

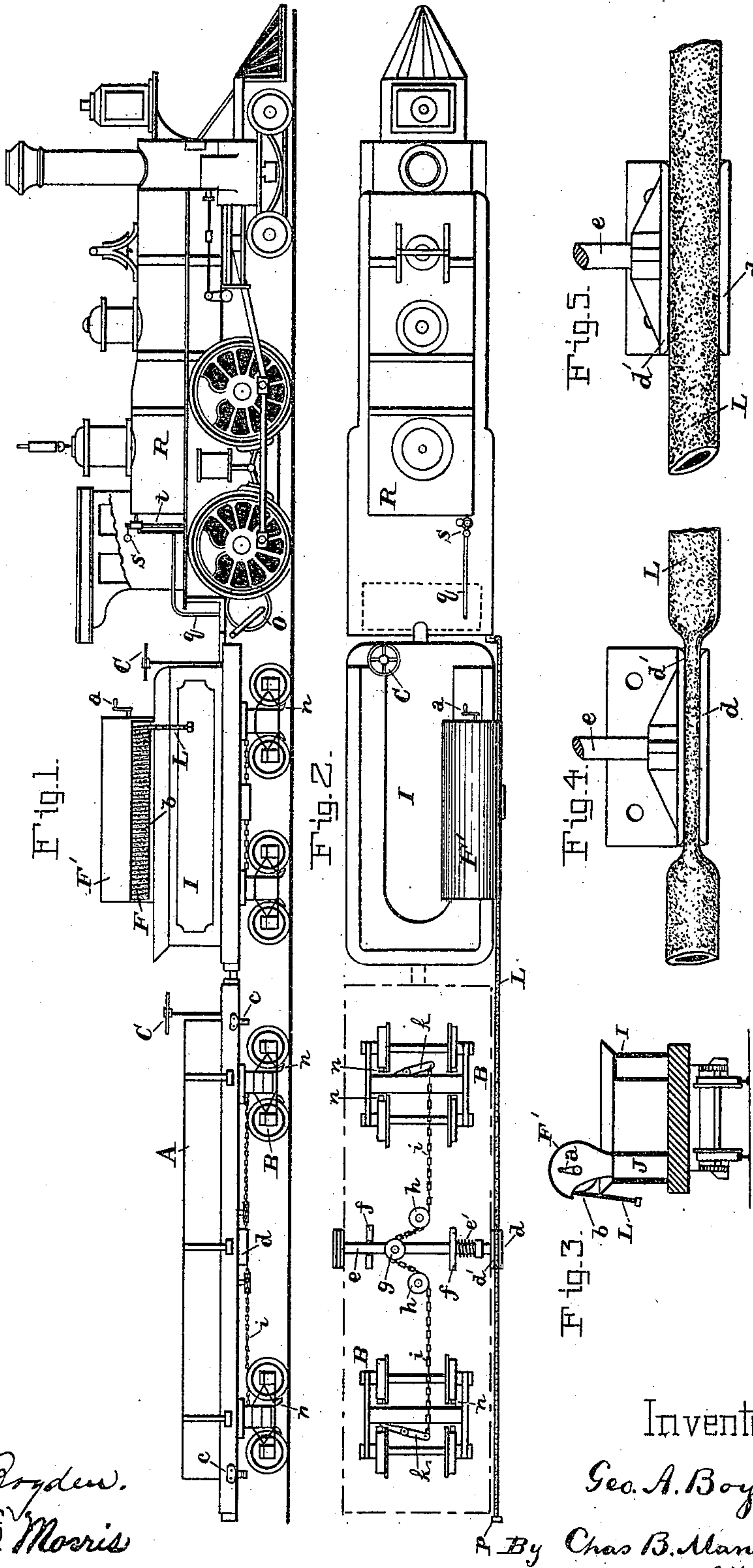
(No Model.)

2 Sheets—Sheet 1.

G. A. BOYDEN.  
FLUID PRESSURE CAR BRAKE.

No. 356,026.

Patented Jan. 11, 1887.



Witnesses:

*Geo. A. Boyden.*  
*John E. Morris*

Inventor:

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By *Chas B. Mann*  
Atty.

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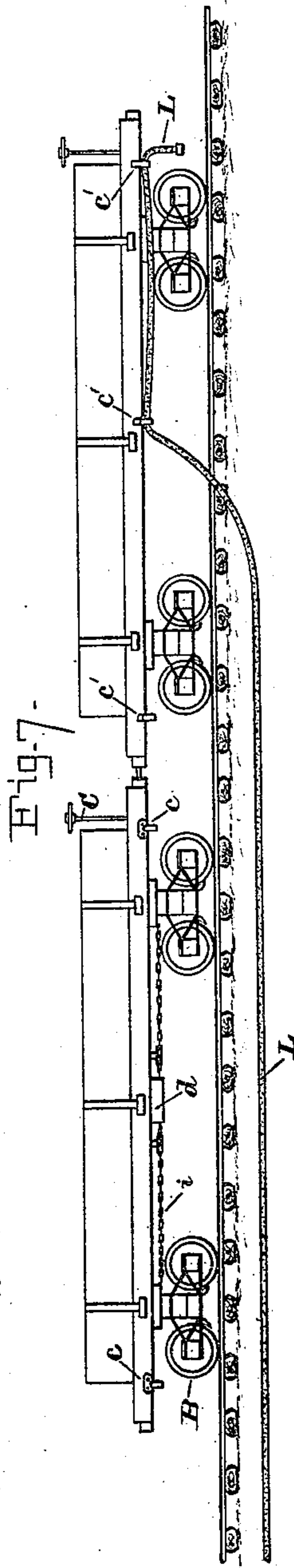
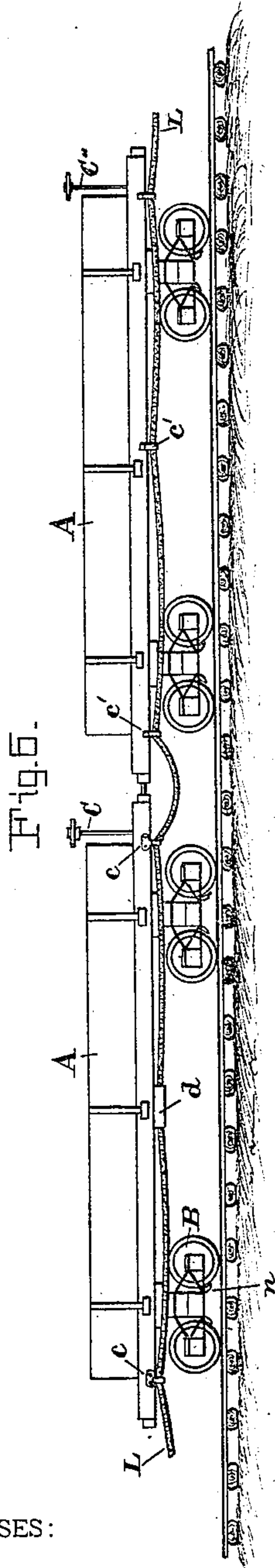


Fig. 11.

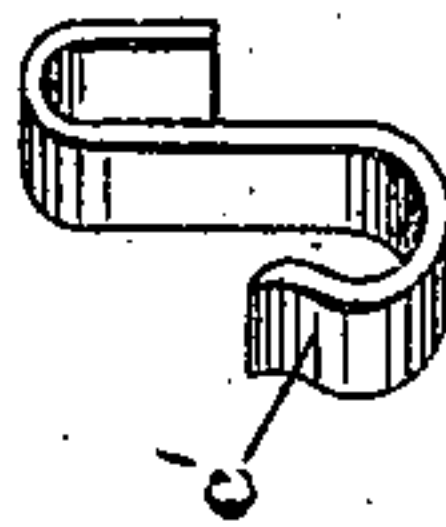


Fig. 10.

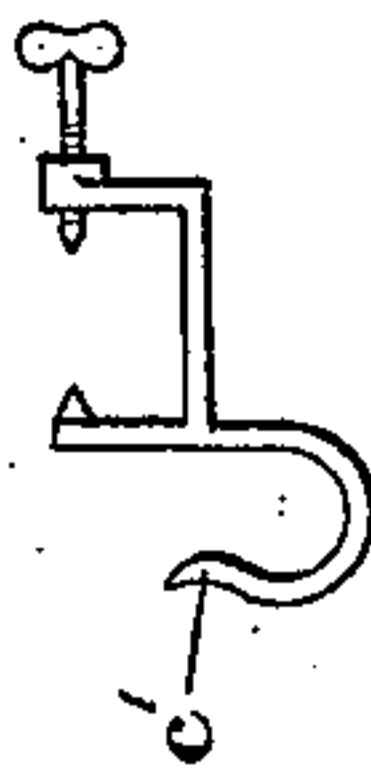


Fig. 9.

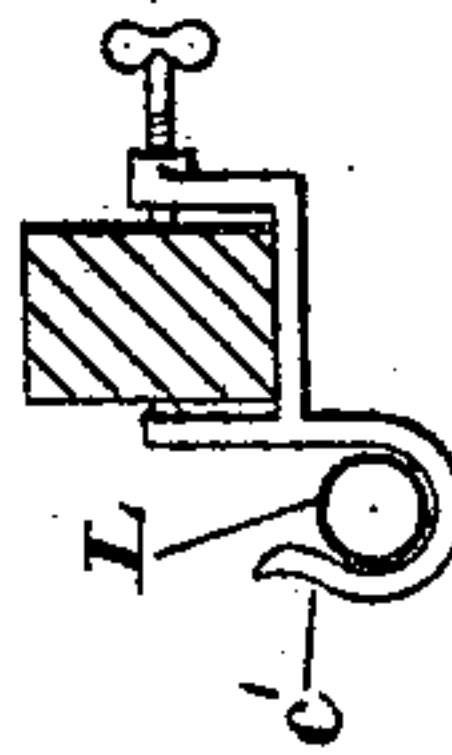
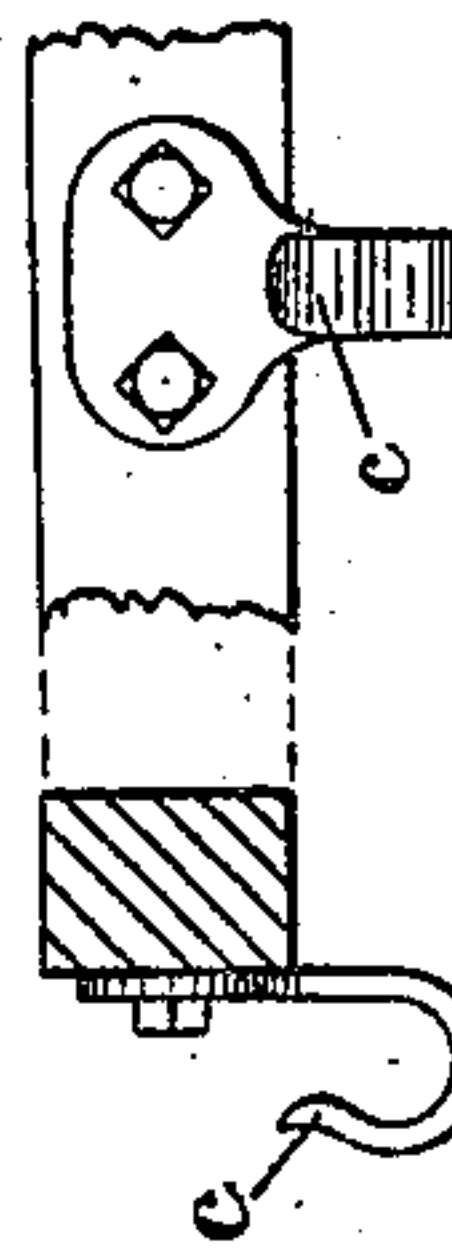


Fig. 8.



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*Chas B. Mann*

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# UNITED STATES PATENT OFFICE.

GEORGE A. BOYDEN, OF BALTIMORE, MARYLAND, ASSIGNOR OF ONE-HALF  
TO CHARLES B. MANN, OF SAME PLACE.

## FLUID-PRESSURE CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 356,026, dated January 11, 1887.

Application filed June 15, 1886. Serial No. 205,190. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE A. BOYDEN, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Fluid-Pressure Car-Brakes, of which the following is a specification.

This invention relates to that class of power-brakes in which the agent for communicating the power is fluid under pressure.

My invention relates to improved means for operating car-brakes by fluid-pressure, and has for its object to provide a detachable or removable train-pipe, which is also collapsible and expansible and connected directly with the source of supply of fluid-pressure, and extending or passing along the cars of the train and actuating the brake mechanism of cars along which it passes.

This invention especially contemplates that the engineer may at all times and under all conditions of running operate and control the brakes of all cars equipped according to this invention, although said cars be in a mixed train—that is, in a train where adjoining cars have a different kind of brake.

The invention consists of a continuous train-pipe which is readily detachable or removable from all of the cars, and having one end connected directly with a source of supply of fluid-pressure and the other end closed; and the invention also consists in the several combinations hereinafter set forth, whereof an element is a train-pipe having the aforesaid features.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side view of a train equipped with my improvements, showing the collapsible train-pipe detached from the car and stored up on a reel under cover, which is mounted on the tender. Fig. 2 is a top view of a train in which the trucks and brake mechanism of one car are shown without the car-body, and showing the collapsible train-pipe extended along the cars in position for operating the brakes. Fig. 3 is a vertical cross-section of the tender, and shows the covered reel mounted thereon. Figs. 4 and 5 are top views of the train-pipe and gripper, showing the former in both the collapsed and expanded condition. Fig. 6 is

a side view showing two cars with the removable train-pipe attached. The left-hand car is equipped with brake mechanism adapted to be operated by the removable train-pipe, while the adjoining right-hand car is not so equipped. Fig. 7 is a side view of the two cars equipped as in Fig. 6, showing the train-pipe partly removed. Fig. 8 shows two views in detail of a hanger for supporting the removable train-pipe. A hanger of this form is designed to be permanently attached to cars equipped with brake mechanism to be operated by the removable train-pipe. Figs. 9, 10, and 11 show two forms of detachable hangers for cars which are not equipped with the brake mechanism here referred to.

Referring to the drawings, the letter A designates an ordinary freight-car; B, the trucks of the car equipped with ordinary brake mechanism, which includes shoes, brake-beams, and lever, which mechanism is arranged, as usual, to be operated by the well-known hand-wheel, C, on an upright shaft. I place on the car and connect with this ordinary brake mechanism a train-pipe or hose gripper, *d*, which may be made in any suitable way.

The drawings show one form of construction for the "gripper," comprising two jaws, *d* *d'*, one of which is fixed to the car stationary and the other movable, its movement being toward and away from the other. The movable jaw is attached to a rod, *e*, which is supported in bearings *f* below the car-body, and extends crosswise thereof. This rod has endwise movement in its bearings.

A pulley, *g*, is mounted on the said rod, and two other pulleys, *h*, are fixed below the car-body, so as to turn but be immovable, one of the said two fixed pulleys being at each side of the rod *e*. A chain, *i*, passes on one side of the rod-pulley *g* and on the opposite side of the two fixed pulleys *h*, and connects with the brake-lever *k* on the car-trucks B.

It will be understood from this description that the gripper-rod *e*, by moving endwise, will cause a pull on the chain *i*, and thereupon the brake-shoes *n* will be applied to the wheels.

I employ a collapsible and expansible train-pipe, L, preferably a suitable kind of hose, to contain fluid under pressure, and the said pipe or hose, when in position for actuating the



brakes, is placed in the gripper, (that is, between the two jaws  $d d'$ ), or a device of equivalent character, from which it may be detached or removed. This train-pipe L is continuous  
 5 from a source of supply of fluid under pressure located on the tender or locomotive along all the cars composing the train, or extends past as many of said cars as may be desired. The forward end of the train-pipe, when in use,  
 10 is connected with the tank O, (which represents the source of supply of fluid under pressure,) and the other end,  $p$ , of said pipe is closed or sealed. As here shown, the train-pipe differs from that of other fluid-pressure brakes,  
 15 in that throughout its entire length it is sealed or closed, or, in other words, it is without openings or branch connections.

The car-brake mechanism is actuated by the collapsing and expanding action of the train-pipe L, which action is illustrated in Figs. 4  
 20 and 5. In Fig. 5 the train-pipe is shown expanded. This condition is produced by the fluid-pressure, the fluid being in and throughout the train pipe. The result of the expansion is to spread the jaws  $d d'$  of the gripper,  
 25 or whatever equivalent device may be used instead, and thereby move the rod  $e$ , and through the connections between it and the brake-lever  $k$  operate the brakes—that is, either to apply  
 30 them or to hold them off.

In Fig. 4 the train-pipe is shown collapsed. This condition is produced by a withdrawal of the fluid-pressure from the train-pipe. When the train-pipe is thus collapsed, the jaws  
 35  $d d'$  of the gripper are nearer together—that is, the movable jaw approaches the stationary one—and the rod  $e$  and connections are moved in the opposite direction.

As here shown, (see Figs. 2 and 5,) the expansion of the train-pipe L between the jaws  
 40  $d d'$  of the gripper serves to apply the brake-shoes  $n$  to the car-wheels. By turning the three-way cock  $s$  the fluid-pressure is cut off from the train-pipe, and the latter is also sufficiently exhausted or relieved to be collapsed,  
 45 as in Fig. 4, at the point where it rests between the jaws of the gripper. This collapsing is effected by the action of the spring  $e'$  on the rod  $e$ , and the same spring serves also to hold  
 50 the brake-shoes off.

The tank O is for the fluid or liquid which is to enter the train-pipe L. A pipe,  $q$ , connects the top of this tank with the steam-boiler R of the locomotive. Thereby the pressure of the steam in the boiler is exerted on  
 55 the liquid in the tank. The train-pipe L is connected with the liquid-tank O. A three-way cock,  $s$ , in the said connecting-pipe controls the passage of the steam to the liquid-tank, and the exhaust-pipe  $t$ , connected with  
 60 the cock, provides for the release of the pressure. By this well-known device the engineer will have control of the brakes, and may at any time apply or release them.

65 To make it practicable to wholly remove the train-pipe from the cars, I provide the tender with a reel, F, upon which the train-

pipe is wound when it has been removed from the cars. This reel is mounted on top of the water-box and at one side of the tender I, the  
 70 axis of the reel extending lengthwise of the tender, and is provided with a crank,  $a$ , and a hood or cover, F', which latter extends from the top of the water-box J up one side of the  
 75 reel, and thence over the top of the reel, but does not inclose the lower outer side,  $b$ , of the reel.

It will be seen that a portion of the reel-hood forms an upward continuation of the inner vertical wall of the water-box J, and  
 80 thereby the coal, which occupies the space between the two side water-boxes, may bank up against said portion of the hood. Thus neither the reel nor the hood on the tender lessens the capacity of the tender for carrying coal. This  
 85 position of the reel on the tender is productive of advantages: First, it is convenient for winding and unwinding the hose, and, second, what is most important, it allows the use of a reel  
 90 large enough for winding sufficient hose for thirty or more cars. Its position, however, makes necessary the hood or cover F' to protect it from the coal that is dumped into the  
 95 tender. Without the protection of the hood the reel could not occupy this very desirable position.

It is obvious the device herein termed a "gripper" may be otherwise constructed, and it is also plain that the mechanism which connects the train-pipe with the ordinary brake-  
 100 shoes may be constructed and arranged in a variety of ways besides that here shown.

My invention consisting of the removable train-pipe is not, therefore, limited or affected by any such changes.  
 105

Such cars as are equipped with grippers—as the car to the left in Figs. 5 and 6—may also be provided at or near each end with a hanger,  $c$ , permanently attached to the car. Fig. 8  
 110 shows two views of this hanger. These hangers support the train-pipe and permit it to be readily removed.

To support the train-pipe on cars which are not equipped with grippers—such as the car to the right in Figs. 5 and 6—a detachable  
 115 hanger,  $c'$ , is employed. This hanger, as in Figs. 9 and 10, may be clamped to the car by a screw, or, as in Fig. 11, the hanger may have a hook for attachment to some suitable part of the car. This removable train-pipe may be  
 120 used on either freight or passenger trains.

No claim is herein made to the following parts or features, to wit: a train-pipe, separately, having the collapsible and expansible feature, claims to the same being embraced in  
 125 my application for patent filed April 12, 1886, Serial No. 198,545. No claim is made to a gripper separately, nor to the mechanism which connects the removable train-pipe with the ordinary brake mechanism on the truck,  
 130 claims to said parts being embraced in my application for patent filed June 22, 1886, Serial No. 205,865.

Having described my invention, I claim and



desire to secure by Letters Patent of the United States—

1. The combination, with a train of cars, of a source of supply of fluid - pressure, brake mechanism on the cars, and a continuous hose train-pipe having one end connected with the source of supply, passing along the cars of the train, actuating brake mechanism of cars along which it passes, and readily removable from all of the cars, for the purpose specified.

2. The combination of a car, a train-pipe hanger attached to the car capable of supporting the train-pipe and permitting its ready removal, and a removable train-pipe resting in the said hanger, for the purpose set forth.

3. The combination of a source of supply of fluid - pressure, brake mechanism on the cars, a train-pipe hanger to support the train-

pipe and permit its ready removal, and a train-pipe passing along the cars of the train resting in the hangers and actuating the said brake mechanism of cars along which it passes, as set forth.

4. The combination of the locomotive-tender, a reel mounted on the tender, a hood or cover extending from the top of the tender water-box up one side of the reel and then over its top, and a removable train-pipe, for the purpose set forth.

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

GEORGE A. BOYDEN.

Witnesses:

JOHN E. MORRIS,  
JNO. T. MADDOX.