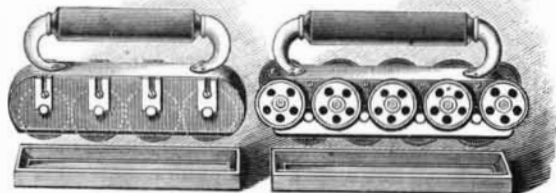


into the casing. The bar is then arranged as shown in the engraving.

The upward movement of the lower sash is prevented by the inclined surface of the main plate and by the arm, while the downward movement of the upper sash is prevented by the engagement of the edges of the angled end of the bar with the sash and parting strip. It is obvious that, with this fastener, a window which is partly open at the top and bottom may be secured so that it cannot be opened further.

HAND IRONING MACHINE.

The invention illustrated in the cut has for its object the suppression of injurious friction in sad irons. While the suppression of this trouble makes the iron peculiarly applicable to the treatment of delicate goods, such as lace curtains and embroidery, it is evident that the saving in labor effected by it is not of less importance. The body of the iron incloses a number of smooth rollers journaled either in suitable boxes or bearing against friction rollers or adjustable bearings. They are to be heated on an ordinary stove. For this end a shallow box or tray is provided, within which they are placed when heating. Two styles of construction are shown, but it is evident that many



CORBETT'S HAND IRONING MACHINE.

modifications may be used, such as steam for heating the rollers. The apparatus may be mounted in a frame with an adjustable pressure device.

This invention has been patented by Frank Corbett, No. 354 Bowery, New York City, N. Y.

Mother-of-pearl Fisheries in the Red Sea.

Consul Jago, of Jeddah, says that the mother-of-pearl fisheries extend the whole length of the Red Sea, from El Wedj on the north to Aden on the south. The principal grounds are in the neighborhood of Suakim, Massowah, and the Farsan Islands. About 300 boats are employed, the majority belonging to the Zobeid Bedouins, a tribe of Arabs inhabiting the coast line between Jeddah and Yambo. About 50 boats belong to Jeddah, and two or three to Confida, Cameran, and Loheih. They are open, undecked boats, of between eight and twenty tons burden, carrying a large lateen sail, manned by crews varying between five and twelve men, and each provided with a number of small canoes, which are imported specially from the coast of Malabar.

There are two fishing seasons during the year, one of four months and one of eight months, during nearly the whole of which the boats keep the sea, the crews living on board, returning to their homes for short periods of two to four weeks. The crews, composed principally of black slaves, are paid by share of the produce of their fishing, the owner of the boat taking one third, the remaining two thirds being divided among the former, after deducting the cost of food consumed by them during the voyage, and which consists of dhourra, rice, and fish, with sometimes a little ghee and dates as a luxury. Fatal accidents are said to be unknown, and the men are remarkable for their strength and good health. They dive between the ages of ten and forty, and the practice is said to have no ill effects.

The fishing takes place in the neighborhood of reefs, the boat anchoring at a certain spot, whence the crew proceed to fish in their canoes in the vicinity. Operations are conducted only in calm weather, when the shell can be discovered by the eye at a depth varying between seven and fifteen fathoms. Of late years, to assist the eye, empty petroleum tins, with the ends knocked out and a sheet of glass inserted in one end, have been used. The tin, with the glass end below, is submerged a little in the sea, and the discovery of the shell thereby facilitated. During the last ten years the find is said to have diminished ten to twenty per cent in quantity, owing to dearth of shells. The value of the total harvest is estimated at 120,000 to 170,000 dollars annually, the dollar varying in value between 3s. and 3s. 6d. The short season of four months, which used to average between 40,000 and 50,000 dollars, only realized, in 1886, 25,000 dollars.

Formerly, all the produce of the Red Sea was brought to Jeddah for sale and export, but recently, owing to fiscal and custom house restrictions, only about one-fourth now goes there, the remainder going to Suakim and Massowah. Shells imported at Jeddah for sale are disposed of by public auction in heaps of about half a hundredweight each. As preliminary inspection is not allowed, the bidding is purely speculative, and bidders have to take account of dirt, coral excrescences, and in-

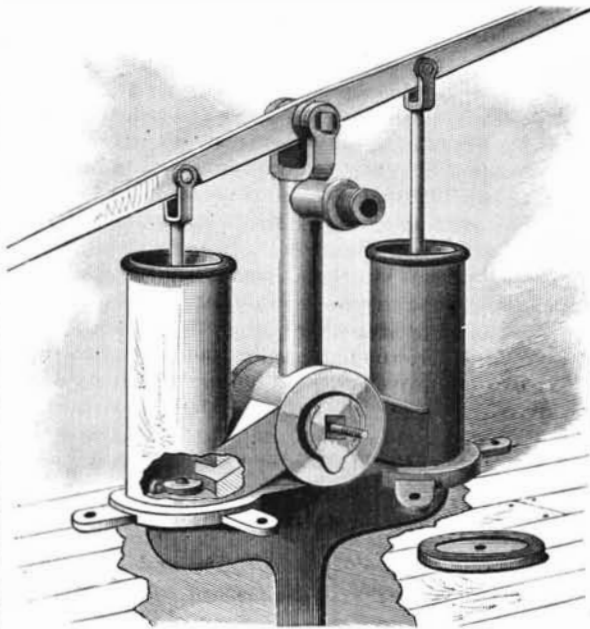
ferior shells. Prior to exportation the shells are sometimes cleaned to remove the coral and dirt, and are then packed in barrels. Up to ten years ago, all shells brought to Jeddah for sale were shipped by natives to Cairo, to be sold there. Now, however, the bulk goes to Trieste, a small quantity to London, and a little to Havre; and a few of the finest and largest shells are purchased for exportation to Bethlehem, where they are engraved and sold to pilgrims.

The Jeddah shell is considered in Europe inferior to that exported from Suakim and Massowah, owing, it is said, in many instances, to the yellowish tint of the former and the fact that many of the shells have a greenish tint round the edges. Some ascribe this to the excessive dampness of the climate of Jeddah.

With regard to the origin of the shells, the following distinctions are made: *Dah al ak-i* shells, found on the group of islands of this name, situated along the African side of the Red Sea; *Barr-adjem-i* shells, found along the same coast, north of the Khor or inlet of Suakim; *Farsan* or *Yeman-i* shells, brought from the Farsan group of islands, on the Arabian side of the Red Sea; *Shebak-i* shells, from the banks between Confidah and Leet; *Sham-i* shells, from El Wedj down to Hasanee Island, on the Arabian side, and found in the neighborhood of Kossair, on the African side. Consul Jago says, in conclusion, that the *Sham-i* is the best, and the *Yeman-i* the most inferior quality.

DOUBLE-ACTING PUMP.

The cylinders of this pump are cast on a base provided with a suction pipe having two branches, which open respectively into the bottom of the cylinders, and are each covered with a hinged valve, opening upwardly. In each cylinder is a plunger, connected by a rod with a beam of any suitable form. Between the cylinders is a central valve seat, connected at each side by channels with the cylinders. In the valve seat is placed a check valve composed of two parts, each having a dovetailed facing, and both forming at their lower ends a half round projection, which fits a corresponding groove formed in the bottom of the valve seat. The projection constitutes a pivotal center, upon which the valve swings either to the right or left, as the case may be, so as to establish alternately a connection between either of the cylinders and the outlet pipe, which communicates with the top of the valve. The side openings of the valve seat are closed by covers seated on gaskets, to form water-tight joints, and held in place by a bolt passing through the center of the valve. When the pump is set in operation, the upward motion of each plunger causes the liquid to flow into the cylinder. The downward motion of the plunger seats the valve at the lower end of the cylinder and forces the liquid against the central valve, which is then thrown to the opposite side, thus permitting the liquid to flow



VAN PELT'S DOUBLE-ACTING PUMP.

through the outlet pipe. A constant motion of the pump beam produces a continuous outflow of the liquid through the pipe. The facings of the central valve are of composition, and can be easily replaced when worn out.

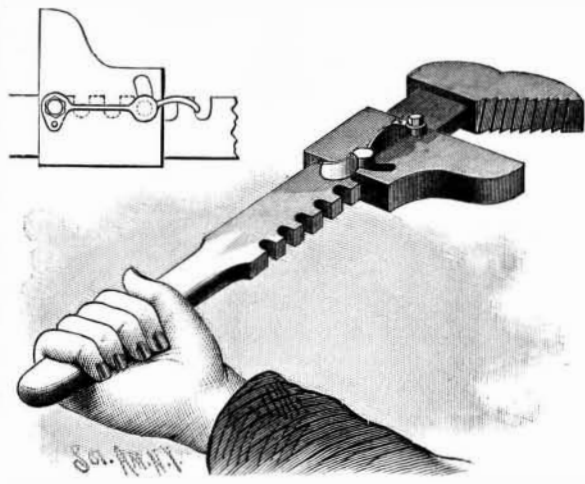
This invention has been patented by Mr. John K. Van Pelt, of Birmingham, Ala.

Vulcanized India Rubber.

According to M. Balland the gradual loss of elasticity frequently observed in articles made of vulcanized India rubber is due to the slow formation of sulphuric acid by the action of atmospheric moisture on sulphur present in the rubber. He recommends that the action of the acid should be prevented by occasional prolonged washing of the article with water or with water rendered slightly alkaline (*Jour. Pharm.*, April 15, p. 417). In this way he has been able to maintain drainage tubes in a supple condition for a considerable time.

IMPROVED WRENCH.

The stock or shank of the wrench is provided with a fixed outer jaw, the face of which is serrated to form teeth to give hold or bite on the pipe or article being worked. The teeth are cut oblique to the sides of the jaw, for the purpose of securing a better hold on the pipe. The movable jaw is fitted to slide along the shank, and is locked in its different positions by means of a spring thumb lever catch, a side pin on which engages with any one of a series of cross grooves cut in that portion of the shank along which the jaw is adjustable. The catch is constructed with a thin or reduced body part, whereby it is made elastic and automatically closing in itself. Consequently, it does not require an independent spring to cause its pin to engage with the grooves, and is much less liable to get



IMPROVED WRENCH.

out of order than when a separate spring is employed. The catch is secured to the jaw by a plain stud arranged eccentrically to the main screw bolt. The eccentric stud prevents the catch from turning on its bolt. The free end of the lever forms a thumb piece by which the catch may be lifted out of engagement with the grooves when it is necessary to change the adjustment of the jaw. The pin which engages with the grooves moves in and is guided by slots passing through both sides of the jaw. It is evident that when strain is put upon the movable jaw, as in use, the back of the groove with which the pin engages will take the main strain and bear upon the center of one side of the pin, and the front walls of the slots will bear in a reverse direction upon the opposite side of the pin, thus giving great strength and stability to the locking device.

All further particulars concerning this invention can be obtained by addressing the American Saw Company, of Trenton, N. J.

Marine Engine Economy.

An interesting example of the comparative economy of the old and more modern styles of oscillating marine engines was lately furnished by an instance quoted by Mr. J. W. T. Harvey before the engineering section of the Bristol Naturalists' Society. The *Juno* was originally worked with a jet condenser; after a time this was replaced by a surface condenser, and finally the engines were compounded. Thus we have the same vessel working under three different conditions, and any alteration of coal consumption must be due to the changes in her machinery. The engines originally worked at 30 pounds per square inch and indicated 1,605 horse power; they drove the vessel at 14.1 knots, using 92 tons of coal per voyage. Subsequently new boilers and a surface condenser were fitted to the ship, the pressure still being 30 pounds; the same horse power and speed were then maintained with a consumption of 84½ tons of coal per voyage, a saving of 7½ tons, or 9 per cent. As competition in the carrying trade became keener, this coal consumption could not be afforded, and it was determined to compound the engines as inexpensively as possible. One of the existing 66 inch cylinders was replaced by another of 40 inches in diameter, and this, together with two sets of link motion, two feed pumps, a steam starting engine, and a pair of cylindrical boilers working at 80 pounds pressure, constituted the whole of the new parts. The engines now gave 1,270 horse power, or 335 horse power less than before, and drove the ship at 13.4 knots, or 0.7 knot slower, on a consumption of 49 tons of coal per voyage. The coal consumption per horse power therefore varied under the three conditions as 100 : 91 : 67. The consumption per voyage varied as 100 : 91 : 53.

A Correction.

Our attention has been called by a correspondent to the word "systematic," occurring in the article on "Treatment of Diphtheria by the Bichloride of Mercury," in our issue of May 7, 1887, pp. 288 and 289. The phrase containing it should read: "but is swallowed, and systemic infection, furthered."