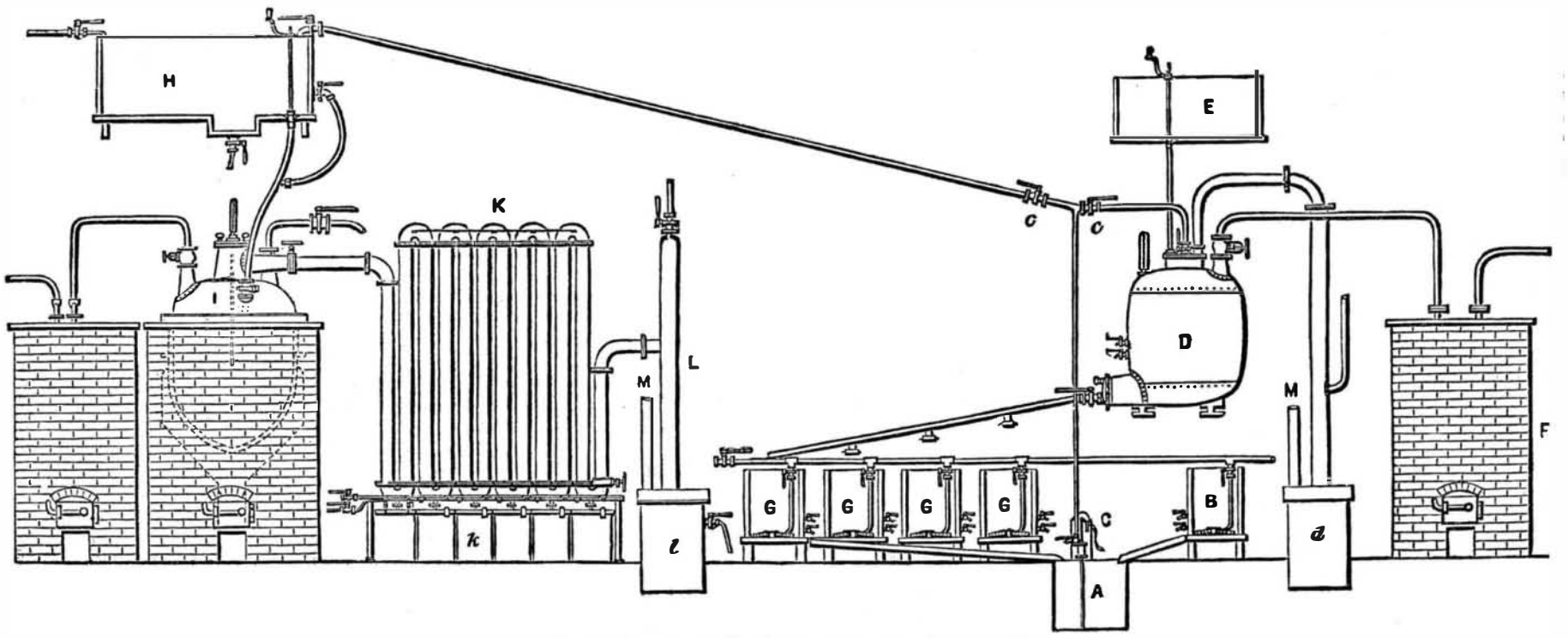
DISTILLING STEARIN.

As an appropriate supplement to our recent article on the oil resources of Africa, in which we described the immense yield of palm and other oils which might be obtained from sources on that continent now unutilized, we give herewith an engraving of a new apparatus for extracting the stearin from oil, by a new process. Stearin is now extensively used for making candles, and it is extracted from grease of all kinds. Hitherto a costly process of saponification has been employed, which the present device (for the illustration of which we are indebted to the *British Trade Journal*) obviates.



NEW STEARIN-DISTILLING APPARATUS.

The palm oil or tallow, or both combined in certain proportions, are melted in a tank, A, by means of steam; the material is then pumped into a copper vessel, B, to which is connected a steam pipe whereby it is boiled up for a certain period, the steam being superheated in the superheater, F. Sulphuric acid is then run into the acidifier, D, from E, when the process of acidification is perfected. The material is next discharged into an open vat, G, and boiled with free steam for a few hours and allowed to settle; it is then drawn off into a tank below, and pumped into a large open tank, H, lined with lead, which is placed at a sufficient elevation above the still, I, to allow it to run by gravity; this tank has a coil inside which is charged with steam in order to keep the contents in a liquid state. By means of a suitable valve, the material finds its way into the still, which is heated externally by fire to about 240° Fah., while superheated steam is let into the interior. The process of distillation now commences, the temperature being regulated according to the quality of the material that is being operated upon. The vapors pass over to the refrigerator or cooler, K, which consists of a series of vertical copper pipes connected at top and bottom with gun metal bends, the bottom bends having outlets to which are attached spiral copper coils placed in a circular tank, *k*. These tanks are fitted with pipes for the admission of steam and cold water. The product is collected in pails from the outlets or mouths of the copper coils, the greater part being fit for making candles without resorting to the process of passing it through hydraulic presses. L is the essence tank, and M a pipe for conveying gas to be burnt in the flue. That part which is not fit for making candles direct from the still is pressed and redistilled.

As the result of distilling tallow, from every 100 lbs. subjected to this process, 78 to 80 lbs. of stearin are obtained; three fourths of this, or about 60 lbs., is ready for making stearin candles without further treatment; the remaining fourth, namely, 20 lbs., after being submitted to pressing and re-distillation, yields about three fourths of stearin and one fourth of oil, the whole producing only 5 lbs. of the latter. It has been mentioned that 78 lbs. is the product by distillation, but in addition to this there is an amount of material called pitch. This is a hard black substance if it be allowed to get cold, but provision is made for passing it into an iron vessel from the still before it becomes hard. It is operated upon at a great heat in this iron vessel, and the product is similar to that from the distilling process. The pitch, after having undergone the operation in the iron vessel, is a commercial article used in many trades, and is well suited for coating iron in lieu of black japan, an article of a somewhat costly character.

IMPROVED SCROLL OR RECIPROCATING SAW.

In the accompanying engraving is represented a new scroll saw, manufactured by the well known firm of Bentel, Margedant & Co., of Hamilton, Ohio. So far as the general construction of the machine extends, beyond strength and uniform excellence of work there are no special features of novelty which would attract attention. The table and stand are very heavy and are cast in a single piece; or a wooden table may be attached, if preferred. There are the usual crank wheel, pitman, and slide to communicate motive power to the saw, the pin of the slide having a hollow chamber which carries the lubricator. The slide is of steel and the guide slides are adjustable.

The novel and important point of the apparatus is, however, in the straining device for the saw, which is both simple and effective. It consists of two springs, two levers, and a connecting belt. The springs are each formed of a round steel bar, which is flattened on the ends and bent to an oval in such a manner that the extremities, while nearly meeting, allow a lever to be inserted between them. By depressing this lever one end of the spring acts as a movable fulcrum, while the other end presses with a force of about 820 lbs. on a point almost opposite the fulcrum. In order to compensate for the extra power which, it would appear, would be required to depress the lever to its full sweep, the leverage, or the distance between the ends of the spring, is proportionately reduced, so that the strain is thus equalized.

BENTEL, MARGEDANT & CO.'S SCROLL SAW.

This device, the manufacturers state, may be adjusted so as to show an actual loss of strain; and as a matter of curiosity they inform us that they have one such apparatus in their possession that loses 3 lbs. during six inches travel or depression.

By raising or lowering the plate which carries the device, and by turning the springs toward or from the center, an increase or reduction of strain is obtained. The saw can be run at a very high speed; and as the two spring levers can be depressed 13 inches, the length of the stroke can be increased in such case to 10 inches, the saw having ordinarily 5 inches stroke.

The further advantages claimed are that the saw runs easier, with less jar, noise, and vibration than does any blade strained by springs, and that the simplicity of the device enables it to be easily manufactured, and reduces its wear and need of repairs.

Patented November 30, 1875. For further information address the manufacturers as above.

Pneumatic Dredging.

Dredging has been a disagreeable necessity ever since docks and canals came into use, and up to quite recent times no improvement upon the ordinary elevator seems to have been thought of. Randolph, of Glasgow, tried, some years ago, to pump up mud along with water, much as M. Bazin later has done, but we have not heard that either got beyond the experimental stage. Still more recently a new dredging plant has been designed by Mr. F. E. Duckham—already well known for his hydraulic devices—for the Millwall Dock Company, who are very well satisfied with it, inasmuch as a saving is effected by its use amounting to about $10,000 a year. The working of this system of pneumatic dredging was exhibited to a party of engineers and others interested in the subject, and met with unanimous approval.

The vessel employed is a screw steamer of about 300 tuns burthen, 113 feet long, of 27 feet beam, 12 feet deep under deck, and drawing 8 feet of water when laden. She is driven by a neat compound engine of 25 nominal horse power, having 15 and 30 inch cylinders and 15 inches stroke, and 2 high pressure boilers loaded to 65 lbs. These, as well as the entire plant, reflect great credit on the makers, Messrs. Rait and Lindsay, of Glasgow. The dredger steamed round from the Clyde to the Thames, and behaved admirably. The screw is disconnecting, so that the whole power of the engines can be applied to the air pump, which forms an important part of the apparatus. This is double acting, and able to work up to a pressure of 60 lbs., though 10 lbs. is the usual working pressure. A water chamber round the cylinder, fed by a circulating pump, keeps the air cool. The dredge proper is of the usual elevator kind, fitted in a well in the center of the vessel, on the line of the keel, and adapted to traverse towards the bow, so as to excavate in advance of the vessel if needed. A couple of steam winches aid in raising and lowering the bucket ladder and varying the position of the dredger while at work.

But the distinguishing feature of this dredger is the mode of disposing of the spoil when brought up. Instead of being tipped into open barges or hoppers, it falls through a hopper on deck, into a couple of tanks, one on each side of the well, each 50 feet long by 9 feet 6 inches wide, and having a total capacity of 240 cubic yards. Iron pipes, 15 inches in diameter, one from the bottom of each tank, rise towards the deck, and unite with a breeches junction into one huge discharge pipe of 20 inches diameter, which is led to the side of the ship, and there ends in a large leather hose, with which connection may be made with a similar pipe onshore. This, at Millwall, is carried on underground—crossing roads,