

## NEW INVENTIONS.

## Improved Artificial Leg.

There is the famous Anglesey leg, the redoubted Palmer leg, and the Yerger leg,—but that is not to say that no improvement can yet be made; we are certain that a good improvement has just been made in artificial legs by David B. Marks, of New York City, who has taken measures to secure a patent for it. This artificial leg is intended to perform all the movements of the natural leg in walking. In taking a step, the foot is brought flat to the ground, with the perfect rigidity of the knee-joint, which is maintained until the ankle is bent by bringing the body forward, as the opposite leg takes the next step. This bending of the ankle leaves the knee free to make the slight bend which is necessary to raise the heel from the ground, and when the knee is thus bent, the ankle becomes stiff, with the toes slightly raised to prevent its dragging during the early portion of the movement of the leg in taking the succeeding step, and it remains stiff until it is necessary for the straightening of the knee and the depression of the toe to bring the foot flat to the ground, both of which latter movements are effected simultaneously. The improvement relates to the means or devices by which the movements of the knee and ankle-joints are controlled, and the necessary rigidity maintained during the cessation of these movements.

## Manufacture of Friction Matches.

Anthony Sohn, of Monroeville, O., has taken measures to secure a patent for useful improvements in machines for filling match frames preparatory to the dipping operation. In the manufacture of friction matches, the dipping of a large number is always effected at the same time, by securing them in a frame in such a manner that their ends are all even. They require to be held in the frame—each match by itself, to prevent their adhering together by the melted sulphur or the igniting compound; the manner of placing them in the frame has always been difficult to perform aright, and has been nearly all done by hand. This improvement is intended to perform and repeat the operation of taking a suitable number, for one row, from a box or hopper, and depositing them separately in the frame, so that all the hand labor necessary to be performed will simply consist in placing a piece of pasteboard or a thin slab of any suitable material between the successive rows. The improvements which have been made in the manufacture of friction matches, within the past fifteen years, have been of the greatest benefit to the human race—friction matches are now one of the most useful and necessary articles of civilized life. For further particulars address the assignee, Wm. Gates, Jr., Frankfort, N. Y.

## Screw Compression Cocks.

Geo. H. Dodge, of Phila., has taken measures to secure a patent for a useful improvement in screw compression cocks, the nature of which improvement consists in making the valve detached from the screw, and furnishing it with a stem passing entirely through the screw to the outside of the cock. The principal object of this improvement is to allow of the valve being ground when it gets loose, and this can be effected while the cock is in place by simply relieving it from the pressure of the screw, and turning it in its seat by the part of the stem protruding through the screw. The valve being detached from the screw makes it fit correctly to the seat, as it is not subject to a racking action, consequent upon any want of accuracy in the screw.

## Improved Horse or Steigh Bells.

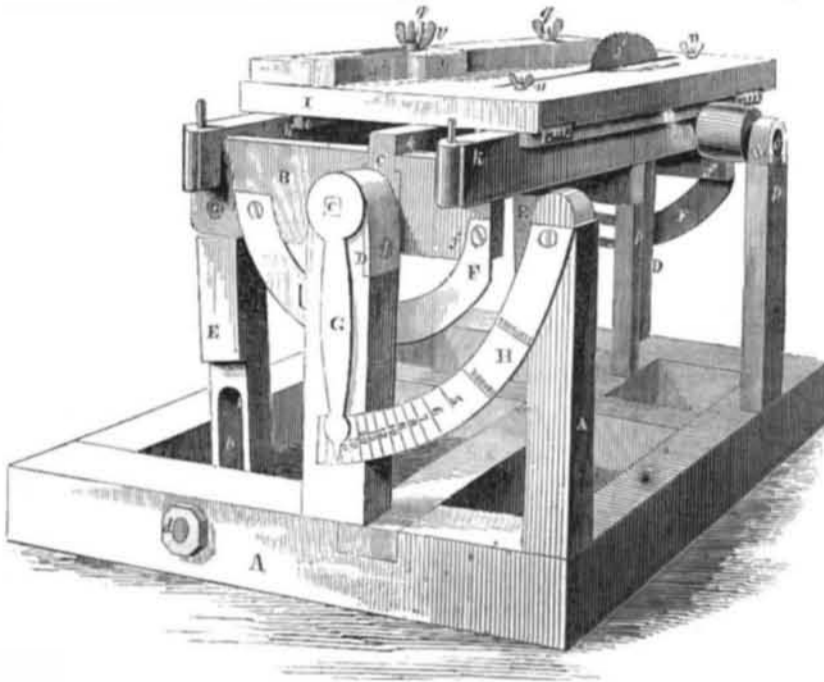
An improvement in bells for horses has been made by Jason Barton, of Middle Haddam, Ct., who has taken measures to secure a patent for the same. The invention relates to a peculiar manner of suspending the tongues within the bells, whereby the positions of the tongues may be varied according to the inclination of the sides of the pad to which the bells are attached. The positions of the sides of the pad vary according to the transverse form of the body of the animal, and by this improvement the tongues of the bells may be adjusted so as to act upon the bells, whatever position the pad or belt and bells may have when attached to the animal.

## Reaction Water Wheels.

J.W. Martin, of Taladega, Ala., has invented an improvement in reaction water wheels, to relieve the lower gudgeon of the shaft from undue friction and load by weight of water after it has acted upon the buckets. The improvement is to prevent up-lift by under

pressure of water, and also down pressure on the shaft. The wheel is open at top and bottom, and the periphery is connected to the shaft by arms, so that no water can lodge in the wheel, whether it may be let in at top or bottom. Measures have been taken to secure a patent.

## MACHINERY FOR SAWING BEVELLED WORK.—Fig. 1.



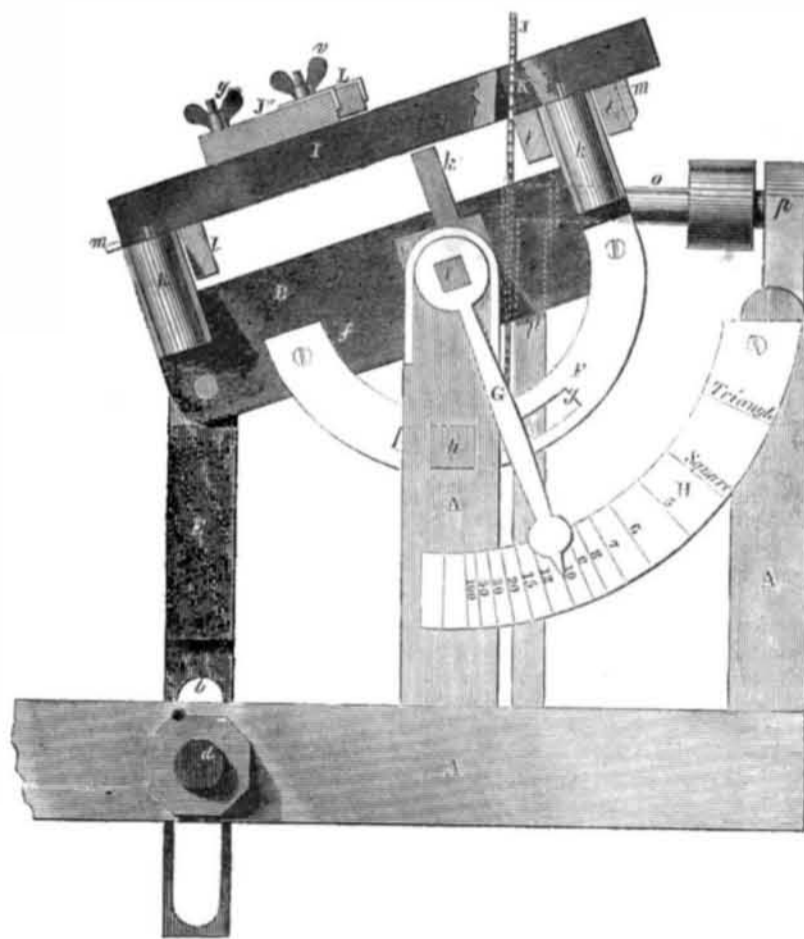
The annexed engravings represent an improvement made in machinery, named "the adjustable bevel gauging and indicating bench, for sawing bevelled work." It is the invention of Alfred C. Cook, of Russellville, Ky., who has taken measures to secure a patent for it.

Figure 1 is a perspective view of the machine, and fig. 2 is an end view. The same letters refer to like parts.

The nature of the improvement consists in an adjustable bevel gauging bench, having a travelling feed carriage on the top to feed

in the lumber to the saw, so as to cut the stuff to any desired bevel, according to the way the frame is set and gauged. A circular saw is represented on the figures, but it is equally adapted to work with a reciprocating one. A is the main frame, which sustains the swinging bench; B is the swinging adjustable bench, it is secured upon and turns on a shaft, C, which extends the length of the frame, and is supported in posts, D D. This bench is attached by each of its ends, on one side, to standards, E E, by a pin, a, at each end, which serve as the fulcra for the bench to turn

Figure 2.



upon; these standards have slots, b b, for screws, d d, to raise or elevate them (the standards) and bench. These set screws, d d retain the standards at such an elevation at one side as will fix the position, inclined or horizontal, of the bench, for the stuff to be fed to the saw. F F are segmental braces let into the two end pieces, f f, of bench B; each curved brace, F, has a slot, g, cut in it for a set screw, h, to work in, as the bench, B, moves in a vertical circle. These braces keep

the swinging bench firm and steady in its position when at work. G is a pointer hand secured on the end of shaft, C; it moves with said shaft, as the bench, B, is raised or lowered at one side, and points to the numerals and words on the index plate, H, to indicate the position of the gauging bevel bench; it tells at once what bevel will be cut upon the stuff fed into the saw.

I is the feed carriage; it slides on the top

and is guided on the ways, k k, by the flange pieces, l l. These flange strips are adjustable by plates of metal, m m, which are secured transversely on the underside of the carriage, and to which the flanges are attached; the set screws, n n, secure the plates, m m, as they work in slots in said plates. These flanges are made adjustable to allow the bench, B, to be set at the greatest possible angle to which it is capable of being set. J<sup>2</sup>J' is the side rest, against which the stuff lays while being sawed; this rest is made adjustable by the set screws, q q, which work in slots: by the use of this rest, in connection with the adjustable bench, the "flare" and bevel of staves may be cut at the same time, as this rest can be set at any angle desired by the set screws, q, and by a pivot axis working in a slot near the distant end of the carriage. L is a bevel rest or dog, for the end of the board or stuff to rest against; it is attached to the side of the rest and is adjustable by the set screw, r, in a slot. J', fig. 1, and J, fig. 2, is a circular saw; it is secured on a horizontal shaft, O, driven by any power, and works through a flaring opening, K, in the bench and carriage. The shaft of the saw is supported in bearing standards, p p.

From the description given of the engravings, our readers will have obtained a correct understanding of the nature, action, and use of the adjustable bench, feed carriage, and their adjuncts, whereby stuff may be mitred and sawed to any bevel and angle, from 0 to 90°. The machine is equally adapted for common straight slitting, and sawing work of all kinds. The improvement can be applied to all saw frames, and the extra expense cannot be much; nothing at least in comparison to the advantages obtained.

More information may be obtained by letter addressed to the inventor.

## Scientific Memoranda.

NIAGARA FALLS AND LAKE ERIE.—Prof. Silliman, the eminent geologist, discredits the opinion advanced by some that information wearing away of the rocks of hard limestone may possibly result in draining Lake Erie. In recent lecture he remarked—"They will not halt at their present thought but point slowly and surely about two miles torrent when they will stop again for an unknown period, and probably forever, since at this place the hard limestone will form both base and top of the falls, and thus stop the destruction of the rock. Some have thought that they would finally reach Lake Erie, and that then the lake would be completely drained. Such an event is impossible. At the point already mentioned, the torrent will gradually wear away the surface of the limestone, forming a rapid, and thenceforth Niagara will be one of the lost wonders of the world."

BED OF THE MISSISSIPPI.—The "Alton Telegraph" says, it has generally been the received opinion of geologists that the Mississippi and tributaries traversed a valley, with a strata dipping towards the bed on each side. Recent observations prove, very conclusively, that this is all a mistake. Dr. Norwood's survey, as well as the excavation of the artesian well at Belcher's refinery, at St. Louis, show that the line of the Mississippi traverses a ridge, and not a valley, and that the strata dips from the river east and west. In other words, that the bed of the Mississippi traverses a line of anti-clinal axis or upheavals.—This theory is applied by Mr. Phillips, to explain the structure of lead veins in the West.

LOCOMOTIVE BUILDING.—The business of building locomotive engines has become an important branch of domestic industry, and is steadily growing in magnitude. According to an estimate made by the "Railroad Journal," there are probably no less than one thousand locomotives built yearly by the shops now in operation, sufficient to stock from three to four thousand miles of road. From ten to fifteen thousand tons of cast-iron, and the same amount of wrought-iron, and a large amount of other stock are used by these establishments for this yearly production.

## San Francisco.

The population of San Francisco, is now 50,000. Six years ago, the "California Star" announced its population as being 321 males and 138 females. This increase is unprecedented.