Science and Art.

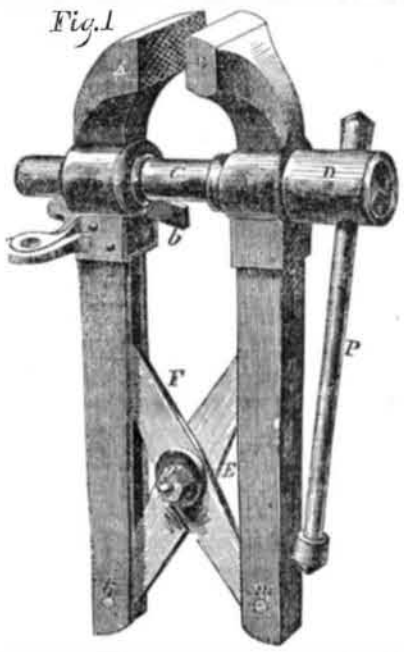
Improvement in Vises.

The accompanying engravings illustrate the improved parallel Vise, for which a patentwas granted to R. W. & D. Davis, of Yellow Springs, Ohio, on the 28th of August last, and for which patents have also been obtained in Europe.

Fig. 1 is a perspective view of the improved iron vise. Fig. 2 is a central vertical section, showing the inside of the jaws. Fig. 3 is a horizontal section, at *x y*, fig. 5, looking down on the cross levers in their recesses. Fig 4 is a plan view, to illustrate the application of the improvement to a wooden vise; and fig. 5 is a direct vertical section of the vise, taken through the center.

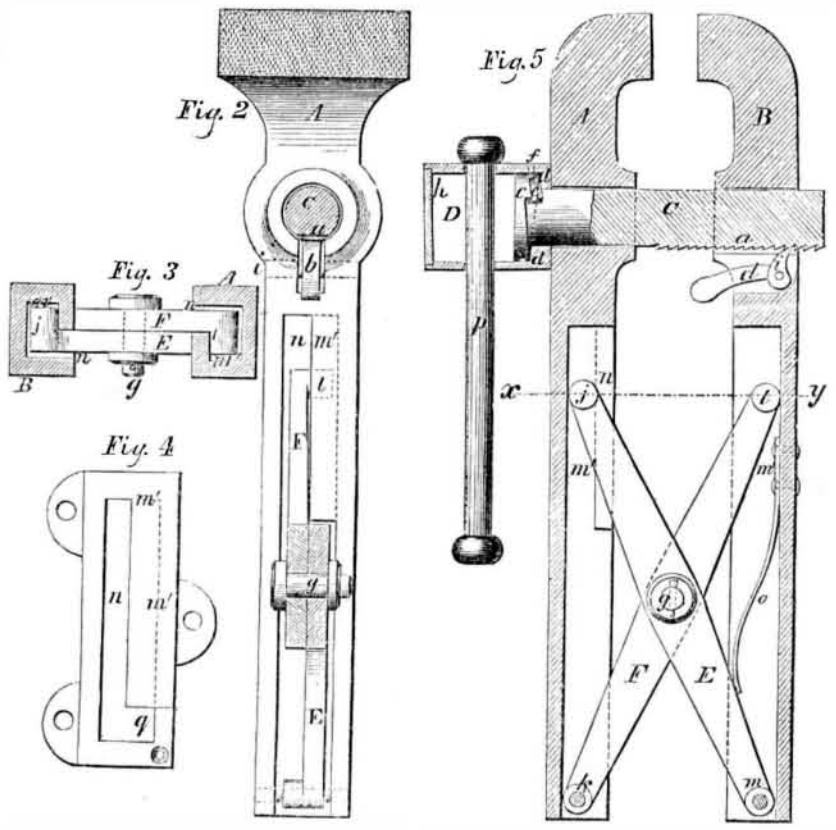
The nature of the improvements embraced in this patent consists, 1st, in the novel means of operating the movable jaw of the vise, dispensing entirely with the common jaw screw, whereby the vise can be moved more rapidly to open and close the jaws, to grip and set free articles to be filed or otherwise acted upon in the vise. 2nd. In the peculiar mode of keeping the movable jaw always parallel with the stationary one.

A is the stationary jaw of the vise, secured by any known means to a bench, and B is the movable one. These jaws are made of iron with steel faces, thoroughly welded to the iron. C is a horizontal strong iron beam, which is substituted for the screw bolt in the common vise. It fits in a suitable opening in the jaws. Its lower side is flattened, and on part of its length has fine ratchet teeth, *a*, cut on it. To act in this ratchet of the bolt, C, in a proper manner, there is provided a peculiar pawl, *i*, fig. 5, having a trigger, *b*, fig. 1, to set it free. This pawl fits in a recess in the shank of jaw, B, and it will be observed in fig. 5, that the bite of the pawl—owing to the peculiar mode of its set—has no tendency to wear the ratchet teeth on the beam, as the pressure comes upon it nearly vertical. The beam, C,



is prevented from moving to open the jaws by placing the finger on the heel of the trigger, *b*, the pawl is relieved, and beam C can then be pushed in, to close the jaws. The beam, C, is made with a solid head, *c*, the face of which next the jaw, forms one or two turns of a spiral or screw. This head is received in a loose box, D, which is formed with a shoulder, *d d*, fig. 5, to come between the spiral face of the head, *c*, and the movable jaw. The face of *d*, next to the jaw, A, is flat, but the other face next *c* is of a spiral form, to correspond with the inner face of the head, so that by turning the loose box, D, with the common lever, P, the spiral face of this box acts as a wedge between the head of the beam, C, and the movable jaw, A, fig. 5, forcing the latter towards the stationary jaw. The rise of the spiral faces should be greater than the distance between the adjacent teeth of the ratchet, about two or three times that distance. The head, *c*, has a spiral groove, *e*, which receives a small pin *f*, projecting from the interior of the box. One object of this pin and groove is to draw back the box when it is turned in the reverse direction to that in which it is turned, to force up the jaw, B; and the pin also serves as a stop, to prevent a complete revolution of the box on the head, *c*, which would cause the grip to be lost. In order to apply the box to the beam, C, the former is made with an opening in the front, large enough for the beam to pass through it. This opening is closed by a cap, *h*, after the beam has been put in the box.

DAVIS' PATENT PARALLEL VISE.



When an article is to be fastened in this vise, it is placed against the stationary jaw, and the movable one is simply pushed forward with the beam, C, until it comes in contact with the article. The pawl, *i*, fig. 5, admits of the forward movement of the bolt, and it will hold the jaws closed. A partial turn of the box, D, now wedges the movable jaw, and causes the article to be held firmly between A and B. By reversing the motion of the box, D, after the article has been operated upon, it is set free. By simply raising the heel of the trigger, *b*, the pawl is thrown out of catch with the ratchet, *a*, and the jaws may be opened as wide as is desired.

We will now describe the mode of connecting the jaws, A B, to keep them parallel. E F are cross levers of equal length, connected by a fulcrum pin, *g*. They form the diagonals of a regular parallelogram, consequently, as each jaw is secured to one end of a lever they always remain parallel. It is, however, the arrangement of these diagonal levers to give an uniform leverage in this vise, which is the novel feature. To effect this, their lower extremities are secured to the bottom of the jaws by pivots, *k* and *m*, which pass through the feet of the jaws, and do not move out of place. The upper ends of the levers, E F, are formed with horns, *j l*, and are fitted in recesses, *m' m'*, in which they are confined laterally, but allowed to slide up and down. The sides of the legs of the jaws have slits in them, which allow the edges of the levers, E F, to play, while the horns, *j l*, are confined within the recesses, *m'*. They (the levers) can, however, be taken out and put in by uncoupling the jaws, and throwing them sufficiently wide apart to allow the upper ends of the levers to come below the flange part, *n*, of jaw A, fig. 5. By the connection of the lower ends of the levers, E F, with the lower ends of the jaws, A B, of the vise, the jaws have a uniform leverage. If the levers were connected to the jaws at the top, instead of in the manner described, the leverage would not be uniform, but decrease as the jaws were moved apart from one another. A spring, *o*, is applied between the stationary jaw and lever E, for the purpose of forcing open the jaws at once when the pawl is released from the ratchet. This spring is only necessary when the jaws are very near together, as the weight of the levers themselves tends to force them apart when they are set out from an upright position; this depends on the thickness of the article enclosed between them. In this manner they are self-opening.

In applying these improvements to a wood vise, all the parts, with the exception of the jaws, are made like the parts already described. The jaws may be of the usual form of wood vises, or any other form. A cavity is made in each to receive the upper horned ends of the levers, E F. An iron plate, of the form of fig. 4, is attached by screws to the outside of the cavity to confine the horns, this plate having a slot, *n*, in it, and a large opening, *q*, at the bottom for the introduction of the horned ends of the levers, and for their removal when necessary.

A vise that would preserve its parallelism without being expensive and complicated, has long been a desideratum with mechanics, and many devices bave been proposed to effect it, but they have been generally discarded, either for their complexity or expense. This vise can be opened or closed in one-tenth the time required to open or close a vise operated by a screw, and is more durable in its use and simple in its operation. By the action of the cross levers the movable jaw is always secured in a parallel position to the stationary jaw, which is a superior improvement on the method of operating vises. These vises are made of the best materials, and are manufactured by the patentees, from whom more information respecting them may be obtained, or by letter addressed to their general agent, Wm. H. Schoffeild, at Yellow Springs, Green Co., Ohio.

The Monster Mortar.

We have every reason to believe that the difficulties experienced in constructing a monster gun or mortar are likely to be overcome through the genius and skill of our scientific countryman, Mr. Robert Malet. The attempt to weld together longitudinal bars so as to form a cylinder, failed in the hands of one of the ablest English engineers, from the circumstance that the long-continued high temperature maintained during the progress of welding, produced a tendency to crystallization, and therefore, was destructive of that fibrous structure essential to the strength of iron for artillery purposes. In Mr. Malet's mortar the cylinder is formed by a series of flat rings, fitting on one another by flanges, and clamped together by strong external bolts. The force exerted by the explosive gas is chiefly lateral, and not longitudinal; that is, it has a tendency to burst the cylinder in a direction at right angles to its axis, and only a small force, comparatively, to separate these rings in a direction parallel to the axis. One of these mortars has been completed at Millwall, and the shell already cast. The dimensions are startling. Instead of the 13 inch shell (the largest hitherto,) weighing about 200 lbs., and carrying 30 lbs. of powder inside, we are to have a shell of 36 inches diameter, weighing about 2,400 lbs., and charged with half a tun of gunpowder. The range will be about half as far again as that of the 13-inch mortar. Hence, a dozen such shells would have left Sebastopol in ruins.—[Dublin Daily Express (Ireland.)

[We wonder if Robert Malet has been a reader of the Scientific American, if so, he will not claim the above mortar as his invention. Probably he does not, and the editor of the Dublin *Express* may, in absence of correct information, be giving him credit for an invention which he does not claim himself. At any rate, he is not the original inventor of the above described method of constructing mortars or cannon, and thanks to the records of the press, we can furnish undeniable proof of our assertion by referring both him and our Dublin cotemporary to an engraving illustrating the invention on page 220, Volume 2, Scientific American. We saw a cannon constructed upon this principle, on exhibition in this City in 1848. The inventor is D. Fitzgerald, of this city, to whom was granted a patent for it eight years ago.

Land Anchor for Carriages.

In 1802, Mr. Richard Pattinger took out a patent for a carriage anchor. Its object was to prevent accidents from runaway horses. When the animal got into a dangerous speed, the plan was to throw the anchor out of the carriage, and so bring it to a stop. The anchor was tied by a rope or chain to the vehicle.

Glue Impervious to Water.

If a coating of glue or size be brushed over with a decoction of one part of powdered gall nuts in twelve of water, reduced to eight parts and strained, it becomes hard, and as solid and impervious to water as a coat of oil paint; in fact, a kind of leather is formed.