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NEW SERIES

## Improvement in Sawmills.

It is usual, in sawing lumber, for the sawyer to have an attendant to assist him in moving the log forward after each board is sawed, in gigging back, &c. ; but by the invention here illustrated, the service of the attendant is dispensed with, the gigging-back levers and rod for moving the saw being brought so near together that they may be operated by the sawyer without requiring him to move from his place. The boards, too, are all sawed of a uniform thickness, and the machine may be readily adjusted to saw boards of any thickness desired.

The log, *A* (see engraving), is fastened upon a frame, *b b*, placed upon the top of the carriage, and

The whole arrangement secures the most perfect work by even an inexperienced sawyer, and saves much time ordinarily wasted in fixing the log before sawing each board.

The patent for this practical improvement was procured through the Scientific American Patent Agency, July 9, 1861, and further information in relation to it may be obtained by addressing the inventor, Dennis Lane, at Plainfield, Vt.

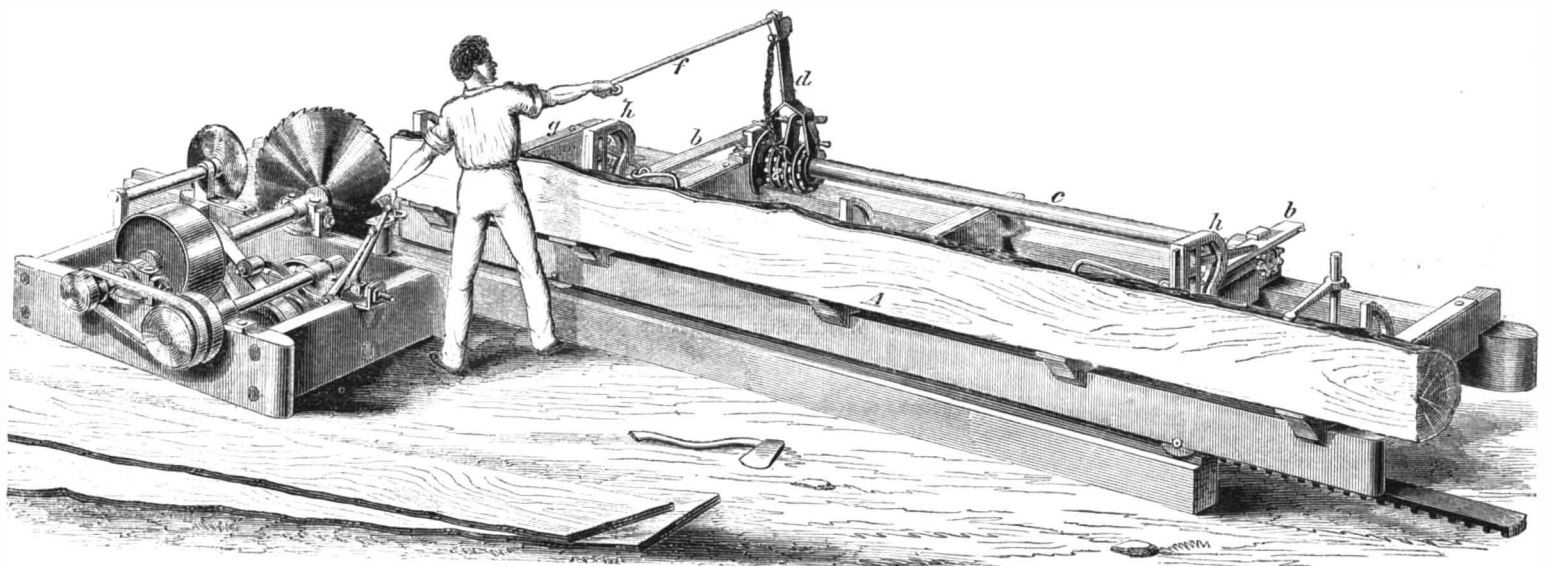
## The Strength of Iron Pillars.

In an article on the above subject, by Wm. Bryson, C.E., published in the *Journal of the Franklin Institute* for this month, the author says :—"Mr. Hodgkinson

## How to Handle Firearms Safely.

An old sportsman gives the following advice in reference to the safe handling of percussion guns :—

When the gun is charged, never allow the lock to be in any other state than at half cock, except at the moment before firing. The reasons why this rule should be adopted and religiously observed are briefly these : The lock is so constructed that when at half cock (provided it is good for anything, and no other should ever be used) it cannot be moved from that point toward the cap to explode it in any possible way. You may strike it violently, and it will not yield until the lock itself breaks in pieces. If, by any accident, it is moved in the opposite direction, it must go back until it is fully cocked, and must remain there until the trigger is touched. If it does not go back to that point, it cannot possibly, in returning, pass the point of its first position—that of half cock—unless the trigger is touched at the moment, which would seldom if ever happen.



## LANE'S IMPROVEMENT IN SAWMILLS.

having a transverse motion across the carriage of a scope equal to the thickness of the log. Upon the under side of the frame, *b b*, are racks which mesh into pinions on the ends of the shaft, *c*, so that by turning this shaft the frame is moved sidewise, and the log is adjusted to the saw. The shaft, *c*, is turned by means of the lever, *d*, which carries a pawl catching into the ratchet wheel, *e*, upon the shaft ; a rod, *f*, extending horizontally from the upper end of the lever, *d*, within reach of the hand of the workman.

The ratchet, *e*, is made in several sections with teeth at various distances, so that boards of any thickness desired may be sawed by placing the pawl to operate the corresponding section of the ratchet.

It will be seen that by this arrangement both ends of the log are moved up at the same instant, and its parallelism with itself is constantly preserved, thus making boards of an equal thickness throughout and all of the same thickness. In sawing thick plank the carriage is moved by two teeth of the ratchet for each plank, and in sawing joist the place of the log is adjusted to the scale, *g*.

In placing the log upon the carriage, the upright supports, *h h*, are placed to accommodate their position to any crooks in the log, or to its tapering form. These uprights are moved horizontally by pinions meshing in racks and worked with a ratchet and pawl ; and one advantage of this arrangement is, that when the log is turned with its face to the uprights no care is required to make the last board of uniform thickness with the others.

found that the weight which would crush the pillars if they were very short would vary as 5 to 9 nearly ; and for flexible pillars, he found the weight varied from 49.94 tons in the strongest iron to 33.60 tons in the weakest. Therefore, if we take the case of a hollow cylindrical pillar of 6 inches external diameter, beginning at ten diameters or 5 feet high, the coefficient of the strength will be 18.81 tons ; for 6 feet high, 20.88 tons ; for 7 feet high, 24.56 tons ; for 8 feet high, 27.84 tons ; and so on, increasing until we arrive at 44.34 tons, or a trifle above 16 feet, or thirty-two diameters. And in the case of a solid pillar of the same height, and 6 inches in diameter, the coefficient of the strength will be 22.69 tons, increasing in a similar manner as the above until we arrive at 44.16 tons, or about 12½ feet, or twenty-five diameters. \* \* \* A hollow pillar 15 feet high and 6 inches external diameter, with a sectional thickness of 2 inches of metal, will support very nearly the same weight as a solid one of the same height and 6 inches in diameter, with a saving in the weight of metal of 147.41 lbs. ; that is, 1,179.37 lbs. will support, as a hollow cylinder, nearly as great a weight as a solid one containing 1,326.78 lbs. The safe weight of the former being 62.94 ; that of the latter, 63.98 tons."

The *London Engineer* expresses the opinion editorially, that steel made by the Bessemer process is the best material for large guns upon any and every principle of construction.

Many sportsmen are in the habit of carrying the gun "at the cock," even when in company with others, as well as when alone. Should a twig accidentally touch the trigger, should the sportsman stumble and fall, or strike a heavy blow with the breech against a tree, the gun explodes ; it may be harmlessly, or perhaps at the expense of life or limb. Never cock the gun until the moment before firing. Again : others are under the erroneous impression that the safest way is to carry the hammer down upon the cap. The truth is, that is the most dangerous of all. When the hammer is pressed upon the cap, the jarring caused by the various movements in handling the gun is constantly bringing the percussion powder to such a state that a very slight tap upon the hammer will explode it. Now this is precisely the way in which almost all the accidents happen by which so many wounds are inflicted and lives lost by the sudden explosion of firearms.

I have endeavored to be as brief as possible, because I am aware that your columns are crowded ; but I earnestly hope that the few hints above will be of service to those who are desirous of learning how to use the gun. It is a trite but nevertheless true saying, that "it is hard to cure old dogs of their tricks." Old sportsmen will follow their old habits, but to young sportsmen I would say, adopt the following short rules, and I will insure you as much safety as can be expected from the use of an instrument at all times dangerous :—

1. When the gun is not charged, always put the hammer down upon the nipple. It relieves the main spring, and preserves its strength.
2. When you load, bring the hammer to half cock, charge the gun, and let the putting on of the cap be the last operation. Press it down lightly with your fingers, and not by carrying the hammer down upon it.
3. Never cock the gun until the moment before firing.
4. In all cases, whether alone or in company, while hunting, keep the gun at half cock, and never, on any account, put the hammer down upon the cap.
5. It is better, on setting the gun aside, first to discharge it ; but if you will or must leave it loaded, be sure to leave it at half cock, and with the cap plainly to be seen. If then it should be accidentally thrown down, it cannot be discharged.