



**Improved Bolt Cutter.**

No tool used in a machine shop is more necessary or oftener required than a bolt cutter. Some are complicated, and yet poorly perform the work, "raising" and weakening the thread, and not being easy of adjustment. The simpler the parts and the more absolute and direct their action, the more efficient and valuable any machine; and the bolt cutter, above all others, should possess these essential requisites. The inventor of the machine here represented, claims to have perfected a tool that is simpler, more readily adjusted, and capable of doing work quicker and better than most implements designed for the purpose. With it, he says, bolts can be cut close to the head and of any length desired, limited only by the size of the shop. But little explanation is necessary to understand its operation.

The cross head, A, sliding on the guide rods, B, is fitted to receive chucks for holding a bolt head, or can be furnished with a vise, the jaws moved by right and left hand screws. The lever, C, is attached to a sliding fulcrum, D, which moves on the rod, E, and can be used, if necessary, to start the cross head at the commencement of a cut. The dies are inserted in the jaws, F, of the revolving head, G, which is secured to a hollow spindle, sustaining the cone, H. By means of inclined slides passing through the head, and attached to the clutch and lever, I, the jaws can be opened from the center, or closed to the size of the screw required. When closed they are held securely in place. The dies can be adjusted to different sizes of bolts by a screw (not shown), which acts against the back end of the die. The recess, J, in the bed is for the reception of the oil and chips.

It is claimed that this bolt cutter is the cheapest in the market, that its work is equal to that of the lathe, and that the dies can be changed without moving a screw.

Patented by J. F. Rodgers, South Bend, Ind., whom address for rights and additional particulars.

**Sliding Parallel Vise.**

The object of this invention is to dispense with the laborious operation of turning the screw out and in to suit different articles of work, and changing the pin at the bottom of the vise jaw, which all mechanics will admit is a great loss of time as well as an annoyance, whereas in the illustration here shown, the movable jaw is adjusted instantaneously from one size to another, and the face of the jaw stands parallel with the bench, therefore it will gripe an article with greater firmness than is possible in the common vise.

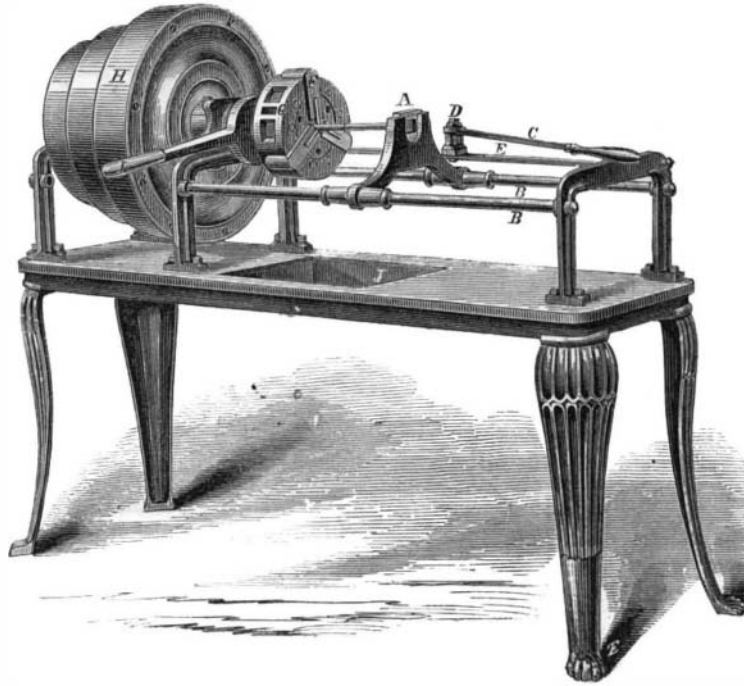
The improvement consists of a ratchet, A, secured to the nut, B, and partially embracing the front of the nut. C is a catch, secured to the rear of the bench leg to engage the teeth of the ratchet. D is the movable jaw of the vise, E the screw, and F a brace, to keep D in a vertical position and insure its parallel movement. Where the screw passes through the bench the aperture is elongated to allow of the raising of the ratchet out of the catch so that the jaw can be drawn out or pushed in at pleasure. A tenon on the upper side of the nut, B, works in a channel in the box, G, to guide the nut. Its operation can be readily seen. The improvement can be attached to any ordinary bench screw at a small cost.

Patented Aug. 14, 1866, by O. V. Flora. All communications should be addressed to Flora, Moore, and Rogers, Box 55, Madison, Ind.

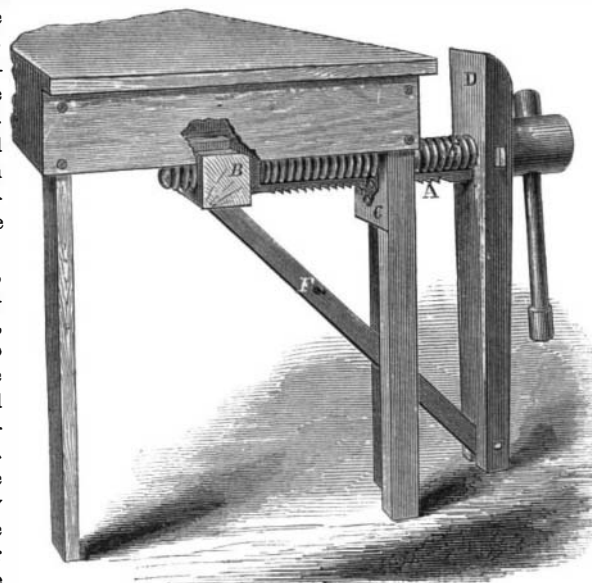
LONDON contains 19,000 miles of gas pipes.

**THE MANUFACTURE OF CARTRIDGES.**

The cartridge for fire-arms for the use of soldiers is a subject which has employed the inventive faculty largely within a few years. The common fowling piece has been loaded for a great many years by means of open powder and shot, the powder being poured into the hand, measured either by a tubular gage on the flask, or estimated by the eye; the amount of shot being calculated in the same manner.

**RODGERS'S BOLT CUTTER.**

Then the paper cartridge was introduced for military purposes, the powder alone being placed in the paper cylinder, and, when used, the twisted end being bitten off by the soldier and its contents emptied into the gun. (Vide Scott's Tactics.) Afterward the paper cartridge, with ball secured at the top, was used, paper and all being introduced into the gun. Then skins, or the prepared intestines of animals, were employed as a receptacle for the powder, the projectile being placed at the open end and the skin secured about its base by a string. These were very neat cartridges. A brief description of their manufacture may not be uninteresting.

**FLORA'S PARALLEL VISE.**

The skins, or animal intestines, were brought from Europe in a dried and salted state. They were macerated in water until they became perfectly pliable and very elastic. The operatives were girls, each one of whom sat at a table, having at her side a tub of the intestines, looking like linen or cotton strings. Before her was a board bearing a number of upright pegs, in form like an elongated

truncated cone, or, in other words, resembling a human finger. Over these, sections of the skin, cut off by a pair of scissors, were stretched, and when all the pegs were covered the board was placed in the sun to dry. When dry these pockets were filled with powder, the quantity graduated by weight, and the bullet was tied at the top. The skin is so thin and yet so tough, that, although the grains of powder are easily distinguishable through it, it will bear a large amount of rough handling. These were far superior to any paper cartridges.

But the metallic cartridges appear to be gradually displacing these other forms. They are made of sheet copper. The copper is cut by a punch into a circular disk, and at the same time, by means of a punch and die, is formed into a cup shape, the punch forcing the center of the copper disk down through a die. This operation is repeated, by means of constantly diminishing punches and dies, until the requisite diameter and length are obtained; annealing and washing being occasionally resorted to for softening the metal and removing the oxidized scales.

When brought to the proper size and shape, the shells are placed upon a revolving spindle and cut to the required length, the upper edges being, of course, irregular in outline when the shell comes from the last die. The shell must then receive a head, or rather the head or bottom, which is now of no larger diameter than the body, must be "upset" to make a receptacle for the fulminating compound, which is distributed around its circumference. To secure this result, the shell is slipped on a spindle, having a shoulder at the proper distance,

and a "header" strikes a blow against the bottom which bulges out equally all around, forming a narrow rim at the base of the shell, of larger diameter than the body of the shell, itself, and hollow.

The fulminate, precisely like the explosive preparation used in percussion caps, is spread over copper plates, perforated with holes about three-sixteenths of an inch diameter. The material lodges in the perforations, which, by a suitable device, are brought over the shells so that the fulminate may be dropped into them. As this substance is to be confined to the rim of the head, it must be distributed. For this purpose each shell is held under a vertical spindle which is made to revolve very rapidly. The end of this spindle is cut into radial teeth, similar to the congeries of radii on the face of a millstone, by which the fulminate is forced centrifugally into the rim of the shell head. This is the only process in the manufacture of these cartridges attended with danger, as the compound is of a highly explosive character. The shell is then filled with powder, the base of the projectile inserted, and the copper crimped around its base.

These cartridges stand the test of rough handling, dampness, climate, and time, better than any others yet invented. They are fast superseding all other cartridges.

**NEW NORTHERN EUROPEAN STEAMSHIP LINE.**—The American-Scandinavian-Russian Emigrant Company has completed three new steamships which are to connect New York with Southampton, England; Christiania, Norway; Guthenberg, Sweden, and Copenhagen, Denmark. They will connect with other vessels running between Copenhagen and Stettin, Dantzic and Königsberg in Prussia, and Riga and St. Petersburg in Russia.

**TUNING PIANOS.**—A correspondent suggests that an improvement might be made for tuning pianos up to a given standard pitch, by means of some device which shall indicate automatically when the required tension has been given to each string. Here is a chance for the ingenious.

**OVER** five hundred cubic feet of air pass through the human lungs in two hours.