

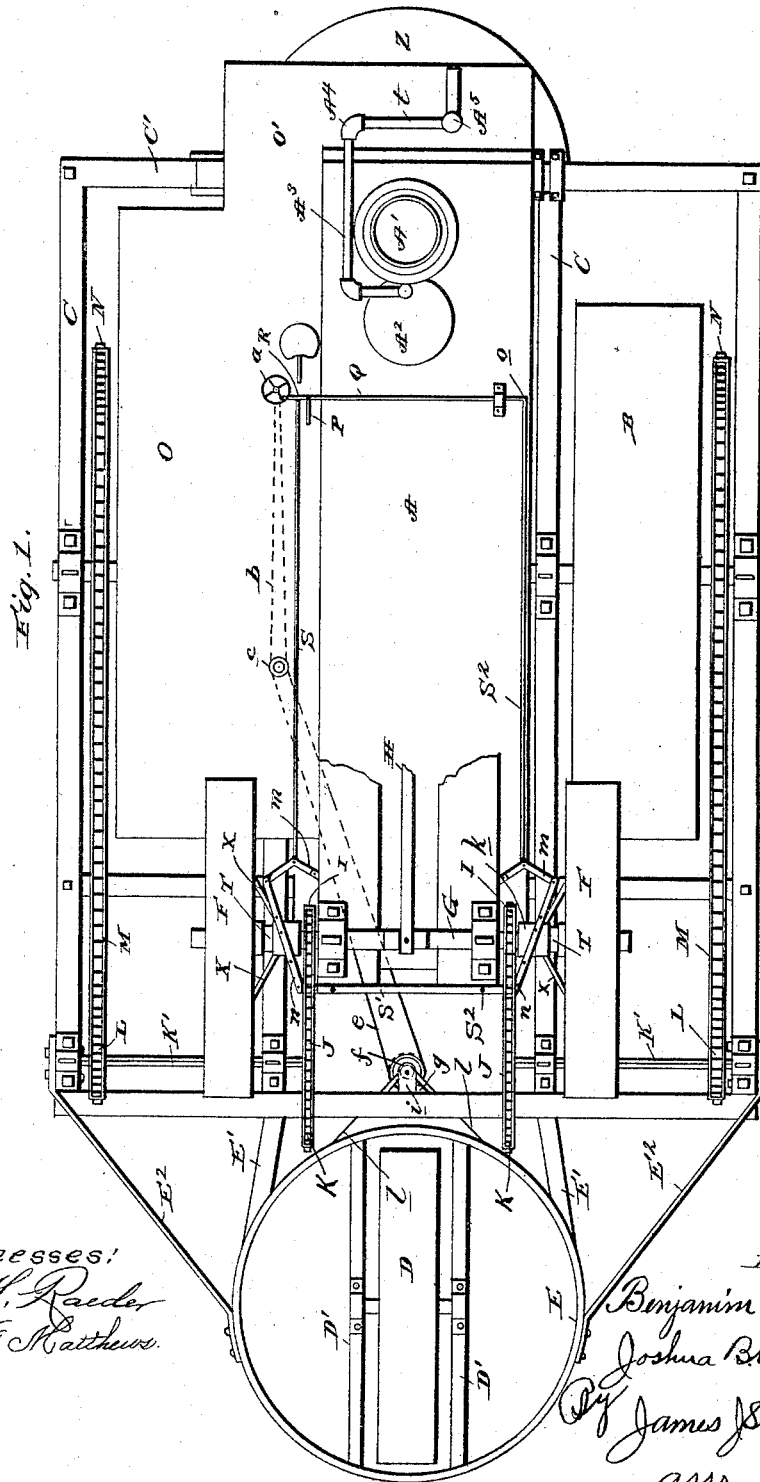
(No Model.)

3 Sheets—Sheet 1.

B. HOLT.  
TRACTION ENGINE.

No. 489,811.

Patented Jan. 10, 1893.



Witnesses:  
C. H. Raeder  
W. F. Matthews.

Inventor  
Benjamin Holt.  
Joshua Webster  
By James Sheehy  
Assd. Attorney

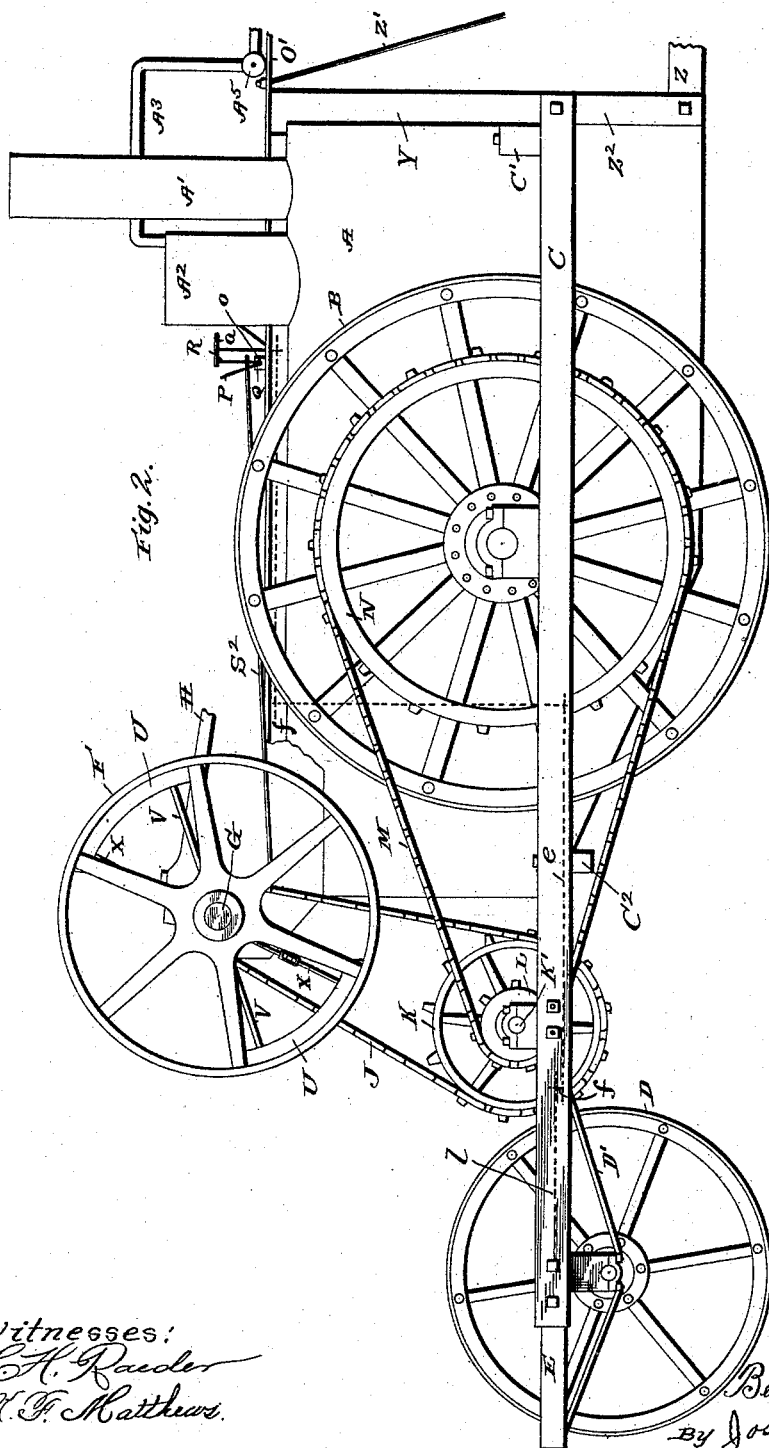
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W. F. Matthews.

Inventor  
Benjamin Holt.  
By Joshua B. Webster  
James J. Sheehy  
attorneys

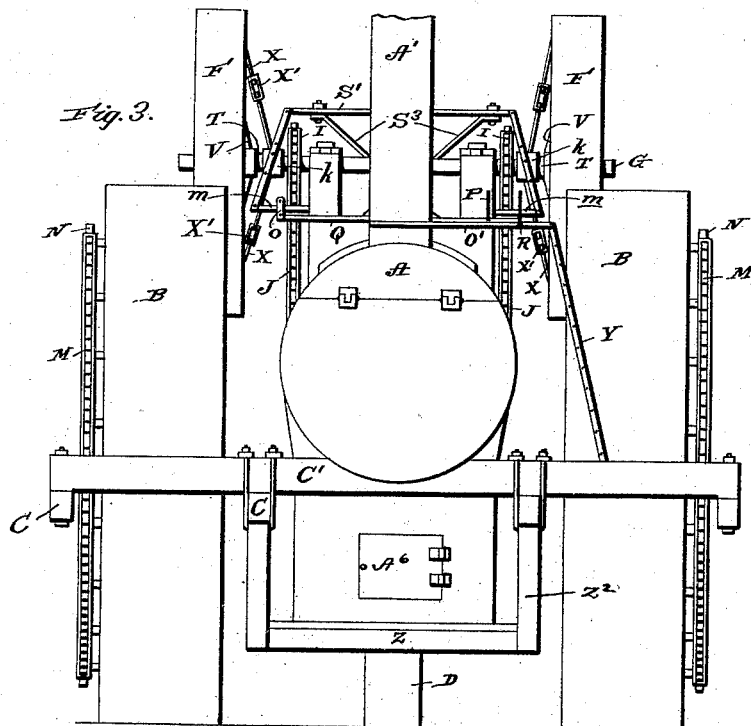
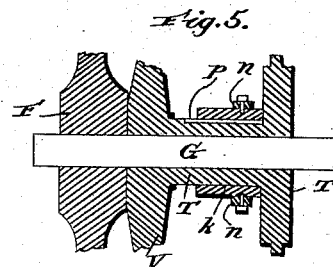
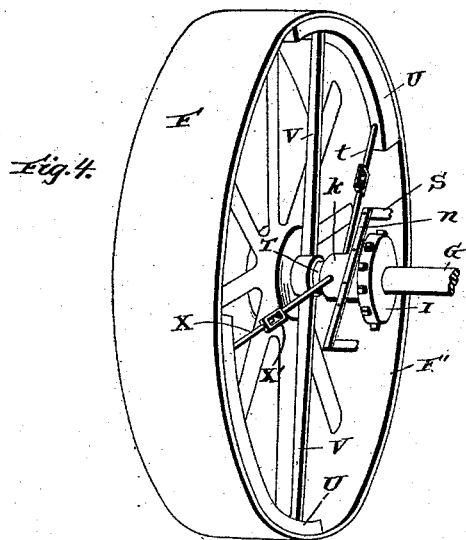
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3 Sheets—Sheet 3.

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Witnesses:  
*C. H. Reader*  
*N. F. Matthews.*

Inventor  
*Benjamin Holt.*  
By *Joshua B. Webster.*  
*James J. Sheehy*  
Asso. Attorney

# UNITED STATES PATENT OFFICE.

BENJAMIN HOLT, OF STOCKTON, CALIFORNIA.

## TRACTION-ENGINE.

SPECIFICATION forming part of Letters Patent No. 489,811, dated January 10, 1893.

Application filed August 9, 1892. Serial No. 442,634. (No model.)

### *To all whom it may concern:*

Be it known that I, BENJAMIN HOLT, a citizen of the United States, residing at Stockton, in the county of San Joaquin and State of California, have invented certain new and useful Improvements in Traction-Engines; and I do 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 appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to that class of engines known as "traction engines" and particularly to that class in which the power of the engine is directed solely to the progression of wheels upon which the frame of the engine and boiler are mounted.

My invention consists of a series of sprocket wheels and gears which, by means of link belts, serve to connect the bearing wheels with the driving shaft of the engine, and of an arrangement of levers whereby the motor power may be easily and readily, in whole or in part, disconnected from the bearing wheels, also in the construction and combination of other devices which I shall hereinafter describe and specifically claim.

Referring to the accompanying drawings, Figure 1 is a plan view of my improved traction engine. Fig. 2 is a left-hand side elevation substantially of the same. Fig. 3 is a rear end view substantially of the same. Fig. 4 is a detached perspective view of one of the fly wheels, crank shaft and its attachments. Fig. 5 is a longitudinal cross section of the same.

A is the boiler of the engine suitably mounted upon traveling or bearing wheels B and the frame consisting of double side beams C upon which are the bearings of the shafts of the wheels B, and of a rear cross beam C'. The double beams C on either side of the boiler are made more rigid and stiff by the use of cross beams C<sup>2</sup> located immediately in front of the wheels B. A front cross beam h is attached at the front ends of all the side beams C, and serves as a support for the frame of the front bearing and guiding wheel D, which is suspended from a turning inner ring j by

hangers D', at the center intersection of which are attached the bearings of the shaft of the wheel D, the hangers D' being attached at their outer ends to the ring j. The ring j is comprehended by a parallel outer ring E, which is embraced by and bolted to two arms E', on either side, which are attached to the inside frame beams C. Diagonal braces E<sup>2</sup> extend from the front end of the outside beams C to the outer ring E and serve to support and stiffen the same. The inner circle j and wheel D are guided and controlled by a link belt l attached at radial points to the periphery of the ring j and extending rearwardly engages with the smaller and upper portion of a two part horizontal sprocket wheel f located at the center of and on the back of the cross beam h on a supporting bench i attached to the beam h and braced by chains or rods g attached to it and to the beam h. The lower and larger portion of the sprocket wheel f engages with a link belt e which extends rearwardly and engages with a small sprocket wheel on the lower end of a standard c at the upper end of which is a small sprocket wheel engaging with a link belt b which extends rearwardly and engages with a small sprocket wheel upon a standard, operated by a horizontal hand wheel, a, attached at its apex, and pivotally attached at its foot to a platform O located at one side and partly over the boiler A. The course of the engine can, by means of the above described devices, be readily and easily controlled, the initial point being the hand wheel, a, on the platform O.

The rear end O' of the platform O extends at right angles thereto directly in the rear of the boiler and serves as a convenient medium of reaching the different parts of the machinery and also as a protection, from cinders falling from the smoke stack, to the fireman who is stationed on a platform Z which is attached to the machine at the lower ends of drop standards Z<sup>2</sup> which at their upper ends are attached to the inner beam C. A brace rod Z' is attached at its upper end to the rear of the platform O', and at its lower end to the outside of the platform Z and serves to support the same. The fuel is carried on the platform Z and is fed into the grates at the door A<sup>6</sup>. Easy access to the platform O is af-

forded by a ladder Y attached at its lower end to the rear beam C'.

The machinery of the engine is not shown in complete detail but may be of any desired pattern and preferably located on top of the boiler. I also have shown no water tanks but preferably locate them at the front of and to the side of the boiler.

I will now explain the traction devices by which power is transmitted from the engine to the traction traveling or bearing wheels B. Near the front of the boiler, suitably mounted in boxes thereon, is the usual crank shaft G which is connected with the engine machinery by a driving shaft or pitman H or in any other approved manner. At each end of the shaft G are secured the fly wheels F, adjacent to which on the shaft G are inside sleeves T and outside sleeves k the particular construction of which and attached devices, I shall presently fully explain. On the inner ends of the sleeves T are sprocket wheels I which engage with link belts J, which extending forwardly engage with sprocket wheels K on the inner ends of shafts K' whose bearings are on the beams C. Sprocket wheels L are attached to the outer ends of the shafts K' and engage with link belts M, which extending forwardly engage with sprocket wheels N which are attached to the spokes of the bearing wheels B which, as will be readily seen, will be turned by the series of belts and sprocket wheels above described as soon as the steam is let on so that the driving shaft H shall set the crank shaft G in motion.

The inside sleeves T are placed loosely upon the shaft G. Supporting braces V are rigidly attached to them, having flexibly attached at their upper ends brake blocks U adapted to engage with grooves or channels F' on the inner surfaces of the wheels F. The braces V are attached at one of the ends of the blocks U, the opposite ends being flexibly held in position by hangers X which are flexibly attached at their lower ends to the outside sleeves k, which comprehend and are inserted upon the sleeves T. The hangers X are provided with tightening nuts or turnbuckles X' at their centers. The faces of the sleeves T are provided with feathers or guides p upon which the sleeves k may be slipped back and forth, being provided with grooves or guideways for that purpose. Swinging bars n are flexibly attached to the sleeves k and at their upper ends are flexibly attached to a cross bar S' mounted upon standards S<sup>3</sup> attached at their feet to the engine. The lower ends of the bars n are flexibly attached at one end of the arms m which at their other ends are attached to the boiler and at their elbows are jointed, and engage respectively with brake rods S and S<sup>2</sup>. The rod S<sup>2</sup> extends rearwardly and engages with an arm o rigidly attached on the end of a cross rock shaft Q suitably mounted on the boiler A and platform O. The rod S extends rearwardly and engages with a lever R whose foot is flexibly attached

to the rock shaft Q near a lever P which is rigidly attached to the shaft Q. The lever P as will be seen controls the rod S<sup>2</sup>, and the lever R controls the rod S. The operator handling at will the levers R and P controls, by means of the connecting devices above described, the brake blocks U, which when caused to impinge tightly upon the surface of the wheels F, cause the sleeves T and k to revolve as one, thereby setting in motion the sprocket wheels I at the end of the sleeves T, which motion is in turn, as heretofore shown, transmitted to the traction wheels B on each side and the progression of the machine accomplished.

By means of the construction I have above described it will be seen that both fly wheels may be connected to or disconnected from the brake blocks U simultaneously or separately, and if separately that either traction wheel may be made use of in directing the course of the machine, which feature will be found of great utility in making sharp curves with the machine.

One of the purposes for which my improved traction engine may be utilized is to draw a combined header and thrasher in the harvest field, a portion of the machinery of which is usually operated by a supplemental engine mounted upon the thrasher and supplied with steam from the boiler of the traction engine. To accomplish this purpose I extend a supply pipe from the traction engine to the supplemental engine. This pipe is connected with the steam dome A<sup>2</sup> which is directly in front of the smoke stack A' which will be observed is, for greater convenience, located at the rear end of the boiler. This supply pipe consists of an angular section A<sup>3</sup> rigidly attached to the steam dome and of an angular section t flexibly connected to the rear of the section A<sup>3</sup> at the joint A<sup>4</sup>, the angle of the section t forming a flexible joint A<sup>5</sup>, making the connection with the supplemental engine on the thrasher of such a nature as to adapt itself to the inequalities of land over which the machine may travel.

I have dispensed in both the description and drawings with many features of my machine which are old and have shown only such old parts as are necessary to illustrate my invention.

I am aware that traction engines have heretofore been driven with sprocket wheels and link belts and that the direction of the same and similar machines have been governed by a swinging guiding wheel in front; also that steam has been supplied from the boiler of the traction engine to an auxiliary engine on an accompanying thrasher, so I do not broadly claim these features but

What I do claim as new and of my invention is:

1. In combination with the main frame of a traction engine suitably mounted on supporting traction wheels, a guiding wheel and its frame and attached to the front beam of

the main frame, a suitable steering mechanism for such guiding wheel, consisting of a two part link belt *l* attached at radial points to the periphery of the turning ring of the frame of the guiding wheel, and engaging with the upper portion of a two part horizontal sprocket wheel *f*, seated on a supporting bench *i*, attached to the beam *h*, the rearwardly extending link belt, *e*, actuating the lower portion of the double sprocket wheel *f*, and comprehending a sprocket wheel on the lower end of a standard *c*, the standard *c* having a sprocket wheel at its head engaging with a rearwardly extending link belt *b*, the said belt *b*, and the standard or shaft having a sprocket wheel in engagement with the belt *b*, and also having the hand wheel *a*, all substantially as set forth.

2. The combination in a traction engine of the main bearing frame having mounted thereon the traction wheels, the front guiding wheel and frame attached to the front of the main frame, the boiler mounted on the main frame, the platform *O* located at one side of the boiler, a suitable mechanism for controlling the front guiding wheel from the platform *O*, the rear platform *O'* at right angles to the platform *O*, the brace rod *Z'* attached at its upper end to the platform *O'*, and its lower end to a platform *Z*, the platform *Z*, attached at its front to drop standards *Z<sup>2</sup>*, and the drop standards *Z<sup>2</sup>* attached to the rear ends of the inner beams *C*, all substantially as shown and described.

3. The combination substantially as described of the main frame having the boiler and traction wheels mounted thereon, the front guiding wheel and frame, attached to the front of the main frame, a suitable mechanism for controlling the front guiding wheel, the platforms *O* and *O'*, and the ladder *Y* attached at its lower end to the rear beam of the frame and at its upper end to the platform *O*.

4. In a traction engine, a supporting frame, having mounted thereon the boiler and suitable traction wheels, and a guiding wheel and frame attached at its front, a suitable mechanism for controlling the guiding wheel, and a traction gearing consisting of sleeves on the crank shaft, suitable means for operating such sleeves from the crank shaft, the sprocket wheels *I*, attached to the ends of such sleeves, the link belts *J*, the sprocket wheels *K* on the shaft *K'*, the shaft *K'* having its bearings mounted on the beams *C*, the sprocket wheels *L* on the outer ends of the shafts *K'*, the link belts *M*, the sprocket wheels *N* attached to the spokes of the traction wheels, all operating substantially as shown and specified.

5. The combination, with the crank shaft of a traction engine, of the fly wheels *F* provided with grooves or channels *F'* on their inner surfaces, the brake blocks *U* adapted to engage with the fly wheels *F* at the grooves *F'*, the braces *V*, the inner sleeves *T* upon the crank shaft and provided with feathers *p* on their

surfaces, the hangers *X* provided with center tighteners or turnbuckles *X'*, the outside sleeves *k* upon the inner sleeves *T* and provided with grooves adapted to engage with the feathers *p*, the sprocket wheels *I* upon the ends of the sleeves *T*, suitable connecting belts and gearing from the sprocket wheels *I* to the traction wheels, and a suitable mechanism controlling the sleeves *k*, all substantially as shown and described.

6. The combination with the crank shaft and fly wheels of a traction engine, of the brake blocks *U*, the braces *V*, the sleeves *T* and *k*, the hangers *X*, the sprocket wheels *I* upon the ends of the sleeves *T*, suitable gearing and link belts connecting such sprocket wheels with the traction wheels of the engine, the swinging bars *n* flexibly attached to the sleeves *k* and to a cross bar *S'*, the cross bar *S'* mounted upon standards *S<sup>2</sup>*, the flexible arms *m* attached to the bars *n* and to the boiler, the brake rods *S* and *S<sup>2</sup>*, the rock shaft *Q* suitably mounted on the platform and boiler and provided with the arm *o*, engaging with the rod *S<sup>2</sup>*, the lever *P* rigidly attached to the rock shaft *Q*, and the lever *R* flexibly attached to the shaft *Q* and engaging with the rod *S*, all operating substantially as described.

7. In a traction engine, the combination with the boiler, the steam dome *A<sup>2</sup>*, located at the rear end of the boiler, and the angular pipe section *A<sup>3</sup>*, attached to and communicating with the steam dome *A<sup>2</sup>*, of the angular pipe section *t*, flexibly connected to the pipe section *A<sup>3</sup>*, and comprising two flexibly connected sections; the said pipe sections *A<sup>3</sup>*, and *t*, being adapted to lead steam from the boiler to a supplemental engine on a thrasher connected to the traction engine, substantially as and for the purpose set forth.

8. In a traction engine the combination of the main frame, the traction wheels and boiler mounted thereon, a guiding wheel and frame suitably attached to the front of the main frame, means for controlling such guiding wheel, a system of sprocket wheels and link belts for the progression of the traction wheels and connecting the same and the crank shaft together, suitable levers and rods for controlling the same, the smoke stack and steam dome located at the rear end of the boiler, and a steam supply pipe, provided with flexible joints, attached to the steam dome and adapted to supply steam to an auxiliary engine located on an accompanying traveling thrasher all arranged and operating substantially as described.

9. In a traction engine, means for communicating power from the crank shaft, consisting of brake blocks impinging upon the inner surfaces of the fly wheels, flexible braces attached to such blocks, and to sleeves, on the crank shaft, the said sleeves provided with sprocket wheels, a suitable system of link belts and sprocket wheels connecting such sprocket wheels with the traction wheels, and

a system of levers and rods controlling such sleeves, all substantially as described.

10. The main frame, composed of the beams C, C', C<sup>2</sup>, and h, the traction wheels B, a suitable guiding wheel and frame attached to the front of the main frame, the platform O, O' attached to the side and rear of the boiler, the boiler A mounted upon the main frame, and the smoke stack A' and steam dome A<sup>2</sup> located at the rear of the boiler A.

11. In a traction engine, substantially as described, the combination with the main frame, and the traveling or bearing wheels B; of the shaft G, the wheels F, fixed on said shaft and having the grooves or channels F',

the sleeves T, mounted and adapted to slide upon the shaft G, the braces V, connected to the sleeve T, and carrying the brake blocks or shoes U, at their outer ends, the hangers X, a suitable means for adjusting the sleeves T, with respect to the wheels F, and mechanism intermediate the sleeves T, and the bearing or traveling wheels B, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

BENJAMIN HOLT.

Witnesses:

JOSHUA B. WEBSTER,

GEO. H. COWIE.