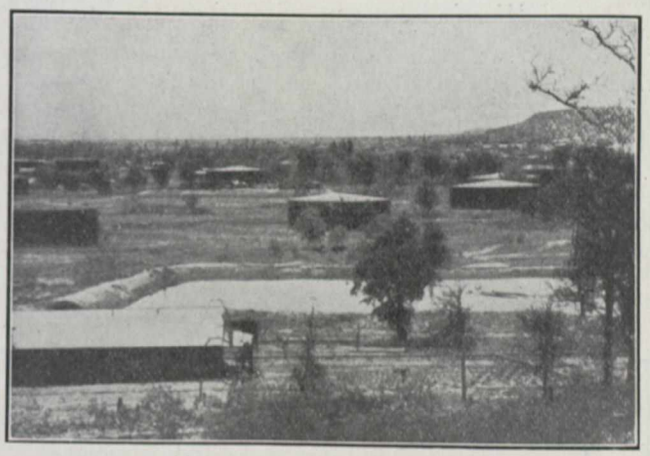
PETROLEUM—ITS ORIGIN, PRODUCTION, AND USE AS LOCOMOTIVE FUEL.

The production of petroleum in small quantities began in Japan and India about two thousand years ago, according to Mr. Eugene McAuliffe, General Fuel Agent, San Francisco Lines. Its use was restricted to remedial purposes. Needless to say, its curative properties were overestimated and its tremendous value as an illuminant and fuel were unknown. Crude petroleum is a natural bitumen composed mainly of combustible elements, carbon and hydrogen. In appearance it is a brownish-black viscous fluid, frequently shading into green, its average specific gravity 86 degrees or about 14 per cent. lighter than water. By subjecting petroleum to heat the lighter and more volatile portions are separated, the denser portion of the residuum splendidly adapted for furnace fuel purposes, the continued application of heat eventually creating a final residuum known as petroleum coke, an extremely hot fuel.

To Russia is due the credit of first using petroleum for fuel purposes. Earlier experiments were made in the direction of burning oil, the open pan method frequently employed, the results, however, unsatisfactory. Almost simultaneously an Englishman, Aydon by name, an engineer by profession, and Spakovsky, a Russian photographer, invented what they then called a "pulverizer," an apparatus which was the forerunner of our present burner and which atomized the oil, reducing it to a vapor which was blown into the furnace in gaseous form. Mr. Aydon used superheated steam to atomize "astatki," i. e. "mazut" or residuum, while Spakovsky used a jet of heated air for which he subsequently substituted a jet of steam at ordinary temperature and pressure. Aydon was the first to put his burner into actual service; his burner was the forerunner of those now in use in the United States; one slight change, that of using an elongated flat opening in the place of a small round one, has been introduced by the United States users. Of more importance than the types of burner is that of placing and keeping it in proper alignment, attempting to see that the proper volume of air necessary to proper combustion is admitted at the right place, it is most important that the point and volume of admission of air admits of such complete admixture of the oxygen and petroleum vapor as will not only effect full combustion but at the same time fill the fire box and flues with burning gases.



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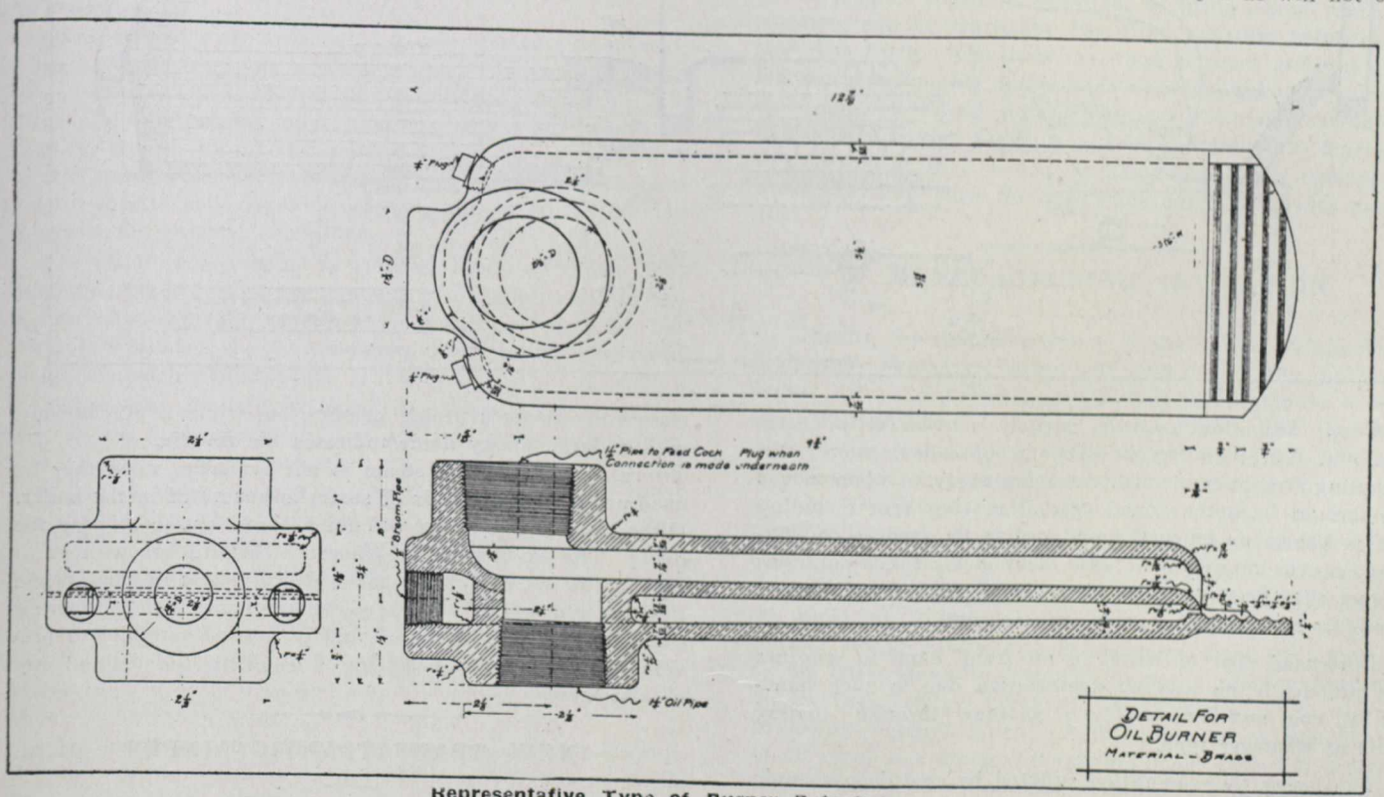
Oil in Earthen Storage, Glenn Field, with Steel Storage Tank in Background.



Representative Type of Burner Patented.

No serious attempts were made in the United States toward using petroleum as a locomotive fuel until the Spindle Top field came in when the Texas roads immediately took up the work of adapting locomotives to burn crude oil; the development of the California fields bringing the railroads of the Pacific coast states into line as oil burners, the con-