

Dec. 30, 1930.

R. B. KRUEGER

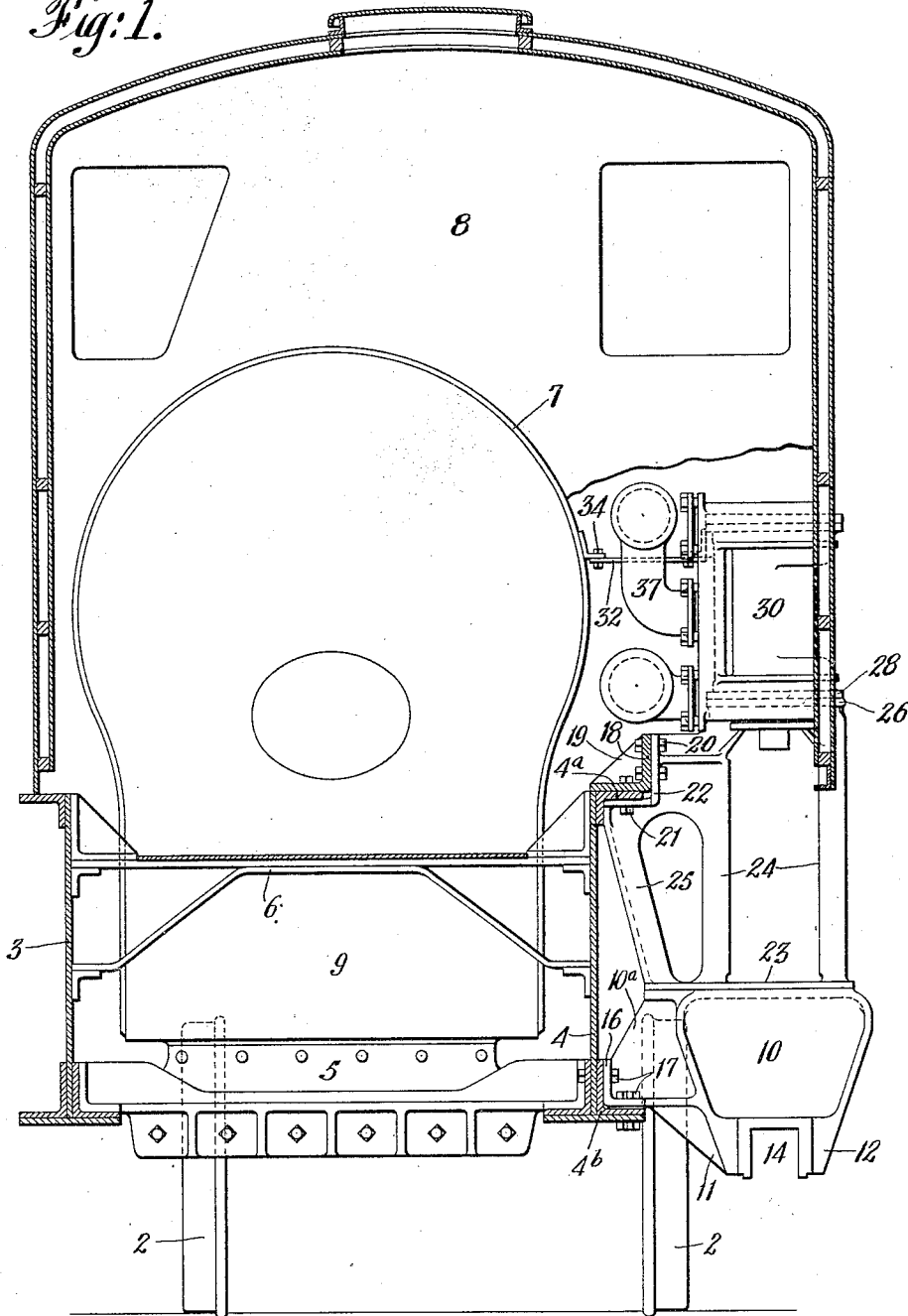
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LOCOMOTIVE FRAME AND ENGINE SUPPORTING STRUCTURE

Filed June 22, 1928

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Fig. 1.



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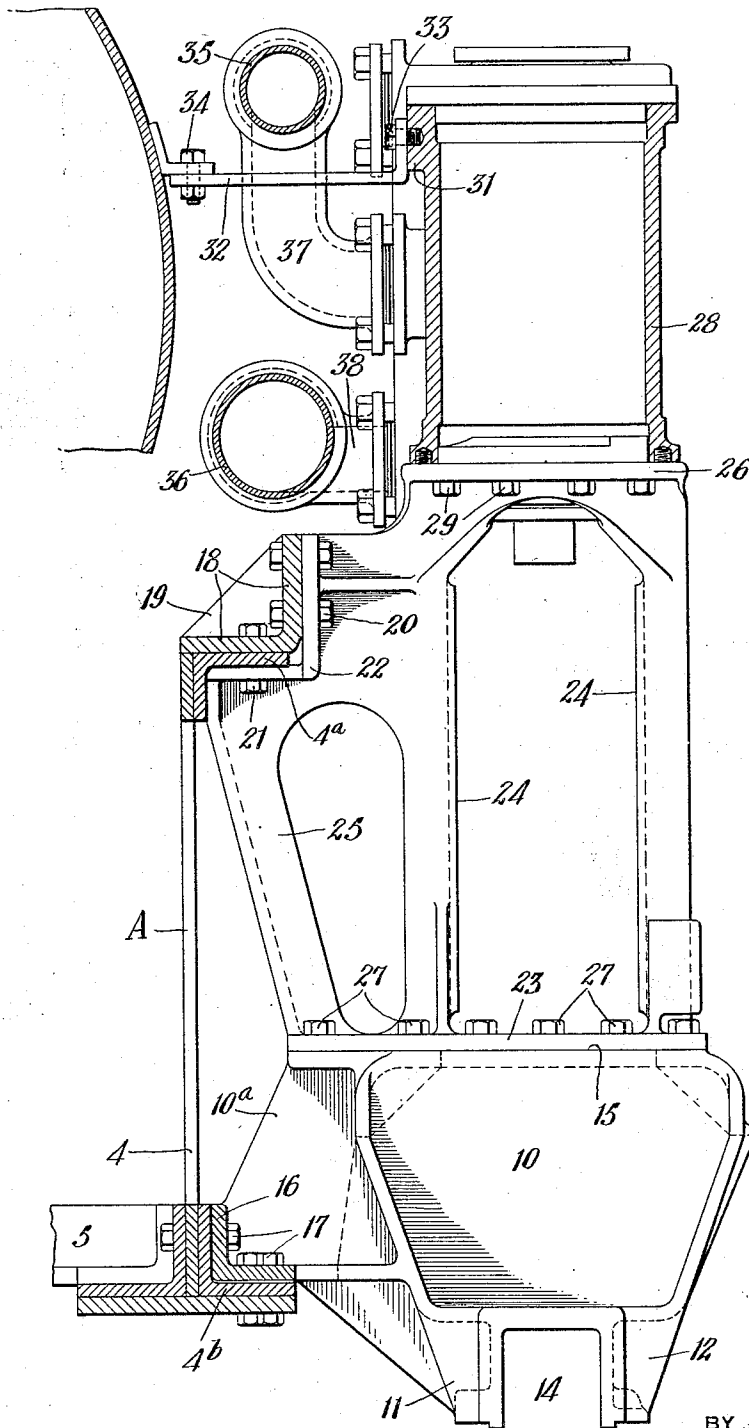


Fig. 2.

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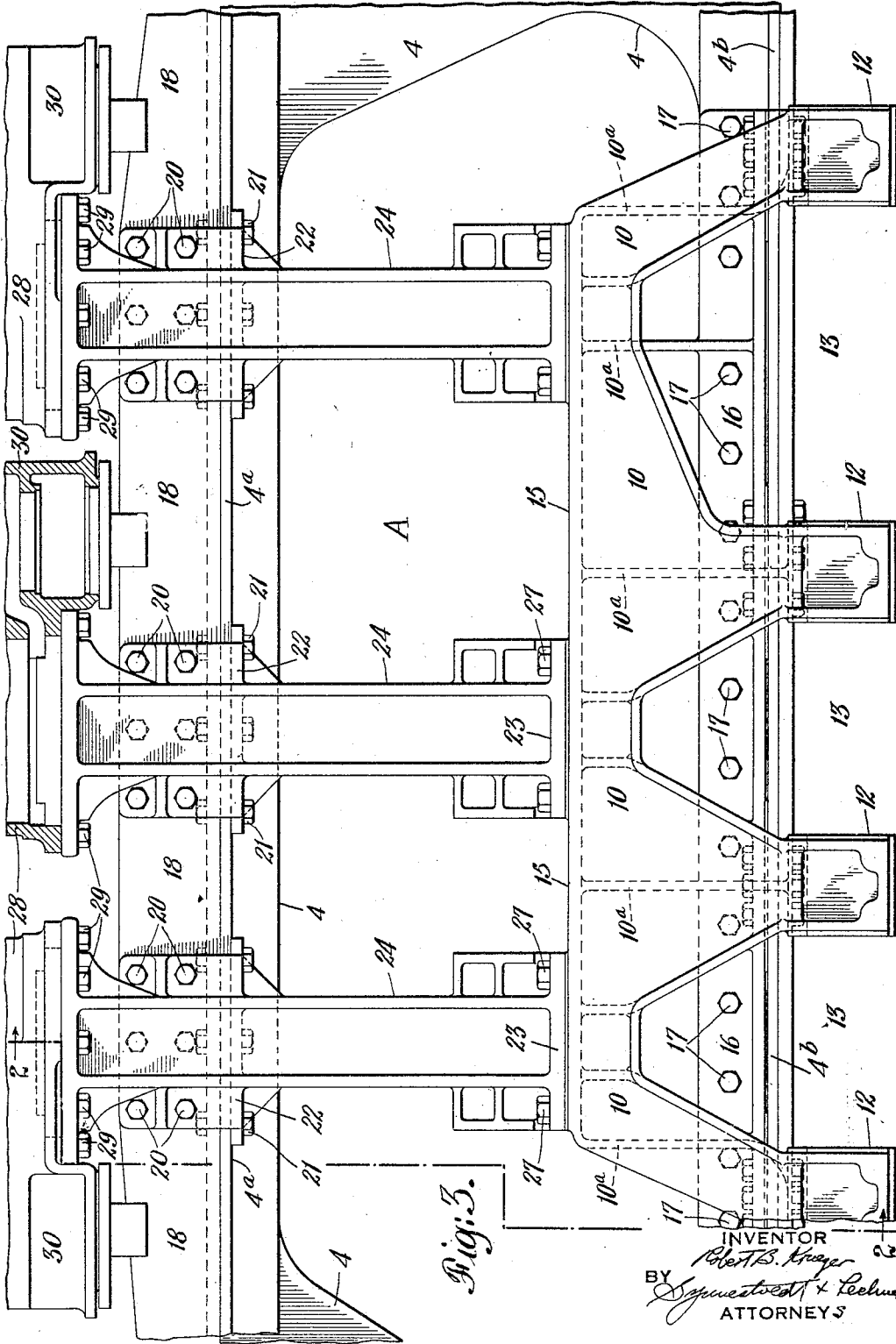
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# UNITED STATES PATENT OFFICE

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## LOCOMOTIVE FRAME AND ENGINE SUPPORTING STRUCTURE

Application filed June 22, 1928. Serial No. 287,459.

This invention relates to locomotive frame and engine supporting structure, with particular reference to geared locomotives having vertical engines mounted on the side thereof.

One of the primary objects of the invention is to simplify and strengthen the mounting of the engine cylinders and other parts on the locomotive.

Another object of the invention is to provide a solid and rugged construction to take the thrust of the engines without causing undue bending moments on the boiler, frame, or other parts.

Still other objects are: to provide for a firm tying together of all the parts involved while at the same time making provision for ready access to them for the purpose of inspecting, taking-down, and assembling; to provide means for mounting the engine structure which serves to reinforce the frame; and to provide cylinder-supporting means which will not interfere with the installation of steam pipes and other elements in the most convenient manner.

How these objects and advantages are attained, together with others which are incidental to the invention or which will occur to those skilled in the art, will appear clearly from the following description, reference being had to the accompanying drawings, in which:

Figure 1 is a transverse section through a geared locomotive, looking forwardly, with certain parts broken away and others omitted, illustrating an embodiment of my invention;

Figure 2 is a detailed view of a portion of Fig. 1, with the rear valve-chest omitted and the rear cylinder shown in section, the view being taken substantially on the line 2—2 of Fig. 3; and

Figure 3 is an enlarged fragmentary elevational view taken from the right of Fig. 1. In the construction shown, the wheels 2, carry (through truck structure, not shown) a frame which includes a left side girder member 3, a right side girder member 4 (both of which ordinarily extend from end to end of the locomotive), and lower and upper

cross-members 5, 6, the frame, in turn, carrying a boiler 7 and cab 8; and it will be seen that the frame and boiler are offset from the longitudinal center line of the wheelbase, in order to provide the necessary space at the right for the mounting of the driving mechanism.

The vertical web of the frame member 4, as clearly shown in Fig. 3, has a large opening or cut-out portion, indicated in general by the reference character "A", to facilitate access to adjacent parts, and to the staybolts of the firebox 9, and the frame member 3 may, of course, be similarly apertured (in that portion lying adjacent the side of the fire-box 9) to give ready access to the staybolts. Frame member 4 is built up at top and bottom with flanges 4a and 4b.

Along the bottom of the frame member 4 is secured a box-like structure 10 with diagonal bracing webs 10a, said structure having a series of inner and outer legs 11, 12, forming longitudinally of the engine a series of gaps 13 in which the usual cranks and connecting rods (not shown) operate (see Fig. 3), and forming between each pair of legs 11, 12, a recess 14 (see Fig. 2) to receive a crankshaft bearing. This whole structure, with its flat longitudinal upper face 15, extends substantially the full length of the gap A in the side frame 4, and is secured by its integral angular web 16, along the bottom of said frame 4, as by bolts 17. Said web thereby serves as a reinforcement to the main frame along the bottom of the opening.

Along the top of the frame member 4 I secure a bridge-like angle member 18 having stiffening webs 19, extending beyond the ends of the gap or opening A, and to this and the frame member 4a I secure, as by bolts 20, 21, the angular brackets 22 of the supporting structure 23, 24, 25, 26. This supporting structure, of which there is one for each cylinder, consists of a base plate 23, a pair of upright crosshead guides 24, a diagonal brace 25 and a head or top plate 26, the base being secured firmly, as by bolts 27 to the top 15 of the structure 10, and the top plate 26 forming a base for a cylinder 28 which is secured thereto, as by bolts 29. The diagonal braces

25, together with the webs 10a of the structure 10, form a trussed connection between the upper and lower parts of frame member 4.

The cylinders each carry, laterally, a valve-chest 30, and on the back, or the side toward  
 5 the boiler, each is preferably provided with means, such as the tapped boss 31, whereby it may be secured to the boiler 7 by means of a bracket or brace 32 and bolts 33, 34. Main  
 10 steam and exhaust pipes 35 and 36, respectively, may be positioned above and below the brackets 32 of the several cylinders, lying longitudinally of the locomotive between the cylinders and chests 28 and 30, on the one hand,  
 15 and the boiler 7, on the other hand. From these pipes, branches 37, 38, may connect to the inlets and outlets of the valve-chests. All these piping arrangements may be conveniently made, without interference from the  
 20 supporting structure shown.

It will now be evident that the engine construction, including the cylinders with their valve-chests, the cross-head guides, and the crank-shaft bearing brackets, are rigidly and  
 25 securely mounted both at top and bottom of the girder frame member 4; that the angle structures 16 and 22, the webbed angle bar or bridge member 18, and the truss-like arrangement of the braces 10a, 25, at the same time  
 30 give reinforcement to said frame member where it is most needed; and that the foregoing construction, in combination with the cross-ties 32, provides a triple support for the engines, vertically thereof, to prevent undue  
 35 bending strains on any of the parts, without interfering with the application of various steam piping arrangements.

What I claim is:—

1. A geared locomotive frame and engine  
 40 support including a row of truss-like braces secured at the top and bottom of a member of the frame.

2. A geared locomotive frame and engine  
 45 support including a row of truss-like braces secured at the top and bottom of a member of the frame and a bridge member extending longitudinally of said frame member.

3. A geared locomotive frame and engine  
 50 support including a row of truss-like braces secured at the top and bottom of a member of the frame and a bridge member extending longitudinally of said frame member adjacent the juncture of said truss-braces with the top of the frame member.

4. A geared locomotive frame and engine  
 55 support including a truss-like structure secured at top and bottom of a frame member and having engine parts mounted thereon, and a support thereabove secured to the engine and the locomotive.

5. In a locomotive having a frame, a boiler,  
 65 and a row of cylinders mounted laterally of the boiler, a supporting structure for the cylinders secured to the frame at top and bottom,

and a brace between each cylinder and the boiler.

6. In a locomotive having a frame, a boiler, and a row of cylinders mounted laterally  
 70 of the boiler, a supporting structure for the cylinders comprising a member extending longitudinally of the row of cylinders and secured along the lower portion of a frame member, and a bracing structure for each  
 75 cylinder including a diagonal member secured to said longitudinal member and to an upper portion of said frame member.

7. In a locomotive having a frame, a boiler, and a row of cylinders mounted laterally  
 80 of the boiler, a supporting structure for the cylinders comprising a member extending longitudinally of the row of cylinders and secured along the lower portion of a frame member, and a bracing structure for each  
 85 cylinder including a diagonal member secured to said longitudinal member and to an upper portion of said frame member, together with a brace between each cylinder and the boiler.

8. In a locomotive, an open girder frame  
 90 member constructed to permit ready access to associated parts, and a truss structure extending across the opening and bracing said member at top and bottom.

9. In a locomotive, an open girder frame  
 95 member constructed to permit ready access to associated parts, and a truss structure extending across the opening and bracing said member at top and bottom, said truss structure serving also as an engine support.

10. A reinforcing member, for an open  
 100 type girder locomotive frame member, formed as an engine and crank shaft support.

11. A reinforcing member, for an open  
 105 type girder locomotive frame member, formed as a crank-shaft support.

12. A supporting structure for the cylinders and crank-shaft of a locomotive comprising crosshead guides and a truss structure  
 110 connected together.

13. A supporting structure for the cylinders and crank-shaft of a locomotive comprising crosshead guides and a truss structure  
 115 connected together, said truss structure having means whereby it may be mounted on the locomotive frame.

14. A supporting structure for the cylinders and crank-shaft of a locomotive comprising cross-head guides and a truss structure  
 120 connected together, said truss structure having means whereby it may be mounted on the locomotive frame, and serving as a brace therefor.

15. In combination with an open girder locomotive frame member, a bridge-like bracing structure extending generally longitudinally thereof adjacent the opening therein  
 125 and also serving as an engine support.

16. In combination with an open girder  
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locomotive frame member, a bridge structure extending longitudinally thereof adjacent the opening therein and a truss structure extending transversely thereof across said opening.

5 17. In combination with an open girder locomotive frame member, a bridge structure extending longitudinally thereof adjacent the opening therein and a truss structure extending transversely thereof across said opening, said structures serving as an engine support.

12 18. In combination with an open girder locomotive frame member, a bridge structure extending longitudinally thereof adjacent the opening therein and a truss structure extending transversely thereof across said opening said truss structure providing bracing for engine parts.

15 19. A supporting structure for the cylinders of a locomotive comprising cross-head guides and a truss structure connected together.

20 In testimony whereof I have hereunto signed my name.

ROBERT B. KRUEGER.

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