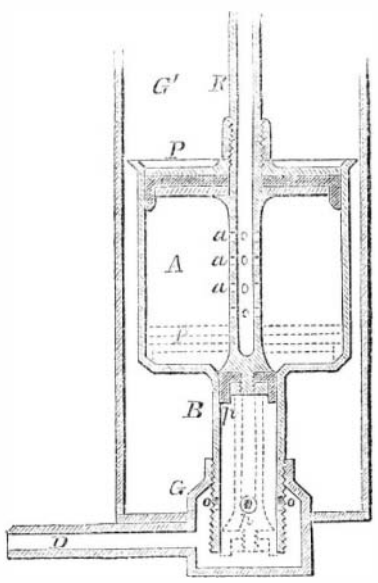
IMPROVED HYDRANT.

The great amount of trouble caused by the freezing of the hydrants from which water is drawn from the pipes in cities, has stimulated inventors to devise plans for obviating the difficulty. Of all these which we have examined we like best the one represented in the accompanying engravings.

Our second illustration is a sectional view of all the working parts of the hydrant. A is the inside of the large or upper part of the metal cylinder, and B is the outside of the small part of the same cylinder. R is the discharge pipe into which the water flows through holes, *a a a a*, placed between the pistons. The pistons are permanently attached to the discharge pipe, and move with it; the large one above the holes just mentioned and the small one below. The large piston



fills the upper part of the cylinder, and the small one the lower part. Near the lower end of the small part of the cylinder are other holes, *o o*, in the cylinder itself, which holes are within the iron water-chamber, G.

By raising the handle the pipe is forced down, carrying the pistons. As soon as the small piston is below the holes, *o o*, near the bottom of the cylinder, the water flows through these holes into the cylinder, and then, entering the pipe, R, through the holes, *a a a a*, escapes at the nozzle or upper end of the discharge pipe. While drawing water, it will be noticed that both of the pistons are at the bottoms of their cylinders. When the handle is released, the pistons and pipe are forced upward by the pressure of the water at the bottom of the lower cylinder. Having risen so that the lower piston is above the holes, *o o*, the flow of water to the pipe ceases. The remainder of the upward motion, which is about two inches, leaves a space in the large cylinder, under the large piston, into which the water in the pipe descends. The pipe is thus instantly emptied; its water placed within the cylinder and completely below the influence of frost, where it remains until the next drawing.

These hydrants also operate as safety valves to prevent the collapse of boilers in case the opening of these is neglected whenever the water is drawn from the mains. The moment a district is shut off and the water drawn from the pipes in that district, the pressure from the water works upon the lower piston ceases; the discharge pipe and its pistons sink immediately in the cylinders, and the moment the lower portion passes below the holes in the lower cylinder, a free current of air passes through the discharge pipe directly to the boiler, effectually preventing any collapse.

These hydrants are manufactured by the Meter and Hydrant Company of Brooklyn, at Nos. 53, 55 and 57 First-street, Williamsburg, N. Y. The perspective view represents the most expensively ornamented style for streets, parks, &c., though a variety of cheaper and plainer ones are also made. They are being generally introduced into this city. The patent for the invention was issued to G. P. Perrine and J. E. Boyle, of Richmond, Va., June 23, 1857.

AVERY'S RAILROAD JOINT.

The expansions and contractions of the rails of railroads from the variations of temperature make it necessary to leave a space between their ends, and the falling of the wheels into these spaces is the principal cause of the jar and its resulting wear to cars and locomotives. The rails, too, from this cause are battered at their ends,

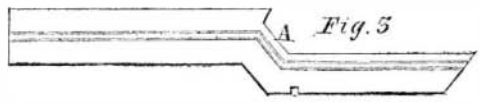
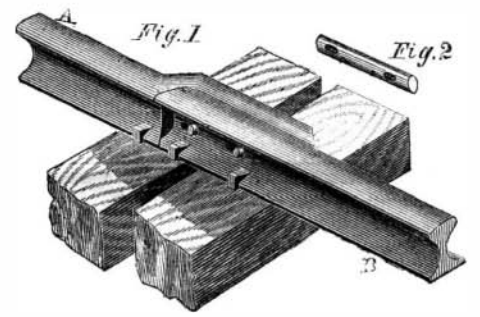


Fig. 3



demanding in this country millions of dollars yearly for the repair of rails, of which all but the ends are in good condition. Great efforts have been made to remedy this evil. The Great Western Railway of Canada has the rails double, equivalent to splitting them vertically, and laid so as to break joints; and all passengers notice the smoothness with which the cars roll over that road.

We illustrate here a cheaper plan for accomplishing the same result. It consists simply in bending about a foot of the end of one rail outside of the adjoining rail, the latter having its end cut off at an angle of about 45 degrees. In Fig. 1 A is the bent rail. Fig. 2 represents the core of wood used to fill the hollow space formed by two T-rails lying alongside of each other; and Fig. 3, the manner in which the flange of the bent rail must be cut to permit the tops of the rails to come together. In bolting rails together provision must be made for the slip of the ends longitudinally from the expansions and contractions of the rails.

The patent for this simple device was granted to G. S. Avery, of Cross River, N. Y., Sept 13, 1859; he will be pleased to answer all inquiries in relation to it which may be addressed to him at that place. Patents on this invention has been secured in foreign countries.

CHANGE OF SEA CURRENTS.—The currents in Beaufort harbor, N. C., have become much stronger than they were some years ago, and yet the tides rise no higher. A correspondent (E. L. Perkins) writing on this subject from Carolina City, states that in various channels where the fishermen, 15 years ago, caught fish with set nets, they cannot do so now, owing to the rapidity of the currents. The people on that coast are perplexed at this behavior of the sea, and cannot account for the phenomena.

GRAPHITE PAINT.

MESSRS. EDITORS:—The communication on page 165, this volume of the SCIENTIFIC AMERICAN, on the subject of graphite paint, over the signature of Quarterman & Son, deserves correction. The analysis is wrong; "20 of linseed oil, and 80 graphite" will not make paint. The paint to which they refer has only pure raw linseed oil or graphite in it, but long experience taught the necessity of properly preparing the graphite for grinding; it is this knowledge which enables the company to make the best paint of this kind in the world. The comunication referred to, while admitting the excellence of graphite paint for wood and iron, alleges that it is "not good for copper and new tin," but it very carefully omits to venture any reason for this assertion, which is in the face of the facts. Graphite is, according to all chemical authority, the most indestructable of all materials, insensible to acids and alkalies, to heat and cold, neither contracting nor expanding; being the purest of carbon; rivaling the diamond; it is anti-septic, will prevent and stay rust in iron and decay in wood. It is alike good for new tin as for other substances. Graphite, in the language of Professor Emmons, possesses "a nature unequaled for strength by any substance," it is of great body, and works with marvelous facility. New tin roofs painted 12 years ago, are now apparently as good as when first painted. For bridges and railroad timber, it is the cheapest and most efficient prevention of decay. Graphite will keep the bottoms of vessels clean from grass or barnacles. If the paint be rubbed with fine sand-paper and a hard brush, it will become as smooth as enamel, and can always be kept bright by rubbing.

Painters are in the habit of buying the dry graphite and mixing it with oil; this mixture will not compare with the ground graphite paint when properly prepared. Graphite paint effectually excludes damp; being anti-attritious it turns water like the back of a duck.

W. H. W.

WARM WEATHER IN ENGLAND.—The London papers note the great heat of the weather and the unusual prevalence of the aurora borealis. On Oct. 4th the thermometer rose to 77½° in the shade and 93° in the sun. On the 5th it stood at 73° in the shade. The heat on the 4th was greater than in any October for the last 60 years. The nearest approach to it was in 1802, when it reached 75°. The aurora does not seem to have elevated the temperature of our atmosphere. We have had very early and severe frosts.