CRUDE PETROLEUM FOR MANUFACTURING PURPOSES.

We illustrate herewith some of the many uses made of crude petroleum as fuel by the processes of the Aerated Fuel Company, of Springfield, Mass.

Fig. 1 shows the application of this system under a boiler, return flue pattern. Among the many advantages claimed by this system over coal are: Uniform heat, constant pressure of steam, no ashes, clinkers, soot or smoke, and consequently clean flues, one man attending from ten to fifteen 100 H. P. boilers burning this fuel easier and with less trouble than with one boiler burning coal.

Fig. 2 shows this system as applied to a forge suitable to a large variety of general work. One cylinder containing six burners is placed on one side, leaving one end open to receive the work. If desirable, both ends may be left open, especially when it is desired to heat long pieces of iron or steel in the center. By putting an adjustable or movable brick partition in the center, as many burners as are not wanted can be shut out, thus reducing the area of the fire box and using one or two burners, as required. At the repair shops of the Boston & Albany Railroad Company, at Springfield, Mass., where this system is generally employed, the superintendent states he regards the system as far superior to coal in every respect, particularly for work requiring a high degree of heat at short notice.

Fig. 3 illustrates the interior and end view of the burner cylinder and shows the proper position of float valve when cap is on end of cylinder.

The object of the float is to prevent the flowing of oil into the cylinder and rising above the mean level as established by the governing device in each cylinder. The float falls of its own weight, so as to open the valve and allow the oil to rise again to the mean level. The sectional cuts show that if, from any cause, the float should sink, it will also close the valve, thus preventing any possibility of flooding the furnace or overflow in tanks.

Referring to Fig. 3, it will be seen there is an air space maintained on an air pressure of from 10 to 25 lb. per square inch, according to the class of work being done. Although the nozzle of the burner is small, from 1-20 to 1-8 inch, and only a small quantity of air used, yet it must be under an equal pressure, that the oil may be finely atomized before igniting.

The Aerated Fuel Company have many forges, muffles, ovens, and similar fires, using over 1,500 burners, in successful operation, in which the fuel is crude Lima oil, burned by being atomized with a governed air pressure, very similar in quality to natural gas and free from danger. Its advantages are, no increased rates of insurance, for the best insurance companies approve of the system as shown in Fig. 2; no odor; no chimney connection needed; no sulphur or other impurities, as is the case with coal; perfect combustion and regulation; and cheaper than any fuel, not excepting natural gas, unless the consumer owns his own wells.

One pound of oil will do the work of from 3 to 6 lb. of the best hard coal in forges, and do it better, and there is less liability of overheating or burning stock.

The system can be adapted to nearly any forge now in use, but as it is necessary to use from 10 to 25 lb. air pressure per square inch, a compressor of some kind is necessary, as no fan blower will maintain this pressure. The oil ceases to flow through the burner when the air pressure is removed, consequently fire is impossible, and only one valve is necessary to control both oil and air. This process is already used for japanning, annealing, hardening, drop forging, shovel welding, heating blanks for bolts, riveting furnaces for boiler and bridge work, hoe, fork, and rake work, cutlery works, mowing, reaping, harvesting, binding, and hay pressing machinery, scale work, railroad repair and locomotive works, glass and copper works, etc.

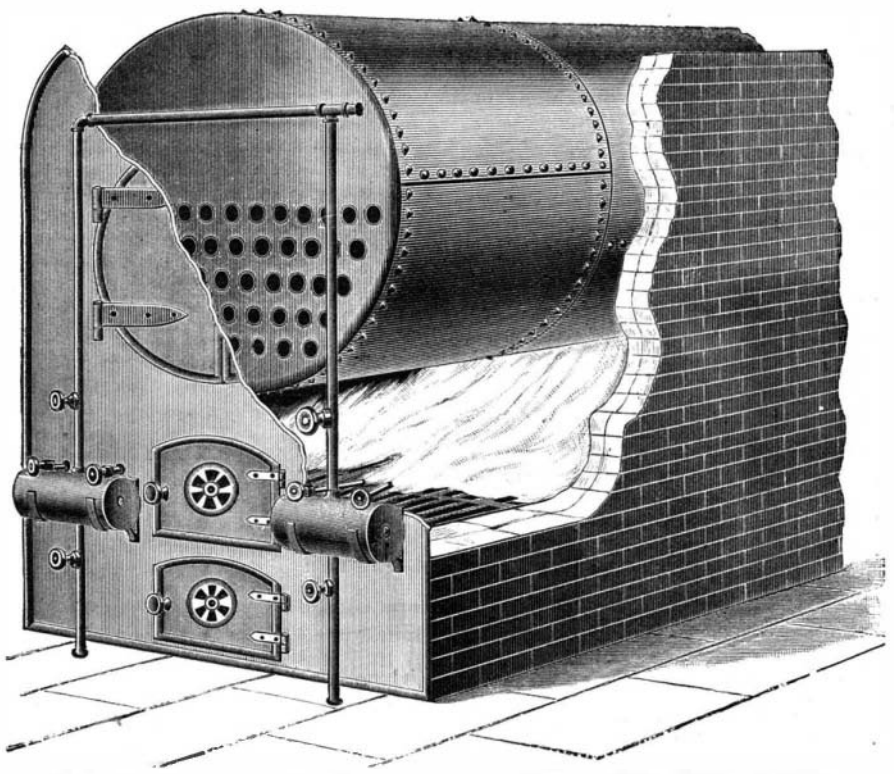

Fig. 1.—BURNING CRUDE OIL UNDER A BOILER RETURN FLUE PATTERN.

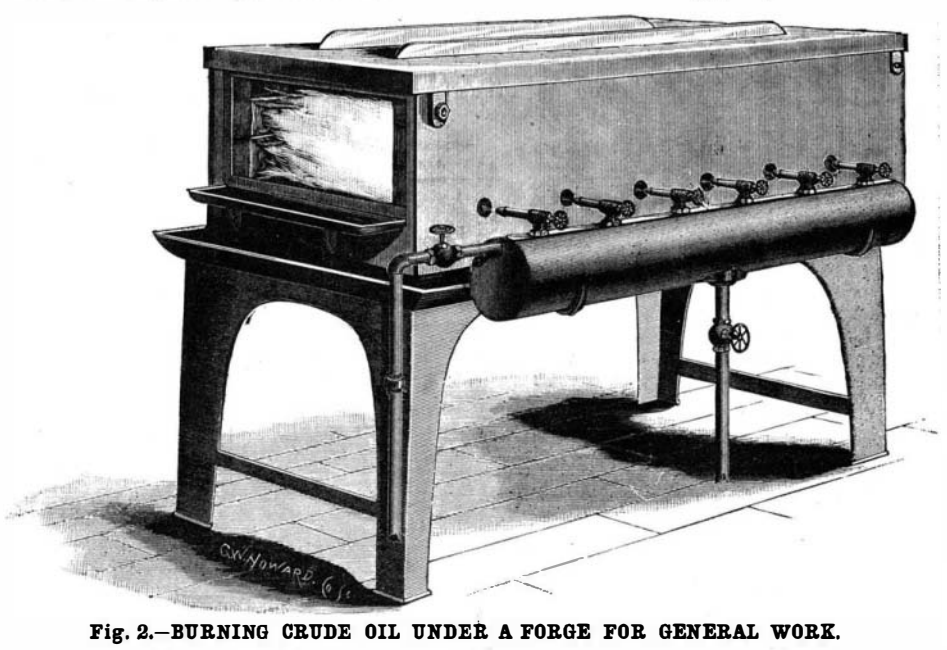

Fig. 2.—BURNING CRUDE OIL UNDER A FORGE FOR GENERAL WORK.

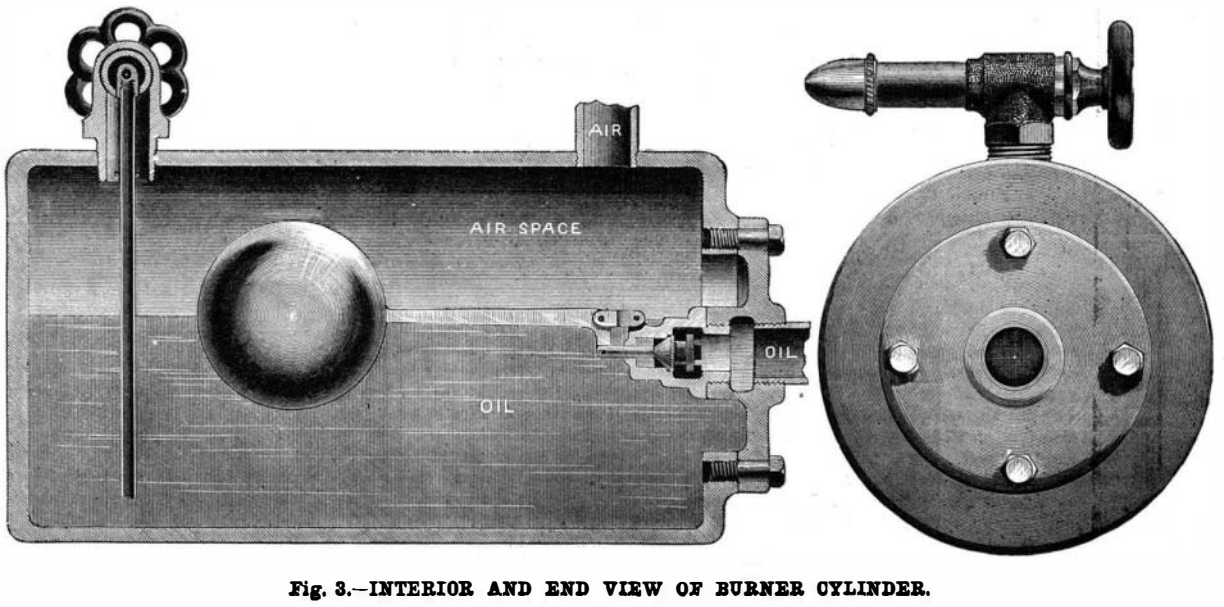

Fig. 3.—INTERIOR AND END VIEW OF BURNER CYLINDER.

On Artificial Organic Dyestuffs and Their Use.

In *calico printing* the dyestuff solutions are mixed with a thickening (starch paste, gum tragacanth) and if necessary a mordant, and applied to the fiber by means of printing blocks or rollers. Then usually follows steaming, whereby the dyestuff and mordant are caused to penetrate the fiber and combine with it. When albumen colors are employed, the albumen, which at the beginning is soluble, coagulates by the steaming process and in this state holds the dyestuff fixed upon the fiber.

Leather dyeing is on the whole based upon the employment of the same dyestuffs which are used for dyeing animal fibers, such as the eosines, fuchsines, methyl violet, malachite green, acid green, quinoline yellow, ponceaux, nigrosine; but also dyestuffs which are specially used in cotton dyeing, such as phosphine and methylene blue. It must be observed, however, that the colors obtained upon leather do not always match those which are produced with the same dyestuffs upon fibrous material. Prior to dyeing the leather must be very carefully cleaned. The dyeing operation consists either in immersion in a dyestuff solution or in the application of the baths by means of brushes. In the latter case aqueous as well as alcoholic or lake solutions are used.

The dyeing of feathers and hair is effected by first cleaning the feathers or hair, before dyeing, or bleaching if necessary, by lukewarm soda water (1:120). For dyeing, all neutral dyestuffs suitable for wool dyeing are employed in the same manner as for this fiber.

The dyeing of horn, bone, ivory, and ivory nuts is ordinarily effected, after cleaning, by laying them down in the suitable dyestuff solutions, or painting with them.

Straw is dyed in the same manner; before dyeing, however, it must be cleaned by laying it down in ammonia or soda solution. Usually it is previously bleached by sulphurous acid.

Wood, grasses, flowers, moss, etc., are stained by laying the objects to be colored down in the solutions, or painting them over, or pressing the coloring liquid into them. The most used colors are fuchsine, methyl violet, malachite green, and aniline blue.

The staining of paper with the artificial organic dyestuffs constitutes an extensive industry on account of the handsome and bright colors obtained and of the simplicity of the dyeing methods, of which two are distinguished, viz., staining in the sheet, when the paper is either immersed in the dyestuff solution or painted over with the same (or with colored lakes), and coloring in the pulp, when the dyestuff is already added to the paper stuff while in the rag engine. Paper can, besides, be printed with colors like tissues, as in the manufacture of wall paper.

For coloring soaps only dyestuffs are used which are soluble in alkaline liquids and are not altered thereby.

Colored varnishes or so-called brilliant lacquers are produced with aniline dyestuffs soluble in alcohol, such as fuchsine, methyl violet, azo and nitro dyestuffs soluble in alcohol, etc.

For colored inks many artificial organic dyestuffs are excellent to use on account of their great tinctorial value, and because the aqueous solutions do not become mouldy. For 3 pts. dyestuff generally 5 pts. gum arabic and 150 pts. water are used, and for copying inks some glycerine is added. Methyl violet is preferably used for violet (mauve) ink, eosine for red, and malachite green for green ink. For making marking ink (stamping) 3 pts. dyestuff are mixed with 144 pts. alcohol 50 per cent and 33 pts. glycerine.

Ink sticks were first, in 1878, produced by E. Jacobson, from aniline dyestuffs, graphite, and kaolin. These materials are mixed in four different proportions, according to the degree of hardness desired; the more kaolin and the less dyestuff and graphite, the harder the stick. The finely ground materials are carefully mixed, made into a paste with water, pressed through a perforated plate so as to form sticks, and dried.—*Textile Colorist.*

Turpentine Baths for Rheumatic Pains.

Make a concentrated emulsion of black soap, 200 grammes, add thereto 100 or 120 grammes of turpentine, and shake the whole vigorously until a beautiful creamy emulsion is obtained. For a bath take half of this mixture, which possesses an agreeable pine odor. At the end of five minutes there is a diminution of the pains, and a favorable warmth throughout the whole body. After remaining in the bath a quarter of an hour, the patient should get into bed, when a prickling sensation, not disagreeable, however, is felt over the entire body, then, after a nap, he awakens, with a marked diminution in the rheumatic pains.—*Prat. Med.*