Dynamite Blasting under Water.

Some few years ago, when it became necessary, owing to the expansion of fuel shipments at Lydney-on-Severn, the chief shipping place for the Dean Forest coal field, to extend the depth of water, to accommodate vessels at the above docks, the resort to dynamite as an explosive proved sufficiently successful, that not only was the undertaking completed, but this was accomplished when other processes had practically failed. As indicated, the object involved the enlargement of the lower floating basin, the depth of water required being 15 feet. In the breaking up of the lower rock, under water, Mr. Keeling eventually determined to try dynamite, and under the recommendation of Mr. William Blanch Brain, of Trafalgar Collieries, the charges were exploded by electricity.

It has been recently determined to perform similar operations in the river basin, and it is in respect to these that some information as to the *modus operandi* may prove of service where blasting operations necessarily carried on under water are a *sine qua non*. Mr. Keeling has again resolved to employ Mr. Blanch Brain's method of simultaneous electric blasting, viz., the electric apparatus, Brain's electric fuses, cables, exploder, etc. The custom is, where operations of the character named are about to be introduced, a responsible person is sent to instruct, and take charge, until the local parties themselves are competent to undertake the operations. As the sides of the basin are slanting, it is intended to remove the rock in order that the lower bed of the dock shall be level across its entire width. The workmen are provided with a raft, about 20 feet by 40 feet, two gangs of men employing "jumpers," three men to each. A series of holes are made—say from four to eight. The fuses have about 9 inch wires attached to them, and to these are connected the joint, insulated with Chatterton compound and tape, with tough cables, to reach the raft from bottom of hole. The fuse is then inserted into a primer in the middle of a calico or canvas bag, containing half a charge in two-ounce cartridges.

Having been thus prepared the charge is dropped down a pipe, the ends of the wires being on the raft. When all the holes are so charged, the wires are connected in series, and to the two end wires are connected the cables from exploder, which is on the shore. This machine is turned from fifteen to twenty times, according to the number of shots to be fired, and by reversing the handle, say 3 inches, the electric charge is freed, and all the shots are simultaneously exploded. Brain's improved American frictional electric exploder is being successfully used, which machine is capable of giving a spark 3 inches in length. After the shots the wires are disconnected and drawn up. Where they are at all damaged by the rock they are cut off above the places, which may be about 6 inches for every shot, and can be used again. Mr. Carl T. B. Brain represented his father at the preliminary explosions, and the work is progressing. In the comparison of expense Mr. Keeling estimates that the present process costs 4s. per cubic yard, against 5s. 6d. with the powder system. It may be added that Mr. Brain's system is being extensively employed in colliery operations in both home and foreign coalfields. At Hawkwell Colliery, Dean Forest, the late Mr. Chivers experienced great difficulty in extending his shafts the last 30 yards, owing to the bottoms being always covered with 2 to 3 feet of water. The charges in that case were simultaneously blasted by the electric machine with the highest degree of success. To mining operations of all degrees where blasting is required the process of Mr. Brain is of great interest and utility, both in respect to its economy, safety, and expedition.—*Colliery Guardian.*

Fluids and Fat.

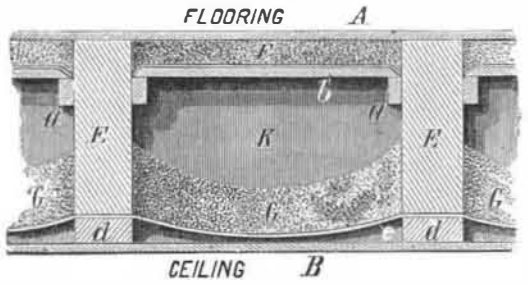
The removal of surplus fat from the body by appropriate means naturally forms a subject of interest to the well-to-do classes Various modifications of solid diet having had their day, the consumption of fluids is now undergoing regulation in respect of quantity among those who find their own presence insupportable. There is something in this theory, inasmuch as liquids, merely as such, materially aid the digestion and absorption of the food with which they are taken. Again, several of the fluids in most common use are, directly or indirectly, fat forming. Thus cocoa contains a very large proportion of fat, coffee a considerable amount along with amyloid substances, which are also represented in tea to a much smaller extent, and which readily pass by chemical decomposition into the form of fat. Beer, wine, and spirit are all fattening, partly in consequence of their saccharine and starchy constituents, and partly from their tendency to hinder excretion of waste products of food, and, when acting on any but a languid frame, to hurry and to slur that methodical oxidation by the blood on which the maintenance of sound tissue depends. General opinion, we are sure, will bear us out in saying that when the solids consumed are moderate in amount and digestible, and when the fluid is merely fluid, not fatty or amyloid in its composition, and not stimulant, free drinking will not influence obesity. We can call to mind heavy drinkers of water and regular consumers of tea, moderate in diet otherwise, whose habits engendered not the slightest tendency to corpulence. We should without hesitation recommend their practice to the stout, and should rely for the reduction of their bulk not on any further alteration of their diet, which might easily be carried so far as to starve their more important tissues, but on the maintenance of regular and sufficient physical exercise.—*Lancet.*

DOLMAN'S FIRE DAMPERS.

The efficacy of ashes as a fireproof material and fire damper was forcibly demonstrated recently in this city, where an exhibition of Mr. W. H. Dolman's system of fireproofing took place. The object aimed at by the inventor is to make buildings with wooden floor beams as safe against fire as iron beams and tiling.

The accompanying illustration is a sectional view of the flooring timbers, B, the plastered ceiling, and A, the floor. After the joists or beams, E E, are in position, a sheet iron ceiling, *e*, is nailed on. One sheet may overlap another one-half to three-quarters of an inch, or each edge may be hooked half an inch. Upon this sheet iron ceiling about three inches of dry, finely-sifted ashes, G G, are placed, the ashes being settled down carefully and banked up against the sides of the joists.

Provision is also made for deafening the floor by constructing another layer, F, above the first, as shown, upon which the flooring is finally laid. Furring strips, D D, are nailed to the bottom of the joists to overcome the sagging of the sheet iron, and then lathed and plastered as usual.



DOLMAN'S FIRE DAMPER.

It will be seen that this method combines simplicity with cheapness. In the test made in this city, which we witnessed, the wooden beams of a structure so protected showed not the slightest indication of attack, after being subjected for more than half an hour to an intense heat; similar trials in Chicago and other cities have had the same successful results.

In small towns, where imperfect or volunteer fire departments exist, the danger from fires would be greatly reduced by this method. The excellence of this system is indorsed by underwriters. By its use any wooden timbered building, at a very small cost, may be greatly protected against fire.

Patented by Mr. Wm. H. Dolman, of No. 229 Broadway, room 15, New York city.

IMPROVED SEWER PIPE TRAP.

This is the invention of Mr. Herman Pietsch, of Flatbush, L. I. The construction and operation are the same as the ordinary trap, except that in the pipe above the water seal there is a light valve, J, as shown in the cut, Fig. 1.

The sewage pipe, C, dips within cup, F; and the overflow rises over the upper edges of same and escapes into box, A, and off through B. The extremity of C is always kept sealed by the liquid within cup, C. In the ordinary trap, when there is a downward suction in B, it is apt to draw out the water seal in F, and when this seal is gone

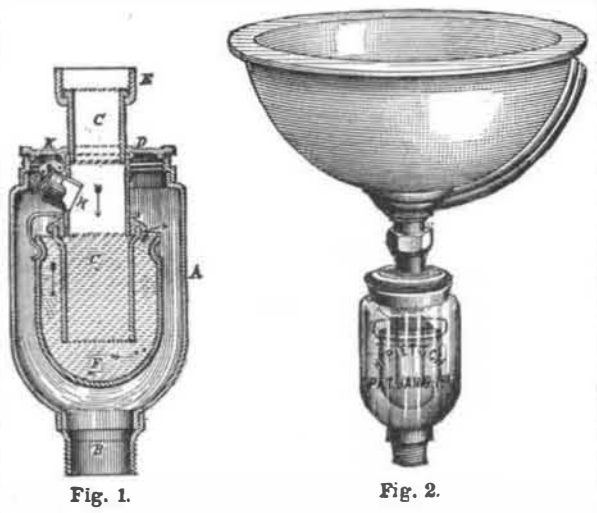


Fig. 1. Fig. 2.

PIETSCH'S IMPROVED SEWER PIPE TRAP.

there is nothing to stop the back flow or rise of the sewer gas into the room or house. But in the present improvement, when any down suction takes place in B, it causes the valve, J, above the seal to open, thus drawing off the gas *without disturbing the water seal in* F, and any rise or back pressure of gas closes valve, J, and is resisted by the water seal in cup, F.

We believe this is almost the only trap which carries with it an effectual means for preventing the siphonage of the water seal. In many cases, especially where the old styles of traps are used, and it is inconvenient to attach ventilating pipes to them, the substitution of this improved trap will instantly remove all troubles from back flow of gas. This trap has, after thorough trial, proved to be superior, and is highly spoken of by several prominent sanitary authorities. The American Institute declared it to be entitled to a higher award than any article of the kind on exhibition, and among its qualities the judges said it could not be siphoned, and it was impossible for back pressure of sewer gas to go through the seal.

Architects and others who wish to provide their structures with an economical but really good safeguard against sewer gas dangers, will do well to examine this improvement.

Wax Matches.

At the Nice Exhibition were two machines employed in the manufacture of wax matches and match boxes, shown by M. Perrier, of Marseilles. The first of these is used to cut the matches to the proper length. The wick covered with the wax coating is wound in long lengths upon the reels, one placed above another and revolving freely. These reels are divided around their circumference and for their whole length into separate compartments, in each of which the match material is wound. Altogether, in the machine shown, there are 100 independent lengths, 50 on each reel, and each length is brought to the front of the machine through a row of horizontal guides placed at equal distances apart. Here they are held, and a slight reciprocating and intermittent motion is given to them in order to feed them forward at each stroke. In front of the machine provision is made for holding a stout wooden frame, having, however, only three sides, the two vertical sides being slotted to receive the ends of a number of narrow wooden strips, covered on each side by cloth. These strips are, before the machine is started, held up clear of the wooden frame before mentioned, and at each stroke of the machine one strip is allowed to fall into the frame; at the same time the latter is moved down slightly. The machine being started, the ends of all the wax-covered wicks are fed forward sufficiently to bring them on to the bottom bar of the frame. As soon as this is done, the lowermost of the strips falls into the frame and lies on top of the ends that have been fed forward, at the same time holding them. A knife is then traversed across the machine, cutting all the wicks to the desired length. After this the frame falls sufficiently to allow the ends of the wicks to be again fed forward, another strip falls, and the operation is repeated. In this way the action is continued until the frame is full, with from 10,000 to 30,000 pieces, according to the size of the machine. The fourth side of the frame is then introduced, and the whole assemblage is securely locked. To convert these blanks into matches all that remains to be done is to dip their ends at one operation into the igniting composition.

The second machine, exhibited by the same maker, is for completing the well-known sliding boxes in which the matches are sold. It is somewhat on the type of an envelope-making machine. The blanks of the boxes or cases, whichever may be in course of manufacture, cut to form and decorated, are placed in a trough, one end of which is fitted with a spring that presses the row of blanks against a gumming device that forms the other end of the box. The operation of drawing the blanks successively from the trough deposits the gum on the exact places required. The attendant then inserts the blanks one after another into a former, which doubles them to the required shape, and delivers them as finished cases or boxes, as may be. But if after being thus finished they were discharged from the machine, the gum would be still wet and would not hold. This difficulty is got over by the use of a large and broad wheel placed in front of the machine. Around the periphery of this wheel, and parallel with its axis, are formed a large number of grooves the width and depth of the boxes. The width of the wheel is equal to the length of four or five boxes, and light strips of brass are placed around the circumference at intervals. As soon as the completed box is delivered from the former, instead of falling to the ground it is forced into one of the grooves in the wheel, the motion being so regulated as to bring a groove opposite the mouth of the former each time a box is delivered. But the action of forcing one box into one side of the groove displaces another on the opposite side. The wheel is then moved forward; another box is completed by the time the next groove is presented, and so on. By this arrangement each box remains in its groove until the wheel, which travels slowly, has made several revolutions, and thus sufficient time for the gum to dry elapses before the turn of any box comes to be ejected.

Egyptian Remains.

At Ekhmeem, a large provincial town of Upper Egypt, situate about halfway between Assiout and Thebes, Prof. Maspero, returning from his annual trip of inspection up the Nile, has just found, according to *Nature*, a hitherto undiscovered and unplundered necropolis of immense extent. As far as has been yet ascertained, the necropolis dates from the Ptolemaic period; but, as the work of exploration proceeds, it will probably be found that it contains more ancient quarters. The riches of this new burial field would meanwhile seem to be almost inexhaustible. Five great tombs or catacombs, already opened, have yielded a hundred and twenty mummies, and, within the short space of three hours, Prof. Maspero verified the sites of over a hundred more similar catacombs, all absolutely intact. The necropolis of Ekhmeem, at a rough estimate, cannot contain fewer than five or six thousand embalmed dead. Of these, perhaps not more than twenty per cent will turn out to be of archæological or historical value; but the harvest of papyri, jewels, and other funeral treasures cannot fail to be of unprecedented extent. Ekhmeem is the ancient Khemnis—the Panopolis of the Greeks. Its architectural remains are insignificant.