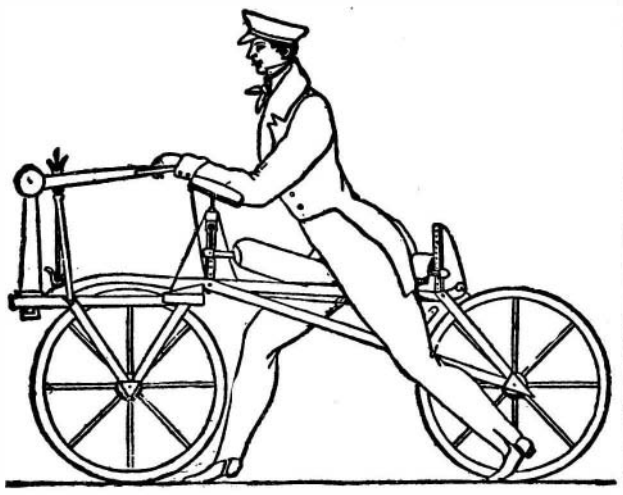
THE BICYCLE INDUSTRY.

BY BEN BOLDER.

The history of the bicycle is rich in all that pertains to crudeness, novelty, and the subsequent rapid development of lines which were the foundation of the



THE "DRAISINE" OF 1816.

modern bicycle of to-day. Since 1816 the inventive genius of man has been at work upon the construction of cycles; but not until 1869, when the American velocipede appeared, can it be said that cycle manufac-

THE VICTOR "FLYER" OF 1893.

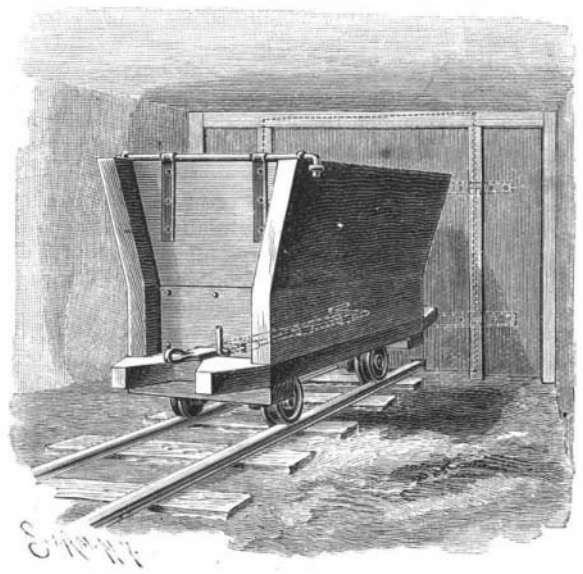
turing took even the slightest form as an industry. The bicycle of to-day is a radically different affair from that of five or six years ago. Within this period the safety bicycle has superseded the dangerous high wheel; cushion tires have succeeded solid ones, and these in turn have been placed among other back numbers by the more modern pneumatic tire. The highest grade bicycles of 1893, such as the world-famed Victor bicycles, have probably reached that stage of development where many more improvements are improbable, if not impossible. The maximum and minimum in weight have been reached, and it is now assured that from 28 to 35 pounds is the proper standard, varying from the former for a racing wheel to the latter for rough usage and very heavy riders. Above or below these weights is undesirable.

Again, art in the manufacture of the bicycle has lightened and beautified the material and lines of design, compensating for weight by a better understanding and application of mechanics, until to-day pleasure, touring, or business trips are equally indulged in by all. The bicycle is coming to be as indispensable as the carriage, simply because the art of bicycle manufacture has made it possible to obtain from the bicycle for business or pleasure that which is impossible from the carriage. Of course there is still much crudeness and imperfection in many bicycles. By far too great a majority are cheap, both in quality and price, and it is even stated that there is but one factory in the world where every part of the bicycle is made complete from A to Z; that is the factory, or rather factories, for there are three of them, being those of Overman Wheel Company, located at Chicopee Falls, Mass., where the Victor bicycles are built complete, without outside assistance. The tires are Victor tires, not those of some part maker; the saddles are Victor saddles, rims Victor rims, and so on. The vast structures devoted to the manufacture of Victor bicycles were all built expressly for the purpose, with the intention of turning out the best and highest grade bicycles in the world at the highest prices.

That the Overman Wheel Company has succeeded goes without saying, and its magnificent plant, complete in every detail, is an object lesson to other makers who desire to reach the summit of fame. The Victor being the first safety bicycle built in America, its makers have always been a little in advance in improved construction. The Victor "Flyer" here illustrated is considered the highest development ever attained. Its contrast to the crude wheel of 1816 is most marked and startling. The Overman Wheel Company has issued an elegantly embossed and printed catalogue for 1893, covering every feature of the Victor product. It is a triumph of the printer's art, and probably the finest catalogue ever devoted to the subject.

AN IMPROVED MINE CAR.

The illustration represents a mine car of simple and durable construction, which has been patented by Mr. Homer Durand, of Starkville, Col. The bottom of the car body extends beyond its ends, and the central portion of the extension is cut away, forming side projections adapted to abut against the door in the mine shaft as the car travels down the track, the car thus automatically opening the door in the shaft. At one

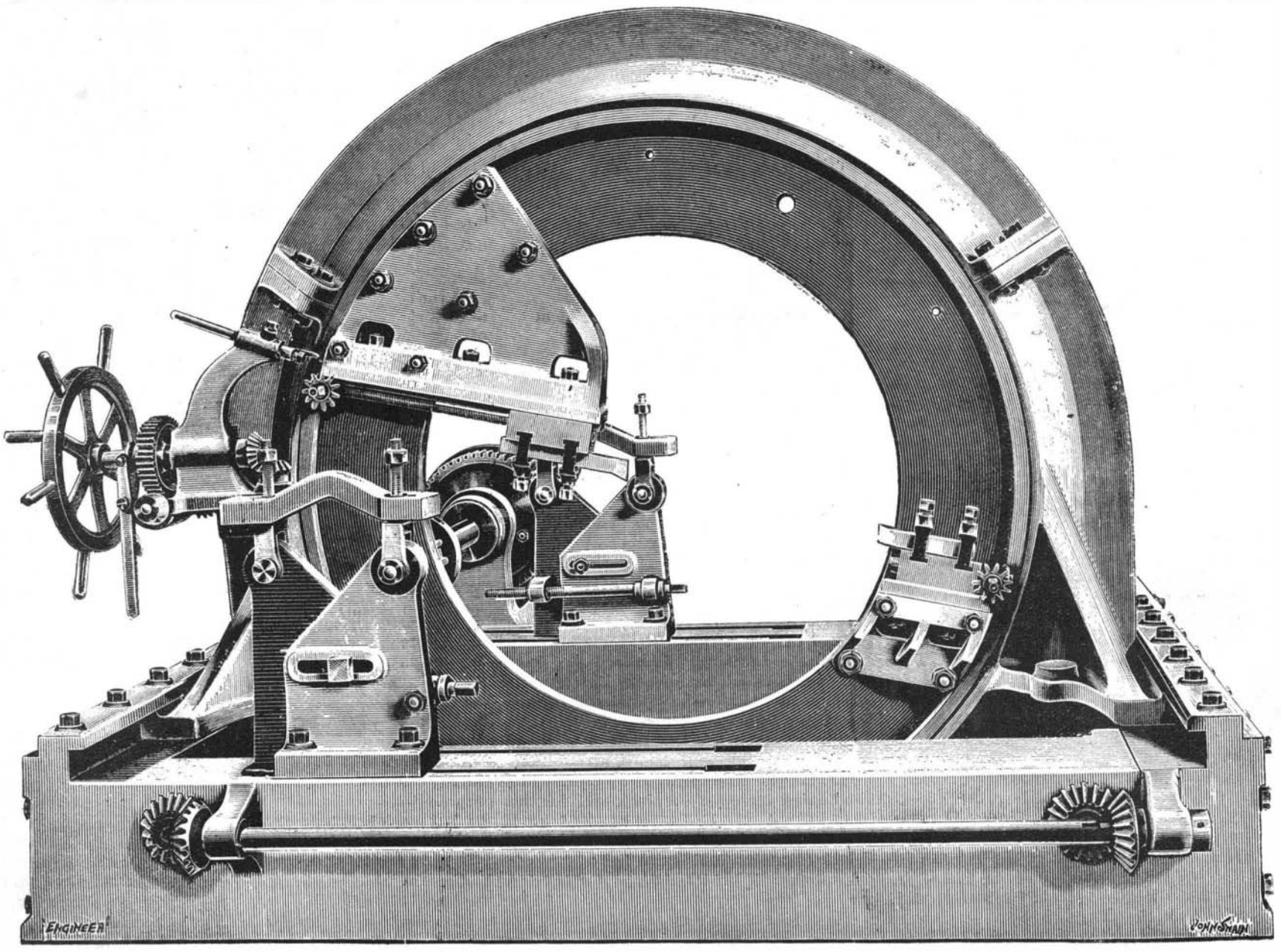


DURAND'S MINE CAR.

end of the car body a door is hung upon a transverse rod, and the door is prevented from swinging outward by a projection on one end of a longitudinal rod turning in suitable bearings, the rod at its other end having a crank arm or handle. When this handle is swung upward the door swings outward to discharge the contents of the car, but when the handle is turned downward the door is locked in closed position.

CRANK SHAPING MACHINE.

The illustration, which is from the *Engineer*, London, represents a crank pin turning machine specially adapted for turning double or single sweep crank necks. As will be seen by the engraving, the machine

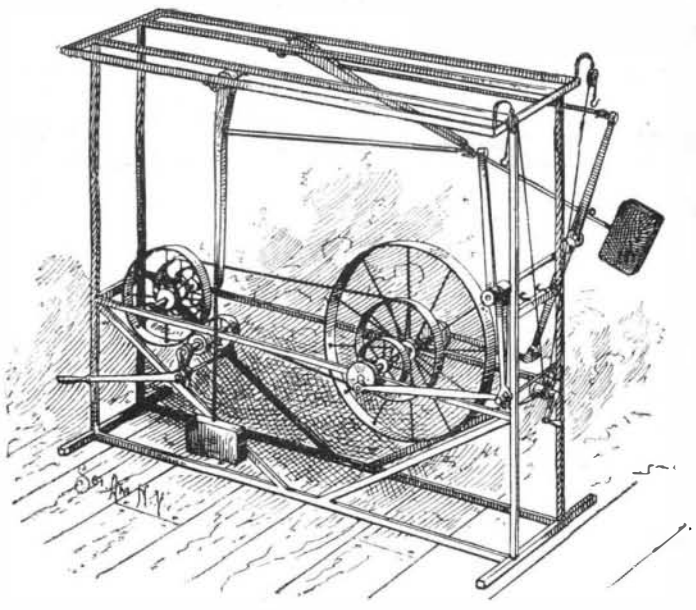


IMPROVED CRANK PIN TURNING MACHINE.

consists of a large internal wheel carried in a V-grooved circular casting, which is supported on a bed frame. The wheel carries the cutting tools, and is driven by a large four-speed cone and double and single purchase gearing. One of the tools is arranged to turn between the crank web, and the other for turning over the top of the webs. The machine is fitted with band and self-acting feed motions, and is capable of admitting cranks having throws up to 18 inches centers. The crank shafts are held secure in two adjustable V blocks, which will admit of shafts from 4 inches to 10 inches diameter, whereby the crank necks are quite true with the body of the shaft, which are otherwise sprung by being held in lathe centers. Machine tools of this kind have hitherto been little used. They are now growing in favor, because their defects have been got over by such firms as Messrs. Booth & Co.

AN IMPROVED MOTOR.

The device shown in the illustration has been invented by Mr. Joseph Havlina, of Rockland, Wis. It is designed when once started to run continuously. The pendulum rods are connected by other rods with cranks on a driving shaft at one end of the machine, the pendulums swinging alternately, so that one is raised while the other is down. On the same shaft are



HAVLINA'S MOTOR.

also cranks extending in opposite directions to connections with pitmen, the two sets of cranks having semi-cylindrical hubs, which may be fastened together if desired, so that the cranks on the two sides of the frame may each be practically in a single piece. The pitmen are connected with cranks on a shaft carrying a large fly wheel, and pulleys belted to other pulleys on a countershaft, from which power may be taken. At one end of the machine is a crank and gear mechanism to turn rollers carrying ropes or cables, by means of which the pendulum rods may be raised one after the other when the machine is to be first started, and there is also a brake mechanism controlled by a lever. By the swinging of the pendulums a rotary motion is given through the pitmen to the fly-wheel shaft and the other pulleys or machinery connected therewith.

AN IMPROVED CRUDE OIL BURNER.

The illustration represents a recent improvement in burners for the combustion of crude oil with the highest degree of efficiency in combination with air and steam, the apparatus being so arranged as to effect a thorough commingling of those elements before the mixture is injected into a furnace. The vaporizing or primary combustion chamber of the apparatus is in the form of a hollow cylinder, G, open at its inner end to allow for the emission of flame therefrom. The vaporizing chamber is secured to the outer end of a furnace (not shown) by means of bolts or other suitable appliances. D represents an injector for forcing oil commingled with steam into the vaporizing chamber, the oil supply pipe leading into a central bore in which is fitted a needle-pointed screw valve regulated by the small hand wheel, B. The inner face of the injector has a series of nipples, each having a single perforation leading from an annular passage of the injector casing in lines parallel with the central axis of a pipe around the oil supply pipe. The inner end of this pipe is secured in a central opening of a front plate which forms a closure for the outer end of the vaporizing chamber, and the front plate also has circular openings corresponding in number and alignment to the nipples of the injector, so that the minute currents of steam issuing from the perforations of the nipples forcibly inject atmospheric air through the circular openings in the front plate from the space between the injector and front plate into the vaporizing chamber.

As soon as the valve, B, is opened to allow the oil to flow into the injector, the steam current forces the oil, reduced to an oily vapor, into the vaporizing chamber, wherein it mingles with the several currents of air injected through the opening in the front plate to produce an intense combustion.

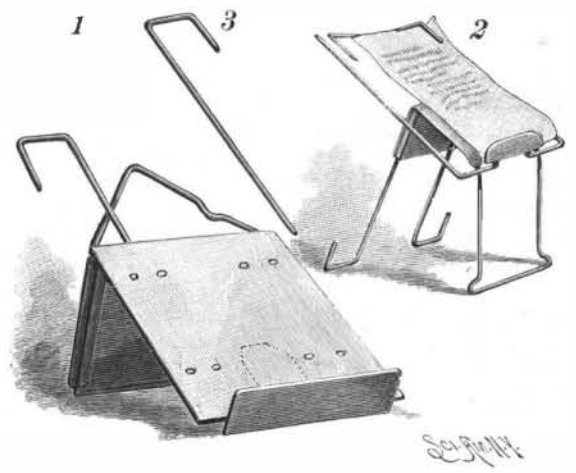
The lifting power of this apparatus is an especially desirable feature, that is, owing to the relative position of the steam and oil points being fixed, its siphoning power cannot be varied by any manipulation of its working parts. Perfect safety is thus insured by having oil supply below level of burner.

It will be readily understood that this improvement affords a reliable oil atomizer and air injector for producing and burning vapor gas developed from liquid fuel. The effective method employed for producing a vapor gas from liquid fuel and steam, combined with the capacity of the apparatus to forcibly inject atmospheric air, in numerous small currents, into the mixing or primary combustion chamber simultaneously with the atomized oil and steam, insures a complete admixture of all the constituents, forming a compound and combustible gas, capable of developing the highest heats and in a manner designed to meet the requirements of the many industries where furnaces are in use.

This new development in devices for economically extracting and utilizing the full means of heat contained in liquid fuels is well deserving of the examination of those who are seeking the best means to attain that end. The apparatus is manufactured by the Shipman Engine Manufacturing Company, Rochester, N. Y.

AN IMPROVED BOOK OR COPY HOLDER.

The simple and inexpensive device shown in the illustration may be manipulated to support copy or a book in such different positions as may be desired, and when not in use may be folded to occupy but small space. The improvement has been patented by Mr. B. Gardinier, of Chippewa Falls, Wis. Fig. 1 shows the holder in position to support a book held open upon a table, Fig. 2 representing it holding papers or notes for typewriters, etc., and Fig. 3 indicating one of the supporting devices. The body of the principal holder is essentially L-shaped, one member constituting the table and the other the support. Slideways are formed upon the under surface of the table member, and on its upper rear end is located an essentially triangular or V-shaped rail, made of stout wire, and adapted to serve as a support for a rod or other piece introduced into the slideways. The front of the body also has a sliding rest, and in connection with the device are employed angular arms of different lengths, as shown in Fig. 3. These arms may be used to elevate the body and also as extension supports for the table, the book or copy laid on the table also resting on the supports. These arms throughout their length are polygonal in cross section, so that they will not turn when introduced into the sockets or slideways of the table, and different forms of legs are employed in connection with the body and the arms. The holder may be conveniently employed for supporting a thin book or magazine or a heavy book, retaining the leaves extended in open position at each side of the center by means of the tongue members of the arms, while also permitting the leaves to be readily turned as desired. This improved holder is said to

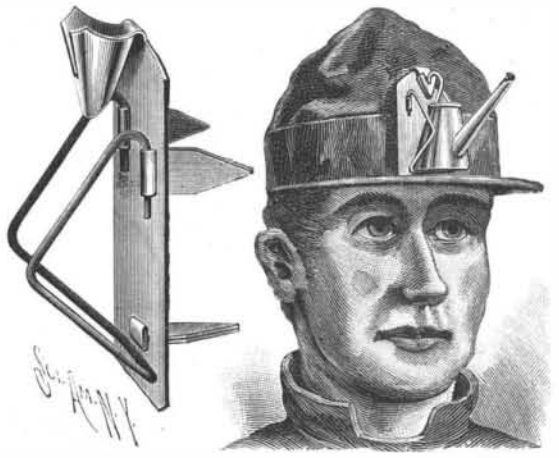


GARDINIER'S BOOK OR COPY HOLDER.

have received especial commendation on account of its ease of manipulation and its adaptability to all sizes and thicknesses of books.

A HAT SUPPORT FOR MINERS' LAMPS.

The device shown in the picture may be quickly and easily attached to an old cast-off hat or cap, or any article of head wear, to hold a lamp in position with as much safety and convenience as may be obtained with hats or caps especially made to carry lamps. The back plate of the bracket is pierced in three places for the reception of a simple form of metal fastening devices, each made of a single piece of metal, and on the front of the upper central portion of the plate is a socket or keeper, made integral with the plate, and bent forward into inverted cone shape. This socket is adapted to receive the hook or handle of the miner's lamp, the lamp being held by its sides and bottom in a guide frame formed of a single piece of wire bent upon itself, the extremities of the wire forming pins, which enter the socket heads of the upper fastening devices. Many miners, using their old headwear, tack on a



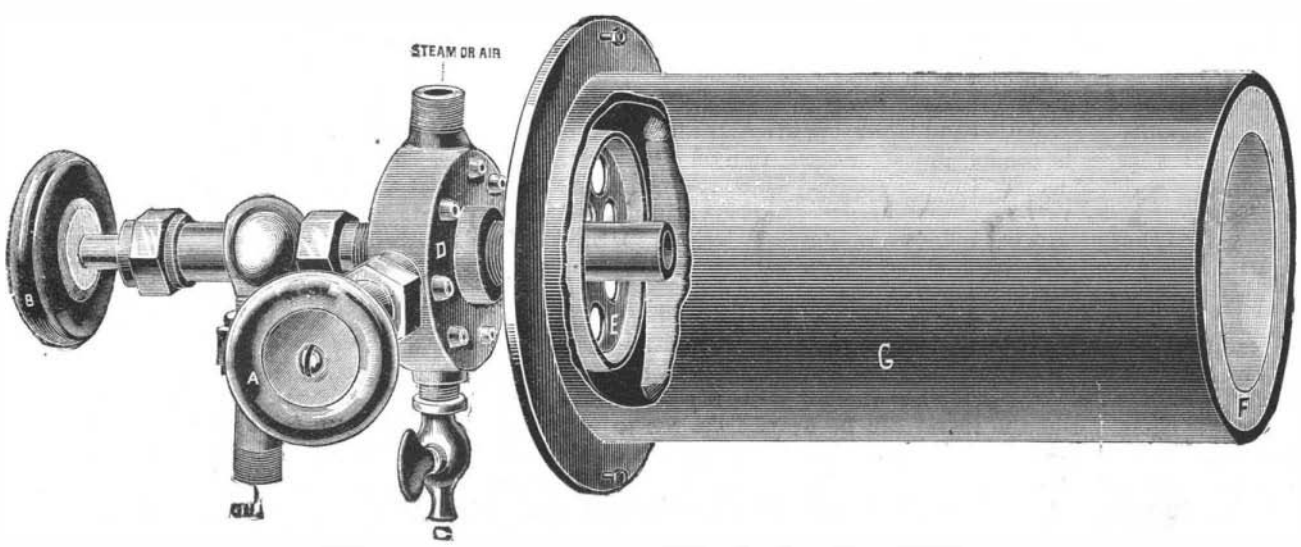
WATTS' BRACKET FOR MINERS' LAMPS.

piece of leather, to which the lamp may be secured, instead of purchasing patent caps with brackets riveted to them; but this improvement is simple and inexpensive, and far preferable to a leather fastening, while it is readily applied to any article of headwear not especially made for mining purposes.

Further information relative to this invention may be obtained by addressing the patentee, Mr. Julius R. Watts, P. O. Box 824, Springfield, Ill.

SUGAR FROM COTTON SEED. — The cotton plant, which has for so many centuries furnished a large part of the population of the globe with clothing, seems to be almost without limit in its usefulness, remarks a scientific authority.

From the seed a valuable oil is expressed, while the husks form an article of food for cattle in the shape of cakes. From the lint which clings to the seed after it has passed through the "gin" felt is made, while the oil extracted from the seed is applied to quite a large number of purposes. But, according to the British consul, Mr. Portal, of Zanzibar, cotton seed is also capable of yielding sugar. A process has been discovered for extracting sugar from cotton seed meal, and, though the details of this process have not been disclosed, it is said that the product obtained is of very superior grade, being fifteen times sweeter than cane sugar and twenty times more so than sugar made from beet. This indicates that sweetness is not due to cane sugar, but to some other chemical.



THE "COLUMBIA" CRUDE OIL BURNER AND AIR INJECTOR.