

UNITED STATES PATENT OFFICE.

CHARLES L. HEISLER, OF PHILADELPHIA, PENNSYLVANIA.

LOCOMOTIVE.

SPECIFICATION forming part of Letters Patent No. 585,031, dated June 22, 1897.

Application filed November 26, 1894. Serial No. 529,997. (No model.)

To all whom it may concern:

Be it known that I, CHARLES L. HEISLER, a citizen of the United States, residing at Philadelphia, Philadelphia county, State of Pennsylvania, have invented certain new and useful Improvements in Locomotives, of which the following is a specification.

My invention relates to locomotives requiring great tractive power at moderate speed, for use in connection with roads having steep grades, sharp curves, and which are liable to have a very uneven road-bed; and my invention consists of special features and construction hereinafter pointed out.

Referring to the accompanying drawings, Figure 1 is a side view of a locomotive embodying my invention. Fig. 2 is a vertical cross-section at the rear of cab and middle of intermediate truck. Fig. 3 is a plan of circular king-bolt slots in foot-plate. Fig. 4 is a vertical cross-section in front of the dome, looking rearward. Fig. 5 is a plan of one of the trucks. Fig. 6 is a longitudinal section of the truck. Fig. 7 is a side view of the truck-frame. Fig. 8 is an end view thereof. Fig. 9 is a skeleton of the double crank, showing the manner of connecting the cylinders. Fig. 10 is a side view of the double crank. Fig. 11 is a side view of ash-pan. Fig. 12 is an end view thereof. Fig. 13 is a plan of tender-brake rig. Fig. 14 is a side view thereof. Fig. 15 is an end view thereof. Fig. 16 is a side view of the spark-arrester. Fig. 17 is an end view thereof. Geared Steam Locomotive Works

In Letters Patent of the United States No. 482,828, issued to me September 20, 1892, I show, describe, and claim several features common to the locomotive herein specified, so that my present invention principally embodies improvements and enlargements made upon the invention covered by the aforesaid Letters Patent. www.gearedsteam.com

To obtain great strength, lightness, simplicity, and to make the mechanism of the locomotive readily accessible, the main frame 1 is constructed of a pair of diamond-shaped side frames extending over the front and intermediate trucks 2 and 3. The side frames are connected at the front end by the usual cross-timber 4, and a saddle-casting 5, forming a support for the locomotive-boiler 6, and a pivot 7 for the front truck. At the back

end the side frames are connected by a heavy foot-plate 8, which forms a pivot 9 for the intermediate truck, also a shaft-bearing 10 and a pocket 11 for the heavy main link 12 and the two safety slotted links 13, which form a flexible connection between the main frame 1 and the tender-frame 14. The tender-frame is of the usual construction, carrying the tank and fuel, being pivotally mounted upon the back truck 15.

The boiler 6 is of the horizontal locomotive type, having a fire-box at the rear end, and which projects below the cylindrical shell thereof. The boiler is supported at the front end by the frame-saddle 5 and at the back end by suitable expansion-links in the usual manner. To avoid excessive heat and smoke in the cab from the fire-door 57, the jacketed boiler is made to extend entirely through the cab, so that the fire-door is outside and to the rear thereof. This arrangement permits the use of a much larger boiler without increasing the length of the main frame. This is an important feature, since the total length of the locomotive must be a minimum in order to readily pass the sharp curves. Moreover, because of the heavy duty required of these engines on mountain work the boiler's capacity must be a maximum. I do not broadly claim this arrangement of boiler and cab, but limit myself to its combination with the type of locomotive having a centrally-located longitudinal driving-shaft and that is mounted upon swiveling geared trucks.

The motor-engines 20 20' 20'' 20''' are mounted upon the main frame and essentially located under the cylindrical end of the boiler, between the fire-box and forward truck, as shown by Fig. 1, thus making it possible to obtain a deep and large fire-box, with ample space for ashes under the grates. This arrangement permits the use of a much larger boiler, thereby greatly increasing the power of the locomotive; moreover, makes possible a more uniform distribution of weights upon the trucks. Heretofore in locomotives of this type having a central longitudinal driving-shaft but two cylinder motor-engines were used and they were connected to a single crank. For the heavy locomotives it is necessary to have far greater cylinder-power in order to slip twelve drivers under the three