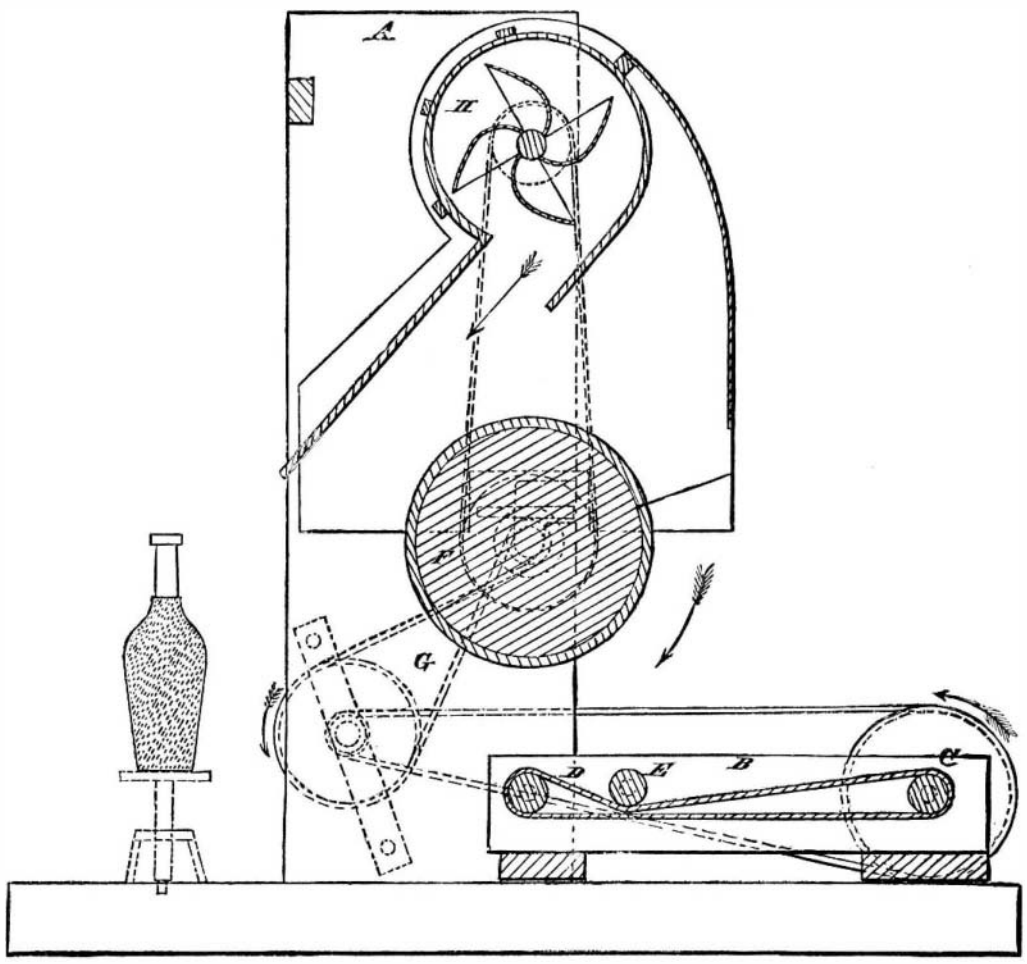
TWO NEW UTILIZATIONS OF PAPER PULP.

We illustrate herewith two new sets of apparatus for making paper pulp into either small vessels or barrels. The first, illustrated in Fig. 1. is an improved machine for depositing paper pulp upon moulds in order to form bottles, pitchers, and other vessels of *papier mache*. A is an upright frame, to which is attached a trough, B. To the end parts of the frame, B, are pivoted two rollers, C, around which passes an endless belt, D, made of wire cloth. To the forward part of the frame, B, is pivoted a third roller, E, beneath which the carrier, D, passes, so that the distributing fingers can only come in contact with its forward part. A drum, F, has rows of spring fingers, G, of such a length that their ends will come in contact with the forward end of the carrier, D, to take particles of pulp from said carrier, and project them upon the object to be coated, in front of the machine, and slowly revolved. The particles of pulp are directed more accurately against the article to be coated by the blast from a fan blower, H. In this way bottles, pitchers, and other vessels may be quickly and evenly coated with pulp, or coatings of pulp may be deposited upon forms, from which they may be withdrawn, when dry, by slitting them. The pager pulp coatings, when dry, may be polished, varnished, and otherwise finished.

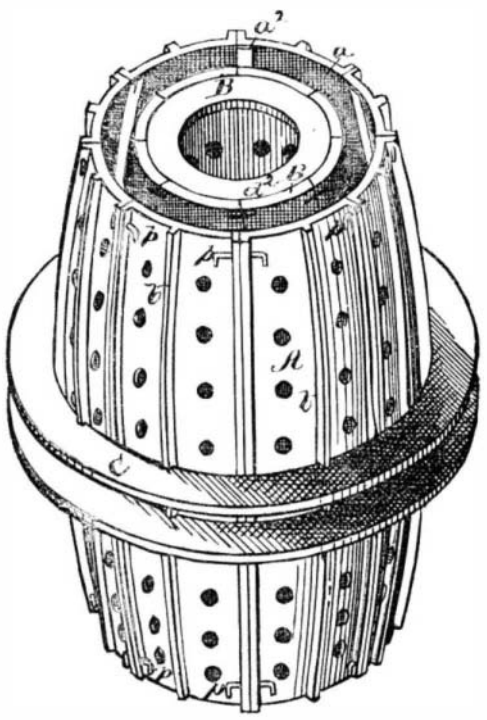


JENNINGS' PAPER PULP DISTRIBUTER.—Fig. 1.

Patented through the Scientific American Patent Agency, March 13, 1877, by Mr. Isaac Jennings, of Fairfield, Conn.

The second invention, illustrated herewith in Fig. 2, has for its object the production of a barrel or other similar article of any convenient size, and composed of ordinary straw pulp, made of straw or other suitable raw material. To this end, therefore, the invention consists of a mould or form in which to compress the pulp into proper shape.

A represents a number of staves, preferably of metal, their interior surface having the form desired for the exterior of the barrel. B B are a number of staves or sections, which, when set up inside the staves, A A, form a cone having an exterior form corresponding to that desired for the interior of the barrel. C C are rings, which are passed over the ends of the staves, A A, in the manner of hoops upon a barrel, and by their pressure preserve the external form of the mould. The stave, A, is perforated, as shown, and on its inside over the perforations is secured in



HUBBARD'S PAPER BARREL MOULD.—Fig. 2.

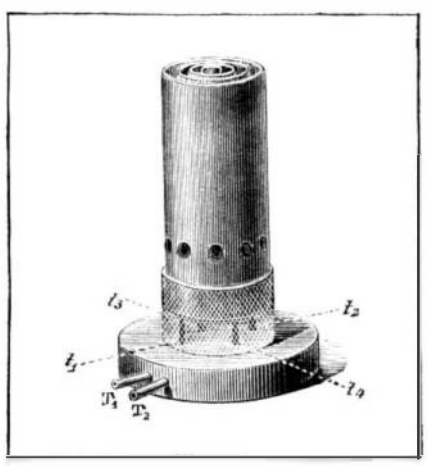
any suitable manner a wire gauze or similar device, *a*. Upon the inner edge of one side of the stave is secured a strip of thin metal forming a rabbet, a^2. This rabbet prevents the pulp from being forced out between the staves as the pressure increases, before the edges of the staves form a tight joint. Upon the back of the stave are three ribs, two of which form the edge of the stave, A, and one is a central rib, *b*. Each end of the sections, B, is formed into an offset for giving a croze or some similar formation to the ends of the barrel when pressed into shape, and said sections are perforated and covered on their exterior surface with wire gauze in the same manner as is the interior surface of the staves, A. The sections, B, are also provided with lugs, *d*, which serve to steady the sections and assist in holding them together when setting them up before pressure is brought upon the mould by serving as supports for the rings, d^2. One of the sections, B, has its edges beveled the reverse of the others, by which means it can be readily removed from the mould when the barrel is made, after which removal the other sections may be easily taken out also. The ring, C, is provided with slots or notches, *c*, which notches guide it as it is forced upon the staves, A A. These staves are also held together by wire pins, *p p*.

The complete operation of the mould or press can now be understood. The staves and sections being all set up, as above described, and the annular space between them filled with any suitable pulp, the rings, C C, are forced over the staves, A, by screw power, when the pulp will be compressed, as the rings approach each other, into the desired shape, the water contained in the pulp at the same time being forced out through the perforations in the staves and gauze. The shaped pulp, still under pressure, may now be subjected to any suitable drying process, the heat reaching it through the wire gauze and the perforations in the staves, both from the inside and outside. When the shaped barrel is considered dry enough, the rings, C C, are removed from the staves, A A. The staves thus released from pressure can readily be withdrawn, as above described, from contact with the barrel, and the barrel, as a completed article, is ready to be headed in any desired manner.

This invention was patented February 1, 1876, by Mr. Eber Hubbard, of Medina, N. Y.

THE NEW GODEFROY BURNER.

M. Godefroy's new burner, which is represented in the annexed illustration, is composed of four concentric sheet iron cylinders. The first and third are pierced with lateral holes at the base. The intervals between the cylinders communicate, some with the pipes, t^1 and t_2, joining the exterior gas tube, T, and others with the tubes, t_3, t_4, which unite with



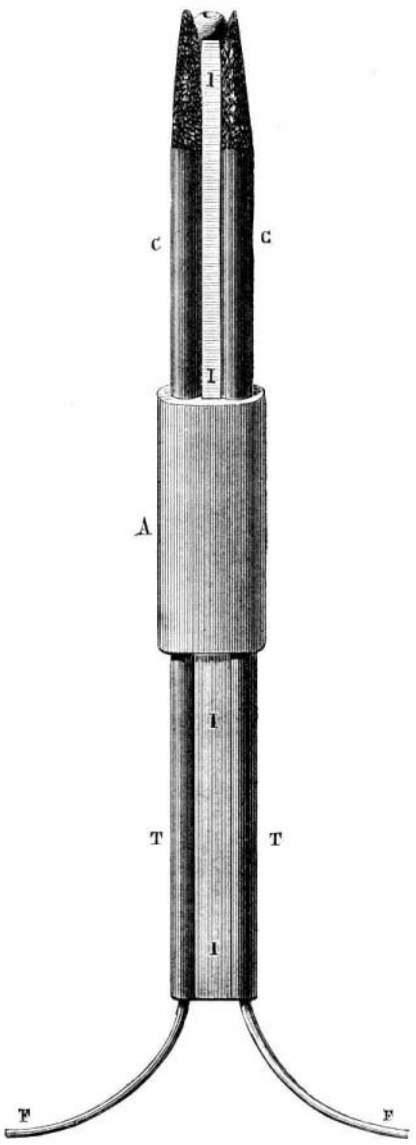
the tube, T_2. Wire gauze placed at the base of the apparatus prevents the flame from flickering, while it regulates the introduction of the air. Only two internal cylinders may be used if desired, in which case a high and regular white flame is produced.

THE ELECTRIC CANDLE.

The Jablochkoff electric candle, which we briefly described some months ago, on the occasion of its introduction to the French Academy of Sciences by its inventors, is now being used in Paris for the illumination of large stores. As the matter of lighting the streets of large cities by the electric light has of late been somewhat discussed, this invention is of timely interest, more especially as it appears to afford a new and simple means for employing that most powerful source of illumination.

The electric light, as all are aware, is now produced by means of two rods of carbon placed end to end, the extremities separated by a distance of some hundredths of an inch. Through the carbons a powerful electric current is passed, which, if the rods touch, simply heats them; but if they are separated, as above mentioned, it causes the production between the ends of the intensely luminous voltaic arc. As the rods become consumed, the arc elongates; and, finally, when the distance becomes too great, it ceases. Consequently, unless machinery is provided which compensates for this consumption by maintaining the ends of the rods always at the proper distance, the arc cannot be kept for longer than a few minutes. Electric lamps therefore are provided usually with clockwork or electro-magnetic devices for this purpose. When the source of the electricity is a battery or a continuous-current electric machine, such as the Gramme, the two rods are unequally consumed, that at the positive pole disappearing about twice as fast as the other. With other machines, whereby the current is alternately reversed, the consumption is about uniform for both.

The disadvantages attending even the most improved lamps, such as the Serrin apparatus, for example, lie in the care and attention required by the delicate mechanism, the difficulty of regulation, the casting of a shadow by the mass above the arc, the necessity of renewing the carbons at intervals of three hours, the consequent extinction of the light, and finally the high cost. It is simply necessary to point out that M. Jablochkoff's candle aims to do away with all of these difficulties to show the importance of the invention.



The device is represented in its full dimensions in the annexed engraving, for which we are indebted to *La Nature*.

It is an asbestos ferrule, sustaining the two gas carbon rods, C, which are also held in copper tubes, T. At I is insulating material placed between the rods, and at F the conducting wires. This arrangement may of course be modified to suit differing circumstances. The insulating material is kaolin or other refractory substance which does not extend to the ends of the rods. When the current passes, the arc is produced between the extremities of the carbons; and as these become consumed, the light is gradually brought near to the refractory substance. This by the great heat is vaporized, in proportion as the rods burn away, so that protruding ends of the latter are always left, while they are always maintained at exactly the proper distance apart to which they are in the beginning adjusted. If a continuous current is used, the double consumption of the positive rod is provided for by making that carbon of double the area of section as compared with others: but the candle works better with alternating currents, in which case the carbons are of the same size. It is easy to reverse the apparatus so that the arc is produced at the lower ends of the rods. The candle may then be employed for an overhead light.

One of the principal advantages of the Perrin lamp is that it may be set in operation from a distance by merely establishing the current, the carbons having been previously prepared. M. Jablochkoff accomplishes this by placing a bit of carbon between his points. When the current passes, this becomes hot, reddens, and finally consumes. Continuity is then broken, and the arc appears. A bit of lead, or fine metallic wire, which melts easily, answers the same purpose.

The gradual fusion of the insulating material presents another advantage, namely, that it becomes conductive on attaining the liquid state, and admits of an elongation of the arc, which increases the light. This conductibility, moreover, admits of the candle being extinguished by the breaking of the circuit and then re-ignited, provided the interval is not longer than a couple of seconds. By this means, it is suggested, the candle might be employed as a means of transmitting signals by flashes, using the Morse telegraphic alphabet. This idea has already been adopted by the Russian army, and trials are soon to be made at the headquarters at Kischenew.

With the ordinary electric lamp, it is not possible to place more than one pair of carbons in the same circuit. This is owing to the necessity of regulation in apparatus where the movement of the rods is accomplished by electromagnetic machinery, which itself is dependent upon the variations of the resistance of the circuit produced by the changes of length of the voltaic arc. If the arc elongates, the resistance augments; the electromagnet weakens, and allows of the relative approach of the carbons. Consequently, if two lamps were placed in the circuit, and one arc elongated, both electromagnets would be affected, and hence both arcs would be shortened. So that the inter-relation of the two machines would constantly produce improper regulations, which would amount to no regulation at all. With the candle, however, it is immaterial how many arc placed in the same circuit, provided the current has sufficient tension to pass through all. In Paris, three and four lights have been maintained from a single electric machine.

M. Jablochkoff is at work on further improvements, some of which he has perfected, and will shortly lay before the French Academy of Sciences, when we shall present them to our readers. It will be seen, however, that the invention is one calculated greatly to extend the usefulness of electric illumination.

Communications.

Our Washington Correspondence.

To the Editor of the Scientific American :

An application having been made by S. D. Locke to Secretary Schurz for an order directing the Commissioner of Patents to rehear the case of Withington *vs.* Locke, on the ground that the case was heard by the Assistant Commissioner at a time when the Commissioner of Patents was present and attending to his official duties, the Secretary has made a decision, denying the application, reviewing and reaffirming the decision of Secretary Delano in the quadruplex telegraph case, as to the right of the Secretary to interfere with the acts of the Commissioner of Patents, when honestly performed. There is no complaint made on this score; and the attorneys of both parties appeared before the Assistant Commissioner and fully argued the case, thereby tacitly admitting his competence to decide the case. No objection was made by either party until the matter was decided, when the defeated contestant made this application. After referring to the long-continued practice of the Office for the Assistant Commissioner to act on cases when the Commissioner is otherwise engaged, the Secretary says: "The duties of the Assistant Commissioner have been, and are, such as the title of his office supposes; and I am of the opinion that where parties, as in this case, submit their proofs and arguments to that officer, with a full understanding of the practice so long established, they must abide by his decision or seek their remedy in the courts."

An appeal from the Board of Examiners-in-Chief having been taken by John N. Swift, an applicant for the registration of a trade mark which had been previously registered by Winfield Peters, February 29, 1876, the Assistant Commissioner affirms the decision of the Interference Examiner and the Board of Appeals. The trade mark in question is "The John C. Ragsdale Ammoniated Dissolved Bone." The name of Ragsdale is that of a gentleman who was president of an agricultural society in Georgia, and his name was taken, by his consent, to popularize the article in that locality. Swift, having been appointed to negotiate with manufacturers for the introduction of this and other brands of fertilizers, made a contract with the firm of Snowden & Peters to furnish the article under this name, which firm afterwards dissolved, and Peters registered the trade mark in his own name. Unlike applications for patents, priority of conception of the idea has no weight in the registration of a trade mark, and Swift not only fails to show that he ever used the trade mark, but he sold the manufactured article of Snowden & Peters on their account. The rights of Snowden or of the agricultural society are not at issue in this case, and are therefore not considered. The Board of Appeals decided the case in Peters' favor, which this decision affirms on the ground that Swift had never adopted or owned the trade mark at all in the sense contemplated by the trade mark law.

Mr. T. C. Connolly, for many years a Primary Examiner, has been reduced to First Assistant Examiner—cause said to be old age.

As a result of the competitive examination for the position made vacant by the appointment of Mr. Wilber as Examiner of Interferences, Mr. H. C. Townsend has been appointed Primary Examiner.

The exploration of our Western territories will be continued during the coming summer under Lieutenant Wheeler, Professor Hayden, and Major Powell, though the field of operations is not fully determined upon. Major Powell will probably continue the geological survey of the Colorado river country, in which his party has already made extensive explorations. Professor Hayden's exploring party last year completed the survey of Colorado, and will make during the summer an exploration north of the Union Pacific Railroad. The main party under Professor Hayden will make Cheyenne their headquarters, and the different divisions will reach the principal points of their fields of operations by the Union Pacific road. The northeast division will be under Mr. G. B. Chittenden, and operate in the Sweet Water and Mud river countries. The southwest division, in charge of Mr. Henry Gunnett, will examine a section of about 10,000 square miles in area on the western slope of the main Rocky Mountain range. The northwestern division, under Mr. Bechler, will survey an equal amount north of that already referred to. This part of the country is of more rugged character than the other sections, embracing within its limits features of surpassing interest. Its topography, geology, and natural history are more remarkable than any of the other sections. The various parties are made up, and will probably have left for their field of operations ere this is published.

Secretary Evarts is represented as expressing regret at the postponement of the extra session of Congress, as it may prevent the representation of the United States at the approaching exposition at Paris. He thinks, however, that a Commission may be appointed which would in part reciprocate the French representation at the Centennial Exhibition. It is probable that a formal communication will be addressed to the French Government explaining the situation. The Secretary thinks, however, that, if Congress when they meet should act promptly in the premises, there would still be sufficient time to organize a respectable representation of our products and manufactures.

The Bureau of Statistics has published a statement showing that the exports of "oleomargarine" or "butterine," from New York, during the seven months ending March 31, amounted to 3,549,629 lbs., of the value of $481,747, of which 2,352,250 lbs. were shipped to France and 991,329 to Great Britain. This probably accounts for a discovery that the English people have lately made that a large quantity of very nice-looking butter, said to have been imported from the island of Jersey, had never been made in Jersey at all; and they were puzzling their brains to find out where it had come from—having very strong suspicions that it was not really butter but oleomargarine.

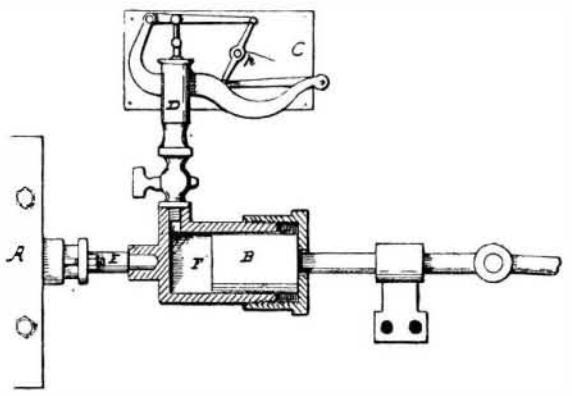
Our Board of Health has condemned a thousand barrels of an article sold in this market by a Chicago firm for vinegar, which, when tested by the chemist, was found not to be vinegar, but a compound containing $54\frac{54}{100}$ grains per gallon of anhydrous sulphuric acid combined with lime to form sulphate of lime (equivalent to $117\frac{36}{100}$ grains of gypsum per gallon) and 5 grains free sulphuric acid per gallon. This stuff is probably shipped all over the country, because it can be made so much cheaper than pure vinegar; and the people should therefore be warned to notice whether they are buying vinegar or diluted sulphuric acid.

Washington, D. C. OCCASIONAL.

A Practical Method of Determining the Friction of Slide Valves.

To the Editor of the Scientific American :

There has recently been considerable discussion of late concerning the friction of slide valves, from which it appears that there is a wide difference of opinion among mechanical engineers on this subject. I propose to show a method by which the friction of a slide valve may be measured; and for that purpose I have designed the instrument shown in the engraving. It is intended for taking diagrams which will indicate the frictional resistance of a steam engine valve at every part of its stroke. In the engraving, E is a valve stem of a steam engine, which works a valve within the steam chest, A. Attached to the end of this valve stem is a cylinder, F, which is provided with a nicely fitting piston, B. The stem of this piston, B, is joined to the eccentric rod of the engine. A common steam engine indicator, D, is connected with the upper part of the cylinder, F. If the cylinder chamber is filled with water, and the piston, B, is



driven forward by the eccentric (the water in the chamber being confined and inelastic), the motion of the piston will be communicated to the valve stem, and all the parts will move forward together as if they were rigidly connected. The cylinder, F, has an external nut by which the valve is drawn back in the opposite direction, and which prevents the piston, B, from being withdrawn from the cylinder. The thrust of the eccentric on the piston, B, will produce a pressure in the cylinder which will cause the pencil, *p*, of the indicator to rise and fall as the pressure increases or diminishes. The card, C, on which the diagram is drawn, is placed flat and stationary (instead of being mounted on a cylinder), while the indicator is carried back and forth with the valve. When the pencil, *p*, is brought in contact with the card, and the valve is moving forward, a diagram will be drawn, with a length equal to the stroke of the valve, which will indicate the pressure at every part of the stroke. The mean resistance of valve and power absorbed in foot lbs. can be determined by the usual method of working out steam diagrams.

If we wish to know the percentage of power of the engine which is absorbed in moving the valve, let a diagram be taken from the cylinder of the engine, and during the same stroke let a valve diagram be taken; then the foot lbs. of work developed by the engine may be compared with that absorbed by the valve. It may be said that the upward movement of the indicator piston would reduce the travel of the valve; but if the piston, B, is made sufficiently large, this reduction would not be of practical importance.

Indianapolis, Ind. JOHN C. DEAN.

The Origin of Petroleum.

To the Editor of the Scientific American:

On page 294 of your current volume, I notice an article on a "New Theory of the Origin of Petroleum." The idea may be new in print; but I heard it advanced during the winter of 1865–66 by a Mr. Smith, then a resident of Enterprise, Pa. He said: "By volcanic action, the earth's crust was broken, leaving crevices through which the ever-present water poured, which, coming into contact with the heated matter near the center of our globe, formed a gas which, in seeking outlets through the earth's crust, became more or less pent up, and necessarily would condense, forming our petroleum." He did not, as our friend in Russia has done, tell the nature of the matter with which the water comes in contact, but gave the idea generally. I think he wrote on this subject either to a Titusville (Pa.) or an Erie (Pa.) paper; but as to that, I am not certain. I remember, however, that he had a number of pretty sharp arguments with oil men on this theory. Mr. Smith went further, accounting for the gas that escaped the condenser by saying that "it passes into the air, forming into globe-like shapes, which in passing upward gather around them a moisture which of course confines them until, by gradually gathering this moisture (thereby gathering weight), they settle little by little until they mingle with the clouds, which generate electricity, or at least contains it, and are exploded by a spark, causing the flash and explosion—thunder and lightning." The latter part of his theory may be a little "airy;" but we must in some way dispose of this gas, and why not in this way as well as any other?

I think this will prove that we as a people are not so far behind the old world as such "credits" make us appear.

Buffalo, N. Y. L. E. PORTER.

Poisonous Enameled Ware.

Much consternation has lately been caused by the announcement in certain Boston papers that the enamels on the so-called marbleized and granite ware, which have for the past year or more found ready and extensive sale in our markets, have been found to contain lead and arsenic. The ware is quite handsome, of a mottled gray and white color, resembling somewhat certain varieties of marble in appearance. The vessels (principally culinary utensils) are in general enameled both inside and out. It will be seen from the letter given below that the statements as to the objectionable character of these enamels are not wholly without foundation in fact. The manufacture of the "marbleized" ware were awarded a medal in the Centennial Exhibition last year; and in the report of the judges, we find the state-