## Zeiodite.

This substance says the American Druggists' Circular, is made by mixing twenty to thirty parts of roll sulphur with twenty-four parts of powdered glue or pumice, which forms a mass as hard as stone that resists the action of water and the strongest acids. Prof. R. Boetger recommends it for making water-tight and air tight cells for galvanic batteries.

# Machinery and Manufactures.

### A Masterpiece of Chronometric Mechanism.

Mr. Collins, silversmith, of Gloucester, England, has recently constructed a most ingenious piece of mechanism—an eight-day clock with "dead beat" escapement maintaining power, which chimes the quarters and plays 16 tunes-one (or more if required) every fourth hour. The hands go around as follows: one, once a minute; one, once an hour; one, once a week; one, once a month; one, once a year. It shows the moon's age, the time of rising and setting of the sun; the time of high and low water, half ebb and half flood; and by a beautiful contrivance, there is a part which represents the water, which rises, lifting the ships at high water tide as if it were in motion, and as it recedes leave those little automaton ships dry on the sands. It also shows the twelve signs of the zodiac; it strikes or not, chimes or not, just as you wish it, it likewise has an equation table, showing the difference of the clock and sun every day in the year. The whole of the mechanism of the clock is of beautiful workmanship, and performs most accurately the many different objects which are called into action by the ingenious inventor.

#### A Remarkable Steam Boiler.

A remarkable steam boiler has been patented by Mr. Edward N. Dickerson, of New York. One of these boilers has exhibited such results as to astonish the practical men who witnessed the trial. The Providence Journal says :- The boilers stand on the dock without any chimney whatever, so that the only draught was that which was produced inside of the boilers themselves, which usually would not serve to make steam in less than two or three hours of firing. In these boilers, however, steam was produced in seventeen minutes from the time the fire was lighted; and in half an hour the pressure The safetywas about seventy pounds to the inch. valve was then opened and the steam blown off at a pressure varying from seventy to thirty pounds to the inch. At the pressure of thirty pounds the safety-valve was blocked open, but the steam could not be blown down below that point, although the safety-valve is about twice as large in proportion to the grate surface as is usual, and the fire was made of ordinary cord-wood burning without any chimney. Instead of blowing off water from the open valve, as boilers usually do, nothing but pure steam could be seen, thus showing that no heat is lost by working water; and the products of combustion as they pass from the boiler tubes are so cooled that persons were walking on the perforated plate through which the hot gases were escaping without burning shoes or clothing, and the hand could be held at the aperture of the tube without any inconvenience whatever. Before the boilers were fired up they were subjected to a cold water pressure of more than a hundred pounds to the inch which they endured without complaining. The boilers are less than half the usual size and yet they make pure steam without any "steam chimney" in less than a quarter of the time usually required, and in far greater quantites, from the same weight of fuel, than any other boiler ever constructed can do.

## The Prevention of Boiler Explosions.

It is now generally understood that nearly every explosion of a steam boiler is the result of its own weakness. This may be either owing to originally defective material or construction, or to its original strength having been impaired by corrosion or overheating of some of its parts; but the most prolific of all causes of explosion is corrosion. The best preventives are therefore a thorough examination and test of the boiler when new, a frequent and thorough periodical inspection after it has been in operation, and a searching investigation into and published report on the cause of every explosion which occurs.

There are two systems under which such examination and inspection can be carried out with respect to boilers owned by private individuals or firms, and by manufacturing companies, viz. :--one, of course, compulsory, by officers appointed by the state or municipal government, under suitable legislative enactment; and another, voluntary, by an association of the parties interested in a city or district, appointing its own examiners and inspectors, aided in case of explosion by an investigating board composed of competent members of the association.

While we would on no account dispense with the compulsory system above referred to, knowing the impossibility of associating all the parties who ought to interest themselves in any subject, we strongly favor the voluntary system, as we believe that by it the desired end can be attained in a more beneficial and satisfactory manner. Every member of the association must feel personally interested in its success, and greater efficiency in the inspectors and other officers appointed to carry out its requirements is therefore likely to be secured, and any delinquency or negligence of the duty on the part of its officers is less likely to occur.

There has been for some years in Manchester (England), which may be considered as the principal seat of manufacture in Great Britain, an association of the character we have spoken of. This association holds regular monthly meetings, at which its chief engineer presents a report of all examinations, inspections, and investigations which have taken place during the month previous to its date, and this report is published, with any discussion which may have taken place upon it. The world is much indebted to this publication, for it has tended in a great measure to dispel the false notions about suddenly developed mysterious agencies which were a few years ago current on the subject of boiler explosions, and to show that they proceed from causes which may be within human control.— *American Artizan*.