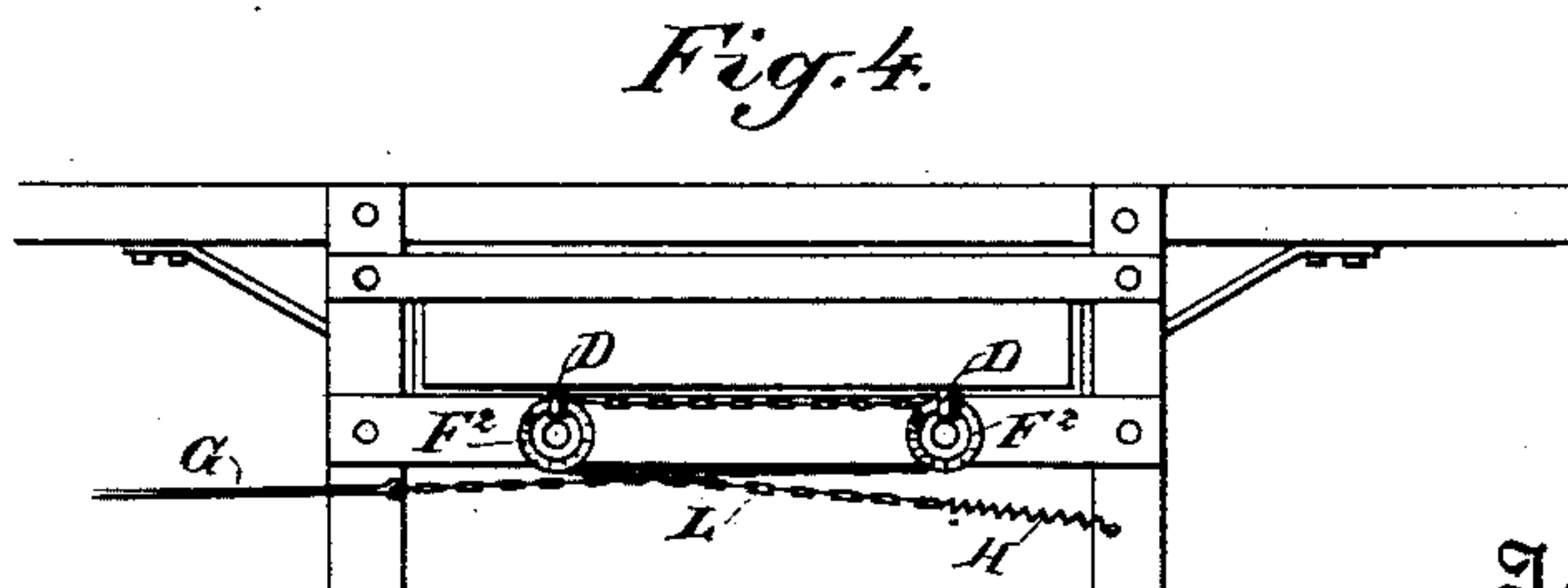
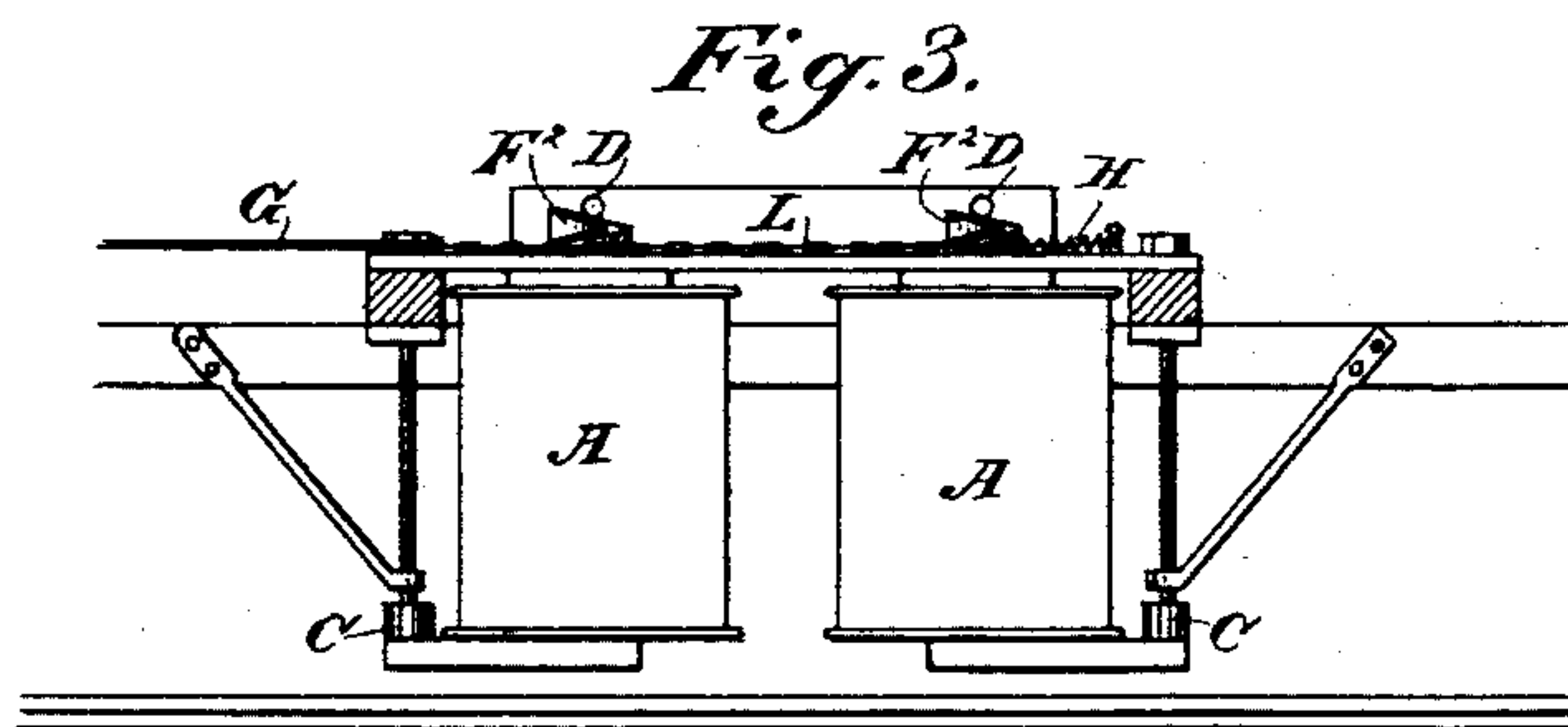
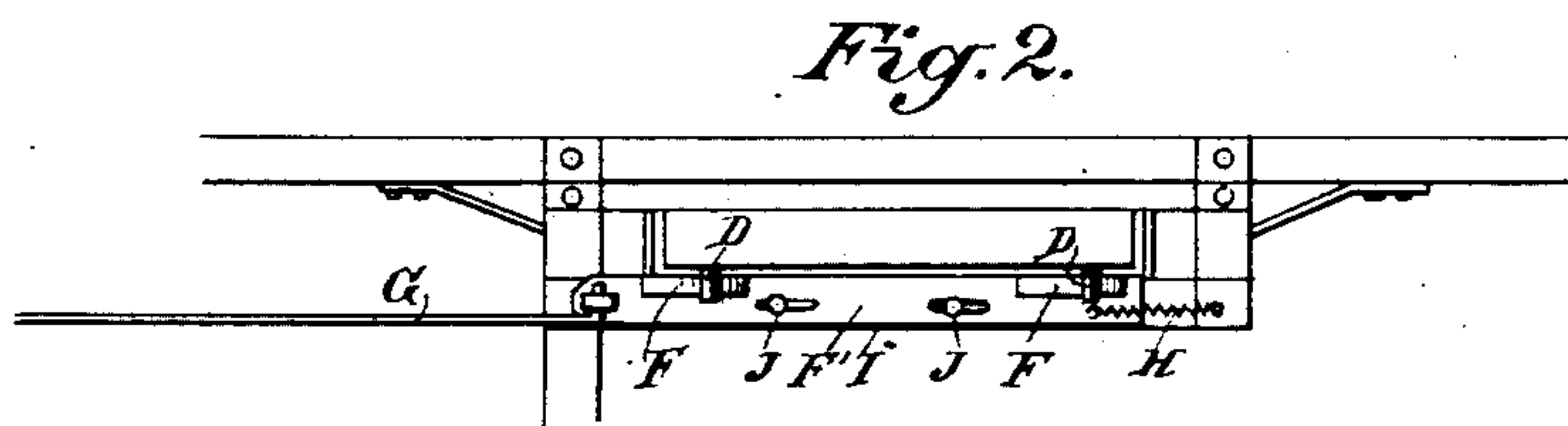
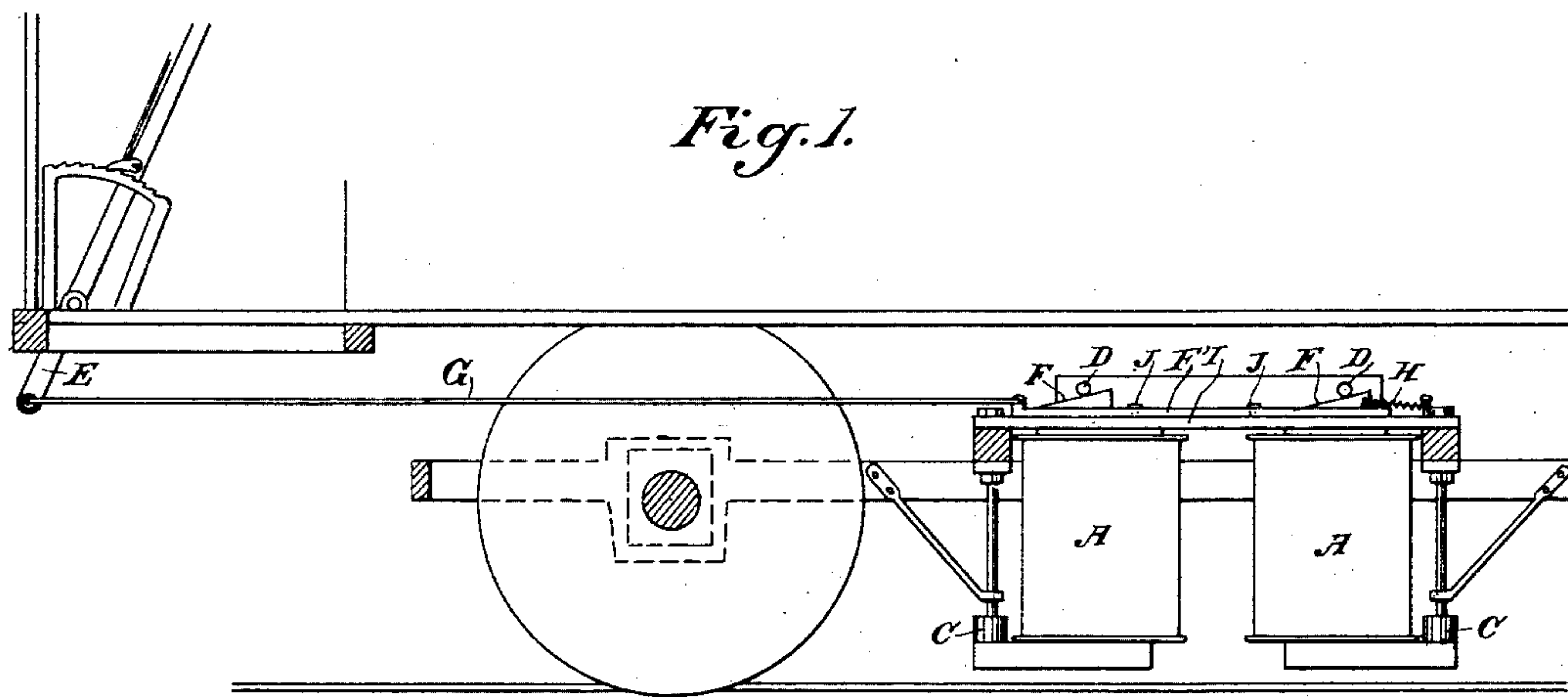


(No Model.)

C. M. ALLEN.  
ELECTROMAGNETIC TRACTILE DEVICE.

No. 525,523.

Patented Sept. 4, 1894.



Witnesses,  
G. H. House  
J. F. Aschbeck

Inventor,  
Charles M. Allen  
By Dewey & Co.  
attys

# UNITED STATES PATENT OFFICE.

CHARLES M. ALLEN, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR OF ONE-HALF TO ROBERT T. MURRAY, OF SAME PLACE.

## ELECTROMAGNETIC TRACTILE DEVICE.

SPECIFICATION forming part of Letters Patent No. 525,523, dated September 4, 1894.

Application filed August 22, 1893. Serial No. 483,761. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES M. ALLEN, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Electromagnetic Tractile Devices; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a novel device for increasing the tractile power of electrical and other motor engines, or locomotives, and it consists of the constructions and combinations of devices which I shall hereinafter fully describe and claim.

Figure 1 is a view illustrating the application of my device. Fig. 2 is a plan view of the same. Fig. 3 is a modification. Fig. 4 is a plan view of it.

The object of my invention is to provide a means for temporarily increasing the tractile force of the wheels of a vehicle, so that they will be prevented from slipping when power is applied to start the motor or train, or to climb steep grades, or under any condition in which it is desirable to increase the tractile power. This result is obtained by the use of powerful electro magnets so arranged with relation to the rails of the track over which the car passes that when the magnets are energized the structure upon which they are mounted will be attracted toward the rails with a power dependent upon the magnetic strength developed, and this attraction is equivalent to the addition of a greater weight to the vehicle whereby the adhesion of the wheels to the rails is correspondingly increased.

The magnets A may be arranged in any suitable or desired manner and supported from some part which maintains a fixed distance from the track. In the present case I have shown them as supported from the car or truck frames or axles, and movable vertically. These magnets are formed in the usual or any suitable manner, by surrounding them with coils of insulated conducting wire, said coils being wound either directly or in independent series, and provided with means for passing the current through as many of the series as necessary to develop the required magnetic power. These mag-

nets are mounted either between the wheels of the trucks in line above the rails, or in any suitable relation thereto for the development of the desired power, and to maintain them in a fixed relation to the track. They are also made vertically movable so that they may be approached close to the rails or withdrawn therefrom as may be desired.

Fig. 1 shows the magnets mounted upon a frame which is so constructed as to move in vertical guides C, and they may be raised or depressed either by toggle levers, by cams or eccentrics, or by inclined planes, as shown in Fig. 1, or screws, as shown in Fig. 2, or any other mechanical device which will produce the desired result. In Fig. 1, I have shown the magnet frame as having projecting lugs D upon each side which travel upon inclined planes F. These inclined planes are fixed to a plate F' which slides upon a guide plate I. The plate F' is slotted and pins J extend up through these slots from the plate I and thus limit the movement of the inclined planes, which move beneath the lugs D, and are connected by a rod G with a lever E or other mechanism within convenient reach of the operator whereby he may move the inclines so as to raise the magnets a considerable distance above the track. When released, the inclined planes are drawn back by action of a spring H. When constructed as shown in Fig. 3, the curved planes F<sup>2</sup> are rotated a part of a revolution by levers or by chains L passing around them as shown, the movement acting upon the pins D to raise the magnets in the same manner as described for the straight inclines. The inclined planes travel upon a supporting horizontal guide-plate I, and act as before described to elevate or depress the magnets through the projecting lugs, and at whatever point the magnets are arrested with relation to the track, they will, whenever a current of electricity is passed through the coils surrounding them, be attracted with a corresponding force, and this will add to the weight upon the wheels in proportion to the magnetic force developed.

When the motor car or locomotive is to be started upon a level track, and it is desired to increase its tractile force, the magnets will be lowered to a point very near to the surface



of the track, and the electrical current being passed through the coils, will develop a strong attractive force in the magnet which will be equivalent to the addition of that much weight, and thus increase the adhesion of the wheels to the rails. The same operation is employed when the motor is climbing grades where the adhesive force of the wheels must be increased, the magnets may be raised from the rails either to decrease the force of attraction, or when passing over curved or rough places of the track where it is necessary to raise them to prevent contact.

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

1. A means for increasing the tractile force of motors consisting of an electro-magnet or magnets vertically movable toward and from

the rails, and movable inclined planes engaging the magnet or magnets for raising them, the latter being depressed by gravitation, or attraction when energized.

2. A means for increasing the tractile force of motors consisting of an electro-magnet, a vertically movable structure containing the magnet and provided with lugs or abutment, and a movable inclined plane engaging the lugs or abutment to raise the magnet and its structure, the magnet descending by gravitation when released.

In witness whereof I have hereunto set my hand.

CHARLES M. ALLEN.

Witnesses:

S. H. NOURSE,

H. F. ASCHECK.