but even then it continued its perversity, and it is to be kept as a curiosity as it is, unless it is decided to saw it in two to inspect its interior.

The most vexatious thing about these "queerities" is that no theory that bears the test of practice has, so far, accounted for them. If the "reason why" could be discovered the causes could be removed and the working of steel be made an exact and certain art. Still, there has been great progress in this direction during the last twenty years; the percentage of loss in hardening and tempering steel has been reduced to a very low figure. These improvements have been owing to the greater uniformity in the character of the steel produced as well as to the greater skill in its after manipulation. We may not despair of yet being able to make the production of hardened steel articles as even and certain as those from any other material.

### A NEW TREATMENT FOR THE DEAD.

The question of cemeteries interests the public more and more, and in view of its hygienic relations has been discussed by scientific societies, legislatures, and municipalities. M. Ch. Depérais announces in the *Cosmos les Mondes* a new method of treating corpses by which they are rendered innocuous.

To day a feeling generally prevails that the cemeteries are centers of infection for the diffusion of epidemic maladies, and that their neighborhood is a menace by reason of their emanations and their influence upon percolating waters. This hurtful influence has long been recognized. In India the natives yet expose their dead upon the banks of the Ganges or at the summit of the Towers of Silence. They become a prey in both instances to rapacious animals, and become partially harmless through their destruction.

The Jews, Etruscans, Ethiopians, Greeks, and Romans had recourse to embalmment or incineration. Cremation fully satisfies the requirements of modern sanitation. The embalmment as practiced to-day demands cares and expenses which are never applied, and it has been shown that the chemical bodies employed are insufficient to destroy all the sorts of germs, spores, bacteria, etc., which arise. It only momentarily protects the body.

The process of embalmment among the Egyptians was long and complicated. It was based upon the use of reagents and upon drying in the air or in furnaces. Cremation as at present executed is completely satisfactory, every atom of noxious gas even being consumed. Nevertheless, the feelings of most people are opposed to it, and there are practical difficulties connected with it not always easily overcome.

It seems therefore necessary to find a new method which, while it guarantees the destruction of the causes of infection, conciliates our customs and desires and is reasonable in its expense. M. Depérais has explained a process based on the fact or statement that at 106° Cent. these pernicious germs are destroyed. He utilizes the well known fact that saline solutions do not boil until after the boiling point of water (100° Cent., 212° F.) has been passed. The salt he employs is the chloride of calcium, on account of its cheapness, the ease of its management, and because it is antiseptic and tanning in its effects. Plunging a corpse into such a solution at 47° Baume and slowly raising the temperature of the bath, it is evident that when the temperature passes 100° Cent. the water of the flesh and tissues will evaporate.

Continuing the heat, the body contracts and the chloride of calcium impregnates it. The prolonged bath kills the disease spores, and the hardening and antiseptic properties of the salt partially embalm the body; as, however, chloride of calcium is deliquescent, the body would not dry on removal from the bath. It is removed by immersion in a bath of sulphate of soda, by which the lime salt remaining in the body and incrusting all its fibers becomes the sulphate of lime, and the chloride of sodium is free in the bath. Then the body is dried either in the open air or in an oven.

### OSAGE ORANGE VS. MULBERRY FOR THE SILKWORM.

There is a strong disposition on the part of those who look for making money by the propagation and sale of mulberry trees to underrate the use of Osage orange as silkworm food. We have thoroughly demonstrated by the most careful tests on several occasions that when *Maclura aurantica* is properly used for this purpose, the resulting silk loses nothing in quantity or quality, and we have now a strain of *Serivaria mori* that has been fed upon the plant for twelve consecutive years without deterioration. There is, perhaps, a slight loss of color, which, if anything, must be looked upon as an advantage. It is more than likely, however, that the different races will differ in their adaptability to the Maclura, and that for the first year the sudden transition to Maclura from Morus, upon which the worms have been fed for centuries, may result in some depreciation. Mr. Virion des Lauriers at the silk farm at Genito has completed some experiments which he details in the opening number of the "Silk Grower's Guide and Manufacturer's Gazette," on the relative value of the two plants. Four varieties of worms were reared. The race known as the "Var" was fed throughout on mulberry leaves. The "Pyrenean" and "Cervennes" worms were fed throughout on leaves and branches of Osage orange, while the "Milanese" worms were fed on Maclura up to the second moult and then changed to mulberry leaves.

At the close samples of each variety of cocoons were sent to the secretary of the Silk Board at Lyons, and appraised by him. The Maclura fed cocoons were rated at 85 cents per pound; those raised partly on Osage and partly on mulberry at 95 cents per pound; and those fed entirely on mulberry at $1.11 per pound. This, M. Des Lauriers thinks, seems to show that the difference between Maclura and Morus as silkworm food is some "twenty-five to thirty per cent in favor of the latter," while it is evident that "the leaf of the Osage orange can be used with some advantage during the *first two* ages of the worms, thus allowing the mulberry trees to grow more leafy for feeding during the last three ages." The experiment, although interesting, is not conclusive from the simple fact that different races were used in the different tests and not the same race, so that the result may have been due to race and not to food.—*C. V. Riley.*

### REAPPEARANCE OF THE COMET OF 1812.

On the third of September, Mr. Brooks, of Phelps, New York, discovered a telescopic comet. Its advent was quickly made known to the scientific world, and it was described as round and faint, and having no tail. Its course was toward the earth, and it was hoped that it would become visible to the naked eye in two or three months. It was generally accepted as a new-comer making its first visit to the clime of the sun, and was known as comet Brooks, or comet *b* 1883.

Instead however of being a new-comer, this comet is an old friend that made its first recorded visit in 1812, and is known as Pons' comet from the name of the discoverer, or, more simply, as the comet of 1812. Encke, an astronomer of the time, found that the comet moved in an ellipse with a probable period of nearly 71 years, so that its return was looked for about this time.

The Rev. George Searle, of New York, was the observer who discovered the identity of comet Brooks and the comet of 1812.

Cometic astronomy was comparatively in its infancy when Encke made the computation of the orbit of this comet. It is simply wonderful that, with the data at his command, he should have reached a result so nearly accurate. Within a few years, however, two series of observations of the comet have been discovered which were unknown to Encke. Two French astronomers, Messrs. Schulhof and Bossert, undertook to recompute the orbit, using all the data known. The Paris observatory published the result of their labors in a pamphlet of 209 pages. From time to time, the enthusiastic French observers issued memoranda of the probable position of the comet when near enough to be seen. Unfortunately, the first observations of comet Brooks did not seem to agree with the French ephemeris, and it was hastily concluded that the erratic visitor was a new member of the cometic family, come to take its first peep at our little planet.

The Rev. Mr. Searle studied the question more carefully, and verified the computations more accurately. He proved beyond question that the positions marked out for comet Brooks were identical, at the time of observation with those in which a comet would be found that was traveling in the ellipse computed by Encke. He went further, using the new orbit of the French astronomers, and proving that the comet was observed in the exact position where it should have been found according to the orbit computed 70 years ago.

There is therefore no shadow of a doubt that our eyes behold the long expected comet of 1812. Its perihelion passage will take place on the 25th of January, 1884. It will then be about 60,000,000 miles distant from the earth, two-thirds the distance of the sun.

In 1812, the comet presented, when discovered in July, the appearance of an irregular nebulous mass, with the tail entirely wanting. In September, the nucleus was 5" in diameter, and the tail was 2° 17' in length. Though not very bright, it was distinctly visible to the naked eye, and was observed for ten weeks before it disappeared in the star depths. The returning comet, when first seen, presented similar elements. About the 23d of September, however, a remarkable and unexpected outburst occurred, the nucleus expanding into a confused circular nebulous patch of light, and the comet increasing many times in brilliancy in the course of two or three days. On the 23d, the nebulous mass was 2' in diameter; on the 25th, it was 4' in diameter and shone with a luster equaling a star of the seventh magnitude. The activity of the display is almost unparalleled in cometic history, and is specially noteworthy on account of the comet's great distance from the sun at the present time. Since this curious outburst, the comet has been a well behaved member of the family, but it is impossible to predict what vagary it may next indulge in.

The comet of 1812 may now be seen in the evening in the northwest in a telescope of moderate power, and is said to be visible in a good opera glass. In a few weeks it will be easily perceptible to the unassisted eye, and when the year 1884 makes its advent, it will be near its culminating point. It will not equal the superb comet of 1882 in size or brilliancy, but it will be visible in the evening sky and will be so much more convenient to observe that there will be compensation in its lessened splendor.

It is an astronomical triumph, that with the inadequate means at command for computing an ephemeris, an astronomer seventy years ago was able to predict nearly the exact time for this comet's return. Our ancient friend is winging its swift flight toward us, and before long our eyes will be gladdened by a sight of its face after a long travel of threescore years and ten, when almost every eye that noted its first appearance has ceased to behold the shining picture that nightly arches over the earth.

There are several comets with a computed period of from 70 to 75 years. Halley's comet with a period of 75 years is the only one of them that has made more than one return. Its last appearance was in 1835, and it is next expected in 1911. The comet of 1812 with a period of 71 years now records its first return. The comet of 1815 with a period of 74 years is confidently anticipated in 1889.

### Clocks and Railway Time Tables to be Changed November 18.

The changes to be made on Sunday, Nov. 18, in the time by which about all the railroads in the country are run, cannot be brought about, at the best, without considerable friction. In Boston, for instance, there is no little opposition to the putting of clocks and watches back some 17 minutes, as will be necessary under the new provision for "Eastern standard" time, but orders have been issued for many of the public clocks in that city to be so regulated, and, as the whole railroad system of the Eastern States will be controlled by this standard, the prevailing opinion seems to be that the innovation will be generally accepted. There may be some who will at first carry the two kinds of time, the "standard" and the true, as can be readily done by having two minute hands on a watch; this is now frequently practiced to keep both New York and Boston time, by those who travel much between the two cities. In New York city, where the change required calls for putting back the true time only four minutes, there will probably be less opposition to the adoption of the new standard, but it may be readily conceived that great confusion will inevitably be caused wherever it is attempted to use the two kinds of time simultaneously.

Full particulars relative to the adoption of the new plan, whereby there will practically be only four standards of time throughout the country, instead of forty-nine, as at present, were published in the SCIENTIFIC AMERICAN of Oct. 13. The time tables of many of the railroads will also have to be changed, as well as the clocks, in order to facilitate the making of connections between lines affected over considerable distances east and west. The following list of changes has, therefore, been furnished by Mr. W. F. Allen, Secretary of the railroad conventions which decided upon the adoption of the new standard, the letter f denoting that the clock is to be set ahead, and the letter s that it is to be set back:

Atchison, Topeka, and Santa Fe, east of Dodge City, clocks only, 9 minutes, f.

Atchison, Topeka, and Santa Fe, west of Dodge City, clocks and schedules, 51 minutes, s.

Baltimore and Ohio (west), both clocks and schedules, 28 minutes, s.

Boston, Hoosac Tunnel and Western, both clocks and schedules, 4 minutes, s.

Boston and Albany, clocks only, 16 minutes, s.

Canadian Pacific (Eastern division), clocks only, 6 minutes, s.

Central Vermont, both clocks and schedules, 12 minutes, s.

Chesapeake and Ohio, both clocks and schedules, 8 minutes, f.

Chicago and Alton, clocks only, 9 minutes, s.

Chicago and Grand Trunk, both clocks and schedules, 9 minutes, s.

Cleveland, Columbus, Cincinnati, and Indianapolis, both clocks and schedules, 28 minutes, s.

Delaware and Hudson Canal Company, clocks only, 4 minutes, s.

Delaware, Lackawanna, and Western, both clocks and schedules, 4 minutes, s.

Fort Wayne, Cincinnati, and Louisville, both clocks and schedules, 23 minutes, s.

Freehold and New York, both clocks and schedules, 4 minutes, s.

Hartford and Connecticut Western, clocks only, 4 minutes, s.

Lake Shore and Michigan Southern, both clocks and schedules, 28 minutes, s.

Lehigh Valley, clocks only, 1 minute, f.

Louisville and Nashville, clocks only, 18 minutes, s.

Missouri Pacific, clocks, schedules at St. Louis only, 8 minutes, s.

New York, Lake Erie, and Western, clocks only, 4 minutes, s.

New York Central and Hudson River, clocks only, 4 minutes, s.

New York City and Northern, clocks only, 4 minutes, s.

New York and New England (east of Connecticut), both clocks and schedules, 14 minutes, s.

New York and New England (in Connecticut), both clocks and schedules, 4 minutes, s.

Pennsylvania, New York division, both clocks and schedules, 1 minute, f.

Pennsylvania, all divisions except New York, clocks only, 1 minute, f.

Philadelphia and Reading, both clocks and schedules, 1 minute, f.

Rome, Watertown, and Ogdensburg, clocks only, 4 minutes, s.

THE Swiss railroad companies now cover a portion of their carriages with a phosphorescent preparation, which makes them visible at night.

### The Possibilities of Land Culture.

A remarkable illustration of what may be done with ten acres of land only has been furnished by a fruit planter named Dillon, of Woodland, California. Six years ago he planted five acres with Muscatel grape, since which he has added two more acres. He has also planted one acre with prunes, nectarines, and peaches. From the five acres first mentioned his gross returns last year were $1,200. Last year he planted three-fourths of an acre of beets, which yielded 35 tons. By the aid of these, and a little bran or short, he kept a span of horses and two cows seven months, besides which he sold $30 worth of beets. One of the cows yields from 10 pounds to 11 pounds of butter per week, besides the milk which the planter's small family uses. By the side of his fencing Dillon further planted 20 walnut trees, which have borne fruit for two years. From the wood cut from these trees this year in the trimmings he made a little over three cords of stove wood. Gum trees planted six years ago, and some of them 12 inches in diameter, will make when cut into wood from one-fourth to one-half a cord of wood per tree. In the condition in which he now has his fruits and vines, this enterprising grower on a small scale states that he can make a living for himself and family, and lay by from $800 to $1,000 annually. His family consists of himself, wife, and one child. It is evident that Mr. Dillon, of Woodland, California, does not allow anything within his reach to lie idle or unutilized.

### Preservative Vapors.

Mention is made in the *Lancet* of two small specimens of lungs, recently exhibited by a well known physician, which had been kept in chloroform vapor, untouched, in their respective bottles, for thirty-five years, and were well preserved. An illustration of the preservative power of ammonia vapor is also cited, namely, a specimen of blood which had been drawn from a sheep's neck in April, 1862, and kept in a well corked bottle ever since, and being still perfectly fresh and fluid. It is found that structures containing much fat become saponified unless chloroform is mixed with ammonia, and that, when it is desirable to retain the color of the blood, the addition to the chloroform of coal gas, which contains sufficient carbonic oxide for the purpose, is entirely successful.

### Recipe for Oatmeal Cakes.

For the benefit of various inquirers Mr. S. N. Stewart gives the following recipe for the oatmeal cakes or crackers recently mentioned in our paper: To coarse oat meal, such as is here known as coarsest Akron (from Akron, Ohio), add sufficient white flour to hold it together. While dry add salt and shortening—butter is best—and rub thoroughly together; then add cold water enough to make quite soft. Let it stand half an hour, when it will have become a stiff dough. Roll very thin, cut in cakes, and bake brown in a slow oven. If fine oatmeal is used, no white flour need be added. Of course they can be made without shortening.

### OIL EXTRACTOR.

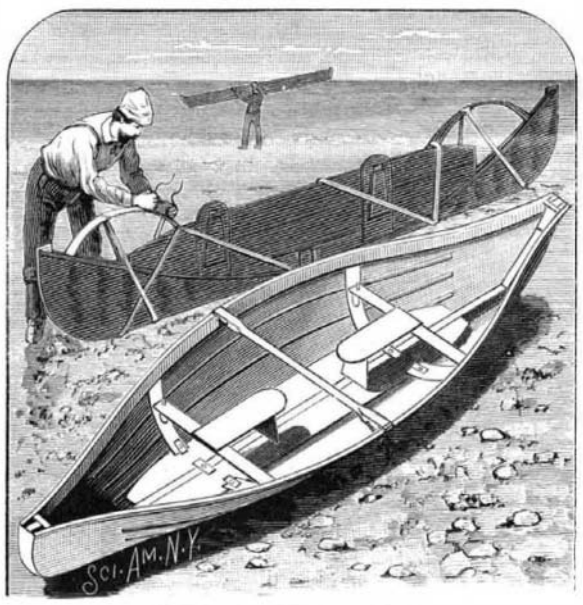
A simple and efficient device for extracting oil from fish liver or blubber, and which can be used on board vessels or on shore, has been recently patented by Mr. F. Payzant, of Lockport, Nova Scotia. A cylindrical furnace is provided with a grate, below which is an ash pit. Air is admitted to the fire by a pipe entering the furnace below the grate and having its upper end, which is above the top of the furnace,

PAYZANT'S OIL EXTRACTOR.

provided with an adjustable hood for catching the air. The furnace is surrounded by a water jacket which can be filled by means of a funnel. The furnace is moved about by the aid of handles attached to it. It is placed upright in a tank, vat, or tub containing the liver or blubber, and is held in place by suitable arms. To use the extractor the jacket is filled with water and fire is started in the furnace. The heated water forces the oil from the liver or blubber and it rises to the surface, the livers sinking to the bottom of the vessel. The oil is then skimmed off, or removed by dippers, or is drawn off by means of a suitable faucet. The jacket must be kept full of water, as the direct heat from the fire will not extract the oil. The engraving represents the extractor with certain parts cut away to show the interior.

### FOLDING BOAT.

The accompanying engraving presents two views of a folding boat recently patented by Mr. C. M. Douglas, of Toronto, Canada, and now being manufactured by the Ontario Canoe Company, of Peterboro, Canada. To the ends of the keelson are secured a stem and stern post braced and stiffened by blocks. The gunwales are curved like the sides of the boat, and are hinged at the ends to the stem and stern posts by shackles, so that they can be folded down when the boat is to be folded for transportation. The shell of the vessel is formed of waterproof canvas or other suitable material tacked to the gunwales and to the bottom of the keelson. Strips are tacked to the outer and inner surface of the canvas for the purpose of stiffening it. There




DOUGLAS' FOLDING BOAT.

are two or more stretchers used, which are curved in the same manner as the ribs of ordinary boats, and passed into recesses in the upper edge of the keelson, over which recesses prongs fastened to the keelson project, and under the prongs the stretchers pass. The upper ends of the stretchers are passed in between the canvas and the inner strip of the gunwale, which extends below the outer strip and keeps the gunwales raised and separated. The stretchers are made of wood or steel. On the inner surfaces of the stretchers blocks are secured from which upwardly projecting pins pass into holes in transverse boards serving as stiffeners for the ribs and supports for the seat. False bottom planks rest on each side of the keelson, and are kept in place by buttons. The boat can be folded very compactly, so as to be easily transported, and can be rapidly erected, while the plan permits a light and yet strong construction.

### Oxalic Acid in Bleaching.

The march of improvement, in the processes of bleaching vegetable fiber, has hardly kept pace with that of dyeing. Indications that it will do so ere long are not wanting, but as yet we go on in the old way. We get rid of the impurities, natural and otherwise, by prolonged boiling in soda lye. We follow this with our bleach proper, consisting of solutions of chlorinated lime (chloride of lime), at first concentrated, then weaker and weaker. We alternate these with the souring, sometimes with sulphuric acid, sometimes with hydrochloric, and with baths of soda lye. The acids set free the chlorine of the solution of chlorinated lime, which saturates the fibers, and combines with the lime, while the lye serves to neutralize the otherwise destructive action of the acid. During these operations the tissues are washed many times with the largest possible quantity of water. Improvements in these operations cannot come too soon. At present they are costly and inconvenient. The water must be heated. The capital required for the first installation is considerable, and even with the best tools and appliances the time taken up, and the amount of hand labor required, are also great.

In order to lessen the inconveniences, says the *Moniteur des Fils et Tissus*, Mr. C. Beyrich, of Arnsdorf, Silesia, has proposed a process based on the three following points: 1. That oxalic acid, either free or as the oxalate of potassa, possesses the property of combining with the lime of the chlorinated lime more energetically than either or both of the acids commonly used in bleaching. 2. That the oxalic acid never attacks the fiber as do the other acids. 3. That the presence of vegetable substances, which, under the common system, are removed before the bleaching proper, does not interfere with the action of oxalic acid.

Of the three substances which compose chlorinated lime, but one, hypochlorite of lime, may be said to be of practical value in bleaching. Instantly deprived of its lime in presence of oxalic acid, the hypochlorous acid is set free, and almost immediately decomposed; its two constituents, chlorine and oxygen, being in the nascent state, act with redoubled energy; the oxygen directly on the coloring matter, the chlorine indirectly through the decomposition of water.

The cloth to be bleached is soaked at a temperature of from 20° to 26° C. for five or six hours in a bath of chlorinated lime, to which oxalic acid has been added. All of the oxalic acid is not introduced at once, the greater part being thus used, and the remainder in an hour or two. After bleaching, the goods are carefully rinsed and passed through a weak solution of sulphuric acid, then through one of sodic carbonate to neutralize the acid, and finally rinsed and dried.

The objections to the process, on the score of the expense of the oxalic acid, would probably not hold were a demand created for the acid The materials of which it is made are comparatively cheap, the methods of manufacture simple, and, stimulated by the demand, active competition would reduce cost. It must not, however, be forgotten that the oxalate of lime formed on the fabric is one of the most insoluble salts known. For scouring, many bleachers prefer hydrochloric acid to sulphuric, because the resulting salt is so readily washed out. They would find the oxalate of lime more objectionable than the sulphate, because of its greater insolubility. The invention is a move in the right direction, and as such it is deserving of a fair trial both with and without the modifications which will readily suggest themselves to experienced hands.

### A Learned Woman.

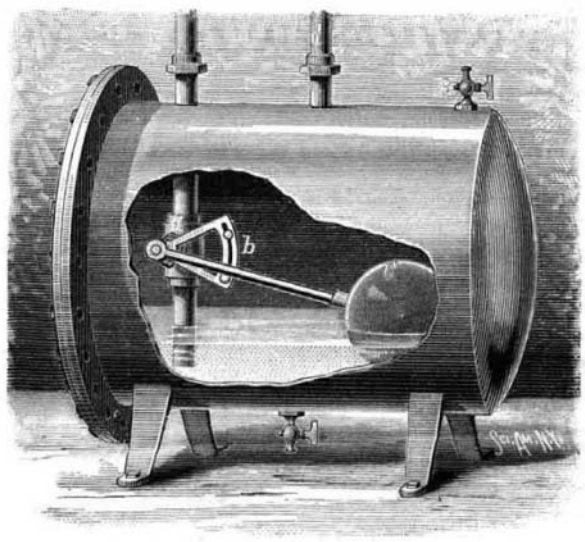
The life of Miss Anna Sutton, recently published in England, presents a character which it is more easy to admire than to imitate. She was born in the province of Ulster, Ireland, in 1791, and died in 1881. At 20 years of age, having previously received only a rudimental education, she found a Latin grammar, and forthwith attempted to master it. She learned the language, and read all the chief classics. Next she took up Greek and read the New Testament, Homer and such other Greek works as fell in her way. French, Italian, Hebrew, Arabic, and Chaldaic followed, and when past 80 years of age she astonished a learned descendant of Abraham by conversing with him in Hebrew. After the age of 70 she lost her eyesight and learned to read the books for the blind printed in raised letters. She was a devoted member of the Methodist communion and a "class leader" till within a year of her death. She, of course, must have had an extraordinary aptitude for languages. Still, her example shows how much more than is supposed the average mind is capable of doing, in any direction to which the taste may lead.

### Flying Money.

While riding on top of a freight car in Chicago last Saturday, going toward the fair grounds, C. W. Leffler noticed a piece of paper flying toward him over the tops of the cars. The train was running at the rate of five or six miles an hour, and the bit of paper when first seen was distant some four or five car lengths. It came directly toward him, and kept on coming until it struck him near his vest watch pocket. He grabbed it, held on to it, scanned it, and ascertained that it was a genuine one dollar bill. Where it came from, or how it got started, will remain a mystery. It is not every day that money is obtained in that way.—*Aurora (Ill.) Beacon.*

### STEAM TRAP.

The steam trap herewith illustrated was recently patented by Mr. James A. Trane, of La Crosse, Wis. The trap case is made, preferably, of cast metal, has one removable head, and is furnished with legs for standing on the floor. In the case is fitted an inlet pipe and a waste pipe, for the water, the latter pipe extending nearly to the bottom of the case, and being provided with a valve which has for its




TRANE'S STEAM TRAP.

stem a triangular plate, *b*, having a curved slot in which two stop pins are adjustably fitted. On the center of the valve stem is one end of a lever, to the other end of which is a float, *c*, and which plays between the two stop pins. The lower pin is so adjusted that the float will close the valve when it descends by the fall of water, and shut off the escape through the pipe, just before the water falls below the end of the pipe. The other pin is to be set according to the height it is desired that the water shall rise before opening the pipe. On the top of the case is an air cock, *e*, and at the bottom a waste cock to draw off the water in cold weather when the trap is not in use.

By this arrangement the water cannot in any case be forced out so that the steam will blow through.