(No Model.)

2 Sheets—Sheet 1.

W. L. SYKES.

LOCOMOTIVE.

No. 387,266. Patented Aug. 7, 1888.

Fig. 1.

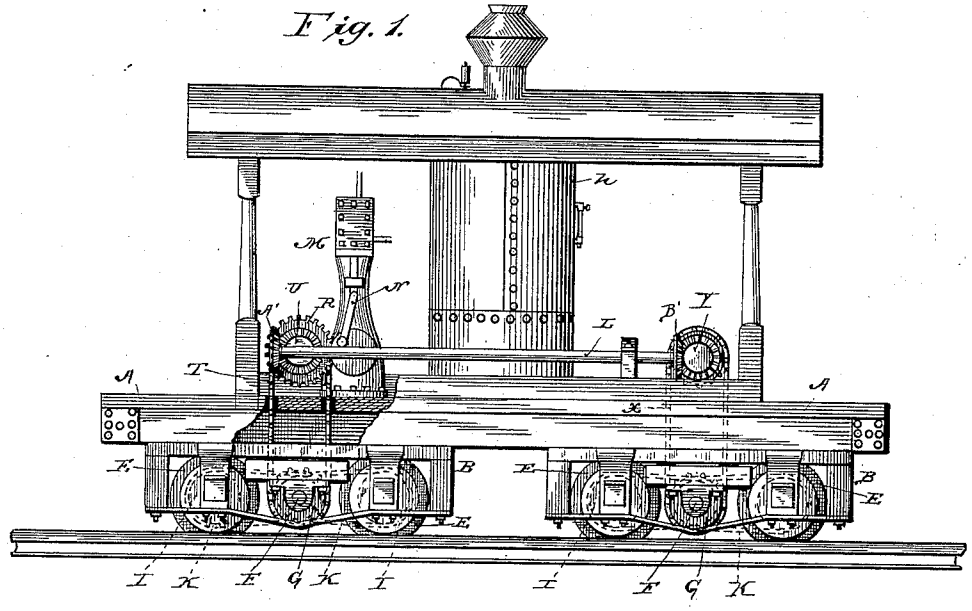
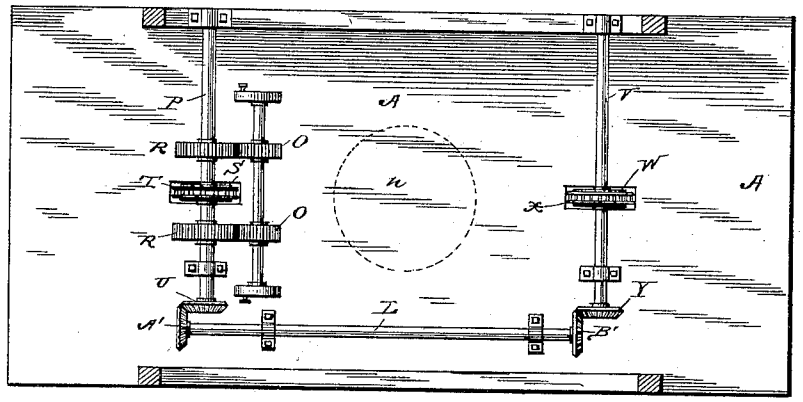


Fig. 3.



Witnesses,
William Keese.
George H. Lamar.

Inventor,
William L. Sykes,
by Schuyler Duryee.
his Attorney.

(No Model.) 2 Sheets—Sheet 1.

W. L. SYKES.

LOCOMOTIVE.

No. 387,266. Patented Aug. 7, 1888.

Fig. 1.

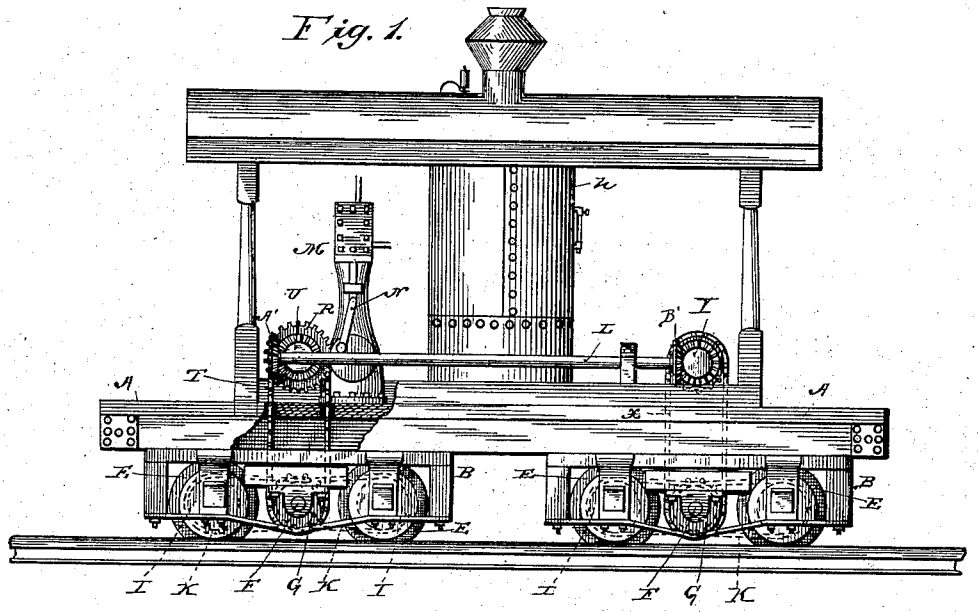
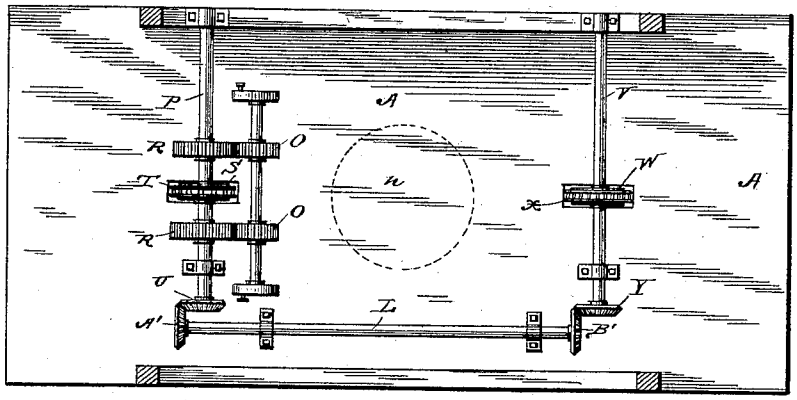


Fig. 3.



Witnesses,
Wallace Greene.
George H. Lamar.

Inventor,
William L. Sykes,
by Schuyler Duryee.
his Attorney.

(No Model.) 2 Sheets—Sheet 2.

W. L. SYKES.

LOCOMOTIVE.

No. 387,266. Patented Aug. 7, 1888.

Fig. 2.

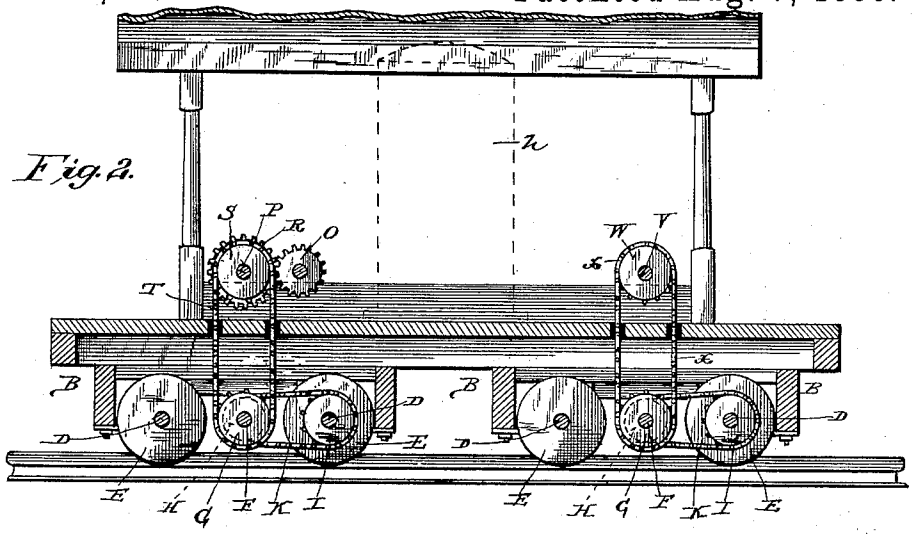
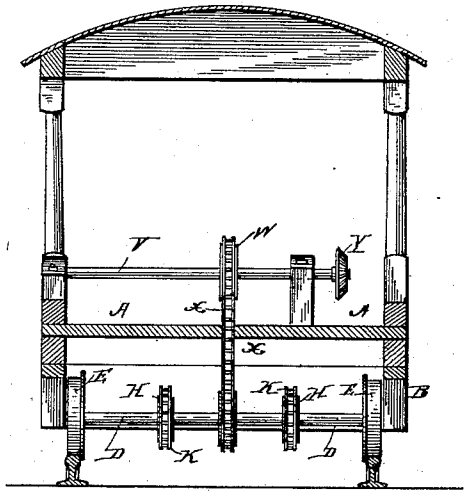


Fig. 4.



Witnesses.
Wallace Greene.
George H. Lawan.

Inventor,
William L. Sykes,
by Church & Curtis,
his Attorneys.

UNITED STATES PATENT OFFICE.

WILLIAM L. SYKES, OF ST. MARY'S, PENNSYLVANIA.

LOCOMOTIVE.

SPECIFICATION forming part of Letters Patent No. 387,266, dated August 7, 1888.

Application filed May 24, 1888. Serial No. 274,898. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM L. SYKES, a resident of St. Mary's, in the county of Elk and State of Pennsylvania, have invented certain new and useful Improvements in Locomotives; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

In the accompanying drawings, forming part of this specification, Figure 1 is a side elevation of a locomotive embodying my improvements. Fig. 2 is a vertical longitudinal central sectional view of the same. Fig. 3 is a horizontal sectional view of the same, taken on the line *x x* of Fig. 1. Fig. 4 is a vertical transverse sectional view taken on the line *y y* of Fig. 1.

A represents the body or platform of the locomotive, which is supported on trucks B, that are arranged under its ends and are pivoted on king-bolts in the usual manner. Each truck has a pair of axles, D, pivoted with the usual flanged wheels, E, that engage the track, and each truck is further provided with a shaft, F, that is journaled in suitable bearings and is arranged midway between the axles and parallel therewith.

To the center of each shaft F is rigidly secured a sprocket-wheel, G, of suitable size, and on opposite sides of said wheels G and at a slight distance therefrom are smaller sprocket-wheels, H. Each axle has a larger sprocket-wheel, I, rigidly secured thereto and in line with one of the sprocket-wheels H on the shaft, and said wheels H and I are connected by endless sprocket-chains K, as shown.

Arranged on the center of the body or platform is a boiler, *h*, which may be either vertical or longitudinal and of suitable pattern, and at one end of the platform is a pair of steam-engines, M, which may also be arranged either in a horizontal or in a vertical position.

The crank-shaft N of the engines has a pair of spur-pinions, O.

P represents a counter-shaft, which is journaled in suitable bearings on the platform, and is arranged directly over the shaft F of one of the trucks. The said shaft P has a pair of spur-wheels, R, which mesh with the pinions O, and to the center of said shaft is secured a sprocket-wheel, S, which is connected by an endless sprocket-chain, T, to the central sprocket-wheel G of the contiguous shaft F. On one end of said shaft P is keyed a miter gear-wheel, U. V represents a similar counter-shaft, which is journaled in suitable bearings near the opposite end of the platform. To the center of this shaft is keyed a sprocket-wheel, W, which is connected to the wheel G of the contiguous truck-shaft F by means of an endless sprocket-chain, X. One end of the said shaft V has a miter gear-wheel, Y.

L represents a longitudinal shaft, which is journaled in suitable bearings on the platform at one side thereof, and said shaft has a miter-wheel, A′, at one end, which meshes with the wheel U, and has a similar miter-wheel, B′, at its opposite end, which meshes with the wheel Y.

The operation of my invention is as follows: When the engines are in motion, the rotation of the crank-shaft N is transmitted to the shaft P by means of the gear-wheels O R. The miter-wheels U A′ impart corresponding rotary motion to the shaft L, and the miter-wheels B′ Y impart rotary motion to the shaft V, the said shafts P and V being driven at the same rate of speed. The endless sprocket-chains T X, which connect the wheels S W to the wheels G of shafts F, impart rotary motion to said shafts, and the latter being connected to the axles of the trucks by the wheels H I and sprocket-chains K, all of the axles of the locomotive are positively rotated, thereby causing the wheels E to exert the greatest possible amount of traction on the track, and consequently increasing the power of the locomotive to the maximum extent.

I do not desire to limit myself to the precise construction and arrangement of devices hereinbefore described, as it is evident that modifications may be made therein without departing from the spirit of my invention.

Having thus described my invention, I claim—

1. The combination, in a locomotive, of the trucks, each of which has the axles provided with driving-wheels, the shafts F, arranged midway between the axles, the endless chains and sprocket-wheels connecting the said shafts F and axles, the counter-shafts arranged on the platform of the locomotive directly above

the shafts F, the endless chains and sprocket-wheels connecting said counter-shafts and shafts F, connections between said counter-shafts, whereby they are caused to rotate in unison, and the engines connected to one of the counter-shafts, substantially as described.

2. In a locomotive, the combination of the platform or frame, the pivoted trucks under the same, each truck having the pair of wheeled axles, the shaft F, midway between the axles, and sprocket-wheels and chains connecting said shaft and axles, and the counter-shafts arranged directly above the shafts F and connected thereto, and means, substantially as set forth, to rotate the said counter-shafts, whereby all the axles of the trucks will be positively impelled, substantially as described.

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

WILLIAM L. SYKES.

Witnesses:
N. T. ARNOLD,
W. W. BARBOUR.