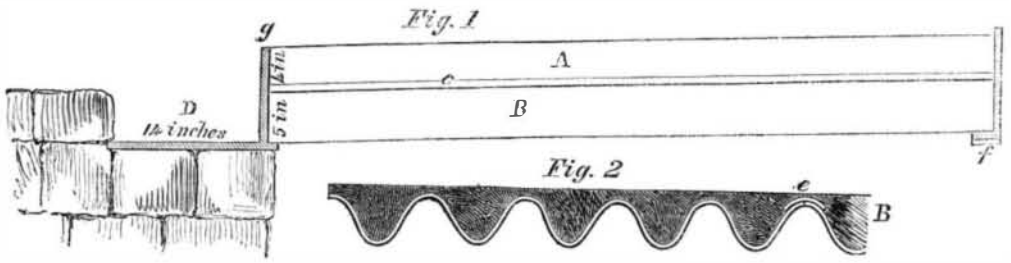
IMPROVED CEILING PLATES FOR VAULTS.

The people who spend their days under the sidewalks of this city would form a population for a considerable town. Among the ceaseless tide of human beings which pour along above the flag-stones on each side of Broadway, how few ever think of their fellow-men who are busy beneath these stones, producing the wealth that is displayed above. So valuable has room become in portions of this city, that it has become profitable to excavate vaults under the sidewalks, and some even extend them to the middle of the street. In these places steam-engines are placed, shops for repairs and manufacturing are established, and a vast variety of industrial operations are prosecuted. Of course, it is absolutely essential that the coverings of these vaults should be perfectly waterproof. The mode of covering generally adopted has been to turn brick arches and fill in over the top with masonry, giving a slight descent towards the street; the top was then made smooth with mortar and covered with a layer of melted asphaltum. A covering of masonry of the character described is about two feet thick, and this thickness is objectionable, occupying so much room in the vault, or necessitating the sinking of the vault so much deeper. The annexed cut represents a vault ceiling, only ten inches in thickness, which has just been used at the fine building erected on the corner of Broadway and White-street.



IMPROVED CEILING PLATES FOR VAULTS.

Fig. 1 is a cross section of the sidewalk, and Fig. 2 represents one of the sections in which the corrugated ceiling is cast. B is a corrugated plate of cast-iron, about one inch thick, reaching across the sidewalk from the area to the curb, cast in sections of five corrugations each; the corrugations being five inches in depth and nine and one-fourth inches in width, and closed at the ends by inch plates of iron cast upon them, thus forming water-tight troughs. Where these sections meet, the joint is covered by a curved plate, *e*, the whole construction rendering the ceiling absolutely waterproof. The ceiling plates, B, rest at the edge of the area upon a flange of the iron supporting beam, *f*, and at the street end upon a flange of the iron beam, *g*, which forms one side of the gutter. The corrugations are filled with concrete which is laid to a depth of one inch above them, and over this the flag-stones are laid, the concrete and the flag-stones operating to prevent the noise from the street penetrating to the vault.

The vault, of which this is an illustration, was constructed by J. B. & W. W. Cornell & Co., whose establishment is at No. 143 Center-street, New York.

IS THE MANUFACTURE OF OIL FROM COAL PROFITABLE?

MESSRS. EDITORS:—This appears to be rather a queer question, and a few months ago, or perhaps even at the present time, everybody who knows nothing and everybody who believes to know something about the above branch of industry would say: "Certainly! Coal-oil manufacture is the most lucrative business in the world, because—everybody says so!" Let us look a little closer, however, and see whether the answer is correct; how much money has been made in making coal-oil, and what may be the prospects for the manufacturers.

A former writer in the SCIENTIFIC AMERICAN asserted that none of all the numerous coal-oil companies had yet paid a dividend; and close examination proves this to be the case, with perhaps one or two exceptions. The reasons are obvious, although unknown to the public at large, and even to many stockholders; a few of those reasons may be found in the succeeding paragraphs.

Most of those that engaged in the coal-oil business had no practical acquaintance whatever with the *modus operandi*. Reading that mischievous article which went through the papers of this country, that Mr. Young had declared, under oath, that he was making more than $200,000 a year in the manufacture of paraffine oil from coal, everybody was anxious to make as much, if not more. It was thought that all that would be necessary consisted in obtaining cannel coal and establishing coal-oil works. Companies were started accordingly, with capitals ranging from $50,000 to $4,000,000; prospectuses were got up, showing clearly to everybody who would believe them, that a mine of cannel coal was at least as valuable as a rich vein of gold; all that was necessary to get the gold was to build oil factories and make oil. Proofs of the truth of all this were Mr. Young's declaration under oath, the quantity of oil that would be produced from a tun of coal and the price it would bring. Bankers and lawyers, ministers and officers of state, merchants and mechanics, "went in"; everybody feeling sure to make a fortune, if not in a week or a month, at least in a year. The land with coal being purchased, and a charter obtained, all the company had to do now was to build the works.

At last, a factory is built, although it has cost three times the amount calculated upon, and taken three times the time to complete; yet it is finished, ready to make oil and, consequently, money. The retorts were charged and fired; but here came the first disappointment. In place of the expected number of gallons of crude oil per tun, seldom more than half was obtained; some who believed to have a tank holding many hundreds of gallons full of oil, found that more than half of it was water! This latter circumstance is an instance of the complete ignorance of the manufacturers in regard to their chosen branch of business. The crude oil retorts broke and cracked without giving any particular notice of their intentions, and causing a very serious damage. Now, all sorts of experiments were made to obviate the breaking of retorts and to obtain more oil from the coal. Revolvers and self-fillers, clay and brick retorts, meerschaum and kiln, round and oval, square and D-shaped, upright and horizontal retorts were tried with ordinary and superheated, low pressure and high pressure steam, exhaustors and air-pumps, to assist. The stockholders grumbled—perhaps swore; but they had to pay for all these costly experiments. These only were the trials incident to the manufacture of crude oil; now came the purification of the oil. If the first manner of proceeding had been changed and re-changed, this was doubly and trebly so. Here were used concave and convex bottomed, high and low domed, cast and wrought-iron stills, with steam in every possible way of application and condensers of every imaginable shape. Chemicals of most heterogenous properties were tried, and large prices paid for information promising to make oil odorless and colorless. The product was this time too dark, next time too heavy, now the oil would smoke, then it had a perfectly unbearable odor, &c. Again, the article presumed to be the most valuable product of the coal, namely, heavy oil, usually called lubricating oil, turned out to be not exactly the thing for greasing machinery.

In the above way, from one experiment to another, from one failure to another, the companies stumbled along. All this time, people believed that the manufacture of coal-oil was one of the most lucrative of all the branches of industry; and one factory after another was erected. Why this belief prevailed, or why the real truth never leaked out, or was only known to a few, is not very difficult to imagine; if a company is prosperous, or is thought to be so, its stock is sought for and may be sold; the stock of a losing concern nobody will purchase. How little some coal-oil refiners knew about the value of crude oil, and perhaps their business in general, may be seen from the fact that eastern refiners paid from 25c. to 40c. for a gallon of crude oil, whereof it took from three to four gallons to make one of purified burning oil; thus paying more for the crude article than the market value of the saleable purified product.

As to the prospects of the coal-oil trade for this year, they are quite the reverse of flattering. Some manufacturers have at last succeeded in making a good article; but they find that, in order to make a good oil, it requires a great deal of attention and skilled experience; and that a gallon of it will cost far more than people generally suppose. The production of oil has far outstripped the demand, although the consumption is on the increase. The price of oil has dropped down considerably in consequence, and already a good deal of oil of eastern manufacture has been sold at a price ruinous to the manufacturer; and if the price of it goes below the present figures, prudent manufacturers will stop. The best advice to coal-oil manufacturers is, not to make other than a good article, and not to sell but at a paying price.

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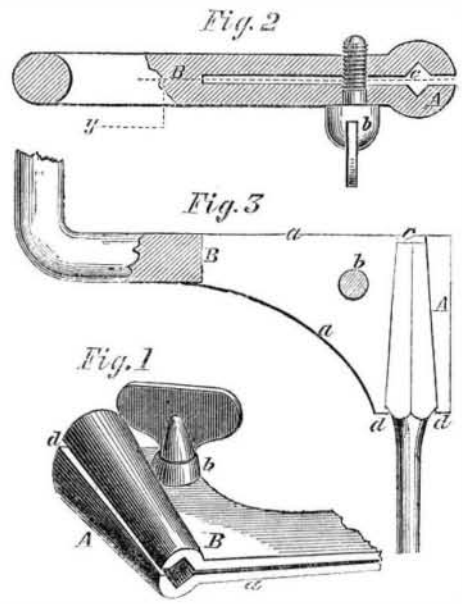
Cincinnati, Ohio, Dec. 5, 1859.

IMPROVED BIT STOCK.

This is a very simple device for holding boring-bits in braces, by which the necessity of fitting the shank of the bit nicely to the socket in the brace, and of filing a notch in the shank is avoided, thus rendering it a cheap article of manufacture.

The plan is to construct the socket and end of the brace in two parts, as if they were split vertically, the parts to be held together by a thumbscrew, and the socket to be furnished at its mouth or larger end with a lip about 1-16th of an inch square, projecting inward. The shank, being inserted past this projection and the divided parts brought together by turning the clamping screw is securely held in its place. A glance at the



engravings will render this plain. Fig. is a perspective view of the brace, Fig. 2 a horizontal section of the socket and divided end, and Fig. 3 a vertical section of the same. A and B are the two halves of the split end, *c* the socket, *b* the clamping screw, and *d d* the projecting lip. The object of this invention is to obviate the necessity of filing a notch in the shank of the bit, and fitting the shank so nicely, as was formerly required, to the socket in the brace. The lower arm and thumbscrew are made of steel. A further improvement in this brace is in the manner of hanging the head. A cup-shaped piece of steel is inserted in the head, and the spindle of the stock, which is also made of steel and nicely polished, fits into this cup; thus reducing the friction to the lowest possible point.

The patent for this invention was secured, through the Scientific American Patent Agency, Nov. 1, 1859, to N. Spofford, of Haverhill, Mass., who may be addressed at that place for further information in relation to the matter.

LAUNCH OF AN IRON STEAMER.—The iron steamer *Matanzas*, minutely described by us on page 255 of the present volume, was launched from the ship-yard of the builder, C. H. Delameter, foot of Thirteenth-street, North river, on Monday, Nov. 28th. It is said that another vessel similar to this, but of larger dimensions, is to be built at the same yard for the same parties.