E. Coleman,

Inclined Railroad,

No. 4,342, Patented Dec. 31, 1845.

Fig. 1

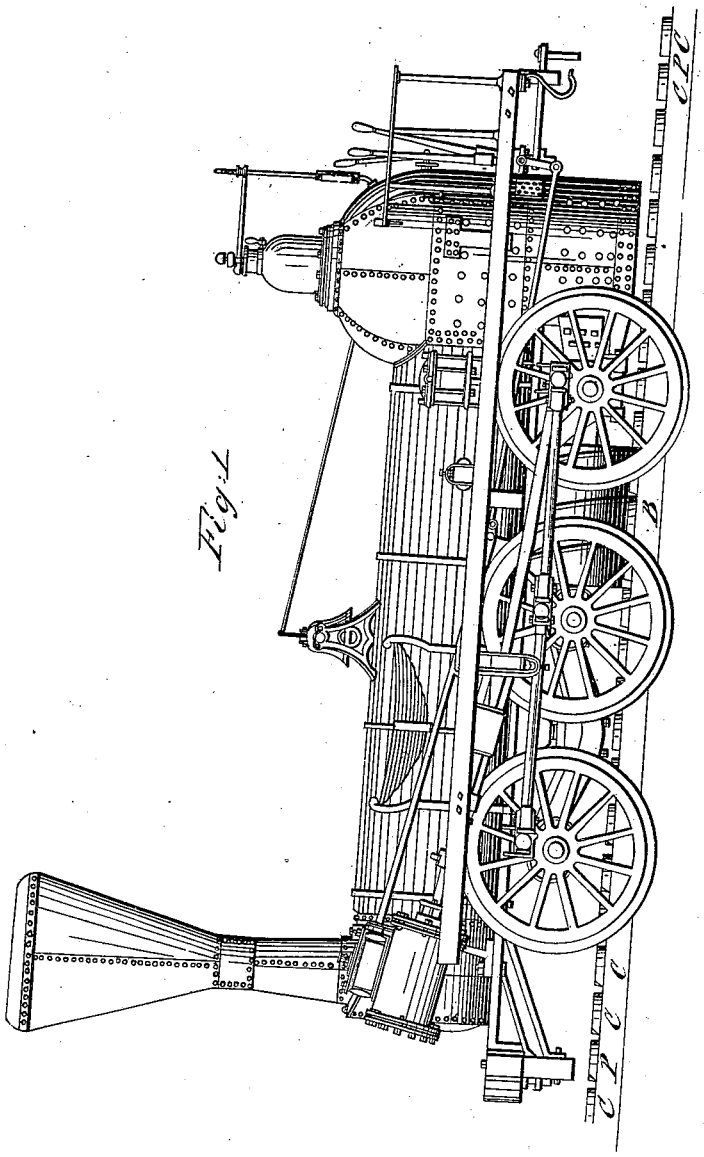


Fig. 2

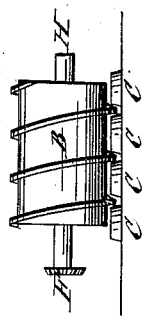
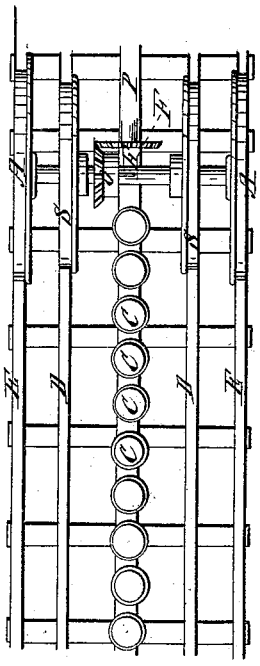


Fig. 3



UNITED STATES PATENT OFFICE.

EZRA COLEMAN, OF PHILADELPHIA, PENNSYLVANIA.

LOCOMOTIVE FOR ASCENDING AND DESCENDING INCLINED PLANES.

Specification of Letters Patent No. 4,342, dated December 31, 1845.

To all whom it may concern:

Be it known that I, EZRA COLEMAN, of the city of Philadelphia and State of Pennsylvania, have invented a new and improved attachment to locomotives and sundry additions to the inclined planes of railroads whereby locomotives with the said attachment appended to them are enabled to ascend and descend inclined planes with such loads as may be attached to them without any extra or additional aid.

I do hereby declare the following to be a full and exact description of my invention, reference being had to the accompanying drawings, making a part of this specification.

Figure 1, is an elevation of a locomotive having my new and improved attachment, resting upon an inclined plane having my new additions.

Fig. 2, is an elevation of an endless screw, B, its shaft H, passing through the same, and a cogged wheel F, upon the shaft; also, a small number of friction rollers C, C, between which the thread of the endless screw works when in motion.

Fig. 3, is a ground plan of my improved railroad for ascending and descending inclined planes, with the driving shaft and wheels of a locomotive resting upon the same; and also showing the connection between the endless screw B, and the driving shaft.

Upon the main driving shaft of the locotive, there is placed a cog wheel O, secured to the same by a feather and groove, which can be moved upon the shaft and be thrown into or out of gear with the cog wheel F, (upon the shaft of the endless screw) by means of a forked lever constructed in the usual manner, and placed at the control of the engineer. Underneath the locomotive the endless screw B, is suspended, lengthwise and parallel with the same, and firmly and strongly secured to the frame of the locomotive by braces, &c., in any known or usual manner, so as to revolve in boxes at each end of its shaft. Inside of the driving wheels A, A, are placed two smaller wheels S, S, which revolve loosely upon the driving shaft.

My additions to the rail-road for ascending and descending inclined planes, consists of an inner track of rails D, D, placed a short distance within the main track E, E, and elevated a few inches above the same. I also add an improved rack, consisting of a single line of broad rail P, or a strong course of timber or stone surmounted with iron plates, elevated a short distance above the inner track of rails D, D, and running parallel with the same, centrally between them; this central rail or beam is surmounted with revolving teeth or friction rollers C, C, arranged at such equal distances from each other, that the thread of the endless screw, as it revolves, will work freely into the spaces between them, bearing equally upon each roller. The improved rack must be continued for a considerable distance upon the summit level at the head of the inclined plane, a distance equal to the longest train of cars that will ever be required to be drawn up the same. When the locomotive with my new attachment, approaches the inclined plane of a rail-road having my additions, the inner wheels S, S, mount the inner track of rails D, D, which lifts the outer driving wheels A, A, from the main track of rails (E, E,); at the same time the thread of the endless screw B, winds between the friction rollers C, C; the cog wheel O, is then thrown into gear with the cog wheel F, and the whole power of the engines is then thrown upon the driving shaft and by that transmitted to the endless screw; the thread of the endless screw working between and bearing against the friction rollers, carries the locomotive and whatever load may be attached to the same, up the inclined plane, and in a similar manner takes the same down an inclined plane, with certainty and safety. Should the steam be shut off and the engines stopped at any point either in ascending or descending an inclined plane, the endless screw and friction rollers will retain the entire load bearing upon the same, stationary, with perfect safety. The thread of the endless screw may embrace as many friction rollers at the same time as safety may require. When a locomotive reaches the foot of an inclined plane the endless screw is thrown out of gear.

Having thus fully described the nature and operation of my invention, what I claim as new therein and desire to secure by Letters Patent, is—

The placing an independent set of bearing wheels within the frame of the locomotive, revolving loosely upon the main driving shaft, and adapted to an inner extra track of rails (raised above the main track),

for the purpose of sustaining the weight of the locomotive in ascending or descending inclined planes, lifting the driving wheels from the main track of rails, and rendering the action of the driving shaft independent of the bearing or driving wheels when it is desired to transfer the whole power of the locomotive steam engines from the driving wheels to the endless screw geared to the driving shaft and its thread working into a rack of friction rollers; the whole arranged, combined and operating substantially in the manner and for the purpose herein set forth.

EZRA COLEMAN.

Witnesses:
LOUIS U. LANE,
GANSWOORT MELVILLE.