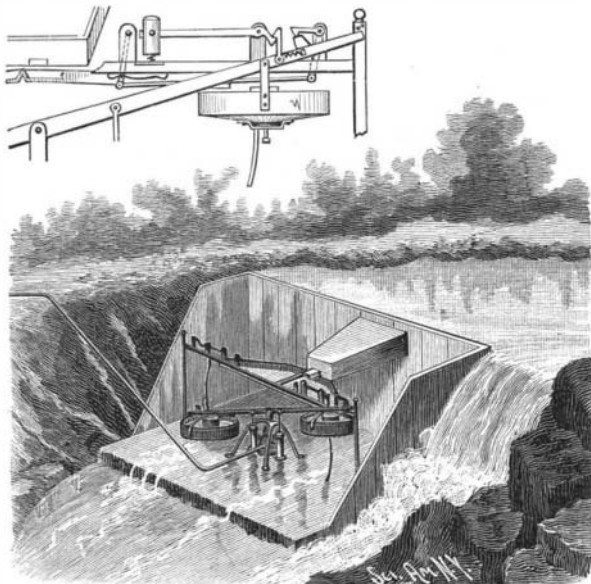


AN AUTOMATIC MOTOR.

In this motor a pivoted oscillating lever has at its ends buckets which alternately receive and discharge water as the ends of the lever rise and fall, the actual weight of the water thus operating the motor with very little friction and a minimum loss of power. The improvement has been patented by Mr. Charles W. Johnston, of No. 127 Pastorius Street, Germantown, Philadelphia, Pa. In the illustration the motor is represented operating a double-acting pump, which, with the motor, is arranged within a suitable open casing at the

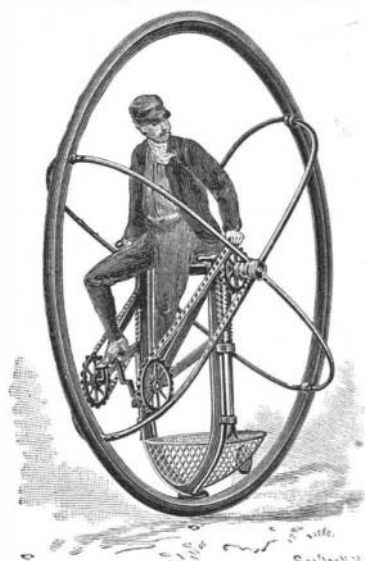


JOHNSTON'S MOTOR.

lower side of a dam in a small stream, the small figure being a detail view at one end of the lever with the bucket raised. In the middle of each bucket is a valve with downwardly extending stem which strikes the base of the frame when the bucket goes down, so that the valve is unseated and the water runs out, the valve being automatically seated when the bucket reaches its uppermost position, where it is connected with a water trough from a central chute. The beam is held in position, while being filled, by a hook which automatically engages a hook on a lever fulcrumed in bearings on the main frame, the other end of the lever being weighted and the weight resting on a spring, whereby the raised end of the beam is locked in place until the water entering the bucket overbalances the weighted lever. The horizontal water trough from which the buckets are supplied is supported by swinging hangers, the trough being connected by links with elbow levers pivoted in the frame of the motor above the highest point of oscillation, whereby the trough is alternately shifted to supply the bucket first on one side and then on the other. A curved guide rod steadies the buckets in their up and down movement.

AN IMPROVED UNICYCLE.

The wheel shown in the illustration, patented by Mr. Robert Hendrich, No. 1643 North Clark Street, Chicago, is designed to facilitate traveling at a high rate of speed, while being of comparatively durable and simple construction. The rim has a cushion tire, two



HENDRICH'S UNICYCLE.

outwardly curved webs from which form a casing or cage for the rider, the webs preferably forming spokes connected with central hubs in which is a shaft on which is loosely hung a frame carrying a seat for the rider. In the forward lower end of the frame are also journals in which turns the crank shaft, with crank arms engaged by the feet of the rider in the usual way, the sprocket chains connecting with wheels on the main shaft on opposite sides of the seat and within the hubs, whereby the wheel is rotated. The brake shoe is on the lower end of a vertically arranged fork, the upper end of each arm of which has a handle in easy reach of the rider, while springs on the fork arms normally hold the brake shoe out of contact with the rim. The wheel is held in upright position at rest by two rods sliding in vertical guides on the frame, the lower forked ends of the rods being normally held out of contact with the ground by springs, and the rods being pressed down into the ground by means of handles at each side of the saddle. At the lower extremity of the frame is a basket to hold packages, etc., and connected with the basket

is a rod on which is held an adjustable weight to counterbalance the weight of the rider on the seat. That the rider may readily pass in or out of the cage, one of the spokes on each side is connected with the hub by means of a hinge, the outer end of the hinged spoke engaging a keeper on the side of the rim by means of a spring latch. The steering is readily effected by the rider bending to one side or the other.

The Late Captain Eads and the Manchester Canal.

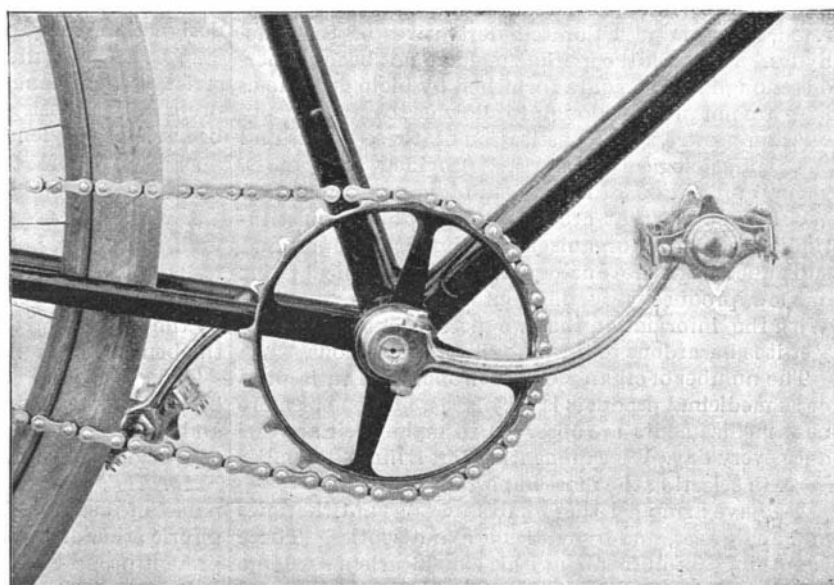
In the summer of 1884, exactly ten years ago, Captain Eads, one of the most eminent civil engineers of America, came over to give his opinion about the Manchester Canal, the inauguration of which is one of the memorable events of this year. Captain Eads it was who constructed the famous bridge over the Mississippi at St. Louis. It was he who built the jetties which enable deep water to be always counted on at the mouth of the Mississippi below New Orleans. The first public move in favor of the Manchester Canal was a meeting at Didsbury, near Manchester, in 1882. Captain Eads, before his examination by the Parliamentary committee, had thoroughly made himself acquainted with the whole region between Liverpool and Manchester. He had made maps of the bottom of the Mersey, and of the sea floor at the mouth of the river. He had no doubt as to the success of the enterprise which Mr. Adamson, the English engineer, had undertaken. The few survivors of that committee must remember the clear and decisive testimony of the American engineer. He knew nothing about the rivalries of Liverpool and Manchester, and gave no thought about the alleged saving of time or distance or cost in bringing passengers or freight or enlarging the water line for ships and trade. His one idea was that a vast new seaport would be made in a region of vast population, which would enable the produce of all the world to be brought to the people without break or change. He did not live to see the completion of the work, but his name is worthy of remembrance amid the triumphant celebrations.—*Leisure Hour.*

An Electrical Self-acting Rudder for Ships.

An interesting device by Mr. Bersier is described in *L'Ind. Elec.* The object is to operate the rudder of large vessels automatically by the compass directly without the use of the usual seaman. Attention is called to the fact that the errors in the ordinary method are scarcely less than from 1 to 2 degrees, corresponding to a lateral error of about 12 miles per day. With the present method greater accuracy is said to be possible; the standard compass is used and a current from a Ruhmkorff coil is passed from the pivot of the needle to the north pole extremity, whence sparks of 3 millimeters' length pass to one of two semicircular pieces of aluminum insulated from each other, the gap between them being set to the desired sailing direction. When the spark passes to one of these the current, by means of a relay, starts a motor in one direction, which in turn operates the rudder, while if the spark passes to the other piece, it moves the rudder in the other direction. The apparatus has been in use for two months on the steamer Neptune, and it operated very successfully. An additional device is mentioned, in which these sparks pass through a strip of paper, by means of which the record is automatically kept.

AN IMPROVED BICYCLE CRANK.

This crank, which was patented about a year ago, has attracted not a little attention among wheelmen, and seems to have given a good deal of satisfaction. As will be seen from the illustration, the crank is bent on about a quarter circle, and when much pressure is put upon the pedal the crank begins to straighten out, thus lengthening it and producing a longer leverage, with correspondingly greater power. It is claimed in this way to have greater advantages for hill climbing than any of the changeable speed gears, as there are no extra pieces to be attended to or get out of order, and the crank itself is made of a special quality of tempered spring steel, which cannot ordinarily be broken or permanently bent. In riding rough roads, also, it cushions the jolt, so that the vibration is nearly all absorbed without being transmitted to the body, rendering such travel much more comfortable than is possible with the ordinary straight crank. These elliptical cranks are a special feature to be found only on the Ide bicycles, manufactured by the F. F. Ide Manufacturing Co., Peoria, Ill.



THE ELLIPTICAL SPRING CRANK OF THE IDE BICYCLE.

AN IMPROVED FARM GATE.

According to the improvement shown in the illustration, which has been patented by Mr. Richard T. Mulcahy, of Rosenberg, Tex., the gate is supported centrally on a pivot post and adapted to be swung in either direction by levers and pull cords, the improvement being also applicable to a single gate. At the front and rear of the center of the gate opening are standards in alignment with the swing post, and above the top rail of the gate, at each side of the swing post, is pivoted a latch, the latches being guided in studs or standards on the gate and engaging keepers on opposite sides of the keeper posts. Each of these upper latches is also connected near its outer end by a vertical rod or link with a similar lower latch pivoted on the lower rail of the gate, and engaging a similar lower keeper on one of the keeper posts. Above the gate, on each side of the swing post, are fulcrumed bell crank or elbow levers, each of which is connected, at each end, by a link, with one end of a lever centrally fulcrumed on one of the standards in alignment with the swing post, each of these standards being also provided with upper and lower keepers adapted to engage the latches on the gate. On the central latch



MULCAHY'S FARM GATE

guide of each gate is also fulcrumed an elbow lever connected through a link by one of its members with one of the members of each of the elbow levers on the swing post, the other member of the elbow lever on the latch guide being connected with one of the latches on the gate. From each end of the levers pivoted on the standards at each side of the gate hang down pull cords, by means of which one approaching the gate on foot or in a carriage, from either direction, may, by pulling on one of the cords, actuate the levers on the central swing post, thereby first raising the latches and then swinging the gate open until the latches engage the keepers upon one of the standards. In opening the gate, the lever upon the standard is moved to a diagonal position by a slightly forward pull, and the gate is closed, after passing through, by a corresponding backward pull.

A New Electric Lighthouse.

The present Fire Island light on the south shore of Long Island is shortly to be replaced by a great electric light, said to be the largest ever made. It is claimed that it will have a brilliancy equal to twenty-five millions of candles. The lighthouse is 168 feet high and it is expected the light can be seen at a distance of 25 miles.