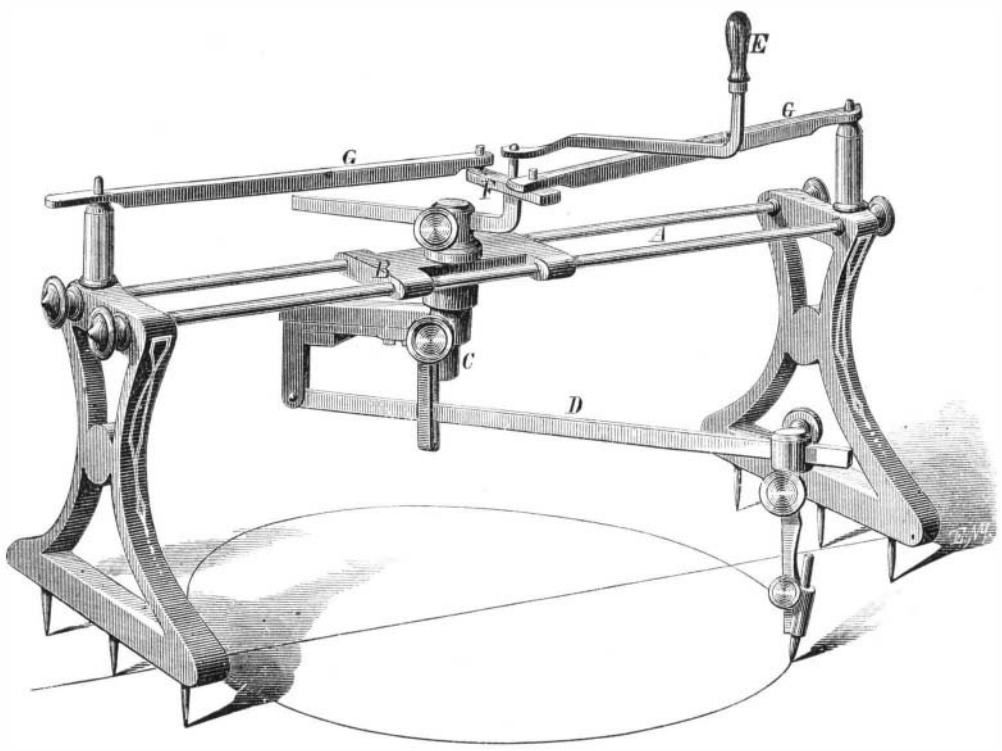
IMPROVED ELLIPSOGRAPH.

We illustrate herewith a new and useful instrument for draftsmen, by means of which any figure, from a circle to a very flat ellipse, can be accurately and quickly described. At A are parallel rods, carrying a carriage, B, through which passes the main axis, C, to which is fastened the drawing arm, D, with a head for the pencil or pen point, secured by a binding screw. The head slides to any desired point on the arm, and is likewise secured by a binding screw. The crank arm, E, passes through the head of the main axis, and also, by a set screw, may be secured in any position. The crosshead, F, fits the crank arm, and carries the parallel motion rods, G, which are secured to steady pins on the frame. There are center points by which the machine is set over any desired line upon which the ellipse is to be drawn.

It operates as follows: The center points are placed upon the minor axis; the pen point is set at the extremity of the major axis, and fastened. The arm, D, is then turned to the minor axis, or 90°, and the pen point is set at its extremity, by means of the arm and by sliding the carriage upon the parallel rods. The crank arm is then clamped. By turning the crank, the point will describe the desired ellipse. It carries the pen at right angles to the drawing bar, so that it will draw an ink line as well as a pencil line.

Samples of the work of this machine, which have been transmitted for our inspection, show that the figures are perfectly drawn.

For further particulars address Messrs. W. L. Bramhall and W. W. Johnson, 607 Seventh street, Washington, D. C.



TOULMIN'S ELLIPSOGRAPH.

IMPROVED RAILWAY TIE.

The invention illustrated herewith is a new iron railway crosstie, intended to replace the wooden tie usually employed. It is claimed to offer the advantages of permanence and indestructibility, and therefore to be much more economical than wood, the renewal of which, owing to its rapid deterioration, is a constant and large source of expense. A perspective view of the track secured in the tie is shown in Fig. 1, and a sectional view of the device is given in Fig. 2

The body of the tie is made of a rolled iron girder of T cross section. It is proposed to cut the girders as they come from the rolls, while hot, and to stamp the lugs, A, at the same handling. It will be seen from Fig. 2 that these lugs, A, overlap the inner base flange of the rail, while the outside flanges are retained by the adjustable clamps, B. The tapering plates or wedges, C, pass under, and are guided and held by, the bent lugs, D, and, by being driven inward, are tightened against clamps, B. The wedges are serrated on one edge, to prevent their tendency to work out through jolts and jars. In order to protect the ties against the weather, while still warm they are immersed in a bath of melted asphalt or other weatherproof substance.

The device shows strength, and apparently is neither difficult nor costly to manufacture. It would probably resist wear, and is as easily laid as a wooden tie.

Patented through the Scientific American Patent Agency, May 11, 1875. For further information address the inventor, Mr. Henry Reese, 209 W. Pratt street, Baltimore, Md.

Fig. 1

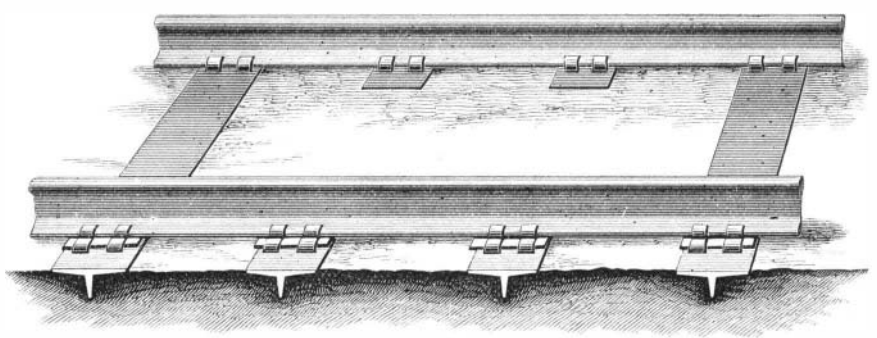
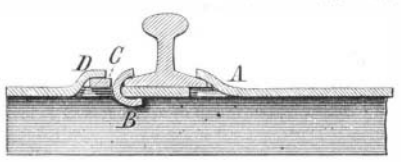


Fig. 2



REESE'S RAILWAY TIE

The Weather Glass.

In compliance with the repeated request of some of our meteorologically inclined correspondents, we publish below instructions for the construction of the so-called chemical barometer or weather glass. The utility of this little instrument is based upon the varying solubility of certain salts under different atmospheric conditions of pressure, humidity, and temperature, and the employment of a menstruum of such a density that the slightest increase or decrease of the same will cause the newly formed crystals to rise or sink in the liquid. The instrument generally consists of a tube, from ten or twelve inches long, and from three quarters to one inch in diameter. It is closed at the lower end, and, after the solution has been poured in, the upper end is drawn out, by means of a spirit lamp or blowpipe, until the tube is hermetically sealed. When cooled, the point is broken off in such a manner that a minute hole is left, which suffices for the necessary communication between the contents of the tube and the external atmosphere. Another arrangement consists of a large test tube with a piece of bladder or caoutchouc tied over the mouth, and a small pinhole made through this covering; this arrangement, however, is not so satisfactory as the first, as the covering does not last very long. The solution may be made as follows: Take pure nitrate of potash (saltpeter) and chloride of ammonium (sal ammoniac) each 1 part, camphor 4 parts, strong alcohol 70 parts, distilled water 50 parts. Shake the alcohol and water well together, and dissolve in it the saltpeter and sal ammoniac, then, after having reduced the camphor by triturating it in a mortar with a few drops of the dilute spirit, add it to the rest of the solution, and heat gently over a water bath until complete solution is effected and the liquid is clear. When this is accomplished, pour the solution immediately into the tube, the mouth of which may then be closed as above directed, and the whole allowed to cool very slowly.

The indications that this little instrument gives are of this nature: If the atmosphere be dry and the weather promising, the solid matter will be found resting on the bottom of the tube, the supernatant liquid being perfectly clear; but on the approach of rain or wind, the solid matter will gradually rise, and small crystals of stellar formation will be found floating in the otherwise pellucid liquid. On the approach of strong winds, flakes of feather-like form will sometimes appear on the surface of the liquid; this often occurs several hours before the actual breaking out of the storm. In cold weather the liquid is rendered milky by the multitude of white stars constantly floating in it. The instruments are pretty ornaments, and their indications are always interesting and instructive.

FLEURY'S EUREKA WEATHERSTRIP.

The invention illustrated herewith is an improved weatherstrip, which may be adjusted to suit any depression worn in the door sill. It consists of flexible tubing, A, Fig. 2, made of rubber, felt, or similar material, through which runs a metal rod, B, the object of which is to keep the tubing in position. Metal fastenings, C, have a hook at one end which fits around the rod, and an eye at the other end, by which they are secured by screws or other simple means to the bottom of the door, as represented in Fig. 1. The strip, by bending, may be fitted to any depression in the sill, so as entirely to fill up the opening between the sill and door when the latter is shut, thus preventing the ingress of either wind or water.

Fig. 1.

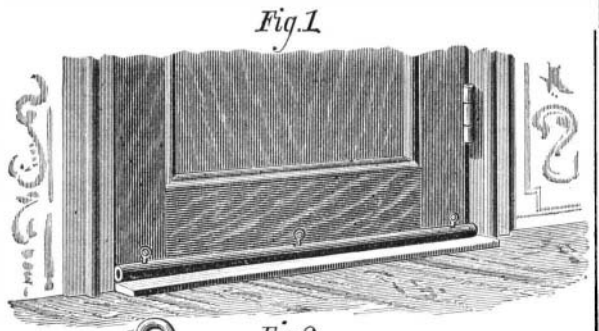


Fig. 2.

The door, by its weight, on being shut, draws the rubber against the threshold, and on opening the dragging of the rubber across the threshhold is prevented. The iron rod is made just the length of the door. The rubber tubing extends over one inch at each end, and rests against the casing.

The device is quite durable, is neat in appearance, and may be manufactured at a small cost.

Patented July 27, 1875. For further particulars relative to sale of rights or of entire patent, address the inventor, Mr. Frank Fleury, Springfield, Ill.

Ah Chu and his Salt.

B. writes as follows:

"'Where is your salt, Ah Chu?' said I. Ah Chu had invited me to dine at his mess, to celebrate a Chinese festival, and, barring the chopsticks and some national dishes, which I did not venture upon, a capital dinner it was. Ah Chu and his messmates were working on a sugar plantation below New Orleans. Ah Chu passed a bottle with a quill fitted in the cork. 'Vinegar?' said I. 'No; here is the vinegar,' said he, passing me a bottle exactly like the first. 'Me thought you asky for salt.' 'Salt it was,' said I. 'Well,' said Ah Chu, 'that is the salt me gave you first.'' And sure enough it was; salt dissolved in water and used in a fluid state. 'So,' says Ah Chu, 'table salt is served in China.'

"For convenience of application, and exactness with which the seasoning can be regulated, give me liquid salt."

A Model Locomotive.

An ingenious mechanical curiosity has recently been shown to us by its maker, Mr. Joseph Butcher, of 43 Center street, this city. It is a miniature locomotive and tender, containing every portion found in the full sized machine, perfectly proportioned, capable of carrying a steam pressure of 75 lbs. to the square inch, and of running at a high rate of speed. An alcohol lamp, which, by its heat, generates an alcohol steam, which, in turn, is ignited under the boiler, heats the latter, which is supplied with water by feed pumps, perfect in every valve and connection. No less than 230 separate pieces enter into the construction of the cab alone. The model is admirable in mechanical execution, and, strange to say, is its maker's first effort at mechanical work, and has occupied his leisure hours, outside his regular trade of ornamental painting, for the past three years. The engine shows remarkable skill both in design and handiwork, and evinces the great patience and native mechanical genius of its constructor, who first made the tools he used in constructing his machine.

Velocity--Effects of its Increase and Arrest.

Mr. F. J. Bramwell, C. E., in a paper read at the recent meeting of the British Association, said: Gravity can put into our frames a velocity in one second amounting to 20 miles an hour without injury, therefore it is reasonable to suppose that that velocity may be taken out at the rate of two and a quarter miles per second with even less risk of injury; and if we want a proof of this, one might instance a swing at a fair. Take the case of a swing 30 feet long, rising to the horizontal at each vibration; when the swing is at the lowest point, it has a velocity of 45 feet per second, or 30 miles; one knows it will make this half vibration and will reach its highest point in less than 1¾ seconds, so that a speed of 30 miles an hour is taken out at the rate of nearly 17 miles per second instead of the two and a quarter miles of the passenger train.

Another instance of rapid reduction of velocity without injury occurs in colliery winding. The Rosebridge Colliery, in the neighborhood of Wigan, is nearly half a mile, actually 806 yards deep; the winding is done under the minute or at an average rate of thirty miles an hour; but this includes the stopping and the starting; the maximum pace is equal to 58 miles an hour, and this 58 miles an hour is brought to rest in from 180 to 200 yards. There is thus, therefore, abundant evidence that the powers of brakes may be carried yet further than they have been without fear of injury to railway passengers from the sudden checking of momentum so long as the brakes are properly applied.