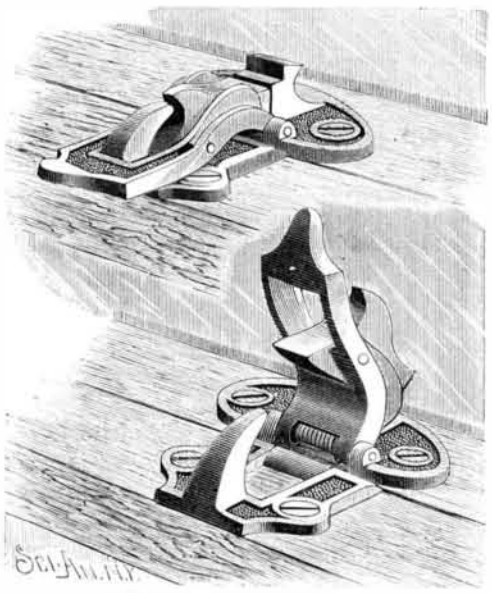
SASH FASTENER.

The plate attached to the upper bar of the lower sash of the window is made with a curved, upwardly projecting horn. Upon the plate attached to the lower cross bar of the upper sash is a locking stud, in front of which is pivoted a locking hasp, which is acted upon by a spring to normally hold it in a horizontal position, to engage with the horn for locking the sashes together. Pivoted in the hasp is a dog that acts in connection with the locking stud for locking the sashes. When in the position shown in the lower view, the toe of the dog stands in front of the curved surface of the



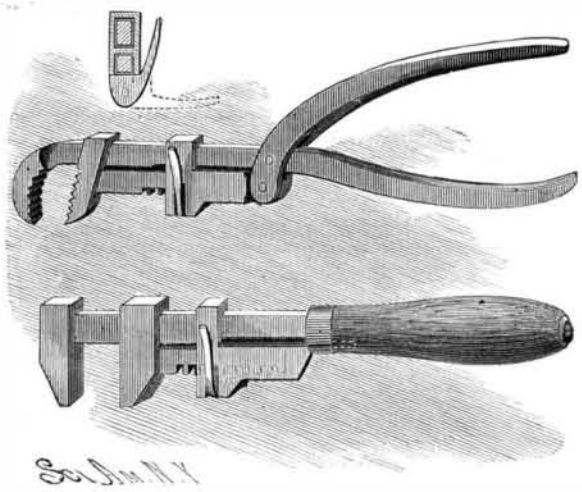
DAVIS' SASH FASTENER.

hasp and in line with a lip on the other bed plate, so that in closing the sash when the lip strikes the toe, it turns the dog on its pivot and detaches it from the shoulder of the locking stud. This permits the spring to force the hasp and dog forward, so that the hasp will drop over the horn and the dog into engagement with the locking stud, and thus automatically lock the sashes. To unlock the sashes, the dog is turned backward and the hasp raised at the same time, and turned backward on its pivot to engage the dog with the stud where it will be held. This fastener is effective and reliable, and requires no attention in locking the window.

This invention has been patented by Mr. Franklin T. Davis, of Mount Vernon, N. Y.

IMPROVED WRENCH.

The pipe wrench shown in the two upper drawings is made with a long bar, having its forward end turned over and serrated to form the fixed jaw. To the bar is pivoted a lever, the long arm of which, together with the back end of the main bar, forms the handle of the tool. To the outer end of the short arm of the lever is pivoted the back end of a metal box having two parallel longitudinal slots, through one of which the bar passes, while in the other fits the shank of a ⊢ bar, whose serrated head is slotted for the passage of the main bar. The outer edge of the shank is formed with notches, any one of which, as the shank is moved endwise in the box, may be engaged by a pawl lever arranged as shown. When the stem of the pawl lever is thrown out, as shown by the dotted lines in the up-



DEAN'S IMPROVED WRENCH.

per view, the shank and its movable jaw may be slipped along to separate the jaws, so as to admit the pipe. The pawl lever is then swung to the position indicated by the full lines, when the jaw bar is locked to the box. As the handle lever is swung toward the main bar, the box and jaw bar will be moved forward to firmly clasp the pipe. It will be seen that this tool is easily adjusted, and may be quickly operated. In the modification shown in the lower view, the same principle is applied to a monkey wrench. In this case the box is immovable endwise, but the jaw bar may be set and locked at any desired position on the main bar.

This invention has been patented by Mr. James B. Dean, of Stockton, N. J.

Forty Knot Ships.

Prof. Chas. F. Hurst, of the College of Practical Engineering, Chiswick, England, says:

If it be the case, as according to Reech's law it confessedly is, that by increasing the linear dimensions of a steamer four times, with a proportionate increase of power, we get twice the original speed, and if, further, it be the fact, as it also confessedly is, that many torpedo boats realize a speed of over 20 knots, then it is plain that we have only to enlarge one of these torpedo boats four times in every direction to get the 40 knots we require. Nobody can pretend that such an enlarged torpedo boat cannot be built, and with these points of knowledge before the public, the onus manifestly lies upon those who deny the practicability of attaining 40 knots to specify wherein lies the impediment to its realization. If we accept Reech's law, then, so far as I am aware, the only objection of the least plausibility that has yet been mooted is, that whereas the strength of the working parts of engines increases simply as their sectional area, while the momentum strain put upon them by excessive speeds increases as the square of the velocity, the momentum strain at very high speeds may so far outrun the strength that some of the parts will give way. To this the simple answer is, that it is not proposed in these engines, more than in any other engines, to employ such excessive speeds as could lead to any such result, and in my last letter I specified several engines, which had been working for years without accident, with a considerably larger momentum strain upon them than I should be disposed to permit.

I have already shown that up to such speeds as I propose to employ, the effect of the inertia or momentum of the working parts will be to equalize strains, and therefore to reduce rather than to augment those which are most considerable. No doubt we have not any vessels yet working at a speed of 40 knots through the water, but we have innumerable examples of engines in all parts of the world running at this speed on railways, and it signifies nothing to an engine, so far as its strength is concerned, whether the resistance it has to surmount is situated on the land or on the sea.

The accuracy of Reech's law as a measure of the resistance of vessels has long been recognized on the Continent, and has also been conclusively demonstrated in this country by the late Mr. Froude. At page 5 of his obituary memoir given in the "Minutes of Proceedings" of the Institution of Civil Engineers for 1870–80, Part II., the following remarks will be found on this subject:

"Mr. Froude's first step in connection with his inquiries touching the resistance of ships was to enunciate the true principle of the relation of the resistance of a ship to her model, namely, that the resistance is in the proportion of the cube of a linear dimension—in other words, as her bulk—at speeds proportionate to the square root of the linear dimension. He demonstrated this mathematically, and by experiments with different sized models, some of which were nearly half a ton in displacement."

If we take a torpedo boat as the model, then a vessel four times larger in each linear dimension will be four times the length, four times the breadth, and four times the depth; while her capacity will be 4^3, or 64 times, her displacement 64 times, and her engine power 64 times; but with these proportions her speed will be $\sqrt{4} = 2$ times greater, or if the speed of the smaller vessel be 20 knots, then that of the larger vessel will be 40 knots. In vol. xxxix. of the British Association Reports for 1869, pp. 43 to 47, and in various recent tracts and papers by Mr. Froude, ample information in regard to the accuracy and applicability of Reech's law is afforded.

If Reech's law be correct, it follows as a necessary consequence that by the introduction of the specified power, a speed of 40 knots will be practically obtained; and this power may be introduced without employing such a speed of engine as would jeopardize its strength and safety, or be otherwise inconvenient in any respect.

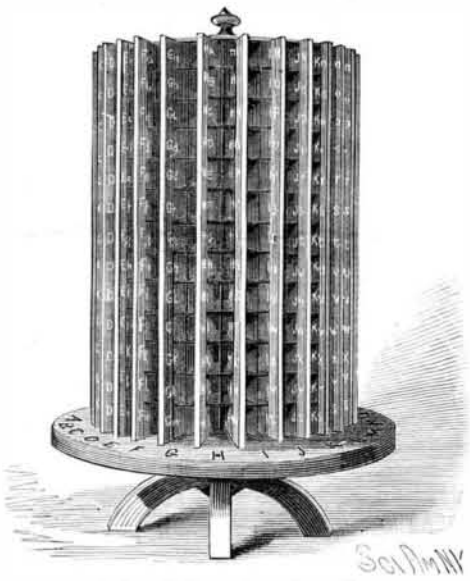
We suggest to the Wall Street schemers that they form a company for the building of a 40 knot boat. Such a vessel, running between New York and Albany, would beat the railway, and enjoy an immense patronage.

Magnetic Clock.

A curious application of the magnet is described in a French journal, the subject of it being a clock recently patented in France. In appearance the clock consists of a tambourine, on the parchment head of which is painted a circle of flowers, corresponding to the hour signs of ordinary dials. On examination, two bees, one large and the other small, are discovered crawling among the flowers. The small bee runs rapidly from one to the other, completing the circle in an hour; while the large one takes twelve hours to finish the circuit. The parchment membrane is unbroken, and the bees are simply laid upon it; but two magnets, connected with the clockwork inside the tambourine, move just under the membrane, and the insects, which are of iron, follow them.

FILE STAND.

The object of this invention, which has been patented by Mr. Erskine D. Parsons, of Kansas City, Mo., is to provide a file stand so constructed as to afford easy access to the pigeon holes and ready reference to the matter placed therein. The body portion of the file stand is pivoted, so that it may be revolved, and is provided with pigeon holes, radiating from the outer edges of which are plates, upon both surfaces of each of which are formed indexes corresponding with the series of the pigeon holes, which are preferably arranged so that two sets will come between each pair of flanges. Opposite

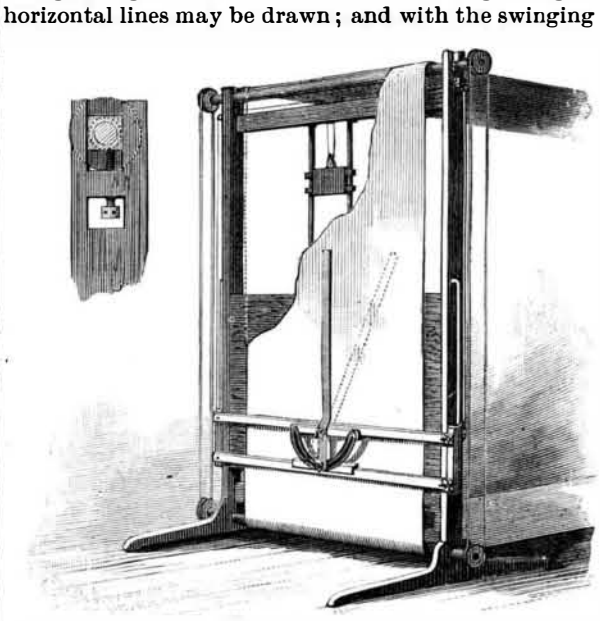


PARSONS' FILE STAND.

each pair of flanges is an index letter, upon the upper surface of the base board, so that these letters indicate the vertical series of holes, while the vertical indexes indicate the holes in each series. As the flanges separate the vertical series of holes, only one set will stand before the user at once, thereby preventing confusion, and avoiding, to a great extent, danger of mistake in filing away matter.

DRAWING APPARATUS.

This apparatus consists of a frame provided with a stationary drawing board, of a movable counterbalanced T square, and of rollers on which an endless sheet of drawing paper is mounted. Each of the bearings of the upper roller is adjustable in a slot, formed in the upper part of each standard, by means of a set screw, as shown in the small view, so that the drawing paper can always be held in a stretched position on the board which connects the standards. The shafts of the rollers are provided with pulleys, over which pass endless cords, by pulling which the paper may be moved up or down. On the outer side of each standard is a guide rod, on which is mounted a slide, to which the T square is attached. Secured to each slide is a cord, which is led over guide rollers to a counter weight. The T square slides in two horizontal straight edges. With the aid of the straight edges, horizontal lines may be drawn; and with the swinging



FERON'S DRAWING APPARATUS.

straight edge (the construction of which is clearly shown in the center of the large view), which can be moved laterally on the straight edges, vertical or diagonal lines may be drawn. With this apparatus, the operator can make drawings on paper of considerable length without moving from the board.

This invention has been patented by Mr. Arthur C. Feron, whose address is care of Pottier & Stymus, corner 41st Street and Lexington Avenue, New York city.

HENRY O'REILLY, one of the pioneers in the establishment of the telegraph, died at Rochester, N. Y., on August 17, aged 80 years.

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