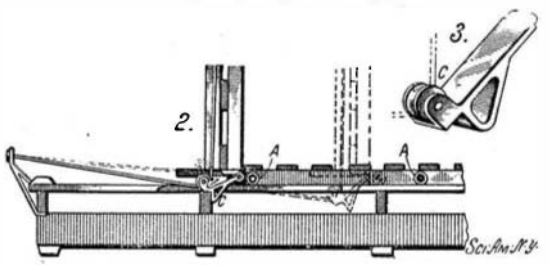
AN IMPROVED HAY RACK.

A number of attempts have been made to devise a hay rack which can be fully loaded from a mechanical loader without requiring that the hay be pitched manually from the loading end to the other. The hay rack illustrated in the accompanying engraving is arranged to effect this result in a very convenient and simple manner. It comprises a main frame, formed with boards running longitudinally along each side, and a movable platform mounted on rollers, *A*, which travel on these boards. At the rear or loading end of the hay rack is a vertical abutment attached to the main or stationary frame, and at the other end is a similar abutment attached to the movable frame. Supported on the central post of this abutment is a windlass, from which a cable passes under a pulley, *C*, to the front of the hay rack, where it is secured to a bracket mounted on the main frame. By winding up this rope the movable platform may be drawn to the front of the hay rack. The pulley referred to is mounted in a swinging bracket, which is pivoted to the movable frame. A projection on this bracket is adapted to normally engage one of the crossbars of the main frame, to prevent the platform from moving forward. But when the windlass is operated, the frame is first drawn up until the crossbars are cleared, after which the forward movement of the platform begins. In use the platform is moved to the rear of the rack, and as soon as the space between the abutments is filled the platform is moved forward, carrying the hay with it, and thus opening a space for further loading. A step is provided on the moving platform for the operator to stand on. The windlass is mounted on a frame which can be attached to the forward abutment at any point suited to the convenience of the operator. Mr. John A. Beierschmitt, of Fairbank, Iowa, is the inventor of this improved hay rack.

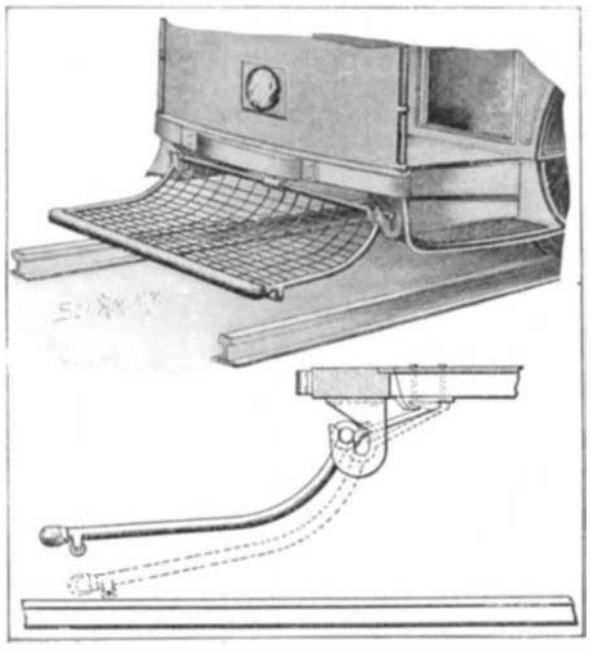
AN IMPROVED HAY RACK.



DETAILS OF THE LOCKING DEVICE.

A SIMPLE CAR FENDER.

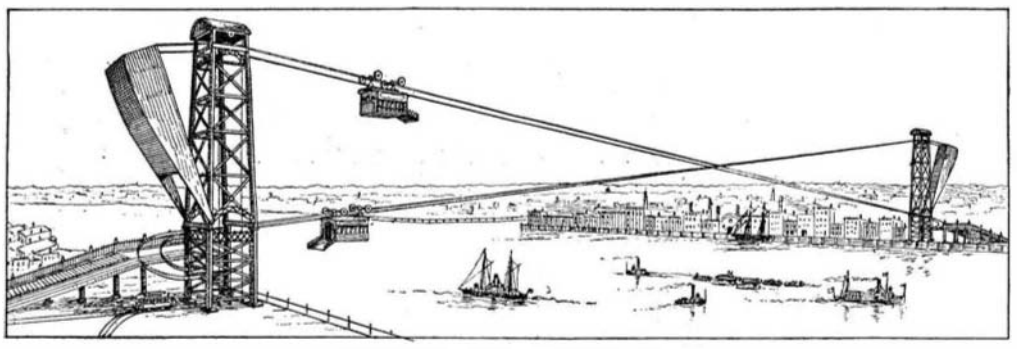
The car fender which we illustrate in the accompanying engraving is a very simple contrivance, which may be readily applied to a car of ordinary construction. The connection between the car and fender is such that the latter may be quickly detached from one end of the car and attached to the other end when desired. The fender is also so arranged that its forward end will be normally held a considerable distance above the street surface, but upon striking a person or other obstruction it will quickly fall to safety position. The hangers on which the fender is supported are each formed with two hook members, and between these the side bars of the fender pass. The hook members are each formed with two sockets or recesses, one above the other, adapted to receive the top cross-bar of the fender. Normally, this bar is supported in the upper recesses, as shown in the illustration, and the forward end of the fender is held clear of the street by a pair of locking arms, which engage a plate secured to the under side of the car platform. A hook member on this plate prevents the fender from being moved forward, but by pressing the fender back the locking arms can be disengaged from the plate and the fender removed. When the fender encounters an obstruction, it will thus move back, and the top bar will fall into the lower recess, permitting the forward end of the fender to drop to the track, on which it will be supported by rollers. In this position it is obvious that a person struck by the fender may fall therein without danger of injury. Mr. Louis A. Bechtel, Jr., of Benwood, West Virginia (P. O. box 134), is the inventor of this improved fender.



A SIMPLE CAR FENDER.

A NEW TYPE OF ELECTRIC COUPÉ.

Our illustration shows a new type of electric coupé invented by W. H. Douglas, of Belleville, N. J., and which is now being built by Healy & Co., well-known carriage builders of New York. The machine has two novelties, namely, steering and driving by the front wheels and a new form of steering gear. As the picture shows, the motors are suspended from the front axle and drive, through universal joints, the pinions which work within the internal gear rings attached to the wheels. The rings containing the internal gear teeth are mounted within the outer rings, which are attached to the wheels. The gear rings are arranged to transmit motion received from the pinion through coiled springs to the outer rings. This flexible connection makes the vehicle start very easily and makes the stripping of a pinion almost an impossibility. The new form of steering gear employed consists of two vertical screw-threaded shafts connected together by spur gears. One of these shafts is extended upward to form the steering column on which is mounted the steering wheel. Mounted on the screw-threaded shafts are two nuts, one of which rises, and the other of which descends when the steering wheel is turned. This motion is used to move an inverted L-shaped lever pivoted on the nut on the steering column and having its shorter, or horizontal, leg slotted near the end to fit over a pin on the nut of the shorter shaft. The long vertical arm of the inverted L-shaped lever is connected to the lever arm on the steering knuckle. This arrangement is absolutely irreversible and will always stay where set.



A NOVEL GRAVITY RAILWAY SYSTEM.

A NOVEL GRAVITY RAILWAY SYSTEM.

We illustrate in the accompanying engraving a novel railway system invented by Mr. Abraham Abelson, of 109 Henry Street, New York city. This system, as shown, is particularly adapted for crossing rivers, gorges, ravines, and the like, and is designed to effect an economy over existing systems of transportation. It consists of a tower at each anchorage built of skeleton framework, in the center of which an elevator operates. Cables are suspended from a cradle at the tower top and anchored near the base of the opposite tower. Pivoted counter-weights are provided, which serve to keep the cable taut and to compensate for any variations in cable lengths. These weights also remove the lateral pressure on the towers, producing instead a downward pressure thereon. The system does not require any elevated approaches to the bridge entrances. The transporter cars are suspended from swivel trucks which travel on the cables. In practice a car is raised by means of the elevator to the top of a tower, the trucks being turned so as to clear the cables. When the top of the tower is reached, the trucks are turned back to normal position, so that on descent of the elevator they will rest on the cables supporting the car. The car thereupon descends by gravity to the opposite tower. The cars are entirely independent of each other, and the speed of the descending car can be regulated at will, thus effecting a saving of time over such systems as employ two counterbalancing cars.

Santos-Dumont is experimenting with a balloon which differs considerably from his preceding airships. Leaving aside the question of steering, he wishes to obtain a constant altitude for the balloon without loss of gas or ballast under all circumstances, and his new balloon is designed especially to make a long stay in the air. It is of a novel form, consisting of an oval-section balloon which carries a flat framework below it. The balloon body measures 62 feet long and 48 feet in diameter. The *nacelle* is to be hung from the framework. A second balloon or bag is attached to the frame and projects up inside the main balloon, forming a pocket containing 5,500 cubic feet. The pocket will contain hot air and the latter is to be supplied by a petrol heater which is carried below. The hot air bag will thus give an added ascensional force which can be varied at will so as to regulate the height of the balloon. The first trial with the new system will bear upon the operation of the heater and the effect of the hot air upon the material of the balloon. If these are successful, he expects to make an ascension later on.

A NEW TYPE OF ELECTRIC COUPÉ.