J. H. SWETT.

TRACTION ENGINE.

No. 185,653. Patented Dec. 26, 1876.

Fig. 1.

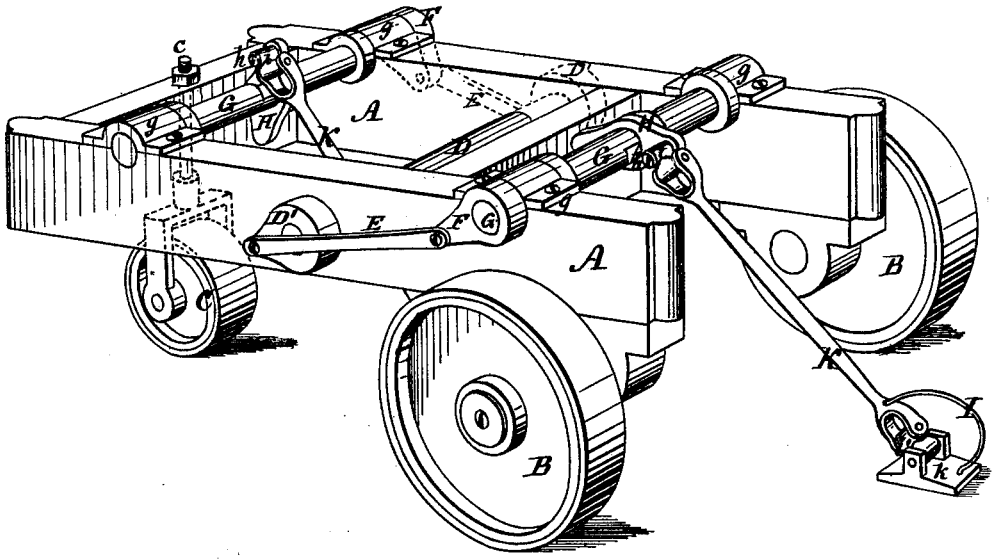
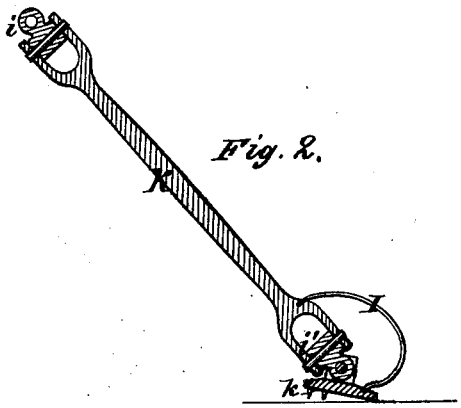


Fig. 2.



Witnesses:

W. R. Edelen.

W. E. Coffee

Inventor:

James H. Swett,

by E. E. Masson

atty.

UNITED STATES PATENT OFFICE.

JAMES H. SWETT, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN TRACTION-ENGINES.

Specification forming part of Letters Patent No. **185,653**, dated December 26, 1876; application filed November 13, 1876.

To all whom it may concern:

Be it known that I, JAMES H. SWETT, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Traction-Engines; and that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents the traction-engine in perspective. Fig. 2 represents a vertical section through one of the pushing-rods and the universal joints that connect it to its rock-shaft, and also to its spring-shoe.

Similar letters of reference, where they occur, denote like parts in both figures.

My invention relates to that class of traction-engines in which a portable steam-engine is placed upon a frame, generally mounted on wheels, and propels itself by means of pushing rods or legs, operated alternately through the medium of rock-shafts connected to the main driving-shaft.

My invention consists in providing each of the pushing-rods with a universal or tumbling joint, both at or near the point where it is connected to the rock-shaft, and at or near the point where it is connected with the shoe, so that the apparatus can be turned within its own length, if necessary.

My invention consists, also, in providing the shoe of each pushing-rod with a spring, connected at one end to the pushing-rod, so that the front of the shoe will be taken off the ground and raised each time that the shoe is advanced for a new hold, as will be hereafter described.

To enable others skilled in the art to make and use my invention, I will proceed to describe the same with reference to the drawings.

A represents a rectangular frame, that can be used to carry the boiler and engine furnishing the power required. B represents the rear wheels, each having a broad face, not liable to sink in soft ground. C represents the front wheel, that may be a caster-wheel, easily turned around from above the frame, or a pair of front wheels, connected to a central vertical pin, *c*, or otherwise connected so that the apparatus can be guided. As it is intended for use mainly as a traction-engine, to draw a gang of plows in large fields, the main requisite is power in preference to speed. Motion is transmitted from the engine to the main driving-shaft D, upon which are mounted, at each extremity, and at right angles to each other, the cranks D′. These cranks are united, by means of connecting-rods E, with the cranks F of two rock-shafts, G, located, one in front and one in the rear of the shaft D. The cranks D′, being made shorter than the cranks F, attached to the shafts G, will, in rotating, cause the latter to simply oscillate in their bearings *g*. Each shaft G carries one or more double cranks or yokes, H, between the bearings *g*, and to each crank is pivoted, at *h*, the universal joint *i*, to which is hinged the forked rod K, that is used to push or advance the vehicle. To the rear extremity of the rod K is attached, by means of another universal joint, *i′*, the shoe *k*, that rests upon the ground. This shoe may be provided with spikes or projections, to enter the ground and retain it immovable while the crank H is descending; but it is important that the spikes or projections of the shoe should be lifted off the ground before advancing for a new retaining hold; otherwise they would act as retaining-anchors and retard the advance of the vehicle. To release and lift the front of the shoe, I connect the rear or heel of it with the rod K by means of an expansive spring, I, to tilt the front of the shoe upward, and cause it to rest or drag on its heel as soon as the rod K begins to advance and the crank H is ascending. If a series of cranks are placed upon each rock-shaft G, and they are arranged at different angles in relation to each other, the result will be a continuous progressive motion of the vehicle. This vehicle can be turned within a short radius, or within its own length, by turning the front wheel or wheels *c* in the direction that it is intended to turn, and inclining the rod K, or a series of them, in the opposite direction. This can be accomplished by the driver from the top of the vehicle by means of levers suitably connected, and the universal joints *i i′* will allow the shoe *k* to rest squarely upon the ground. The rods K, operated by the oscillating yokes H,

have a tendency to raise the weight of the vehicle off the wheels, and remove one of the obstacles to plowing with steam traction-engines, in which the ground is so compressed in the track of the wheels that the succeeding plowing cannot restore the soil to that light condition necessary to the growing of plants. The compression produced by the shoes *k* is slight, if there are many of them, and if they are armed with spikes the ground will be pulverized more than compressed.

Having now fully described my invention, what I claim as my invention is—

1. In combination with the rock-shaft G of a traction-engine, its crank H, pushing-rod K, and shoe *k*, the universal joints *i i'*, to connect said rod K with the rock-shaft and the shoe *k*, substantially in the manner shown and described.

2. In combination with the pushing-rod K and shoe *k* of a traction-engine, the spring I, located substantially as and for the purpose described.

JAMES H. SWETT.

Witnesses:
E. E. MASSON,
W. R. EDELEN.