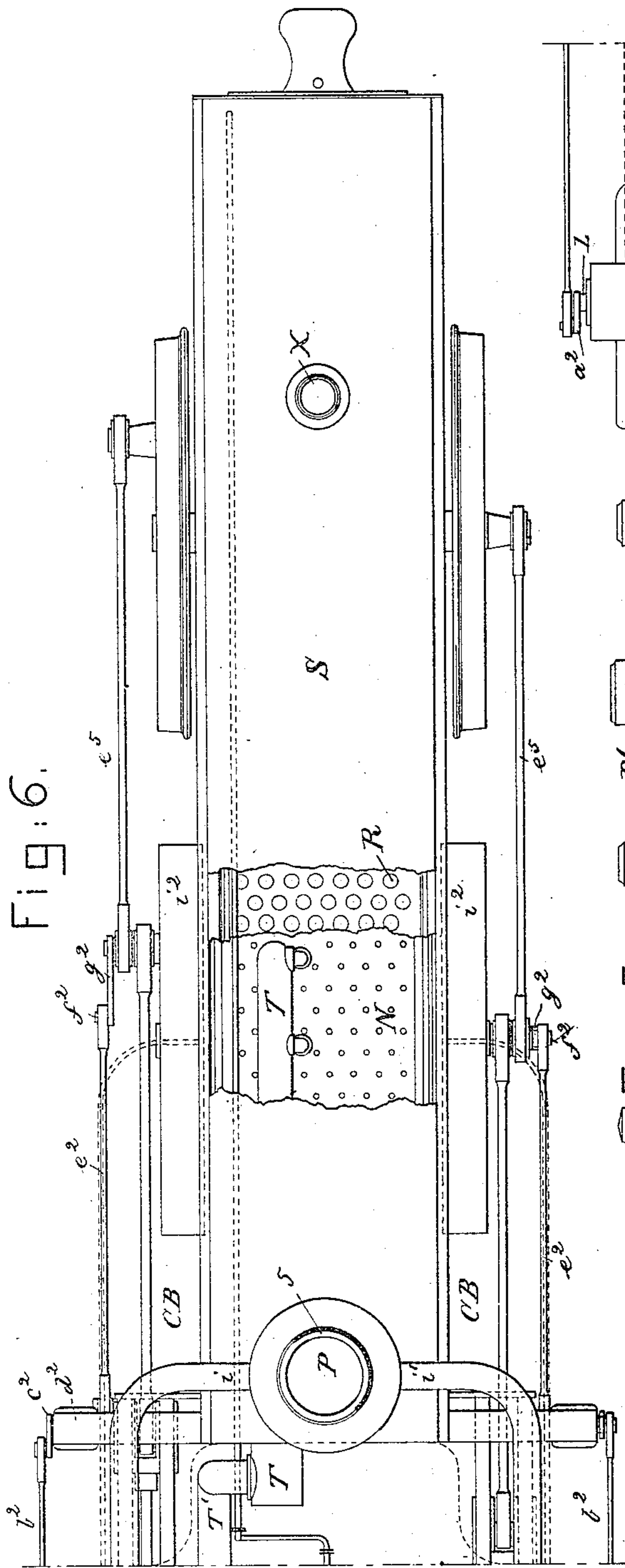


Fig: 6.

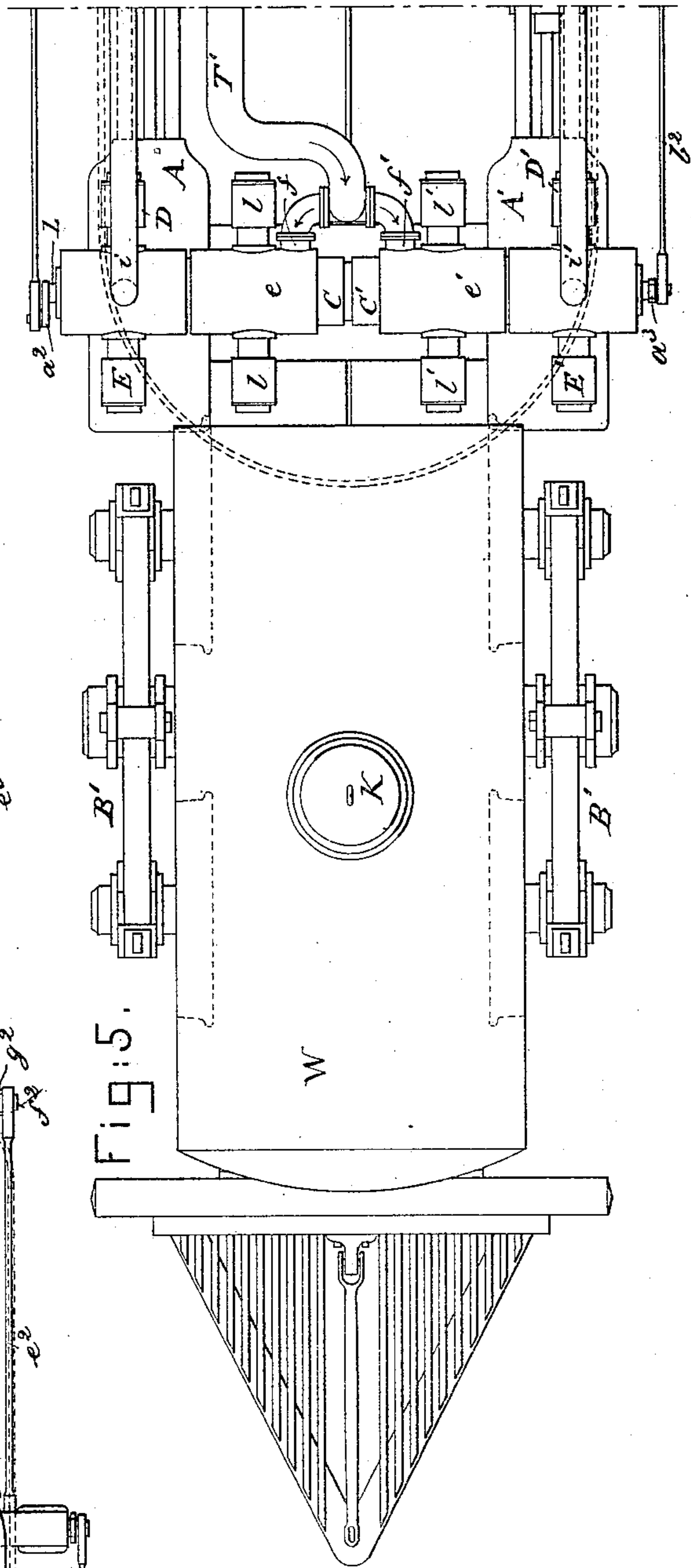


Fig: 5.

Witnesses.

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UNITED STATES PATENT OFFICE.

FRANK M. STEVENS, OF CONCORD, NEW HAMPSHIRE.

LOCOMOTIVE-ENGINE.

SPECIFICATION forming part of Letters Patent No. 246,235, dated August 23, 1881.

Application filed February 11, 1881. (No model.)

To all whom it may concern:

Be it known that I, FRANK M. STEVENS, of Concord, county of Merrimack, State of New Hampshire, have invented a new and useful
5 Improvement in Locomotive-Engines, of which the following description, in connection with the accompanying drawings, is a specification.

This invention relates to improvements in locomotive-engines, and has for its object such
10 a construction and arrangement of parts as to place the engine between the water-tank and boiler, the tank, boiler, and engine being all supported on one frame, whereby I am also enabled to increase the adhesive power of the
15 locomotive. This arrangement of parts enables the engineer's cab to be placed in front of the boiler and smoke-pipe, where the engineer has a clear and unobstructed view of the track, and in such position has all the valve mechanism immediately under his inspection and control. The water-tank in front of the engineer's
20 cab affords protection for the latter and its inmates in case of accident, and by making the water-tank cylindrical or elliptical in cross-section it is possible to cheapen its construction, for flanging or bending of angle-irons, or staying of flat surfaces is thus avoided, and it is possible, also, with the construction herein described to reduce the weight of the boiler,
25 and the shape given to it is that which is capable of withstanding greatest strain with same amount of metal. In order to cause the smoke in the smoke-pipe to rise as high as possible above the train, the said pipe has been provided with an annular casing, leaving a steam-space between the pipe and casing, into which
30 exhaust-steam from the exhaust-steam pipe is led, the said exhaust-steam being free to pass out from the said space through an annular opening surrounding the top of the smoke-pipe, the exhaust steam in an annular layer surrounding the smoke as it leaves the smoke-pipe and blowing it upward.

Figures 1 and 2 of the drawings, taken together, represent a side elevation of my improved locomotive. Figs. 3 and 4, taken together, show a vertical longitudinal section of the parts shown in Figs. 1 and 2, except the water-tank, the head-light being omitted, the
35 said figures also showing but few of the circulating-tubes. Figs. 5 and 6, taken together,

represent a plan or top view of my improved locomotive, the engineer's cab and coal-bunkers being shown in double dotted lines, the flooring of the cab being omitted to show parts
55 of the locomotive apparatus below it, part of the jacket for the boiler and the boiler itself being broken out at top.

This invention is an improvement on United States Patent No. 232,776, granted to me, to
60 which reference may be had.

In this invention the main frame-work B of the machine is of such length and shape as to support the water-tank W at its front end directly over the bogie-truck B', the latter being
65 of any usual construction, and also the engineer's cab H, the boiler N, and jacket or setting S. The water-tank is supposed to be cylindrical or slightly oval in cross-section, and to be supplied with water at the man-hole K.
70 The feed-water pipe L', (see Fig. 3,) which supplies the boiler N with water, is connected with the water-tank, led under the floor or foot-board in the engineer's cab, thence up in front of the boiler, where it in practice will be
75 joined with any usual or suitable boiler-feeder, not necessary to be herein shown, and from that point a continuation of the said feed-water pipe is extended through the return-flue M and connected with the rear end of the boiler,
80 the water in the said feed-water pipe L' being heated in its passage through that part of the pipe exposed to the products of combustion, passing in the direction of the arrows, Fig. 4, from the combustion-chamber O, along said re-
85 turn-flue to the smoke-pipe P.

By making the water-tank cylindrical, or nearly so, it is possible to avoid flanging or bending the metal, the use of angle-irons, and avoid staying flat surfaces, as is now the case
90 with locomotive water-tanks as heretofore constructed. A cylindrical or oval vessel is capable of withstanding the greatest strain in proportion to the thickness of metal used, and this is here made available.
95

The boiler N and its circulating water-tubes R, some of which are shown in section, Fig. 4, are and will be as in my patent No. 232,773, dated September 28, 1880, to which reference
100 may be had. This boiler is incased or inclosed within the metal jacket or setting S, which forms the combustion-chamber O, the bottom

and sides of which, in practice, will be lined with suitable fire-brick or refractory material, the end of the setting at the right of Fig. 4 not necessarily being lined. The setting is made of sufficient size to leave above the boiler a return-flue, M, for the passage of the products of combustion from the combustive chamber O, the fuel supporting combustion being supplied to the fire-box Q through a door, 2, opening into the engineer's cab H'. (See Fig. 4.) The end of the setting S has two doors or slides, 3 4, for the insertion therein of a suitable tool by which to remove any soot, ashes, or cinders which may lodge on the boiler or in the combustion-chamber. Steam generated in the boiler rises therefrom through suitable branches into the steam-pipe T; thence along its continuation T' into inlets $f f'$.

Fig. 5 shows the valve mechanism and engine part of the locomotive. These parts and their connection with the driving-wheels are as in my application for United States patent filed November 20, 1880, to which reference may be had, and in this application I have marked the parts common to the said application, filed November 20, 1880, with like letters, so a detailed description of the valve mechanism is not herein necessary, for no specific claim is herein made to said mechanism; and instead of the particular valve mechanism herein shown, it is obvious that I might employ any other well-known or suitable valve mechanism. I will briefly state that the engine-cylinders are lettered A A', the links for the piston-rods e^1 , the coupling-rods e^5 , the crank-pins h^2 , the cranks g^2 , their pins f^2 , the links e^2 , the working levers or connections c^2 , the links b^2 . The shaft which moves the cylindrical valves or steam-regulators CC' is lettered L.

The boiler will be provided with any usual safety-valve, as at X. The smoke-pipe P is surrounded with a casing, P², so as to leave between them a steam-space, 5, having an annular mouth open to the atmosphere, to permit the escape therefrom of the exhaust-steam supplied thereto from the exhaust-steam pipes $i i'$, common to my said application, the said exhaust-steam as it escapes from the annular mouth of the space 5 about the central opening of the smoke-pipe acting to project the smoke upward above the train, and also in a measure to stimulate the draft.

By placing the bogie-truck in front of the engine-cylinders A A', I am enabled to use with the bogie-truck larger wheels, and also to support the front of the locomotive frame-work on journals of the axles of the bogie-truck outside of the wheels, whereby it is possible to have ready access to the said journals to renew the bearings, or oil and pack them, whereas

in locomotives as now constructed the journals fitted to the bogie-axles are between the wheels, and can only be reached by going under the engine.

The engineer's cab H' will have in it a foot-board or platform, 6, (shown in section, Fig. 3,) on which he and the fireman may stand. All the valve mechanism and means to shift it to start the locomotive forward, stop, or reverse it, is contained in the said cab, under the immediate control of the engineer, and he, occupying a position in front of the boiler and smoke-pipe, has, through the cab-windows 8, an unobstructed view of the track. The steam-pipe T will have in it the usual throttle-valve. The coal-bunkers (lettered C B, Fig. 2) are located at each side forward of the setting or casing S, and open into the engineer's cab.

Instead of the particular form of boiler or steam-generator herein shown, I might employ any other usual or suitable boiler.

The smoke, being blown or carried up above the train, will, in most cases, not descend upon and so as to enter the train at the windows of the cars.

I have herein shown the boiler setting as having a large return-flue above it and with the feed-water pipe extending into it; but I do not herein lay any claim thereto, as those features form the subject-matter of another application for United States patent.

I claim—

1. The herein-described improved locomotive, it including a frame-work to receive both the water-tank and boiler, the driving-wheels and bogie-truck, the water-tank located on the frame-work in front of the driving-wheels and engine-cylinders, an engineer's cab next the water-tank, and a boiler at the rear of the said intermediate cab, the fire-box door of the boiler being in the engineer's cab, and a pair of engine-cylinders, the latter being located between the boiler and water-tank, substantially as shown and described.

2. In a locomotive, the steam-chest and pipe i , extended therefrom through or above the cab, combined with the smoke-pipe and its surrounding casing, to form a steam-space, 5, the pipe i delivering the exhaust-steam into the said space 5, from which it escapes about the top of the smoke-stack to carry up the smoke, substantially as described.

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

FRANK M. STEVENS.

Witnesses:

G. W. GREGORY,
ARTHUR REYNOLDS.