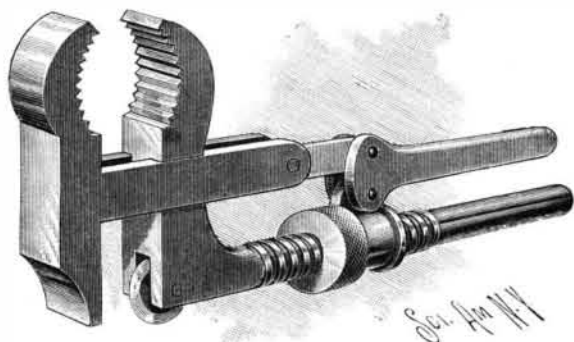


AN IMPROVED WRENCH AND CUTTER.

A tool adapted to use as a wrench for ordinary purposes, and also as a pipe wrench or pipe cutter, is shown in the illustration. It has been patented in the United States, England and Canada, by Mr. Theodore Fletcher, of Macdonia, Texas. The shank or handle of the wrench, which is integral with its inner jaw, has a screw-threaded portion on which is mounted a spool-shaped nut, carrying a collar to which is pivotally connected a lever, the latter being pivotally connected by means of a link with the shank of the outer jaw.



FLETCHER'S WRENCH AND CUTTER.

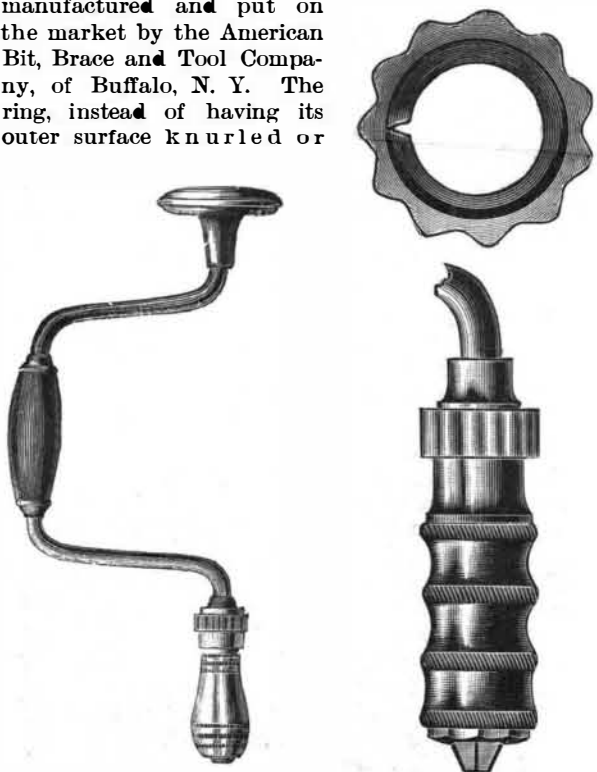
Both jaws have at one end flat surfaces, to engage a nut, while at their other end they have concave toothed surfaces to clamp a pipe. A removable rotary cutter is secured on a pin in a recess in the flat surface of the inner jaw. By gently squeezing the handles together, after the jaws have been adjusted upon a nut or pipe, an exceedingly firm grip is obtained, its pressure increasing with the strength of the pull, while the jaws may be automatically opened by slackening the hold upon the two handles, thus enabling the tool to be used almost as a ratchet wrench, and saving much time. When the cutter is to be used, after adjustment with the wheel in place, the lever affords means of bringing all the force desired upon the cutter.

Discard the Old—Get the Best.

Only a practical man can appreciate the immense advantages which arise from the use of good machinery. To the manufacturer whose capital accrues large interest through the aid of his employes and machinery, it may seem unreasonable that machinery, which in his estimation should last forever, rightfully belongs to the scrap pile. A little common sense, and just a bit of mathematical computation, however, says the *Woodworker*, will usually abolish such illusion. Notwithstanding the most careful attention that can be given it, the time surely comes in its life when age and the effects of repairs render a machine unfit for further service.

AN IMPROVED CORRUGATED BIT BRACE RING.

The illustrations represent an improved form of corrugated ratchet ring for bit braces, which is being manufactured and put on the market by the American Bit, Brace and Tool Company, of Buffalo, N. Y. The ring, instead of having its outer surface knurled or



IMPROVED BIT BRACE RING IN PLACE.

milled, as usual heretofore, has a corrugated surface, as more plainly shown in the small sectional view, the other views showing the ring in position on the brace. This form of ring is designed to enable the workman to obtain a firmer grip in using the brace, being deemed especially advantageous when the hands are moist or greasy. The improvement will commend itself particularly to plumbers and linemen, as well as to carpenters and mechanics generally.

HYDRAULIC PROPULSION OF VESSELS.

Improved means of applying the jet principle in the hydraulic propulsion of vessels are shown in the accompanying illustrations, Fig. 1 being a sectional and Fig. 2 a plan view of a jet-propelled vessel patented by Mr. James C. Walker, No. 1741 De Sales Street, Washington, D. C. Main pipes, A, one on each side, open into the water at the bow, and extend back through the boat near the keel, having a slight decline and diminished size from bow to stern, where they discharge. Smaller pipes, B, extend from the main pipes through the sides of the boat, where they terminate in nozzles which may be turned in any direction by means of levers, C. Air and waste water pipes, D, lead from near the bow to a well or reservoir, E, at about the lowest point in the bottom of the boat, to draw in pure air and remove water from the front part of the boat. From this reservoir a waste water pipe, F, extends close to the keel to an outlet near the stern, and other pipes, G, H, lead from the reservoir to an outlet at the stern above the water line. In the main pipes, A, near the bow, are force water wheels or propellers, each having a rim fixed to the outer edges of its blades, so that the wheels will work close to the inner surfaces of the pipes, and these propellers force the water through the pipes, branches and nozzles, with great velocity. The stern nozzles are straight, but so jointed to the main pipes that they may be readily turned to the right or left by levers connected with the engine room or pilot house, the vessel being thereby steered with great facility. There are valves in the main pipes to shut off water from the front in case of accident or when at the wharf, and valves, I, in the main and suction pipes, are adapted to shut off water from the stern nozzles when the vessel is moving backward or standing still. By means of the side nozzles the boat may be steered in any direction without rudder or using the stern nozzles, and if the boat should get aground, the directing of the nozzles down-

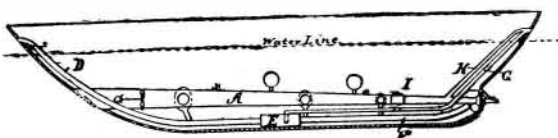


Fig. 1.—WALKER'S JET-PROPELLED VESSEL.

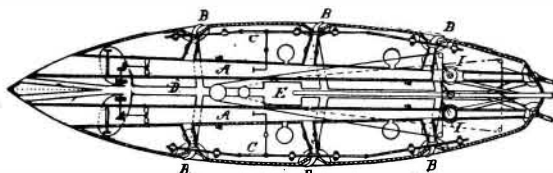
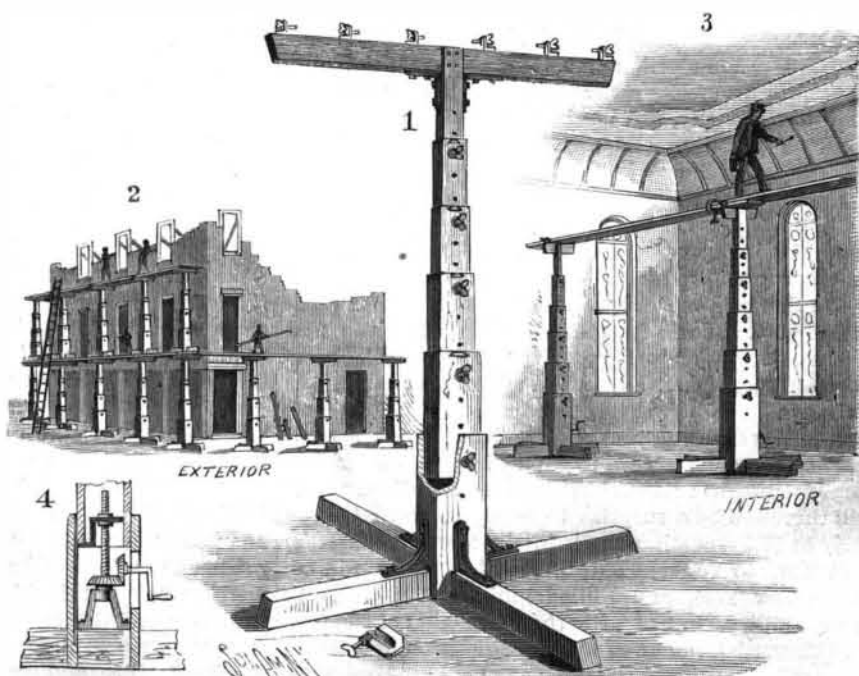


Fig. 2.—WALKER'S JET-PROPELLED VESSEL.

ward would not only tend to lift the boat, but to scour out the bottom under it. The drawing in of so much water at the bow, thus saving the force which would otherwise be required to push this water out of the way of the vessel, is designed to be especially advantageous, the force thus expended also operating as a suction to draw the vessel forward.

AN IMPROVED SCAFFOLD TRUSS.

The construction and use of an adjustable telescopic scaffold truss, to facilitate the repair of ceilings and all kinds of outside work upon buildings, are represented in the accompanying illustration. The improvement has been patented by Mr. Thomas Kennedy, No. 279 West 118th Street, New York City. Fig. 1 shows the truss in perspective, Figs. 2 and 3 illustrating its use, and Fig. 4 being a section of its lower portion, showing how a close adjustment of the truss may be made for a particular elevation. The telescoping sections are similarly constructed, of consecutively diminishing size transversely, and the whole is mainly of wood, so that it may be readily built by any carpenter. The several sections are vertically adjustable by means of bolt holes in opposite sides, through which are passed detachable screw bolts, fitted with locking nuts. For a nice adjustment, after the truss has been extended to the approximate height desired, the bottom section is fitted with a crank and gear, actuating a screw, as shown in Fig. 4, by means of which the other sections may be collectively raised or lowered. The top section is provided with short or long heads for the support of the scaffold floor, the planking of which is held in place by screw irons on the head, and a screw clamp is provided for readily binding in place top planks

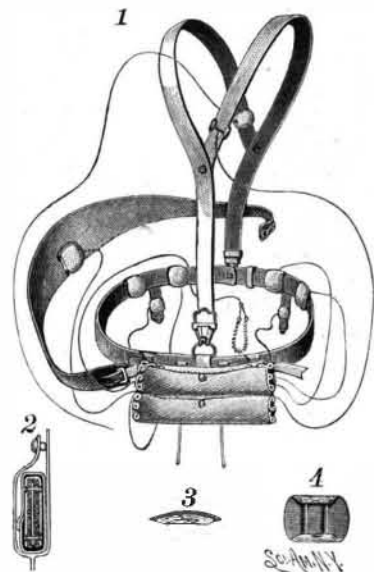


KENNEDY'S SCAFFOLD-SUPPORTING TRUSS.

or stretchers. The adjustment of all the parts is effected without the use of a nail, so that the scaffolding may be readily put up and taken down with little or no noise, and the entire structure, when not in use, can be closed up, so as to occupy but little space.

AN IMPROVED ELECTRIC BELT.

A belt to be buckled around the waist, and supported by shoulder straps, the belt carrying a battery and attachments for sending a current of electricity through the body in the treatment of acute and chronic diseases, is shown in the illustration, and has been patented by Dr. George F. Webb, of Cleveland, Ohio. Fig. 1 represents the complete apparatus, Fig. 2 a cross section through one of the batteries and its case, and Figs. 3 and 4 a cross section and inverted plan of one of the electrodes. The battery cases at the back of the belt are attached thereto by buttons, any desired number of such cases being used, and each battery is in a waterproof pocket, preventing injurious effects from the acid. The battery consists of a number of connected elements hinged together to conform to the movements and shape of the body, the elements comprising a central copper plate, inclosed by a jacket of absorbent insulating felt, and an outer double zinc plate. The several elements are connected together by copper hinges, so that the entire force of the battery may be used when necessary, the hinges connecting the zinc plate of one element with the



WEBB'S ELECTRIC BELT.

copper plate of the next, and suitable terminals are provided for the attachment of conducting cords or wires. An adjuster or cut-out is also provided for use in case only a portion of the battery power is required. Connected with the battery by the conducting cords are the electrodes on different parts of the apparatus, to contact with the body. The electrodes are preferably made of aluminum, of oval convex shape, as shown in Figs. 3 and 4, and are bent to form a clasp readily engaging the belt or straps on any desired part of the breast or back. A neck band is also provided on which an electrode may be used, the electrodes being arranged according to circumstances to contact with the necessary parts of the body, while the amount of the current is regulated by the adjuster.

An Improved Aspirator.

Dr. Smith, in the *Medical Record*, says an aspirator which any one could make had been first used by him during the civil war. Take a quart bottle, a tightly fitting cork, pierce the latter with a glass tube, attach to this one end of a rubber tube and the other end to an aspirator needle. Put a drachm of ether into the bottle. Put in the stopper, set the bottle into hot water, and when the ether has become vapor, take it out of the water, introduce the aspirator needle, and as the ether condensed on becoming cool, it would form almost a complete vacuum in the bottle, so that nearly a full quart of fluid would be drawn into it.