2 Sheets--Sheet 1.

# J. W. MURPHY.

## Device for Increasing Traction of Locomotives.

No. 164,863. Patented June 22, 1875.

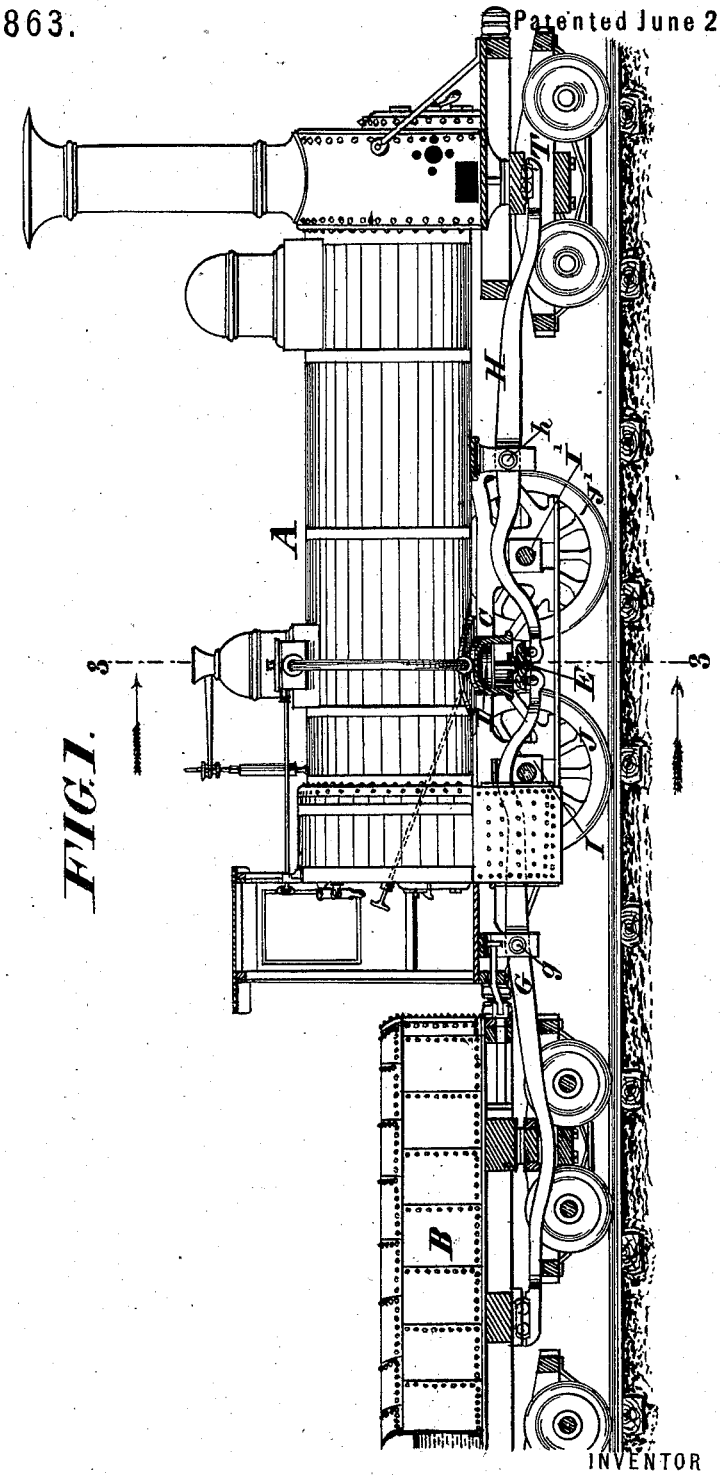


FIG. 1.

WITNESSES

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2 Sheets--Sheet 2.

# J. W. MURPHY.

## Device for Increasing Traction of Locomotives.

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FIG. 2.

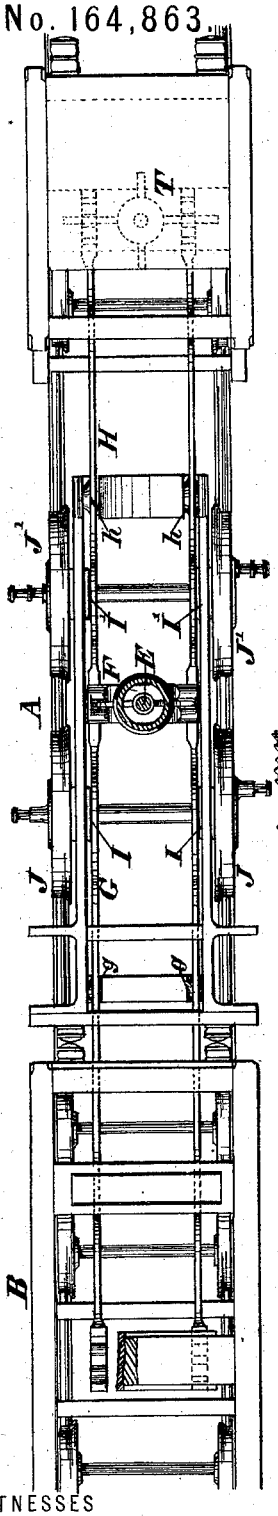
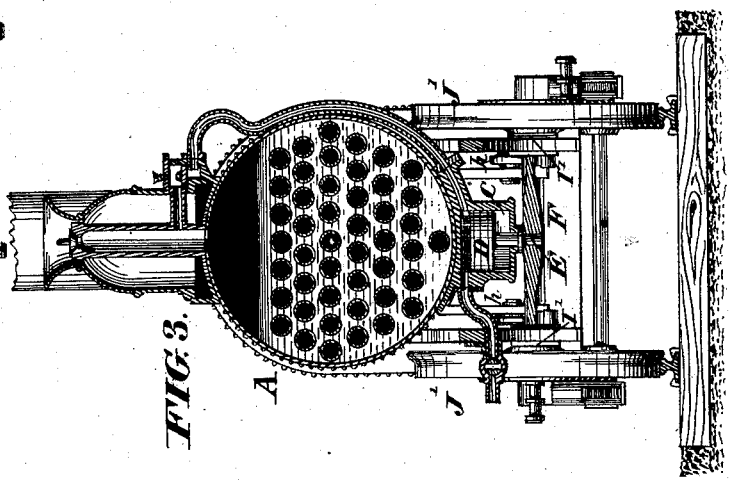



FIG. 3.




WITNESSES

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# UNITED STATES PATENT OFFICE.

JOHN W. MURPHY, OF BALTIMORE, MARYLAND.

## IMPROVEMENT IN DEVICES FOR INCREASING TRACTION OF LOCOMOTIVES.

Specification forming part of Letters Patent No. **164,863**, dated June 22, 1875; application filed December 10, 1874.

*To all whom it may concern:*

Be it known that I, JOHN W. MURPHY, of Baltimore, in the State of Maryland, have invented a new and useful Device for Increasing the Traction of Locomotives, of which the following is a specification:

My invention relates to a device for increasing the traction of locomotive-engines; and it consists in the combination of a vertical cylinder and piston, a cross-head, and a system of levers, by which a portion of the weight of the tender, or of the front of the locomotive, or any other adjacent load, can be transferred to the driving-wheels, so as to increase their pressure upon the rails.

In the accompanying drawing, Figure 1 is a sectional elevation of a locomotive and tender, illustrating the application of my invention. Fig. 2 is a plan of the running-gear of the same. Fig. 3 is a vertical transverse section on the line 3 3, Fig. 1.

My invention may be applied to a locomotive, A, and tender B of common form. C represents a steam-cylinder, with a piston, D, working vertically therein. The rod E is connected with cross-heads F, which bear upon the adjacent ends of two pairs of levers, G H, fulcrumed at *g h*, respectively. The free ends of the levers G engage beneath the frame of the tender B. The free ends of the levers H are connected with the truck T, or other suitable part of the front of the locomotive. At any convenient points between the fulcrums *g* and the forward ends of the levers G, to which the power is applied, the said levers bear upon the boxes I of the driving-wheels J. In like manner the levers H, at points between the fulcrums *h* and the rear ends of the said levers, to which power is applied to them, bear upon the boxes I′ of the driving-wheels J′.

Steam is admitted to the upper end of the cylinder C above the piston D, at the will of the engineer, by a suitable valve-connection, and it may be exhausted into the atmosphere. The lower end of the cylinder may be open to the air, though these details are not essential to my invention.

When it is desired to increase the traction upon the driving-wheels, steam is admitted to the upper end of the cylinder C, so as to bear down upon the adjacent ends of the levers G H with any desirable force.

It will appear that, by reason of the longer arms of the levers resting beneath the superincumbent weight of the tender and the front part of the locomotive, and the relative positions of the bearings of the driving-wheels, the fulcrums *g h* and the adjacent ends of the levers G H, to which the power is applied, the weight of the tender and of the front of the locomotive is caused to act upon the bearings of the axles with a powerful leverage, so that, through the agency of the steam-piston D, a great increase of pressure can be applied by a slight movement of the piston D, without impairing the steadiness upon the track of the tender B or the truck T, on which the front of the locomotive rests.

I claim as new and of my invention—

1. The combination of vertical cylinder C, piston D E, cross-head F, and longitudinal levers G G, substantially as and for the purpose set forth.

2. The combination of the cylinder C, piston D E, cross-head F, and two sets of levers, G G H H, substantially as and for the purposes set forth.

JOHN W. MURPHY.

Witnesses:
PATRICK A. MCCALL,
OCTAVIUS KNIGHT.