nal air, the latter, by a cylinder and piston, constantly acting, but with less power than the former. The valves are moved by levers which are struck at the proper time by a *plug frame* of similar construction to those employed in the ancient atmospheric engine. The power is communicated to the screw by tumbling shafts, connecting rods and levers, the construction and operation of which could not be rendered intelligible without full drawings for reference. More words would, perhaps, render this brief notice as mysterious as the contrivance of which it treats; I will, therefore, close, by adding that eight of these systems, attached to eight screw presses, constitute the coining power of the British Mint.

On the management of Turn-outs on Rail Roads. By A. C. JONES, Engineer.

FOR THE JOURNAL OF THE FRANKLIN INSTITUTE.

GENTLEMEN:—At the present rapid rate of traveling on rail roads, it is a desideratum (in point of safety,) to know that the switches of the turn-outs are in the line of the road, so that the train is not necessitated to be much checked, in passing over them. The best method for insuring the right position of the switches, is that used on some short roads, by having a man stationed at them; but on long lines of road, where there are many turn-outs, this is not practised, owing to the expense attending it. As a substitute, a ball is placed on the end of the lever used to shift the switches, to show their position. This, I believe, is the best plan in use; that it is defective is proved by the numerous accidents occurring on rail roads by running off at the turn-outs, it not being foreseen that the switches are wrong. Where the turn-out is in, or at the end of a curve, it is difficult to tell by the ball how the turn-out stands, until you are so near as to make it impossible to stop in time, if it is not right.

The following arrangement will have a tendency to promote safety in this particular, and the additional expense will be but trifling. Instead of the ball, I propose having a board placed on the post, its face at right angles to the road, with hinges fastened to one edge, and from its face extends a short lever, which is connected to the lever that moves the turn-out, so that when the switches are changed, the dial, or board, takes either the horizontal or vertical position. This will be shown more fully by an inspection of the cuts.

On a curve or grade, this method would have the same advantages as on a straight part of the road, and it is evident, the face or edge being presented to the engineer, that he will be thereby enabled to judge how the turn-out stands, at a greater distance from it, than by the method in practice, and will consequently admit of his stopping the train in time to prevent accidents.

A. The post. B. The lever. C. Connecting rod. D. Dial.

Respectfully, yours,

Philadelphia, Sept. 1836.

A. C. JONES.

This appears to be a good suggestion. A board, or disk, with a black circle in the centre, surrounded by a broad white border, would be more

conspicuous, and its position, in the way proposed, more easily perceived than the ball now in use. In turn-outs that are much used, it may be expedient to keep a lamp burning during the night, to show the position of the disk. It seems desirable, however, that every precaution should be taken to prevent the necessity of stopping a locomotive train in order to adjust the switches of a turn-out.

J. G.

Franklin Institute.

COMMITTEE ON SCIENCE AND THE ARTS.

Report on Mr. C. Kenzie's Water Wheel.

The Committee on Science and the Arts, constituted by the Franklin Institute of the State of Pennsylvania for the promotion of the Mechanic Arts, to whom was referred for examination the model of a Water Wheel, invented by Mr. C. Kenzie, of Troy, New York, REPORT:—

That they have carefully examined the object submitted to them, and find that it is a modification of the tub and the undershot wheel. The peculiarity of the invention consists in receiving the water from a number of chutes at once, distributed around the periphery of the wheel. The buckets or float-boards, are set in the direction of the radii, and the water is directed as nearly as practicable in the line of a tangent to each float. In this arrangement the water is, of necessity, discharged from the wheel within the rim, or shrouding, and is allowed a free escape on both sides of the wheel. The wheel is placed in a horizontal position, at the bottom of the fall, entirely under water, and is surrounded by a box or tank of an equal depth with the wheel, to which it is accurately fitted to prevent the escape of water between them, whilst it permits the latter to revolve freely.

The supply of water is through a water-tight trunk connected with the tank, by which the entire head and fall is made available, the wheel being sunk below the lower level as before stated.

One of the benefits arising from this arrangement, is that of the water being received on the wheel in a compact form, owing to the spaces being kept always full by the centrifugal force. A principal advantage, however, is that of being able to employ a much greater quantity of water than could be brought to bear upon the floats by any other wheel of equal size.

The Committee believe that the advantages above enumerated, are in accordance with the principles of hydrodynamics, and that its inventor has attained a high degree of perfection in that description of wheel, and they are happy to add, that so far as their knowledge extends, the arrangement is new.

The Committee take leave to suggest, that since the water always retains a part of its power, proportionate to the square of its velocity, on leaving the wheel, no inconsiderable portion of it would be saved in this instance by extending the buckets to the centre, so as to deliver the water at as low a velocity as possible; and they would also recommend the use of a partition which should cause all the water to take the same course in the floats. In this case the rim must of course be made wider so as to contract the diameter of the opening to what would be just sufficient for a free delivery of the water.

By order of the committee.

Oct. 13, 1836.

WILLIAM HAMILTON, *Actuary*.