

over and between the two king-bolts of the intermediate truck.

The brake-cylinder 50 is of the usual construction, and for simplicity and ready access is mounted under the motor-engines, as shown in Figs. 1 and 4, the brake-levers 51 reaching from the cylinder to the central rods 52, connected with the truck, and which run parallel with the track, being situated directly under the central driving-shaft. By this arrangement they are accessible, clear of obstructions, and do not loosen or tighten on curves, since they draw directly from the truck-center.

The ash-pan 53 is fitted with an arch 54 in the bottom to clear the central shaft. On each side of the arch is arranged a suitable drop-door 53, provided with hinges and levers 56 for the purpose of operating them from the cab, if desired, the lever being locked by means of a latch 78. Evidently this device saves the laborious cleaning of the ash-pan by washing and scraping, as is common practice.

Fig. 13 shows the rear-truck brake device, which permits a free movement of the tender and trucks on sharp curves and uneven tracks without affecting the tension upon the brake-shoes or causing unnecessary movement of the brake-lever system. The brake-cylinder 58 is mounted upon the main frame 1 so its pivoted connection with one of the parallel rods 60' is opposite the link 12, connecting the tender-frame with the main frame. The end of the parallel rod 60 is pivoted to the main frame so the link is in line with the ends of both rods. The rods are also connected with a compensating bar 61. This bar is connected to an upright lever 59. The upright lever is pivoted at one end to the tender-frame. At the other end it is attached to a centrally-located brake-rod 62, operating the truck-brakes in the usual manner. Evidently any pull applied to one of the parallel rods is transmitted to the brake-rod 62, whatever the angular movement of the tender-frame. Furthermore, since a line drawn through the ends of the parallel rods 60 and 60' and the link 12 is practically parallel with the bar 61, thus the whole forms a parallelogram. Therefore the angular movement of the tender-frame about the link 12 as a center will not appreciably affect either the upright lever 59 or the brake-cylinder piston. The same results are obtained whether or not the rods 60 and 60' are on opposite sides of the link 12, so long as the parallelogram is not eliminated. If desired, the hand-brake 63 can be attached to the bar 61 and the rod 60' can be slotted to permit an independent action of the hand-brake. www.gearedsteam.com

These locomotives being extensively used in heavy timber, it is essential that sparks must not escape from the stack. For this purpose the cylindrical boiler-shell 73 is extended to provide extra room in the smoke-box 79, as shown in Figs. 16 and 17. The ex-

haust-nozzle 69 is situated at the lower side of the smoke-box, and directly over it is a short tube 70, which is provided with a suitable hood 71. The smoke-box is divided into two sections 80 and 81 by the removable partition 72. The exhaust-steam forces the products of combustion through the tube and against the hood, which deflects the current and causes the sparks or cinders to lodge in the pocket 81. The grating 74 prevents the current in its passage to the stack from lifting the cinders out of the pocket. Any suitable means may be provided for removing the accumulated cinders from the device.

What I claim is—

1. In a locomotive, the combination of a diamond-shaped main frame, trucks supporting each end thereof, and a centrally-located longitudinal driving-shaft connecting the trucks, substantially as described.

2. In a locomotive, the combination of a diamond-shaped main frame, trucks supporting each end thereof, engines mounted thereon, and arranged with their center lines at an angle to each other, and so that they project through the openings between the upper and lower members of the diamond main frame, substantially as described.

3. In a locomotive, the combination of a diamond main frame, swiveling trucks supporting the ends thereof, a tender-frame mounted upon a separate truck, and hinge-like connections between said latter truck and the main frame, substantially as described.

4. In a locomotive, the combination of a main frame, a swiveling truck at each end of the main frame, a boiler resting upon the frame, a centrally-located longitudinal shaft, motor-engines arranged at an angle to each other, and located essentially beneath the boiler but separate therefrom, and secured to the main frame, the said boiler being arranged within the angle and passing through the plane of the angle with its axis perpendicular to said plane, substantially as described. Geared Steam Locomotive Works

5. In a locomotive, the combination of a truck at each end of a main frame, a centrally-located longitudinal shaft connecting the pair of trucks, a second central shaft driving the tender or rear truck, a foot-plate connecting the back end of the main frame, and pivotally connected to the intermediate truck, forming a support for the fixed section of the second shaft, substantially as described.

6. In a locomotive mounted upon trucks, and having a centrally-located shaft connecting the trucks, the combination of diamond-shaped longitudinal main frames supported by the trucks, and motor-engines mounted in and projecting through the openings in the frames at an angle to each other, and having more than two cylinders acting upon a double-throw crank-shaft, substantially as described.

7. In a locomotive mounted upon trucks, and having a centrally-located shaft connecting the trucks, the combination of diamond-