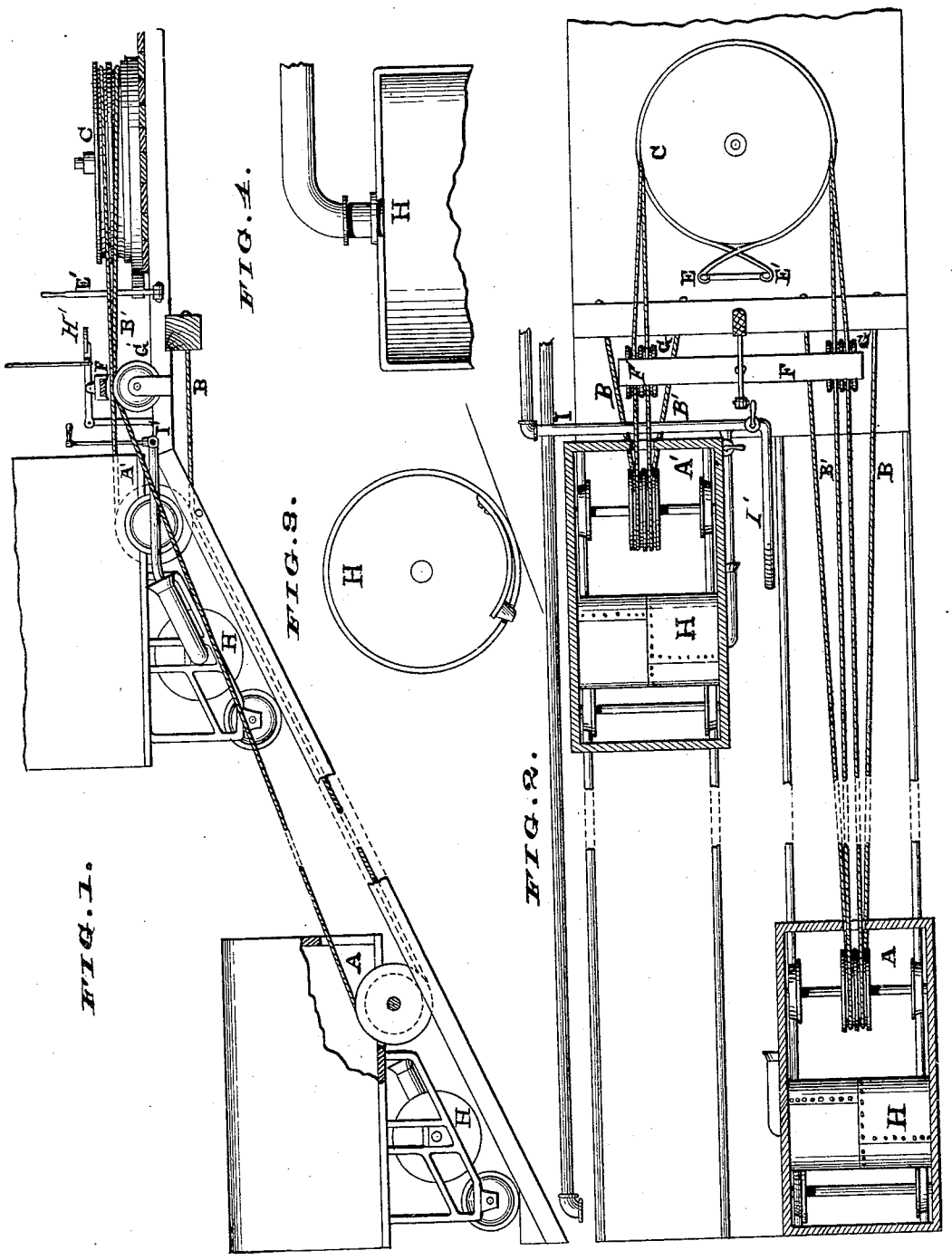
(No Model.)

J. C. MORRIS.

OPERATING INCLINED PLANE RAILWAY CARS.

No. 266,301. Patented Oct. 24, 1882.



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OPERATING INCLINED-PLANE-RAILWAY CARS.

SPECIFICATION forming part of Letters Patent No. 266,301, dated October 24, 1882.

Application filed December 8, 1881. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. MORRIS, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and useful improvement in Operating Inclined-Plane-Railway Carriages; and I do hereby declare the following to be a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

The means by which the invention is carried into effect is illustrated in the accompanying drawings, wherein Figure 1 represents a side elevation of a double-track inclined-plane railway, showing the cars respectively at the termini, with draft and safety cables arranged to work over sheaves on the front axle of each truck, the brakes, levers, change-wheel, and guide-rollers; Fig. 2, a plan view of the same with the car-bodies removed, otherwise equipped for one mode of operation, showing a system of water-pipes with stop-valves which lead to the water-chamber of each truck when at the upper terminus, and a force main pipe leading to the upper from the lower terminus; Fig. 3, a sectional view of the water-chamber, showing one of a number of outlet-valves seated interiorly; Fig. 4, an elevation of one end of the water-chamber, showing the inlet-pipe or hollow journal and a portion of the funnel-pipe.

Similar letters refer to similar parts throughout the several views.

A A and A′ A′ are cars of ordinary construction for like purposes, mounted on well-braced truck-frames, and wheels which conform to the inclination of the tracks.

B B and B′ B′ are cables of wire rope. C is a change-wheel, of a construction common for the transmission of power by wire rope, of a diameter equal to the distance between the centers of the tracks. One portion of its periphery is made flush for brake-surface. Its motion in either direction is about a vertical axis. A substantial metallic strap-brake encircles the change-wheel, operated by two levers, E and E′, which are provided with pawls to drop into ratchets to fix the brake on or release it. Another brake, F and F′, is suspended to act on the cables and the guide-rollers G and G′, operated by treadle-levers H′.

H H are cylindrical water-chambers, constructed of sheet metal or other material, each thoroughly covered or otherwise fitted for protection against congelation of its contents when charged, and of dimensions to afford a capacity for a water-load equal to the maximum of the work contemplated in drawing up the ascending car, and is provided with a journal at each end, fitted in bearings formed in the truck-frames, so as to swing clear of the track and remain passive in position. Inlet and outlet pipes and valves are fitted to the chamber, and its interior is accessible to inspect and adjust the valves by means of a manhole formed in one end or side. One or both journals are made hollow and fitted with a funnel-pipe.

I and I′ is a system of water-pipes connected with any conveniently-arranged reservoir, that is supplied in any usual manner with water; but in situations where water is limited in quantity, or costly, then, when the reservoir or tank is once filled, the same water, with some reparation for leakages and waste, is used over continuously by means of a steam or other operative pump arranged to operate at the lower terminus, drawing the water of the discharged chambers, forcing and delivering the water through the force main pipe J into the reservoir at the upper terminus.

For each cable one of its ends is made fast to secure anchorage near the center of and below the track at the upper terminus. Then the running part of the cable is led to the lower terminus over the pulley or sheave on the front axle of one car, thence back up to and over the change-wheel and to and over the pulley or sheave on the front axle of the other car, thence to a like point near the center of and below the other track at the upper terminus, and there made fast to secure anchorage. Two or more cables are employed as draft and safety cables. If either be attached directly to the car, a separated section of the change-wheel or another independent wheel or drum to move in the same or another plane would be required to accommodate the variation of speed. It is obvious that if either cable is arranged to wind on a drum only one of its ends would be made fast to secure anchorage.

Thus constructed and arranged, the operation is as follows: The cars are placed at or

have come to rest in their respective positions at the termini. The upper car has had the end of the charging-pipe inserted, automatically or otherwise, in the funnel-pipe. The other car has had its chamber discharged of its water-load. The attendant at the upper terminus, standing immediately accessible to the valve and brake-levers, after being notified that the car next to ascend has its trip-load on board, opens the valve to charge the chamber with its water-load, then releases the brakes. As soon as the counterpoise of the trip-load to ascend is obtained and some excess of weight indicated as sufficient, the valve is closed. The cars start in motion, and are controlled by the application of the brakes during the run, and then fixed in their respective positions of rest after the run—one to have the water-load discharged into a wasteway or receiver by tripping the outlet-valves automatically or otherwise, the other in readiness to receive its water-load. Each car becomes alternately the ascending and the descending car, bearing trip-loads each way, but water-load, more or less, only one way, and not at all when the descending trip-load exceeds in weight the other. The funicular arrangement of the draft and safety cables diminishes the force heretofore required for motion and for the control of moving cars, however operated, by gravity or other motor. The form of the water-chamber affords a maximum of capacity for water-load with a minimum of material and weight and an adaptation by suitable adjusting means for use as wheels. All weight of the descending trip-load contributes to the useful effect in moving the ascending car, and water on account of its mobility, replenished from natural or artificial sources, is employed to make up any deficit of weight.

What I claim is—

1. The combination, with the double-track inclined way and a change-wheel, of cars arranged to travel on said way and having pulleys or sheaves, and one or more cables secured at both ends to substantial anchorage and passing around said sheaves.

2. The combination of inclined-railway cars having pulleys or sheaves lapped by bights formed in the cables B B B′ B′ in a manner to sustain said cars while in motion or at rest upon the tracks, with the change-wheel brake and levers E E, substantially as shown and specified.

3. The combination of guide rollers or wheels G G G′ G′ with the brake F F′, extended to bring its rubbing-surface in contact with all said rollers and the running parts of the descending and ascending portion of the cables moving in opposite directions, substantially as and for the purposes shown.

4. In the arrangement of a double-track inclined railway whereon cars are moved by gravity, employing water derived from a reservoir or other source at the upper terminus to make up the deficit of weight on the descending car required for traction of the ascending car, a cylindrical water-chamber carried by each car, arranged to admit covering all its exterior surfaces for protection of its contents from congelation, and having charging mechanism and discharging mechanism, each for its respective terminus, as specified, in combination with water-pipes arranged to admit of connections for the reciprocal interchange of water between the source of supply and said water-chamber, substantially as described.

JOHN C. MORRIS.

Witnesses:
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