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New Process of Embalming the Dead

Dr. Lowell, of Brooklyn, N. Y., has devised a process of embalming bodies which bids fair to revolutionize the business of undertaking. If his plan shall be adopted and succeed, the use of the ice-box and other expensive appliances, generally in request for the preservation of cadavers by the agency of cold, will become entirely unnecessary, and will be superseded by an inexpensive and simple process, which we will briefly indicate as follows: A solution of chloride of zinc is the preservative fluid used; this is contained in a porcelain-lined vessel, which is elevated to a convenient height, so that the contents will be injected into the cadaver after the manner of a gravity-syringe. For the passage of the fluid from its receptacle into a vein of the cadaver, glass and rubber tubing are all that is required. A finely tapered glass tube is held tightly in place in the vein, while a glass U-shaped tube acts as a siphon to conduct fluid from the receptacle. The quantity of fluid will, of necessity, vary in different cases; four or five gallons may be required. This plan will not work when operations have been performed whereby large vessels have been opened. A body thus treated was transported from this city to Richmond, Va., this summer, without odor, and without disfigurement or any external signs of decay. All that is required is that the physician shall expose a vessel, adjust the glass tube, and the fluid will find its own way. Dr. Lowell has let the instrument run all night. There is promise in this of a saving to the City of Brooklyn alone of from $75,000 to $100,000 each year in the one item of ice, in addition to doing away with much unpleasant and cumbersome material in caring for the dead. Dr. Lowell writes: "The injection may be made by either artery or vein. I have tried both with success. I prefer the brachial artery above the elbow as the point for introduction of glass tube, for the primary incision is slighter, and consequently divides smaller and fewer veins than when I expose the femoral artery. I use the gravity method, and introduce about five gallons of the antiseptic fluid. The effects are eminently satisfactory. The color of the integument is improved, even at points where hypotasis has been at work. I inspected a cadaver night before last—a lady. The body was in splendid condition—skin white and clear, and all points of discoloration along spine, nates, posterior surface of thighs, neck, etc., etc., clearing up. The patient died of typhoid fever; post-mortem discoloration rapidly supervened, and decomposition was rife. All changes were arrested, the skin cleared up, and when I saw the body last, its appearance had improved wonderfully.—*Proceedings of the Kings County Medical Society.*

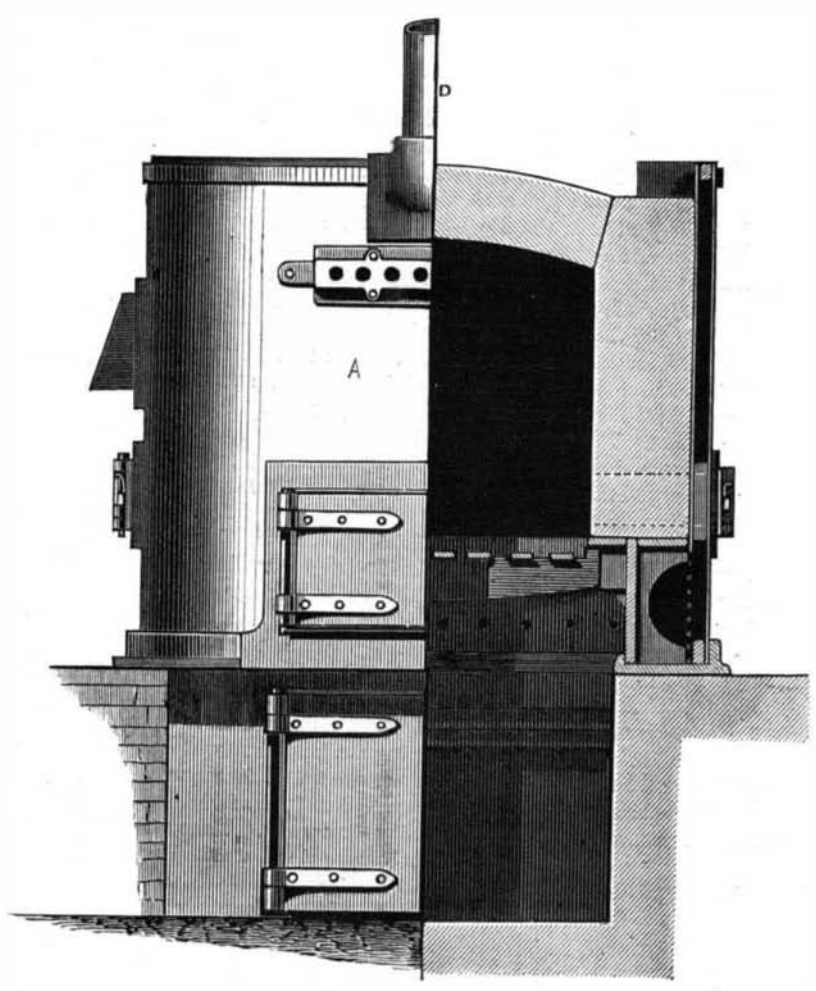

Fig. 1.—CADDICK AND MAYBERY PUDDLING FURNACE.

News from Naples announces an increased activity of Mount Vesuvius. The glow of fire in the crater is so intense that it can be distinctly seen from Naples at night.

IMPROVED PUDDLING FURNACE.

We illustrate from *The Engineer* a furnace patented by Messrs. Caddick and Maybery, which has been at work for some months at the Old Castle Iron and Tin-plate Works, Llanelly, South Wales. Mr. Caddick is a practical furnace builder, while Mr. Maybery is manager of the works.

Before proceeding to describe the furnace or particularize the results, it may be stated that the nature of the system of puddling employed is peculiar, not to the furnace but to the district, and materially affects the results obtained.

The Old Castle Works are employed solely in the manufacture of black, tin, and terne plates. It is scarcely necessary to say that the iron used in making tin plates must be of very fine quality or the plates would be worthless. Two or three different grades or classes of sheet are made. At one end of the scale is found the finest charcoal plates, at the other a very excellent iron made in the puddling furnace. The furnace as illustrated is double. It consists of a chamber or gas generator of fire bricks surrounded by a casing of thin iron plates, say, three sixteenths inch thick, and a puddling hearth. The whole of the plates are of wrought iron, the buckstaves, as we may term them, being cast iron columns, held together at the top by suitable tie rods. It is impossible to imagine a neater, simpler, or more compact furnace than that thus produced. The ordinary sliding firebrick door is used, but outside of this is provided a second door of thin plate iron, in which a suitable aperture is made to admit the rabble; this door acts to perfection in protecting the puddler from radiant heat.

Referring to the engraving, Fig. 1 is a half end view and half transverse section of the combustion chamber or generator; Fig. 2 is a longitudinal elevation; Fig. 3 a longitudinal section; and Fig. 4 a sectional plan. A is the generator; B the inner casing, and C the outer casing. Blast is admitted into the space between the inner and outer casing through the pipe, D; the air becomes heated by coming into contact with the inner casing, and passes into the inclosed space below the grate bars, through holes formed in the lower part of this casing. Here the already heated blast is heated to a further degree by the red hot ashes. A portion

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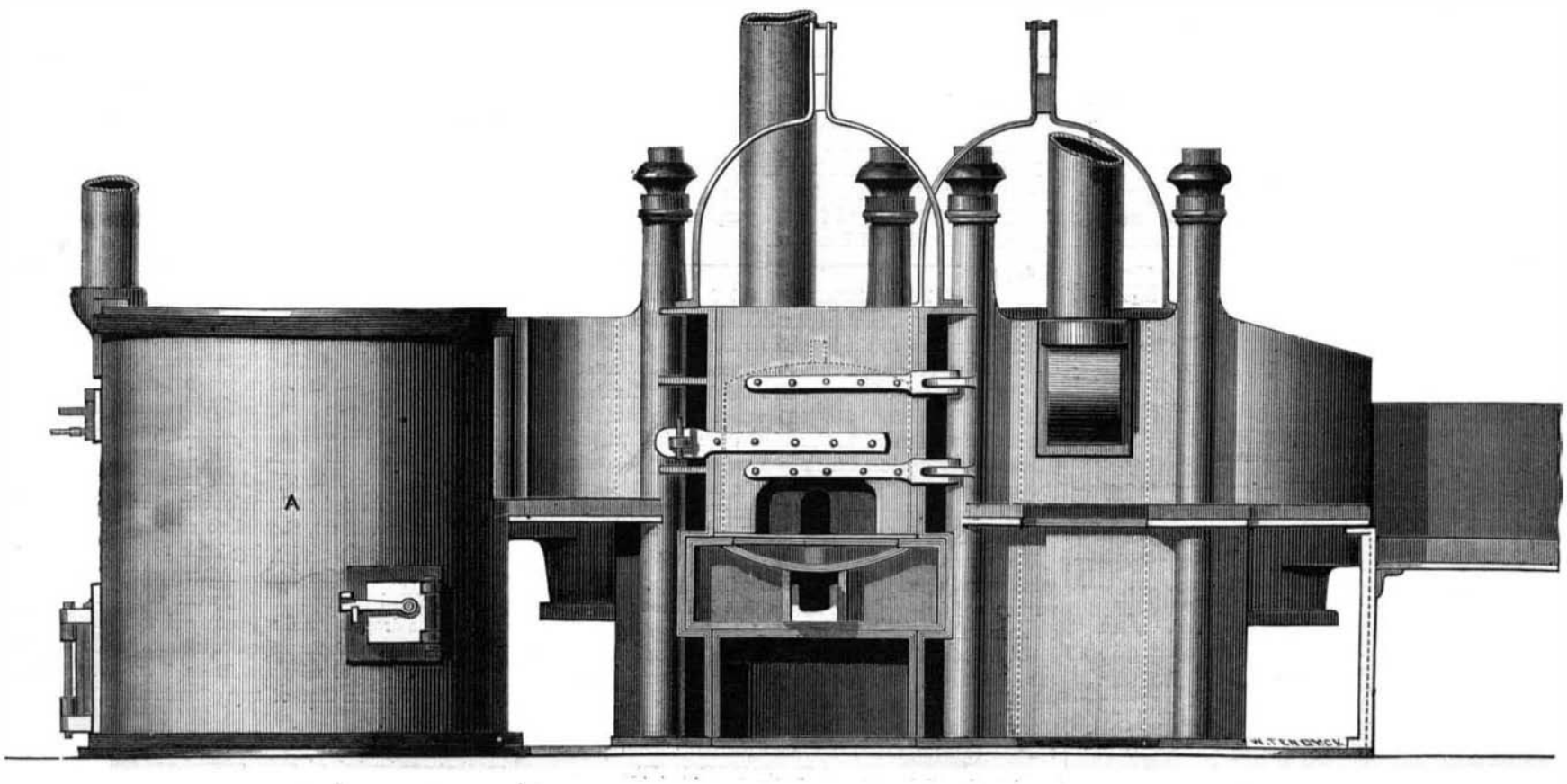

Fig. 2.—CADDICK AND MAYBERY PUDDLING FURNACE—LONGITUDINAL ELEVATION.

[*Continued from first page.*]

passes up through the grate bars, while another portion is admitted to the combustion chamber above the level of the fire. The result is complete combustion, so that smoke is practically prevented, and saving of fuel is effected. The admission of the blast over the fire is regulated by a valve, F. The frame which contains this valve is provided with a slide having sight holes, through which the holes in the brickwork may be kept free from obstruction. There is a gusset, G, on each side of the furnace opening downwards into the space below the furnace; the waste water from the boshes flows under the furnace, the vapor arising from which, together with the heated air, is drawn up through the gussets, and passes off through the pipes fixed on the same, so that there is a constant circulation of air under the bottom of the furnace, which keeps it cool, and a considerable saving of fettling, as compared with the ordinary puddling furnaces, is effected. Blast is supplied by a fan.

The system of puddling affects the results. This will be understood if it be borne in mind that puddling furnace economy may be dealt with under two heads, namely, economy of fuel and economy of iron. The latter item is measured by the proportion which the weight of puddled blooms produced bears to the weight of pig iron charged. It is evident that cinder being very heavy, if plenty of cinder is left in the iron, the yield will apparently be high. Again, if very rich fettling is used in a large quantity, a portion of this fettling will be actually deoxidized and converted into wrought iron by a species of direct process; and cases are not wanting in which the weight of puddled bars turned out by a furnace in a given time has exceeded that of the pig charged, the difference coming of course from the fettling. Now at the Old Castle Works, and indeed at all the Welsh tin plate works, the iron is puddled on a dry bottom; it is freely bled during the operation, and every possible precaution is taken to expel every particle of cinder. In fact the balls as drawn from the puddling furnaces are so dry that they can only be got to stick together under the shingling hammer with difficulty. It follows of course that the yields must appear to be small as compared with those to be had from furnaces making common iron.

Before an estimate can be made of the value of the furnace, it is necessary to have figures giving the work of the old furnaces, with which to compare them. A careful examination of the books shows that the results obtained are not very uniform, much depending no doubt on whether the furnaces are in good condition or not; but it may be said that the coal used on the old system averages 23 cwt. per ton of stamps, and the stamp average 18 cwt. 2 qr., or perhaps a shade more, per ton of pigs and scrap. From this it appears that the new furnace saves nearly 44 per cent in fuel, while the yield is augmented by 35 lbs. to 40 lbs. of iron per ton. There is 50 also a sav ng of over per cent in fettling.

It may be urged that this economy is due to the double furnace system. Even grant this to be the case, still the credit will remain with Messrs. Caddick and Maybery of producing an exceedingly simple and compact furnace, from which no heat is radiated to the annoyance of the puddler, while it is indispntable that the combustion is as nearly as possible perfect.

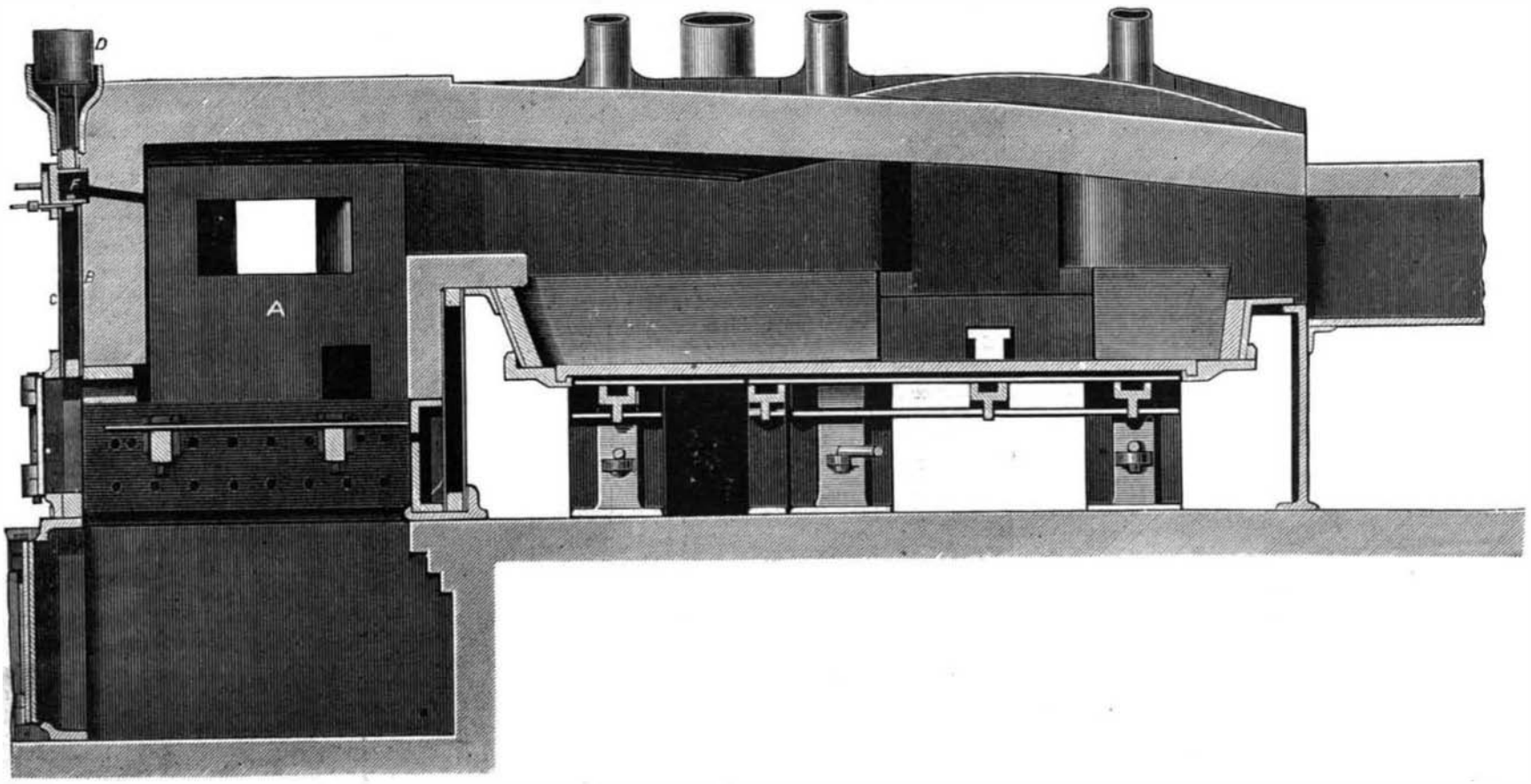

Fig. 3.—CADDICK AND MAYBERY PUDDLING FURNACE.—LONGITUDINAL SECTION.

The Satellites of Mars seen with a 7 Inch Glass.

In striking illustration of the truth of the assertion of Sir W. Herschel, that when a very faint object has been once discovered with a large telescope, it may be seen with a much smaller one, we received, since the above was written, a communication from Mr. Wentworth Erck, of Sherrington, Bray, dated September 8, in which he writes: "The outer satellite has been seen here three times; 1st, on September 2, at 22h. 40m. G.S.T., when the position was about 290°, and distance from limb something less than three diameters of the planet; 2nd, on September 3, at 23h. 0m. G.S.T., when the position was 54°; this position is pretty accurate; on this occasion I watched the satellite for two hours, during which I saw it move from 64° to 55°; at the latter position its distance from limb was equal to two diameters of the planet; 3rd, on September 8, at 22h. 35m. G S.T., when the position was about 78°. It was steadily visible with 7 inches aperture on my Alvan Clark, and was, I should say, something brighter than Enceladus, the second satellite of Saturn."

On comparing these observations with positions calculated from the above elements (which closely represent the Paris observation of August 27), it is evident the object observed on September 2 was a star, the satellite at the time being on an angle of 325°, and only 15 seconds from the limb, but it appears beyond doubt that Mr. Erck observed the outer satellite on the following night, when the position at the time named would be 65°, distance from center of planet 79 seconds, and two hours later the angle would have diminished to 53°, and the distance to 61 seconds, or roughly two diameters from the planet's limb as observed. On September 8 the angle was 71°, distance 85 seconds, so that the satellite may have been seen again this evening. So far as we know these are the first observations of a satellite of Mars in these islands, and it is singular that they have been made with an instrument constructed by the same optician as the great Washington telescope, with which the satellites were discovered.—*Nature.*

In this city, Mr. Rutherford, with his 13 inch glass, we believe, has not yet seen either of the satellites.—EDS.

Vapor Volumes.

In the *Journal* of the German Chemical Society there is a paper by Troost, detailing experiments made to determine the accuracy of Avogadro's theory that "equal volumes of substances in the state of vapor contained the same number of molecules," that is, that the volume of the molecule of hydrogen being called 2, the volume of all other molecules must also be 2; instead of, as happens in certain cases, apparently 4, 6, or 8. The method of experiment adopted was to introduce into the vapor of chloral hydrate a salt containing water having a dissociation tension nearly equal to that of chloral hydrate; if the chloral hydrate vapor undergoes dissociation, and consists of equal volumes of chloral and aqueous vapors, then the vapor volume will remain

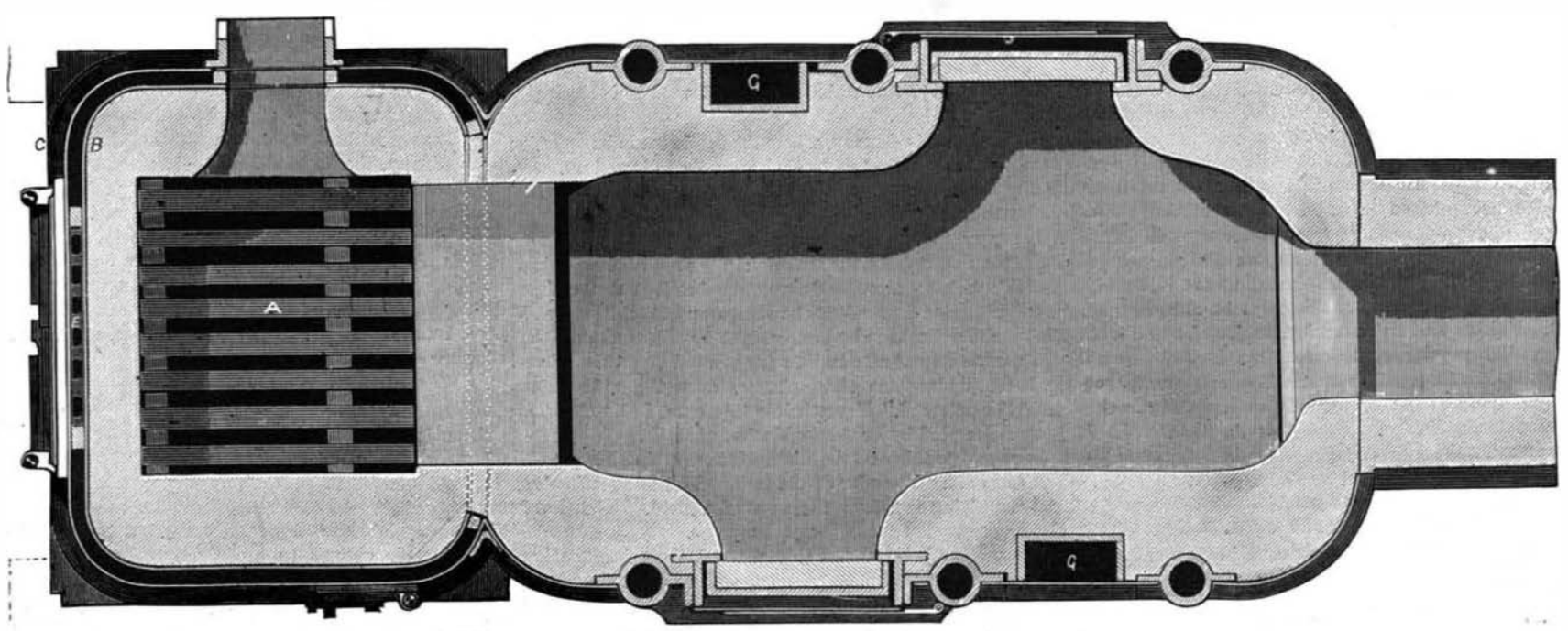

Fig. 4.—CADDICK AND MAYBERRY PUDDLING FURNACE.—SECTIONAL PLAN.

constant; but if chloral hydrate is volatile as such, its vapor will be free from water, and on introducing the salt it will give up water, and the volume of vapor will increase till the dissociation tension is reached. The salt used was potassium oxalate, containing one molecule of water. Troost has found that the volume increases on the addition of the oxalate, leading him therefore to the conclusion that chloral hydrate undergoes volatilization without decomposition.

Curious Phenomena in the Oil Regions.

A correspondent of the *Baltimore American* says that at Titusville, Pa., Senator Anderson's beautiful grounds, on the suburbs of the city, present a splendid sight every clear night during summer. The great attraction is the fact that they are brilliantly illuminated by natural gas from the Newtown Well, about four miles distant. This well yields nothing but gas, and when first opened the roar of the escaping gas could be heard, it is said, for a distance of seven miles. The gas has since been confined so as to be conveyed in pipes to the city and is used extensively for cooking and heating purposes. In the house of Senator Anderson not a stick of wood or lump of coal is used during the year either for cooking or heating. He uses the gas in cooking stoves and in open grates in his parlors, sitting rooms, and chambers. It gives too much smoke to be used for light indoors, and simply takes the place of fuel. There are about twenty standards on the lawns and around the fountain and lake in the Senator's grounds, and one magnificent arch, the innumerable jets from the pipe each throwing out a flame about twelve inches long. There are about twenty standards in all, with about thirty jets, each jet throwing out a fierce flame from twelve to eighteen inches long. The portion of the grounds illuminated is to the extent of about four acres, and is as light as day in every part. The fountain is a magnificent work of art, surmounted by a nymph pouring water from an urn into a goblet, and four swans, each throwing

Fig. 1.—VIEW OF THE EARTH FROM MERCURY.

streams into the basin below, while there is a beautiful floral display at the base of the fountain and on the ground surrounding it. The lawn is kept in splendid condition, interspersed with variegated flowers, and the effect of this brilliant illumination may be imagined amid such a scene of floral attractions. The gas is also used for heat in the conservatory, and we are informed by the gardener that the entire cost of the gas used for domestic purposes and illumination of the grounds is but $100 per annum. The force of this gas is so great that recently, in tapping the pipe to put in a service pipe for a dwelling, the particles of iron were forced out with such velocity as to enter the flesh of the plumber's arm. The gas from the Newtown Well is extensively used in Titusville in place of fuel, similar to its use in the mansion of Senator Anderson, and there is some talk of using it for the general lighting of the city.

The *Pittsburgh Despatch* says that situated about four miles southwest of Clintonville, Venango county, is a well which, for volume of production, surpasses anything yet discovered in that county. The well was completed upward of a month ago. No oil was found, but an immense gas vein was encountered at the place where oil was expected. Before abandoning the well the owners resolved to draw out the casing. This was attempted in the usual way, but the casing stuck about a foot above its former resting place. As it was elevated to its present position, the fresh water from the upper part of the hole rushed into the well at the bottom of the casing in great quantity. As it did so, the gas raised it to the surface of the earth after sending it forty feet above the top of the derrick. There it continues to gush, and may for all time. It is estimated that at least twenty thousand barrels of water are thrown out daily. It is truly a remarkable phenomenon.

HOW OUR WORLD LOOKS FROM OTHER WORLDS.

There is no consideration better calculated to exhibit to

Fig. 2.—VIEW OF THE EARTH FROM VENUS.

us how entirely insignificant our earth is as a part of the universe, than that which leads us to realize how our globe would appear to one of its own inhabitants if he could be transported to one after another of the heavenly bodies. The journey of our imaginary celestial traveler need not extend to the fixed stars, for from them the earth is not visible at all. The nearest fixed star is 226,400 times more distant from us than is the sun. Figures convey no idea of this vast interval, for no one can conceive of a trillion, much less of 24 trillions, of miles. A spider thread on that star would blot out the space between sun and earth. Our luminary would appear as a small brilliant dot, our earth, even if it were not lost in the solar effulgence, would be absolutely and mathematically invisible. And this on the nearest fixed star, if we proceeded further into the star depths our sun itself would dwindle smaller and smaller and disappear long before, the stars were reached which now form the limit of our imperfect observations. If any fixed star is inhabited, the inhabitants are not merely ignorant of our earth but of all the other planets of the solar system, all might be swept away by some vast cataclysm and the rest of the universe would be none the wiser.

Restricting ourselves, however, to the planets of the sun's family, it is probable that three are more familiar with our

Fig. 3.—VIEW OF THE EARTH FROM THE MOON.

earth's characteristics than we are with theirs, the other three or the people who live on them if we make that violent assumption, probably see no more of us than do the dwellers on the fixed stars. The excursion we have suggested therefore being restricted to the planets, the starting point will be on Mercury, which moves around the sun at an average distance of 42 millions of miles, its year being 88 days and each of its seasons three weeks. Since the earth travels on an exterior orbit to that of Mercury just as Mars and Jupiter move in orbits exterior to our own, the best epoch for its observation from Mercury is when that planet, the earth and the sun are in a right line. Then the earth's side nearest Mercury is illuminated and our globe appears as a large brilliant star moving as shown by the arrow in Fig. 1, from west to east along the zodiac.

From Venus, the earth presents a far more splendid appearance. Every 584 days it approximates most closely to that planet and is only 180 millions of miles distant. Then it appears as a large bluish white and dazzling star, eclipsing in magnitude every other in the firmament, Fig. 2. The arrow again shows the direction of motion.

From the moon, the earth seems a colossal orb. Sun and planets all pass behind it. It has phases like the moon itself; and in beautiful accord with the needs of the lunar day (equal to fifteen terrestrial days) the earth is full at midnight, in quadrature at sunrise, Fig. 3, new at noon, and in quadrature at sunset. At full earth, the lunar inhabitant can see the seas and continents, the poles white with snow and the cloud banks floating in the air. A light vapor surrounds the earth which, refracting the light of the millions of stars, make it seem as if our globe were bathed in a pale halo. Probably the view of full earth from the moon when our planet seems fourteen times as large as the sun is one of the grandest celestial spectacles that exist in all the universe.

Continuing our voyage through space, we next reach Mars, 168 millions of miles from the sun. The period when the earth is best visible to the Martial inhabitant is just opposite to the similar period in the cases of Mercury and Venus. Since the earth revolves around the sun in an orbit within

Fig. 4.—VIEW OF THE EARTH FROM MARS.

that of Mars, its greatest proximity to the latter occurs when between Mars, and the sun. But then it turns its shaded hemisphere to Mars and is therefore invisible. It is necessary then to find, before and after this position, situations in which the earth shows to Mars a portion of its hemisphere illuminated by the sun. The further it is separated from Mars, the greater will be the phase, but on the other hand the smaller will be the disk. There is however a moment of maximum brilliancy which occurs near quadrature. Then the earth appears to the Martial eye as a bright star and through a telescope as a large crescent. In fact there is an accurate reproduction of the behavior of Venus as regards the earth. As Venus is our morning and evening star, so are we the morning and evening star to Mars. The Martial inhabitant sees the earth as a larger star than Jupiter appears to us, while the brilliancy is such as to render the earth visible in daytime.

To the inhabitants then of Mercury, Venus, the moon, and Mars, the earth stands chief of the heavenly bodies. To those of Jupiter, however, it becomes suddenly of almost total insignificance. The orbit of Jupiter is 576 millions of miles from the sun. Hence the earth in revolving around the sun never appears further from it than 12 degrees. The earth is therefore not visible during the Jovian night, for there the twilight continues some time after sunset, and when twilight has ended, the earth itself has set. Moreover at the only moments when it might be visible from Jupiter the earth is in quadrature, and only half illuminated, and besides, it is too small to be seen by the naked eye. Astronomers on Jupiter could only discover the existence of the earth by telescopes, and at a suitable epoch, as for instance in the east just before sunrise or in the west just after