RECENT INVENTIONS.

New Alcohol Cock.

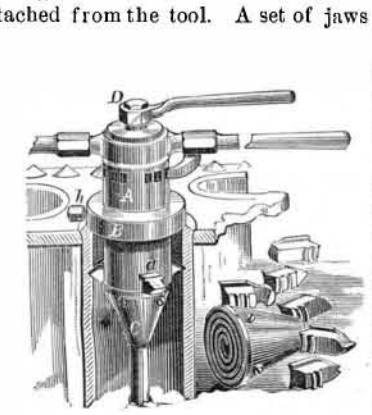
This is an improved alcohol cock to be used in dissolving the hydrocarbon substances in gas service-pipes, and it is arranged so as to prevent the loss and waste of gas and alcohol during the operation. The device consists of a closed vessel, adapted to contain alcohol, connected with the gas service-pipe, and provided with a three-way cock for establishing communication with the gas service-pipe or between the gas service-pipe and a pipe or tube leading from the cock up to the top of the closed vessel, so that the gas issuing from a test-cock on the vessel can be ignited when the direct communication between the gas service-pipe and the vessel is interrupted, this test-cock being used to ascertain if the obstructions in the service-pipe have been removed by the alcohol flowing from the vessel into the service-pipe for the purpose of dissolving these obstructions, generally consisting of congealed hydrocarbons. The alcohol is filled into the vessel through a tube provided with a circular loop or bend. In this way a trap or seal for preventing the escape of gas is formed. To use the alcohol cock the cap at the top is unscrewed and the alcohol is filled into the vessel through the seal tube, the plug of the lower stop-cock having been turned so as to close the communication of the glass vessel with the service-pipe, and close the pass-tube shown at the front of the glass cylinder. When the vessel is filled the cap is closed. If the plug of the lower cock is turned to establish a communication between the top and bottom of the vessel and the service-pipe, the alcohol will flow from the vessel into the service-pipe and will dissolve the hydrocarbon substance which closes the pipe and obstructs the passage of the gas. After a certain quantity of alcohol has been admitted into the service-pipe the plug is turned one-quarter of a revolution, so as to interrupt the communication between the service-pipe and the bottom of the vessel, and to establish a communication between the service-pipe and the top of the vessel by means of the pass-tube. The cock near the burner is opened, and if the gas can be ignited at the burner, the service-pipe is clear and the substances have been removed; but if the gas cannot be ignited the service-pipe is still obstructed and an additional quantity of alcohol must be admitted into the service-pipe, and this must be repeated until this pipe is cleared—that is, until the gas will burn at the test-burner.

New Alcohol Cock.

This invention has been patented by Mr. C. C. Mulford, of Streator, Ill.

New Tube Cutter or Expander.

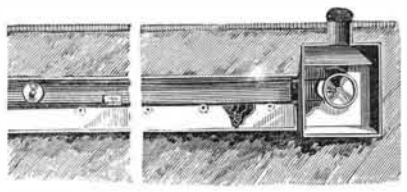
We give an engraving of a new tool designed for the removal of tubes from boilers in order that they may be replaced with new ones. The tubes are cut from within just inside of the flue sheet by the revolving expanding cutters of the tool, and its central bar being considerably longer than the main portion of the tool, prevents the tube from dropping after being cut. The tool may be withdrawn and the cutters removed and replaced by the wrench jaws which bite into the inner surface of the tube end and admit of wrenching it out of the tube sheet. Should a burr be found on the outside of the end of the main part of the tube, it may be removed by using the three external cutters shown in the engraving as detached from the tool. A set of jaws for engaging the inner surface of the tube, for the purpose of pulling it out of the boiler, are also shown in detail. These cutters and jaws are moved by the spiral in the end of the conical portion of the tool, and by expanding them more or less the same tool is adapted to different sizes of tube. The tool is worked by the pawl and ratchet in either direction, and when it is desired to work near the rim of the boiler one half of the handle may be removed and the tool can be worked by the remaining handle. This tool may be used to great advantage as a tube expander, also as a wrench for nipples and pipes. As it works from the inside there is no danger of collapsing the tube. It can also be used to hold nipple and short pieces of pipe while they are being threaded on the outside. The general usefulness of this tool will be understood and appreciated by fitters and boiler makers whose patience has been tried by ordinary tools for performing the various operations of which this instrument is capable. This invention has been patented by Mr. A. C. Hunsberger, of Portland, Pa.



Device for Laying and Holding Underground Electric Wires.

The engraving represents an improved device for laying and holding underground wires, recently patented by Dr. H. C. Register, of 1907 Chestnut street, Philadelphia, Pa.

In this device there is a water tight longitudinal boxing, of cast or sheet iron, or of wood or clay, placed in the street under the roadway, and at suitable intervals it is provided with enlargements having manholes leading to the street. On the bottom of the longitudinal box there are two or more longitudinal troughs or compartments, some for telephone and telegraph wires, and the others for electric light wires. Two partitions on the bottom of the longitudinal box extend throughout its entire length, and near the upper edges of these partitions a series of rollers are journaled. In each enlargement at the end of a section, and at suitable intervals in the longitudinal box, is journaled a horizontal shaft,

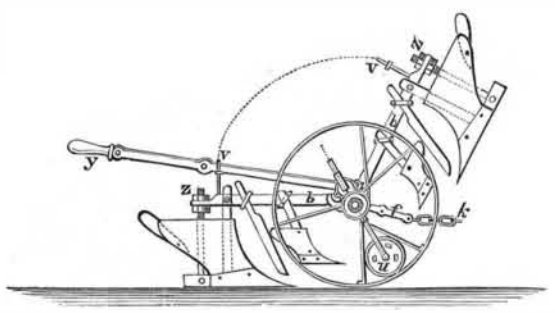


each carrying a grooved pulley directly above the middle line between the partitions. Endless ropes pass over these pulleys, and the ropes can be moved by turning the shaft by means of hand wheels at the manholes.

A carriage rests on the upper edges of the partitions, and can be firmly clamped to the endless rope. In operation the clamping carrier is fastened to the rope at one manhole or enlargement of the box, and one or more wires are attached to the pegs or staples of the carrier. By rotating the shaft the carrier will be carried to the next enlargement or manhole, and the wires will have been carried through the longitudinal box from one station or enlargement to the next, and can easily be placed into one of the compartments of the box. In this manner the wire can be carried through any length of boxing, for when the ends of the wires have arrived at one station—that is, at the end of one section of the boxing—the wires can be attached to the carrier of the next section, and so on. The wires can be removed in a similar manner.

Reversible Plow.

The engraving shows a new reversible plow, constructed so that it can be reversed at the end of the furrow in a very simple and convenient way, can be adjusted in height as may be necessary, and is provided with a carriage that can



be adjusted in width to suit the furrows, and which draws the plow with an equal and uniform draught. The engraving shows the plow with one of the shares raised, while the other is in position for work. This improvement is the invention of Mr. Julius Hartman, of New York city.

Ammonia for Extinguishing Petroleum Fires.

A committee of the Polytechnic Society of Munich has issued a report on the means to be employed for extinguishing burning petroleum. They say that since concentrated water of ammonia evolves a great amount of gas when heated, and as this gas is unable to sustain the combustion of any burning substance, burning petroleum must also be extinguished for want of oxygen if brought into a space filled with ammonia gas, and it may be safely asserted that petroleum will not continue to burn even in a room filled with atmospheric air, when there is a considerable quantity of ammonia gas mixed with the air, assuming, of course, that the place is closed so as to prevent a free interchange of air and cut off the access of a fresh quantity of oxygen to support combustion.

A second condition necessary for success, which is intimately associated with the first, is that the space be not much larger than that of an ordinary house-cellar, so that there shall be only a small number of barrels of oil, as is the case with a retail dealer. It may be assumed with certainty that it would be in vain to attempt to put out a fire in a large store-house with ammonia.

Finally, the third condition is that the ammonia be used in large amount and of sufficient strength. The ordinary commercial aqua ammonia has a specific gravity of 0·906, and contains nearly 10 per cent by weight of ammonia gas, but it can be made a good deal stronger, for *cold* water absorbs so much ammonia gas that when the water is perfectly saturated with this gas the solution contains nearly 47 per cent of ammonia. The stronger it can be used, the more gaseous ammonia will be evolved on heating it, and the more efficient it will be for extinguishing a fire. But in no cases should ammonia water be used that has a higher specific gravity than 0·960, and hence contains less than 10 per cent of gas.

Unfortunately it is impossible to say definitely how much ammonia ought to be kept in a petroleum room as a precaution against fire. For while it is easy to determine the cubical contents of the room, experience is lacking to tell what volume of ammonia must be mixed with a given volume of air to extinguish a flame in it. Nor is it possible to tell how much of the ammonia which is there will be evaporated if a fire breaks out, and how much ammonia gas will be evolved and mixed with the air. Yet there will only be a greater or smaller portion of ammonia liberated according to how much heat is produced.

In 1881, Schlumberger proposed to extinguish a fire in a petroleum store quickly at the outset by keeping a large closely stoppered bottle of concentrated ammonia on every barrel, so that in case of a fire or explosion the bottles would break and the evolved fumes of ammonia prevent the fire from spreading any further. Schlumberger employed this simple method with the best results in his extensive experiments on the distillation of petroleum.

Assuming that a large bottle held 10 liters of water of ammonia, and this contained but 10 per cent of gas, so that in the 20 liters there is dissolved not quite 2 kilos (1,920 grammes) of ammonia, and if on the breaking out of a fire only half of it vaporizes or is converted into gas, it would still fill quite a large space with ammonia gas. The weight of a liter of ammonia gas is at 0° C., and under the normal pressure only 0·7617 gramme, so that 1 liter of liquid ammonia would produce 1·313 cubic meters (48½ cubic feet) of gaseous ammonia, measured at the freezing point of water. At the high temperature produced by the burning oil the gas would naturally expand and fill a much larger space.

It must also be remembered that Schlumberger's proposition, to put a large bottle of ammonia on each barrel, could be easily carried out without interfering at all with business. The cost of ammonia can scarcely stand in the way of its use for prevention of petroleum fire from spreading, because at retail 100 kilos (220 lb.) can be had for $9.25. If no fire takes place none of it is lost, and when it is no longer needed it can be easily dispensed with.

The use of water of ammonia as a preventive of petroleum fires, or rather to extinguish a fire that breaks out in a small store of it, ought to attract the attention of companies and societies concerned in extinguishing fires, and although the matter has not yet been so thoroughly tested that the owners of these store-houses can be *compelled*, as Schlumberger proposed, to keep closed bottles full of ammonia in the cellars where petroleum is stored, it might be well to recommend that this should be done, leaving it to the owners, if they would consult their own interest, to carry it out.—*Deutsche Industrie Zeitung.*

An illustration of the action of ammonia gas in extinguishing flame was afforded recently at a fire in Scharmann's brewery in Brooklyn, E. D. While repairing the Delamater ice machine the ether vapors took fire, and an explosion followed which enveloped the whole building in flames. As a result of the heat the ammonia machine exploded, and liberated such an enormous amount of ammonia gas that it checked the fire and prevented it from spreading to the neighboring buildings.

Novel Telegraphic System.

The Mutual Union Telegraph Company proposes to adopt a new method of doing business by telegraph. The plan is not unlike the telephone system. To illustrate the scheme: Suppose that A in New York finds in the course of the day that he wishes to settle a certain matter with B, of Chicago. He sends word to the Mutual Union office to send to B, asking if he can be in the Chicago office of the Mutual Union at, say, 4 o'clock, in order to talk with A. If the answer is "Yes," then the two meet at 4 o'clock, one in Chicago and the other in New York, and two operators ask and answer whatever questions and answers are sent over the wire. In this way there will be no opportunity for delays or misunderstandings.

Grape Leaves for Pickles.

A writer in the *Country Gentleman* recommends the use of fresh green grape leaves to place on top of pickles in jars in place of flannel or other cloth usually employed. He claims the leaves will preserve the vinegar sharp and clear and impart a nice flavor. The leaves should be rinsed in pure water and left to drain before use, and occasionally changed. They exclude the air, and besides imparting a delightful flavor to the pickle cause less trouble to the housewife.