

D. Teeter,
Rotary Steam Valve.

N^o 37,596.

Patented Feb. 3, 1863.

Fig. 1

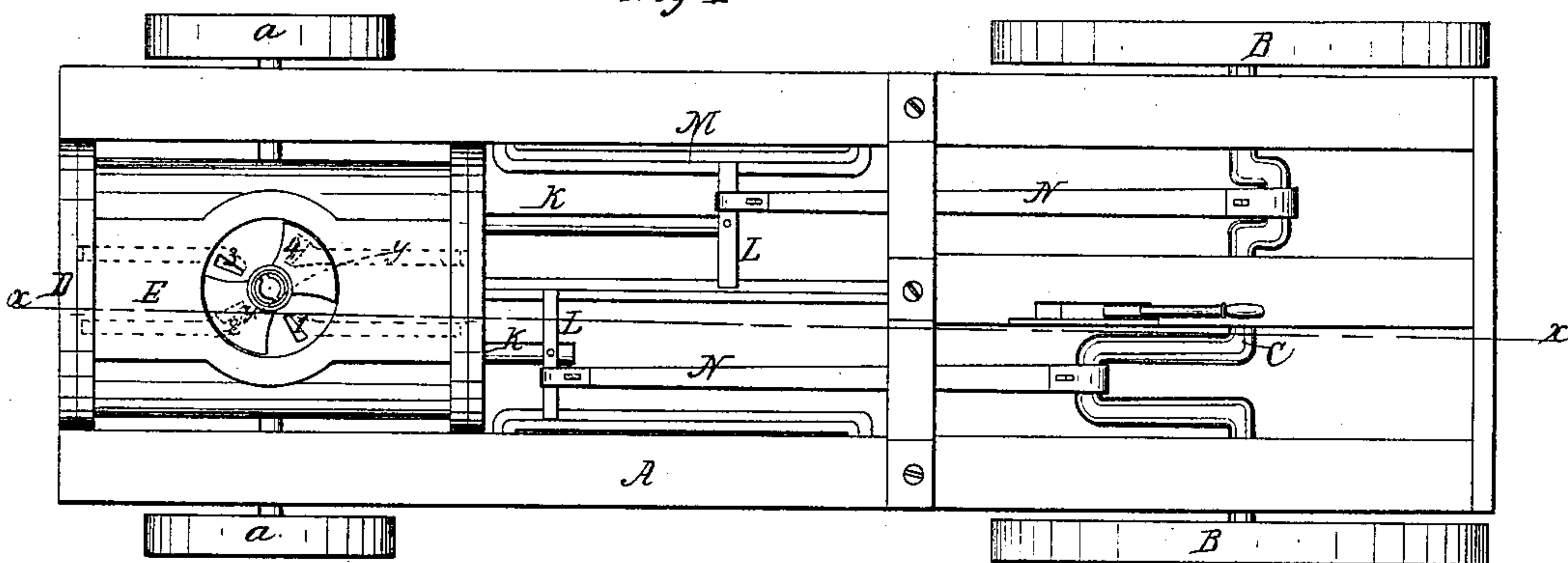


Fig. 2

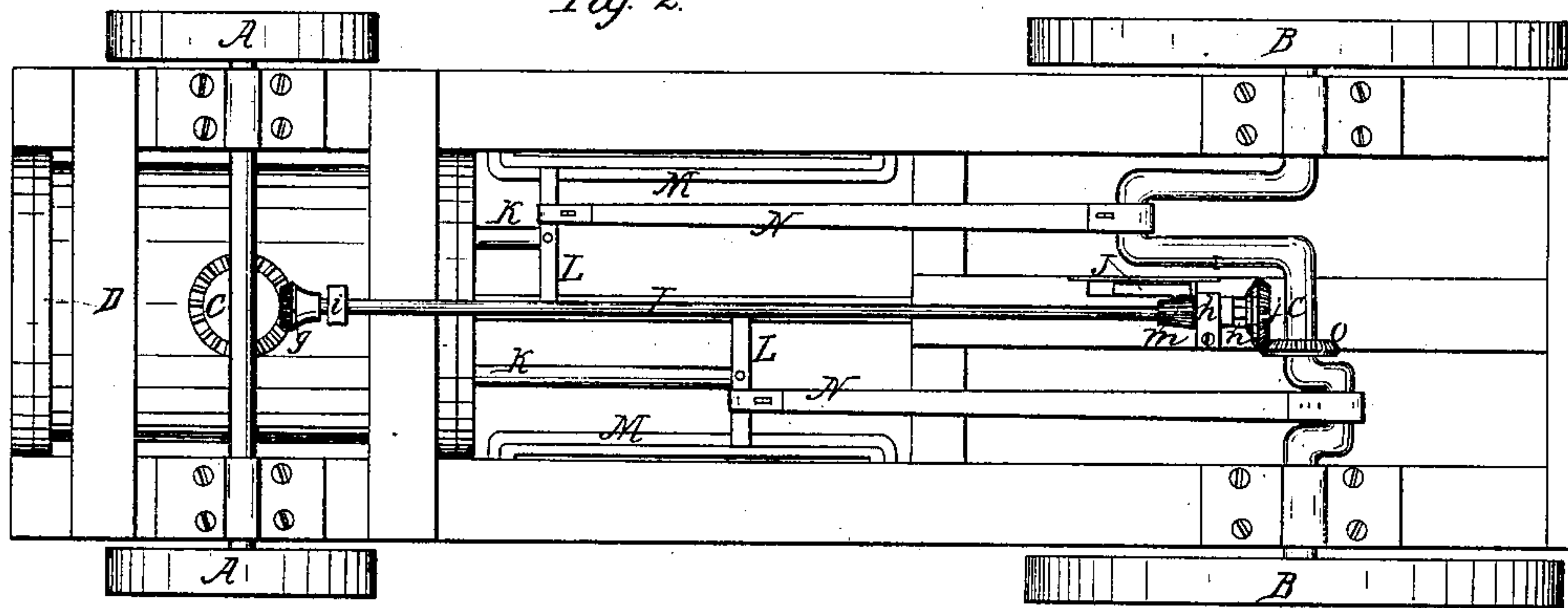


Fig. 5

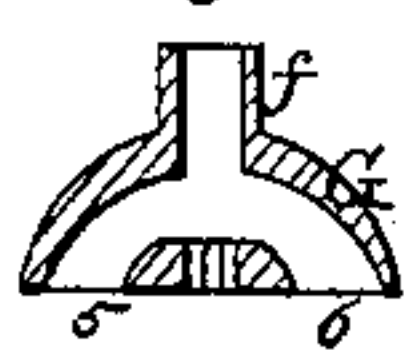


Fig. 4



Fig. 6

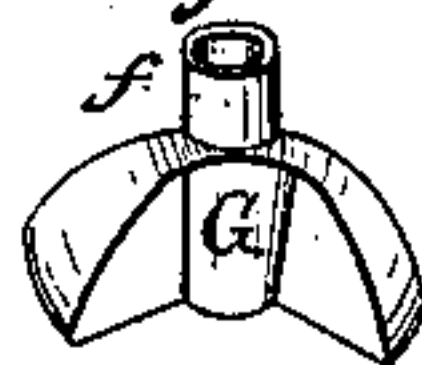


Fig. 3

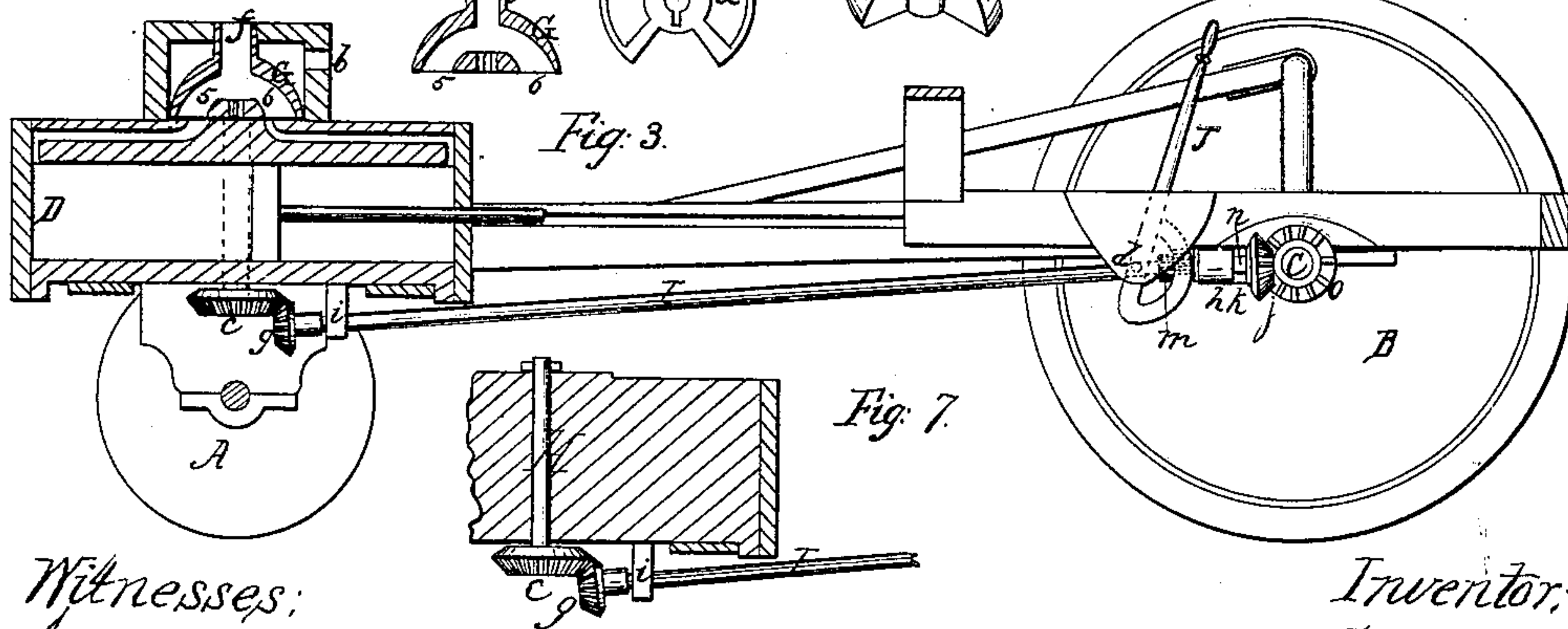
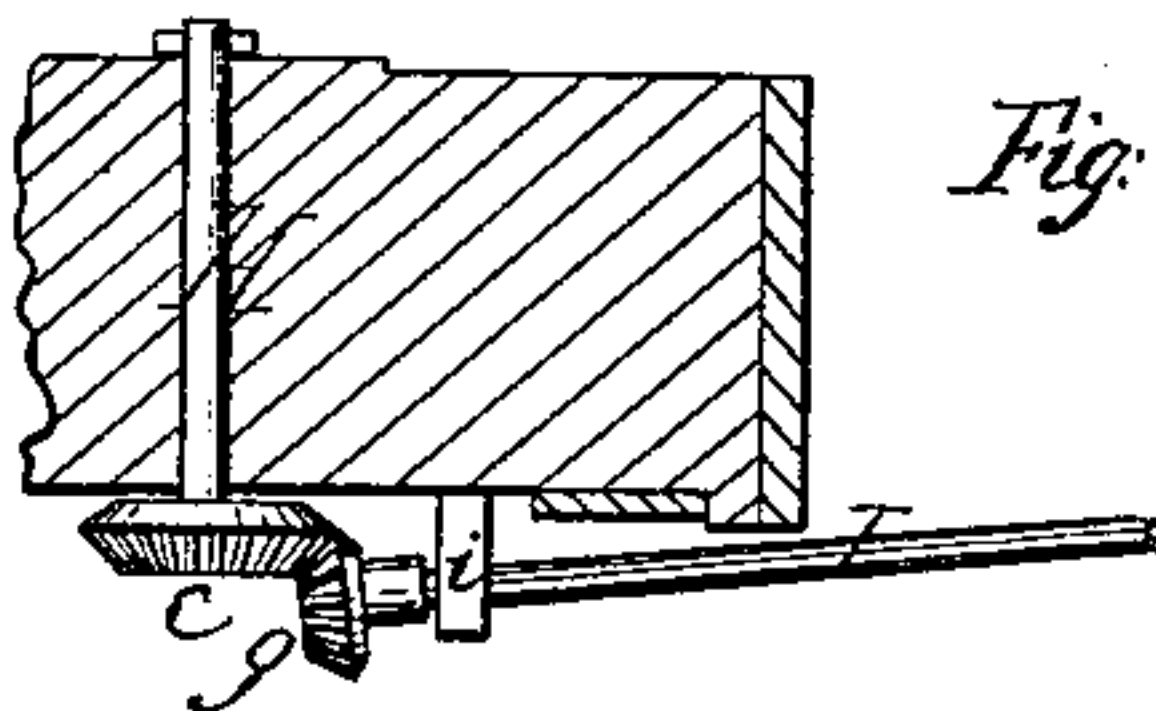


Fig. 7



Witnesses:

James H. Gidley
John B. Paulson

Inventor:

Daniel Teeter
Per Atty. & Co.

UNITED STATES PATENT OFFICE.

DANIEL TEETER, OF HAGERSTOWN, INDIANA.

IMPROVEMENT IN VALVES FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. 37,596, dated February 3, 1863.

To all whom it may concern:

Be it known that I, DANIEL TEETER, of Hagerstown, in the county of Wayne and State of Indiana, have invented certain new and useful Improvements in Double-Acting Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents a plan or top view of an engine embodying my invention, the steam-chest being removed to show the rotary valve. Fig. 2 is an under side view or inverted plan of the same. Fig. 3 is a vertical longitudinal section in the line *x x* of Fig. 1, of everything except the valve and steam-chest, which are shown by a section in the line *y y* of Fig. 1. Fig. 4 is an under side view, and Fig. 5 is a sectional elevation of the valve.

Similar letters of reference indicate corresponding parts in the several figures.

This invention consists, first, in the combination of a peculiarly-constructed rotary valve with the steam or ingress and egress ports of a double cylinder, when the said steam-ports are arranged in the manner and for the purpose hereinafter to be fully explained; second, in an arrangement of mechanism for imparting motion to the rotary valve; third, in certain means provided for changing the relative position of the valve on its seat, thereby adapting the engine for movement in either direction, as will be hereinafter fully explained.

To enable others skilled in the art to fully understand and use my invention, I will proceed to describe its construction and operation.

In the accompanying drawings my invention is represented as applied to a land-carriage or locomotive.

A represents an oblong rectangular frame, which is supported at its forward and rear ends, respectively, on trucks *a a* and propelling or driving wheels B B, which latter are secured on opposite ends of an axle, C, which is offset in two places, said offsets being at right angles with each other and forming what is usually termed a "double-crank axle."

D is a double cylinder, which is furnished on its upper and lower sides with flat and parallel surfaces; the upper flat surface, E, having attached to it by bolts or otherwise a steam-chest, F, (shown in Fig. 3,) within which and

covering ports in the flat surface inclosed is arranged a peculiar-shaped rotary valve, G. The form of this valve, both internally and externally, is clearly illustrated by Figs. 4, 5, and 6 of the drawings.

The steam-chest F is furnished in one side with an opening, *b*, for the ingress of steam from the boiler to drive the engine, and one in the center of its top for the escape of steam after it has expended its propulsive force. That portion of the flat surface E inclosed within the steam-chest, and forming a valve-seat, is provided with four radial openings or ports, 1 2 3 4, (being shown by dotted and full lines in Fig. 1,) of equal size and opening into passages which lead to the ends of the chambers of the double cylinder, thereby forming a communication between the steam-chest and chambers at each end of the double cylinder.

The radial ports 1 2 3 4 in the valve-seat are situated thus: Suppose a circle to be described so as to touch the outer extremities of each of these ports. Divide this circle into eight equal parts, then one of these parts will be included between 2 and 3, two of them between 1 and 2, and also between 3 and 4, and three of them will be included between 1 and 4.

G is a rotary valve, its form, externally, being that of a conic frustum terminating at top in a tube, *f*, the outside of which is turned and fitted in the opening in the top of the steam-chest, forming thereby a gudgeon for the upper end of the valve G, the gudgeon for the lower end or face being formed by the upper end of a spindle, H, (shown by dotted lines in Figs. 3 and 7,) which, being provided with a T-head, which is fitted in a recess in the valve, serves both as gudgeon and means of transmitting motion to the valve. The tube, internally, communicates with the ports 5 and 6 in the valve, and with them forms the escape or exhaust pipe of the engine. These ports 5 and 6 in the valve G are directly opposite to each other, of equal size, and occupy about sixty degrees or one-sixth of a circle each. The spindle H is journaled in two boxes or bearings, which are formed in the metal uniting together the two cylinders or chambers. The lower end of the spindle H has attached to it a beveled cog-wheel, *c*, which meshes into and receives motion from a pinion, *g*, on the end of shaft I, said pinion *g* being equal to one-half the di-

ameter of the beveled cog-wheel *c*. The shaft I is journaled near its opposite ends in two boxes, *h i*, which depend from the central beam of the frame and lower flat surface of the double cylinder, respectively. On the end of the shaft I, opposite to that to which the pinion is secured, is loosely fitted a miter cog-wheel, *j*. This wheel is provided with a hub which precedes it on the shaft, and has cut in it a radial mortise, *k*, extending around it a little more than half of its circumference, for the purpose of allowing the shaft I, to which the cog-wheel imparts motion through the medium of a pin, *n*, working in the said radial mortise, to make a partial revolution independent of or without turning the cog-wheel *j*, thereby allowing the relative position of the valve to be changed on its seat, so as to reverse the motion of the engine. This turning of the shaft I so as to reverse the engine is effected by means of a segment-lever, *J*, which vibrates upon a pivot, *d*, and has its segment portion provided with cog-teeth adapted to mesh into the teeth of pinion *m*. There should be just a sufficient number of cog-teeth in the segment to move the shaft I half of a revolution when the lever is adjusted as far as it can be in either direction. The pinion or miter-wheel *j* meshes into a similar gear-wheel, *O*, on crank-axle *C*, and conveys motion from the latter through the shaft and gearing, before described, to the rotary-valve.

K L M N represent, respectively, the piston-rods, cross-heads, guide-ways, and pitmen or connecting-rods, all of which may be of customary construction, and therefore need not be more specifically referred to here.

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

1. The rotary-valve *G*, constructed as herein represented and described, in combination with the steam-ports 1 2 3 4 in the valve-seat of the double cylinder *D*, when said ports are arranged and the rotary valve adapted to operate in connection with them in the manner and for the purpose set forth.

2. The T-headed spindle *H*, beveled cog-wheels *c g*, and shaft *I*, in combination with the loosely-fitted beveled gear-wheel *j*, feather *n*, and gear-wheel *O*, when arranged in the manner and for the purpose specified.

3. The bevel pinion *j*, fitted loosely on the end of shaft *I* and attached to it by means of a feather or pin, *n*, fitting a radial mortise in the hub of the pinion *j* in the manner described, in combination with the fixed cog-wheel *m* and toothed segment-lever *J*, adapted for reversing the motion of the engine by changing the relative position of the valve on its seat, substantially as described.

Attest: DANIEL TEETHER.

JOHN FINLEY,
GEORGE TAYLOR.