June 17, 1930. S. M. VAUCLAIN ET AL 1,765,251

LOCOMOTIVE

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Fig. 1.

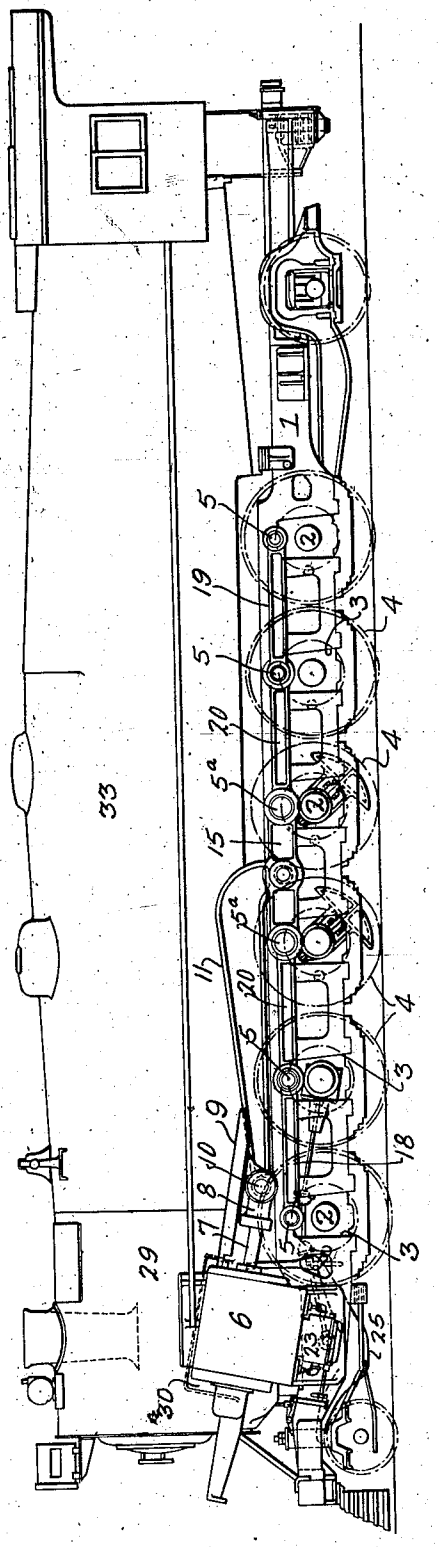
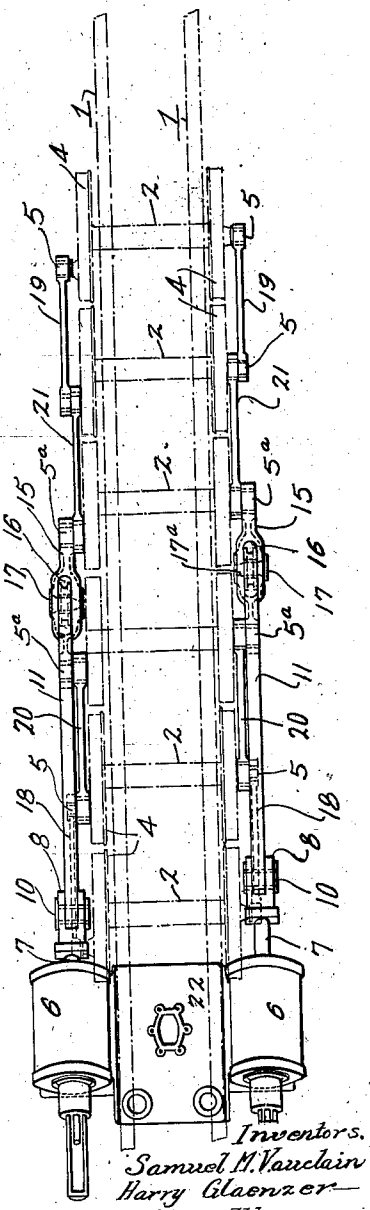


Fig. 2.



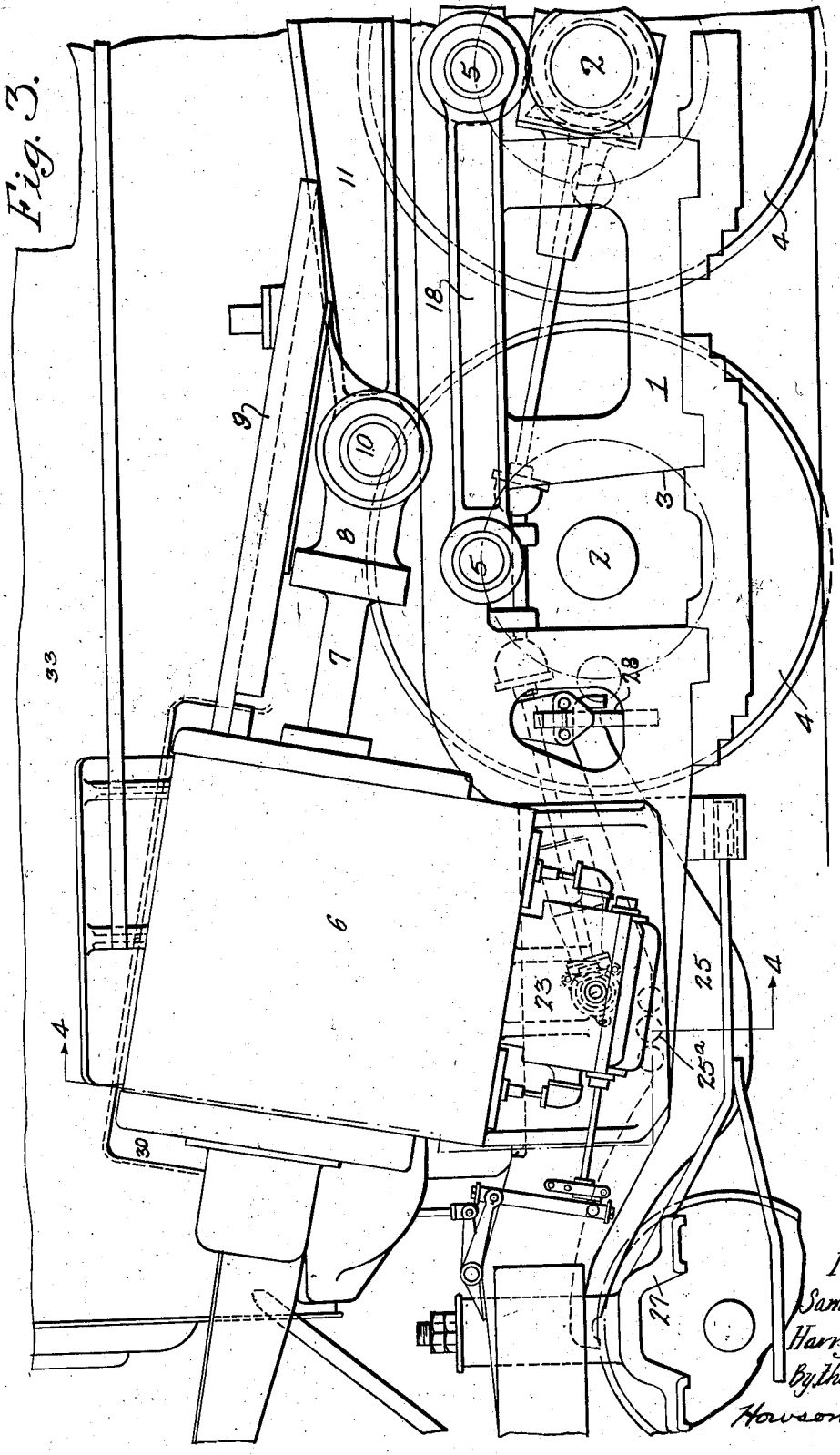
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Fig. 3.



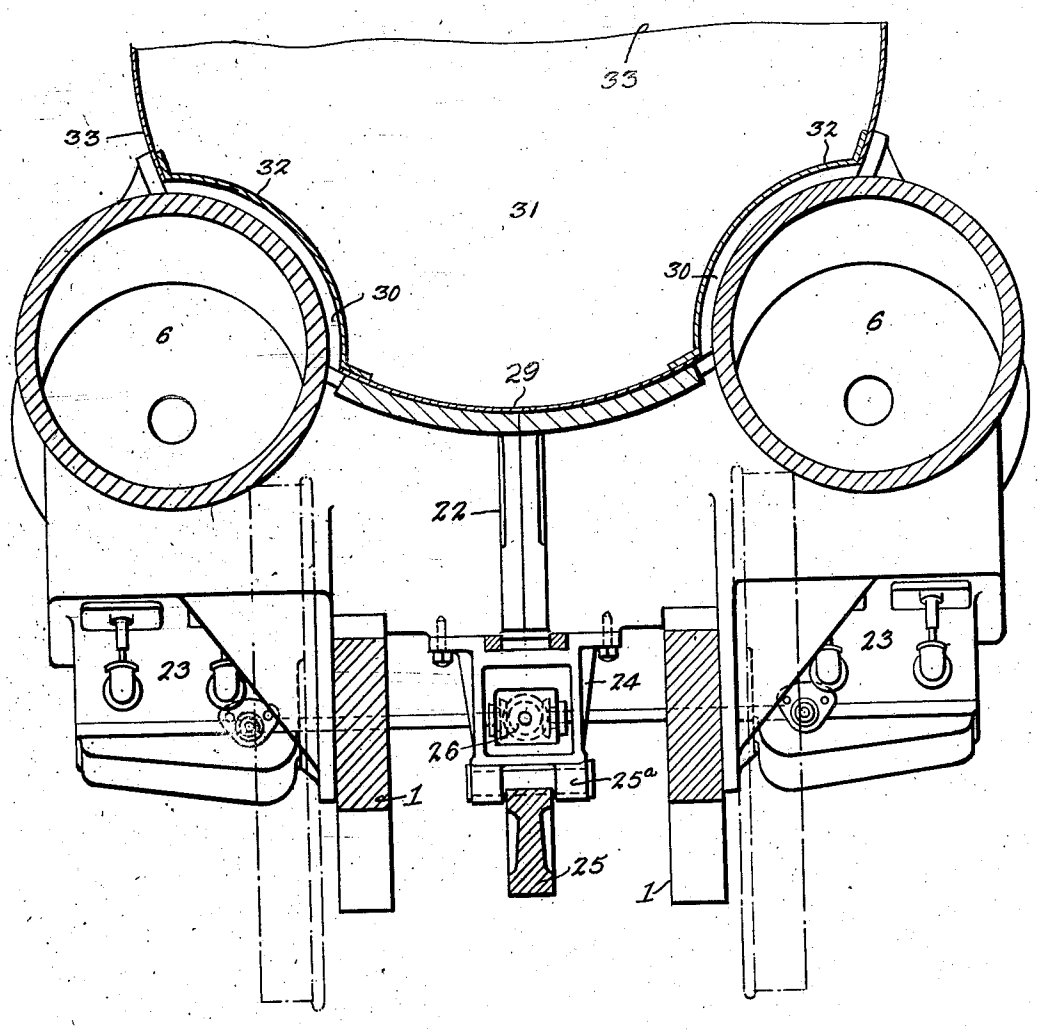
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LOCOMOTIVE

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Fig. 4.



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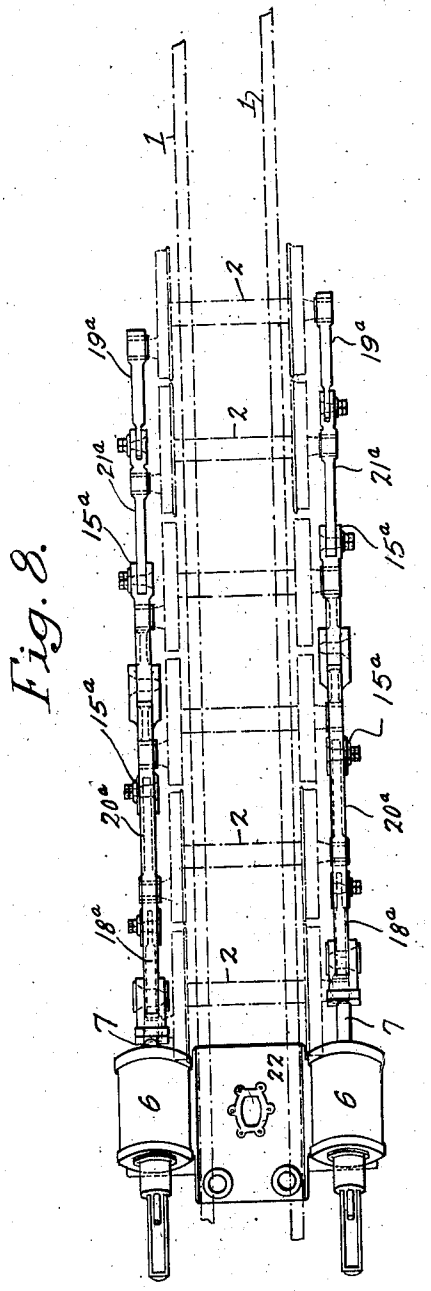


Fig. 8.

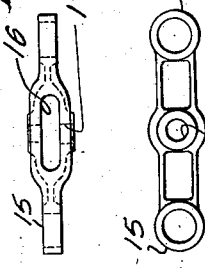


Fig. 7.

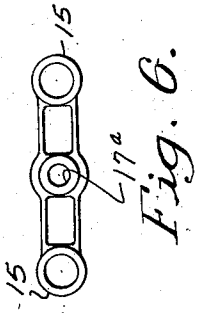


Fig. 6.

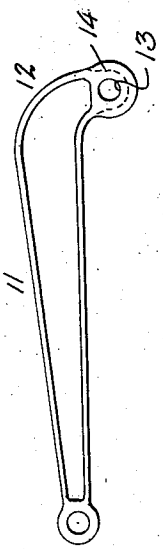


Fig. 5.

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1,765,251

UNITED STATES PATENT OFFICE

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LOCOMOTIVE

Application filed May 10, 1929. Serial No. 361,936.

Our invention relates to certain improvements in two-cylinder, non-articulated locomotives.

One object of our invention is to provide means whereby cylinders of large capacity can be used.

A further object of the invention is to so construct the locomotive that the vertical plane of travel of the main rod will be over the side rods.

And a still further object of the invention is to increase the size of the connecting rod and wrist-pin bearings.

In the accompanying drawings:

Fig. 1 is a side view of a locomotive, the wheels being shown by dotted lines to more clearly illustrate the invention;

Fig. 2 is a plan view, showing the cylinders and rods in full lines, and the frames, axles and wheels in dotted lines;

Fig. 3 is an enlarged partial side view of the locomotive;

Fig. 4 is a sectional view on the line 4—4, Fig. 3;

Fig. 5 is a detached side view of one of the main rods;

Fig. 6 is a side view of one of the main side rods;

Fig. 7 is a plan view of said main site rod; and

Fig. 8 is a view illustrating a modification of the invention.

Due to clearance limits, in width specially, the size of cylinders is limited, and when larger diameter cylinders are considered, the question of connecting rod and wrist pin bearings becomes a serious problem, since the clearance widths enter into this also.

In the usual construction, the main rod moves in an vertical plane alongside of the side rods, and the pin bearings of these rods have been a source of annoyance and expense on account of excessive bearing pressures of the modern locomotive.

In our construction, where the vertical plane of travel of the main rod is over and above the side rods, larger bearings for both the main rod and side rods are secured. This construction necessitates the location of the cylinders at an angle and at a much greater height than usual, and in order to allow for cylinders of increased size, the smoke-box is recessed at each side to receive the enlarged cylinders, as clearly shown in Fig. 4 of the drawings.

In the present instance, six pairs of driving wheels are proposed as the adhesive weight of these will be required to take care of the increased tractive power of larger cylinders, and the boiler is increased in capacity.

Referring to the drawings: 1—1 are the side frames of a locomotive. 2 are the axles which are adapted to boxes located between the pedestals 3 of the frames 1. The wheels 4, which are shown in dotted lines, are mounted on the axles 2, and each wheel has a wrist-pin 5.

The cylinders 6 are arranged at an angle as shown. A piston rod 7 has a cross-head 8 which is adapted to slide in ways 9. Pivotally connected to the cross-head 8 by a pin 10 is a main rod 11, made as shown in detail Fig. 5, the rod being curved at its outer end 12 and having an eye 13 provided with enlarged side wearing surfaces 14 which are adapted to the main side rod 15, shown in detail Fig. 7. The end with the enlarged side surfaces extends into a slot 16 in the main side rod 15, and a knuckle pin 17 extends through openings 17^a in the main side rod and through the eye 13 in the main rod 11. In some instances, this construction may be reversed and the main rod may have a jaw which fits over a single member, the main side rod having a single member instead of being provided with a slot.

The ends of the main side rod are coupled to the pins 5^a of certain wheels. The front rod 18 and the rear rod 19, as well as the intermediate rods 20 and 21, are shown as being each separately operating on the crank pins 5—5^a through the usual rod bushing.

In some instances, the main side rod 15 may be made as shown in Fig. 8, with jaw tight connections 15^a at each end which are connected to the intermediate side rods 20^a—21^a, and these again may have the usual stub connecting them to the front side rod 18^a and rear side rod 19^a.

The cylinders 6—6 form an integral part

of the saddle 22 which may be made in two parts as shown or may be made in a single casting, the saddle being secured to the side frames in any manner desirable. Under each cylinder, in the present instance, is a valve chest 23 having what is known as a "Caprotti" valve mechanism. The internal mechanism of this valve forms no part of the present invention.

Secured to the underside of the cylinder saddle 22 is a frame 24, carrying transverse pins 25ª, which forms the fulcrum for an equalizing beam 25. Within the frame is located the gearing 26 of the "Caprotti" valve mechanism. The equalizing beam 25 rests upon the truck 27 at the forward end of the locomotive and is coupled to the bar 28 of the equalizing mechanism of the locomotive.

It will be noted in referring to Fig. 4 that in order to properly locate the cylinders in the smoke-box 31 of the boiler 33, pockets 30 are formed in the shell 29 of the smoke-box 31, and these pockets are closed by curved plates 32.

While we have illustrated a locomotive having six pairs of driving wheels, any number of pairs of driving wheels may be used as the adhesive weight of the locomotive may warrant.

In the drawings two-wheel trucks are shown, but four-wheel trucks may be used if desired.

The valve gear shown in the drawings is known as a "Caprotti" valve gear. It will be understood that any suitable valve gear may be used without departing from the essential features of the invention.

It will be seen by the above construction that we are enabled to make a high pressure, two-cylinder, non-articulated locomotive of larger capacity than heretofore, and one which will be within the clearance limits.

We claim:

1. The combination in a locomotive, of a cylinder; a piston rod and a cross-head; a main side rod; and a main rod having its forward end connected to the cross-head and curved at the rear end and coupled to the middle of the main side rod and located in a vertical plane above the said side rod.

2. The combination in a locomotive, of a cylinder; a piston rod and a cross-head; a main side rod having a slot therein; a main rod pivoted at its forward end to the cross-head and having a depending portion at its rear end extending into the slot of the main side rod; and a knuckle pin connecting the main rod to the main side rod.

3. The combination in a locomotive, of a cylinder structure mounted on a frame and having two cylinders of large diameter; a boiler mounted on the frame and having a smoke box, said cylinders extending into pockets in the smoke-box, each cylinder having a piston rod and a cross-head; a main side rod located on each side of the locomotive outside of the frame thereof; and a main rod located in a vertical plane of travel above the side rod, the main rod being connected at its forward end to a cross-head and at its opposite end to a main side rod.

4. The combination in a locomotive, of main frames; a cylinder structure; two elevated cylinders arranged at an incline; a valve mechanism of the "Caprotti" type located under each cylinder; means for operating the said valve mechanism; a piston rod and a cross-head for each cylinder; a series of driving wheels; crank pins on the said wheels; side rods mounted on the crank pins; and a main rod connecting the cross-head with the main side rods, said main rod being located in the same vertical plane as the main side rods and located above said rods.

5. The combination in a locomotive, of main frames; a cylinder structure; two elevated cylinders arranged at an incline; a valve mechanism located under each cylinder; means for operating the said valve mechanism; a piston rod and a cross-head for each cylinder; a series of driving wheels; crank pins on the said wheels; side rods mounted on the crank pins; and a main rod connecting the cross-head with the main side rods, said main rod being located in the same vertical plane as the main side rods and located above said rods.

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