

No. 670,901.

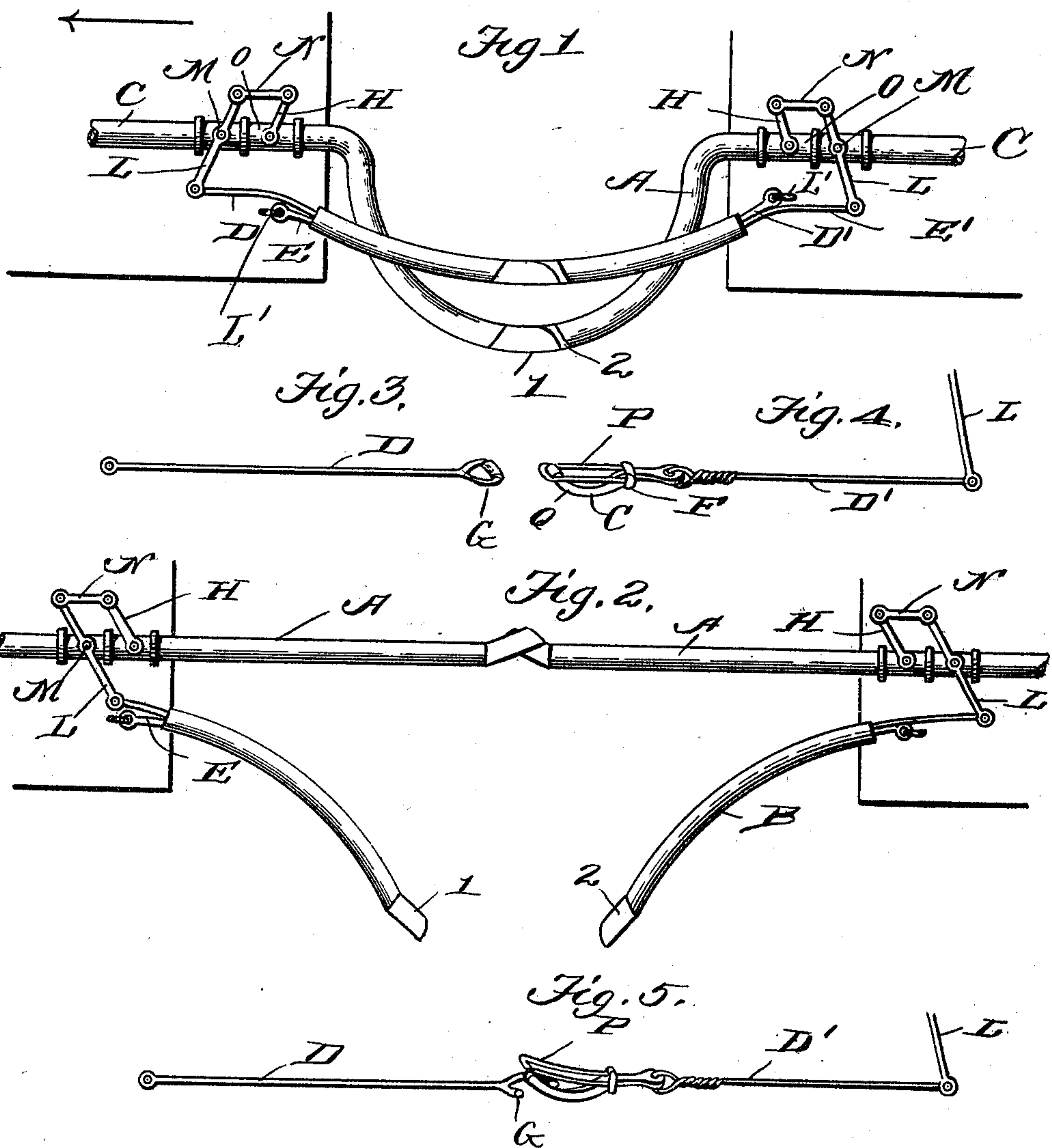
Patented Mar. 26, 1901.

F. LINCE.  
AIR BRAKE.

(Application filed Feb. 23, 1900.)

(No Model.)

2 Sheets—Sheet 1.



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2 Sheets—Sheet 2.

Fig. 6.

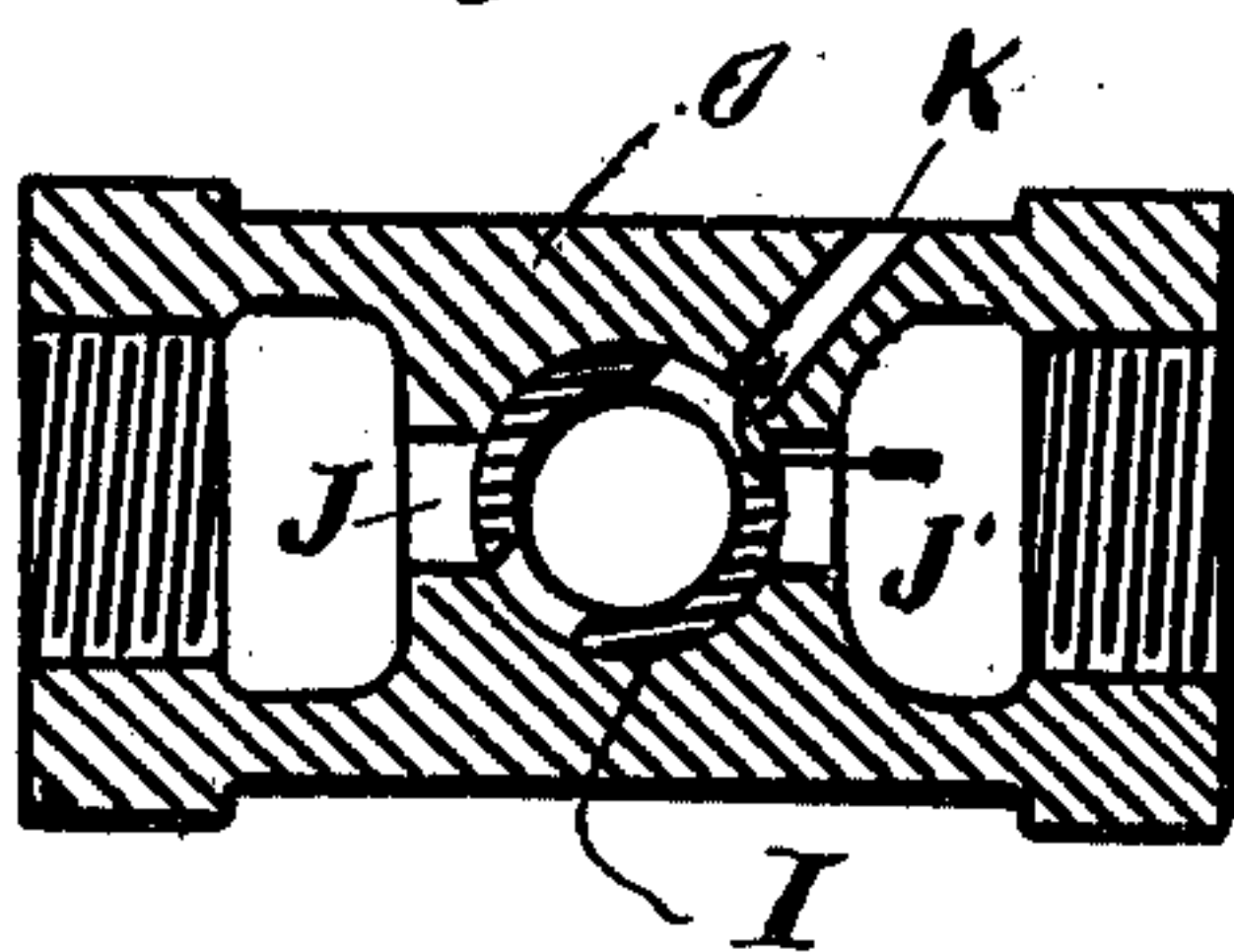


Fig. 10.

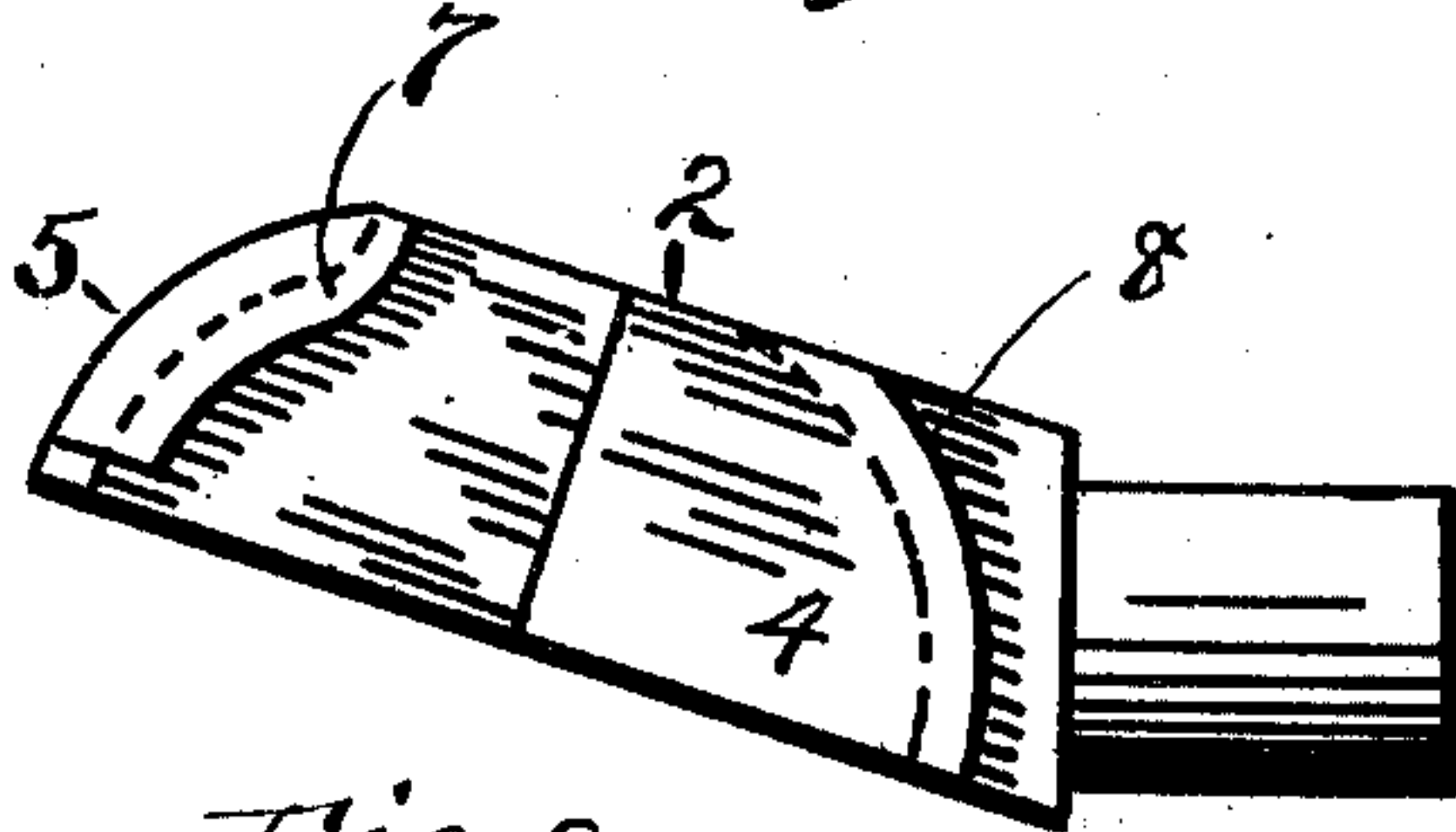


Fig. 7.

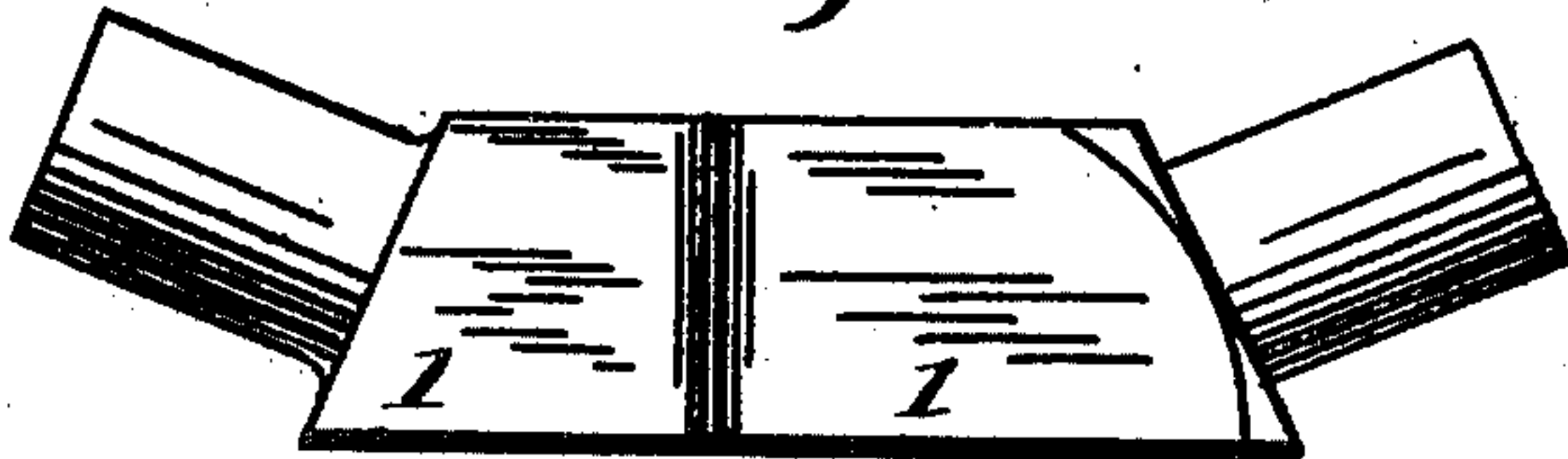


Fig. 9.

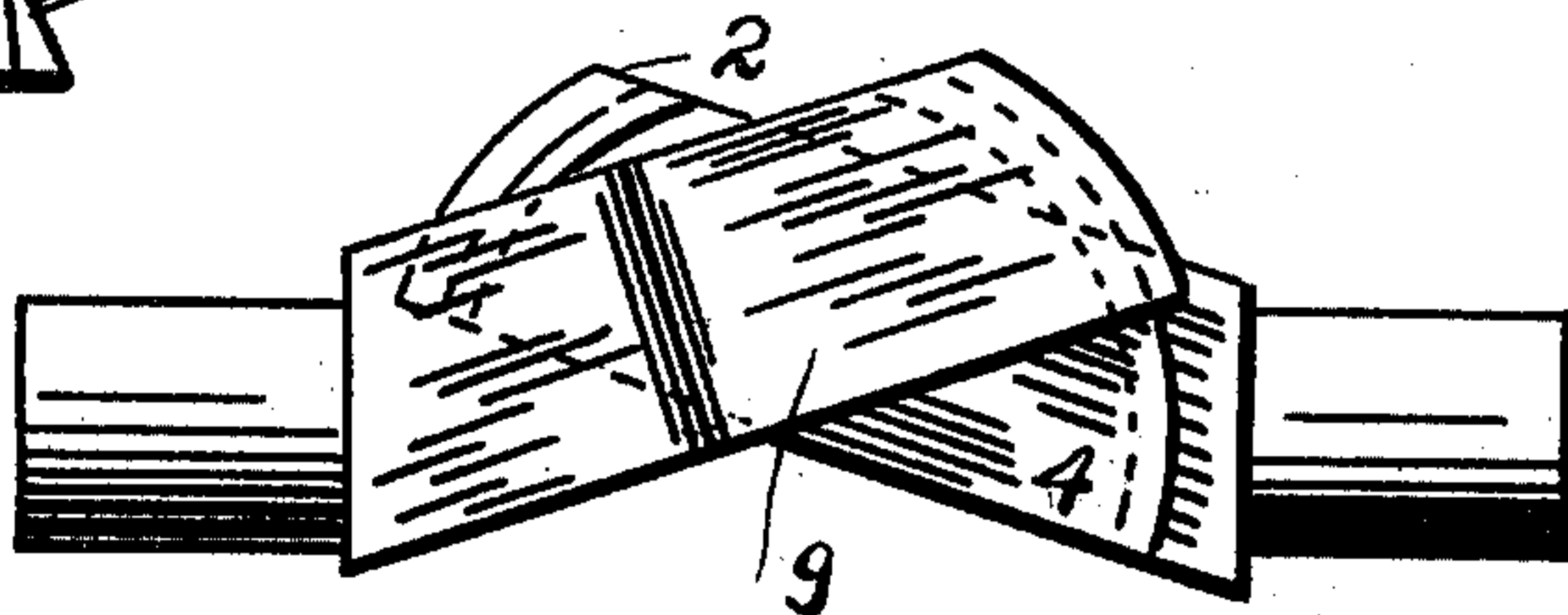
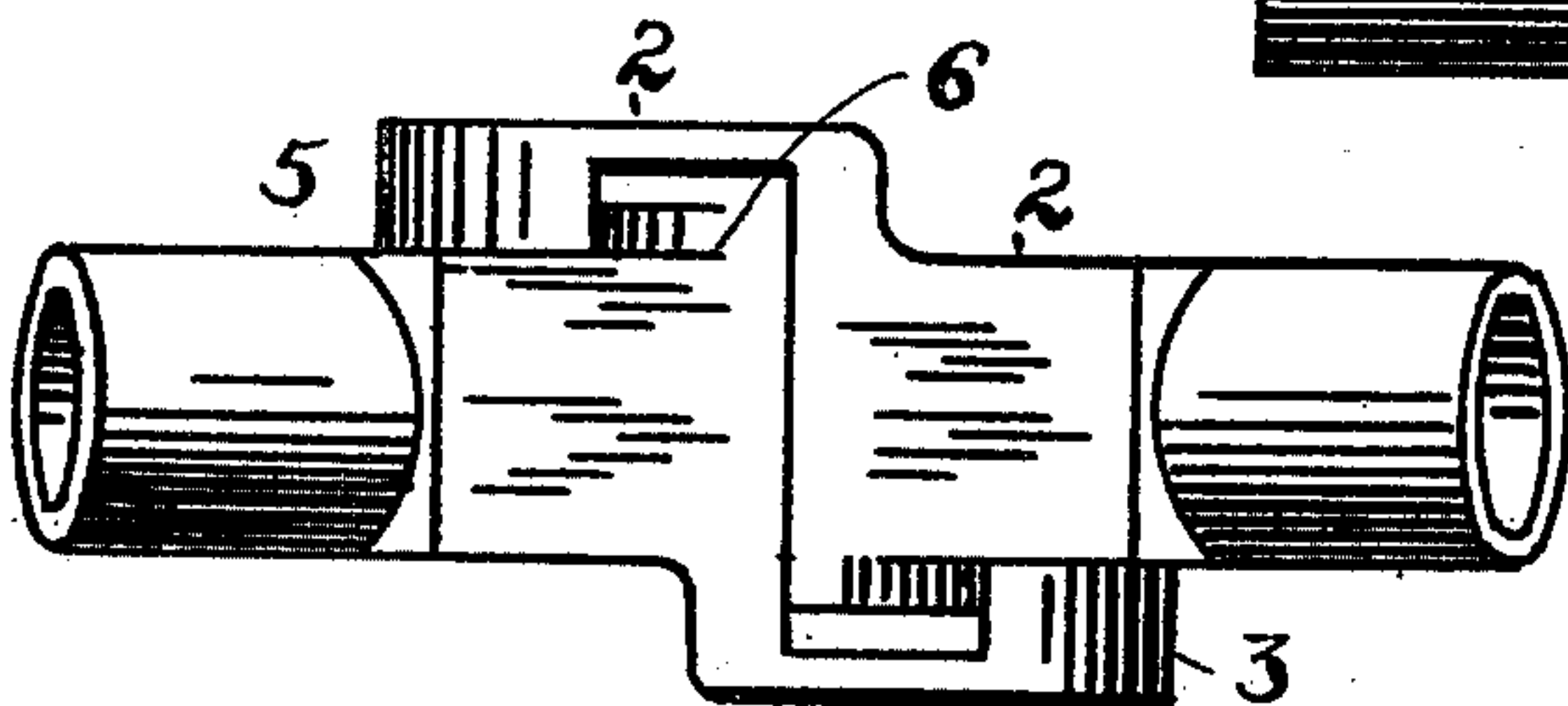


Fig. 8.



WITNESSES.

Harry J. Perkins.

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Edward Tappan



# UNITED STATES PATENT OFFICE.

FRANK LINCE, OF GRAND RAPIDS, MICHIGAN, ASSIGNOR OF ONE-HALF TO  
JAMES MATHIE, OF SAME PLACE.

## AIR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 670,901, dated March 26, 1901.

Application filed February 23, 1900. Serial No. 6,215. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK LINCE, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented new and useful Improvements in Air-Brakes, of which the following is a specification.

This invention relates to certain new and useful improvements in air-brakes for cars; and the invention consists, first, in combining with the ordinary air-brake suitable mechanism for preventing the automatic setting of the brakes on cars in front of the point of breakage in case the train accidentally becomes separated while in motion; also, in applying the brake to the entire train in case of defective coupling or partial separation, and also in various features of construction and combination of parts hereinafter described and claimed.

The objects of my invention are, first, to provide efficient means for setting the brakes on cars which become detached from the train without setting or applying the brakes to the cars left connected with the locomotive; second, to furnish means for gradually applying the brakes to the entire train when partially separated, as hereinafter described; third, to separate automatically the brake-setting device, and, fourth, other objects particularly pointed out in this specification. These objects I accomplish by means of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 shows a side elevation of that portion of an air-brake as it appears when the cars are coupled, showing my automatic brake-setting device in position. Fig. 2 shows a like view, partly in section, with the parts in position as they would appear just before the separation of the air-brake tube. Fig. 3 shows the eye or hook on one part of the cable or wire which operates the automatic braking device. Fig. 4 shows the hook or snap attached to the other part of the same cable or wire. Fig. 5 shows the snap or hook opened, so as to allow the eye to escape. Fig. 6 shows a longitudinal sectional view through the center of the three-way valve O. Fig. 7 shows a side view of the tube-coupling in the position it occupies when coupled. Fig. 8

shows a plan view of the same. Fig. 9 shows a side elevation of the same with the coupling-jaws as they appear when uncoupled and ready to separate. Fig. 10 shows an inside elevation of the jaw 2 in its uncoupled position.

Similar characters refer to similar parts throughout the several views.

A represents the air-brake tube as it appears between the cars when said cars are coupled together. Mounted at the end of each car is a three-way valve O, to which the tube A is connected so as to leave a through passage through O except in case of accident. The tube A is secured to the valve-cylinder O in any suitable manner. The valve O is provided with a cylindrical body I, passing transversely through the shell of O and provided with openings adapted to register with the air-passages J and J' and also with the port K, as hereinafter described. Each cylinder I is connected to a lever H, as shown in Figs. 1 and 2, and each lever H is connected by the pivoted rod or bar N to the lever L, which levers L turn on pivots M as fulcrums and pass downward and are attached to the cables D D' and E E', respectively, as shown in Fig. 1. Each cable is preferably made in two sections attached together by a buckle or snap or any other suitable means which will allow the sections to be separated by a strong strain.

G and F, Figs. 3 and 4, show my preferred method of coupling the cable. The snap F is provided with an incline hooked portion Q and a spring P. The eye G rests in the snap and is held in place by the stiff spring P. As shown in Fig. 1, the cable D D' is secured at one end to the lower end of one of the levers L and at the other end to the car in the rear of the car carrying the lever L, to which the other end is attached, and the cable E E' is secured at one end to the lower end of the other lever L and at its opposite end to the car carrying the lever L, to which one end of the cable D D' is secured, as above described. Should the coupling between the cars break, so as to cause the cord or cable D D' to act upon the lever L, and still not enough to separate the cars entirely, the lever L would be shifted and turn the cylinder I until it would open the port K, as shown in



Fig. 6, and the air escaping from K would gradually apply the brakes to the entire train, when the engineer would learn of the accidental defect in the coupling, and in case the cars should be entirely separated the lever L would be quickly thrown into the inclined position shown in full lines at the left of Fig. 2, and the air would be prevented from escaping from the air-tube A, attached to the front car, preventing the setting of the brakes on the cars in front of the breakage, while the parting of the tube A would immediately permit the air to escape from the tube A, attached to the cars in the rear of the point of separation and apply the brakes to all the detached cars. When the cars are moving in the direction shown by the arrow, the cable E E' is detached and is not in use, but if the cars are moving in the opposite direction the sections of E E' are attached together and the end in the direction of the movement of the cars is attached to the lever L and the other end to the car by means of the staples L' in the rear, and the cable D D' is detached and not in use. The operation of D D' and E E' is identical and the construction of the two precisely alike.

B represents a tube or hose, preferably of india-rubber, suspended between the cars and adapted to receive within it the cables D D' and E E', and in order to prevent the destruction of this tube B, I construct it in two parts with a coupling that will be automatically detached in case of the breaking apart of the cars. The normal position of the tube B with the cables inclosed is shown in Fig. 1, and the normal position of the coupling is shown enlarged in Fig. 7. The coupling is composed of the two jaws 1 and 2. The jaw 1 is provided with the grooved lug 3, which engages with female lug 4 on jaw 2, and jaw 2 is provided with the grooved lug 5, which engages with the female lug 6 of jaw 1. Each of the lugs 3 and 5 has a groove (shown by 7) and each of the female lugs has a groove, (shown by 8.) These two jaws 1 and 2 engage with each other when the tube B hangs

in the normal position, as shown in Figs. 1 and 7, and when the car-coupling gives way and the tube B is raised, as shown in Figs. 2 and 9, the two jaws 1 and 2 become separated or uncoupled. The sole object of the tube B is to protect the cables inclosed therein, and the sole object of the coupling composed of the jaws 1 and 2 is to prevent the breakage in case of the accidental uncoupling of the cars.

In the above description I have given the preferred form of my invention; but it is obvious that the form may be changed without departing from the spirit of the same.

Having thus described my invention, what I claim to have invented, and desire to secure by Letters Patent, is—

1. The combination with the section of an air-brake tube extending between two cars in a train a valve in the tube at the rear of the front car, a cable connecting the valve with the front end of the car immediately in the rear, and a tube inclosing said cable substantially as described.

2. The combination with a section of an air-brake tube extending between two cars in a train a valve in the tube at the rear end of a car, a cable made in detachable sections connected to said valve at one end and to the car immediately in the rear at the other end.

3. The combination with the air-brake tube a valve at the rear end of the car in a train, a lever connected to said valve, a cable connecting said valve-lever with the car immediately in the rear, a tube made in two sections inclosing said cable, a coupling connecting the two sections of the last-named tube and adapted to uncouple upon the separation of said cars.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

FRANK LINCE.

Witnesses:

EDWARD TAGGART,  
JAMES B. DAVIES.