The Colorado Oil Field.

According to the *Petroleum Age*, Mr. David Kirk, President of the McCalmont Oil Company, lately visited the oil field which is located on the plains of Florence, ten miles southeast of Canon City, on the Denver & Rio Grande Railroad. The four wells now producing are owned by three different companies, and have an aggregate production of ten barrels. They are situated on a stretch of ground about three miles in length and with its width undefined. One small well was drilled north of the better ones, but no dry holes have been found, and the extent of the territory is a matter of conjecture. The wells produce the maximum amount of oil when they are pumped by heads twice a day. When the walking beam is kept constantly wagging, the wells do not produce any more oil than when they are pumped by heads.

The best well is owned by the Arkansas Valley Oil Company. It was placed on exhibition for Mr. Kirk's benefit, and pumped five barrels per day. A well which has been shut down for a month or more will not produce any more oil when started than it would if it had been worked steadily. For some unexplained reason, the wells do not fill up. The oil comes from a shale rock about 1,200 feet below the surface. It is of a beautiful yellowish-green color, and about 30 gravity. Local representatives of the Standard Oil Company report that it will afford 40 per cent of illuminating and 12 per cent of lubricating oil. The question of transportation is a perplexing one to the oil operators beyond the "Father of Waters." The oil produced must be taken to Pueblo, 40 miles away, before fair freight rates can be obtained through competing lines. Cleveland parties are now building a refinery at Canon City, which will bring the oil produced here in competition with that brought across the plains. Mr. Blake, who represents the Standard at Denver, is authority for the statement that the States and Territories of Colorado, New Mexico, Montana, Wyoming, and Utah have a daily consumption of refined which is equivalent to 200 barrels of crude oil.

A Remarkable Drainage Enterprise.

Few people are probably aware of the great engineering undertaking, in which Russia has been engaged for years, of draining the Pinsk marshes. These are so extensive as to secure special designation on the ordinary map of Europe, being, we believe, the only case of the kind; and, in point of area, are very much larger than Ireland. Situated on the Russo-Polish confines, they have become famous in Russian history as a refuge for all manners of romantic characters, and have remained an irreclaimable wilderness in the midst of a prosperous corn-growing region up to within the last few years.

In 1870 the Russian Government first took in hand seriously the abolition of this wild expanse, which, owing to being perpetually more or less submerged and covered with a jungle growth of forest, prevented not only communication between the Russian districts on either side, but also between Russia and Austro-Germany. Consequently, a large staff of engineering officers and several thousand troops were draughted into the region, and these have been engaged upon the undertaking since. Up to the present time about 4,000,000 acres have been reclaimed, thanks to the construction of several thousand miles of ditches and of canals so broad as to be navigable for barges of several hundred tons burden. Just now the engineers are drawing up the programme for next year, which comprises the drainage of 350,000 acres by means of the construction of 120 miles of ditches and canals.

Of the 4,000,000 acres already reclaimed, 600,000 acres consisted of sheer bog, which has been converted into good meadow land; 900,000 acres of "forest tangle," which have been prepared for timber purposes by cutting down all the underwood and thinning the trees; 500,000 acres of good forest land—forest oases in the midst of the marshes—hitherto inaccessible, but which have been connected more or less by navigable canals, and thereby with the distant markets; and finally 2,000,000 acres have been thrown open to cultivation, although only 120,000 acres have been actually occupied up to now. Besides making the canals and ditches, the engineers have built 179 bridges, bored 152 wells from 40 feet to 80 feet deep, and 425 from 20 feet to 40 feet, and have made a survey of 20,000 square miles of country hitherto unmapped. When their task is finished, Russia will have effaced from the map of Europe one of the oldest and toughest bits of savage nature on the Continent, and a few years will suffice to render the Pinsk marshes undistinguishable from the rest of the cultivated region of the sources of the Dnieper. From an engineering, geological, and scientific point of view, generally, the work is one of special interest, and capable globe trotters, anxious for a novel theme, might do worse than spend a few months amidst the fading Pinsk marshes, describing the changes.—*Engineering.*

A NEW DOMESTIC MOTOR.

Our readers are already acquainted with the many efforts that have been made to devise a motor adapted to the requirements of the smaller industries. We have from time to time described such motors—run by steam, gas, hot air, or water—and we now propose to speak of one which is interesting from the problem that the inventor proposed to himself to solve, as well as from the means he took to solve it. The inventor,

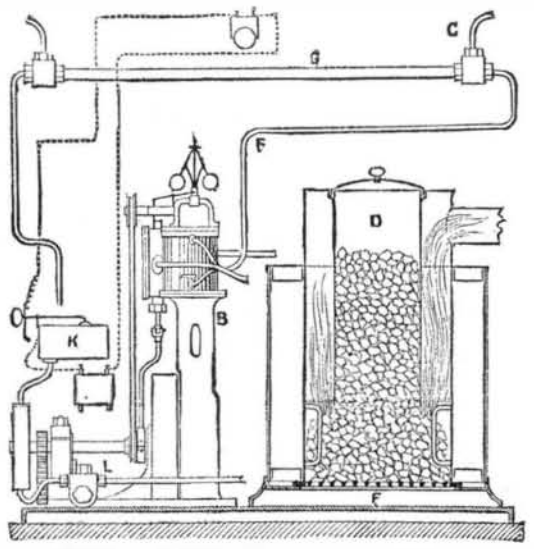

Fig. 2.—DETAILS OF THE MECHANISM.

Mr. A. Pifre, set out to construct a motor that should be capable of being used everywhere, even in the city or the village, be easy to set in motion, and keep in repair without special knowledge, and combine the simplicity of gas motors with the economy, etc., of the steam engine.

In order to solve this problem, which is one that has often attracted the attention of engineers, and is of great importance, Mr. Pifre had recourse to steam. His idea was that since the steam engine, raised to its highest power, has centralized motive power to the profit of the greatest enterprises of our epoch, it might become its province to likewise act as a domestic motor. As the chief defect of small steam engines is that they require more care and watchfulness than are demanded by large ones, M. Pifre has changed the usual mode of producing steam and converting it into work, and has devised an apparatus which is capable of running automatically for several hours without any supervision on the part of its owner. Hence the characteristic name of "Automotor" that has been bestowed upon it.

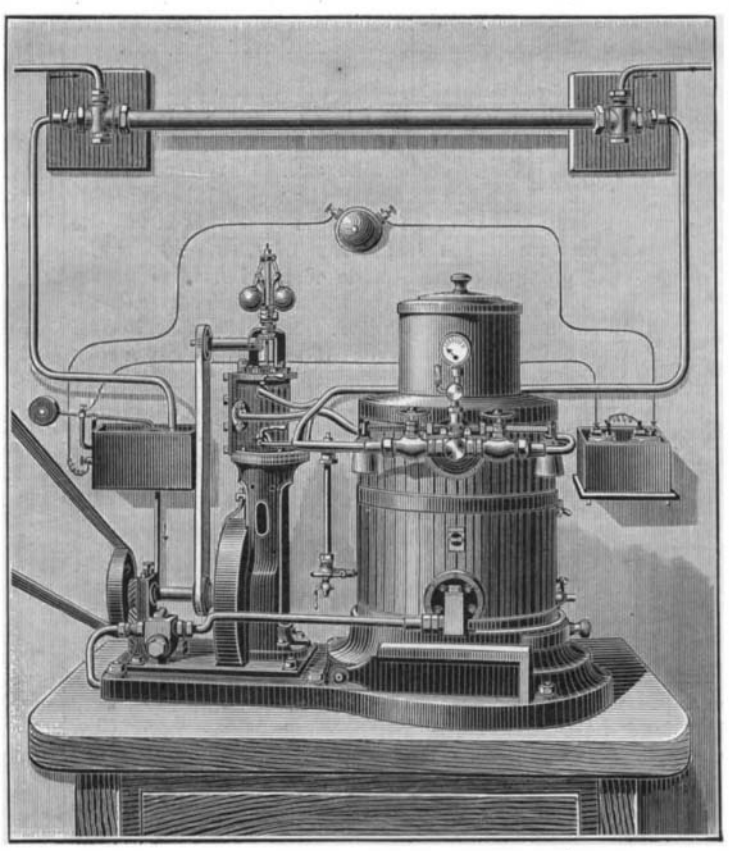

Fig. 1.—PIFRE'S DOMESTIC MOTOR.

The generator and motor are united upon the same base, and the condenser is located wherever most convenient.

The generator, A (Fig. 2), has some resemblance to a hot air stove, but one that has been changed internally in such a way as to produce an abundance of steam. The fire is lighted at the base of a central cylinder, D, which is afterward filled up to the top with fuel. The combustion proceeds upon the grate, E, at the base of the cylinder, and is absolutely constant so long as any coke remains. Fuel is put in at distant intervals to make up for what has been burned. This suffices to render the production of steam constant and regular, without any of those disturbances that take place in the usual boilers of small size. The intensity of the fire is regulated through the door of the ashbox and the damper in the chimney.

The motor, B, is of the vertical type. Its cylinder, its piston, and its valves operate without ever being lubricated with any fatty matter. As for the condenser, C, that consists of a pipe, G, that surrounds the escape pipe, F, to a certain distance, and permits of the circulation of cold water around it.

The steam produced in the generator passes into the cylinder, and, after moving the piston therein, escapes through the pipe, F, is condensed in the pipe, G, and falls in the form of water into the small reservoir, K. From this latter the distilled water is taken up by the feed pump, L, and introduced again, well aerated and free from grease, into the generator, A, whose level remains constant. This constancy in the level of the water and the automatic feeding of fuel in the furnace are characteristic traits of this new motor, the surveillance of which is thus reduced to it simplest limits.

The automotor shown in Fig. 1 is the smallest size that Mr. Pifre constructs. It is of one-quarter horse power, weighs 770 pounds, and occupies a space of but 3¼ x 2 feet. Its height is 2¼ feet. Notwithstanding its small dimensions, it is provided with all those safety apparatus that are found in large engines. The small reservoir for condensed steam is surmounted by an electric telltale, which makes itself heard whenever anything wrong occurs.

Aside from the applications already made by Mr. Pifre in various Parisian industries, one of these little motors has recently been very ingeniously applied to the running of a steam launch twenty feet in length, which it takes but one man to maneuver.—*La Nature.*

The Miller Process for Refining Gold and Silver.

Mr. G. W. Griffin, U. S. Consul, Sydney, N. S. W., says: This process was discovered in 1868 by Mr. F. Boyer Miller, then one of the assayers to the Sydney mint and now superintendent of the bullion office in the Melbourne branch. It was introduced on a practical scale in 1869, when over 200,000 ounces were treated; since then it has been applied to the whole of the gold brought to the Sydney mint for coinage, with the exception of such small quantities as had been previously refined. The total weight operated on at the Sydney mint has amounted to more than 6,600,000 ounces (or 20 tons), and the value of the silver extracted and sold to $875,000, of which $200,000 have been paid over as revenue, and the remainder to the owners of the gold. The average assay of the refined gold, which in 1869 was 0·9931, is now 0·9965. These results have been obtained with comparatively little expense, while the introduction of the process has been in many ways of the greatest advantage to the successful working of the mint.

The chlorine process has also been in use at the Melbourne branch since its opening in 1872 and over 7,000,000 ounces of gold have been refined with the same satisfactory results.

Mr. Miller stated in his application for a patent that his invention has for its object the toughening of brittle gold bullion and the refining of alloyed gold, whether naturally or artificially alloyed, together with the separation of any silver it may contain. The operations requisite may be performed on the sole of a reverberatory or other furnace or in retorts made of some refractory material, or, as the inventor prefers, in good clay crucibles.

The crucibles are prepared by dipping them in a strong solution of borax in hot water, and subsequently drying them. In these the gold to be operated on is melted in the ordinary manner, with the addition of one-half of 1 per cent of fused borax, a well fitting cover having first been luted over the mouth of each crucible employed. In this cover are one or more holes to allow of the introduction of a tube or tubes constructed of some suitable refractory material, such as fire-clay, descending to the bottom of the crucible, and through which chlorine gas or hydrochloric acid gas is forced while the gold is still in a melted state. After the chlorine gas or hydrochloric acid gas has been thus passed through the melted gold for a sufficient time, which necessarily varies according to the quantity and quality of the gold operated on, the silver and baser metals are converted into chlorides, and rise to the surface of the refined gold. The more volatile chlorides partially escape, and the remainder is easily removed by pouring the entire contents of the crucible into the moulds and taking out the cake of chloride as soon as cold, or by allowing the gold to cool sufficiently to set or become solid, but not to become so cold as to prevent the more fusible chlorides from being poured off, to be subsequently reduced to the metallic state by any of the well known methods.

A BOILER has been constructed in France in which the metallic surface exposed to fire does not touch the water.