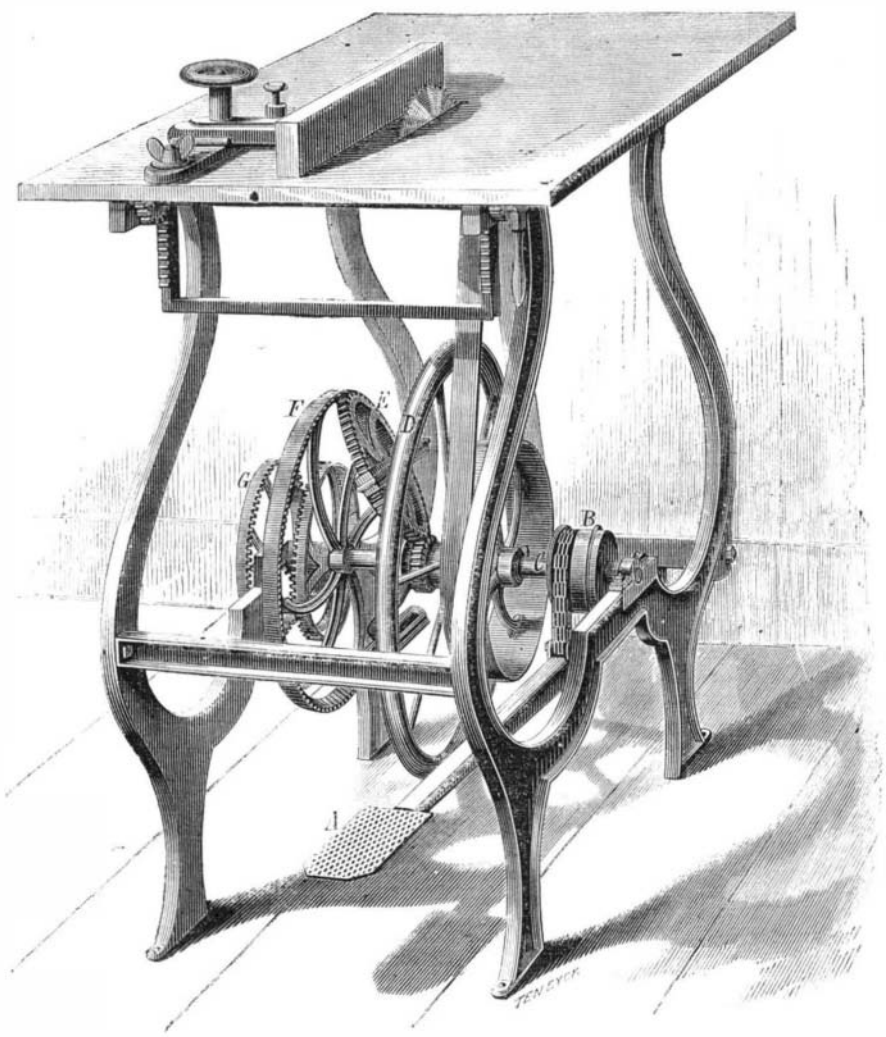
Foot Power Buzz Saw.

The saw represented in our engraving is run by an application of the principle, involved in Mr. L. S. Fithian's vertical multiplier, which was described by that gentleman on page 251, Vol. XXII. of the SCIENTIFIC AMERICAN. The treadle, A, is supported, as shown, by lathe chain wound on the small drum, B. This drum is loose on the shaft, C, but is governed in its motions by a contained ratchet wheel, keyed to the shaft, and so arranged that when the treadle is depressed the drum, ratchet wheel, and shaft are made to revolve, and the chain is unwound. On releasing the treadle, a weight at its far end brings it again into position; and a weight attached to the drum reverses its motion and causes it to rewind the chain; but the ratchet, being now free, does not affect the motion set up in the shaft, which is continued by means of the balance wheel, D. This balance wheel has attached to it a small pinion on the one side and the driving pulley on the other (as seen in the engraving), which are all loose on the shaft and driven as described hereafter. E is an intermediate wheel revolving, in the position represented, on one of two arms projecting from and revolving with the shaft. This intermediate wheel, E, engages with the pinion of the balance wheel, D, and gives motion thereto. The wheel, F, also engages, on its opposite side, with the outer gearing of the reverse wheel, E, as shown. This wheel, F, is loose on the shaft, and is connected by its inner gearing at the side with a small intermediate wheel, which, in its turn, engages with the wheel, G. This last wheel, G, is keyed to the shaft, and is the conveyer of the power. The other parts of the machine can readily be understood from the engraving.

Without going into the principle of operation in this combination, we may state that, in the saw shown us, the balance wheel revolved seventeen times to one revolution of the shaft.

The inventor states that the revolutions in this machine are from one to one hundred and two, forty steps on the treadle per minute giving four thousand and eighty revolutions of the saw. The sawing is as smooth and true as fine planing; and to one who is accustomed to the treadle and remembers that he can do no more than put his weight upon it, the work is as easy as any manual labor can be.

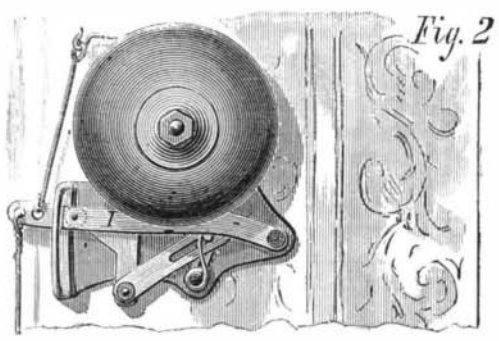
Patented in the United States and Europe through the Scientific American Patent Agency. Address H. A. Miller, President, Room 9, 23 Dey street, New York, or Charles B. Fithian, 341 North Third street, Philadelphia, Pa.

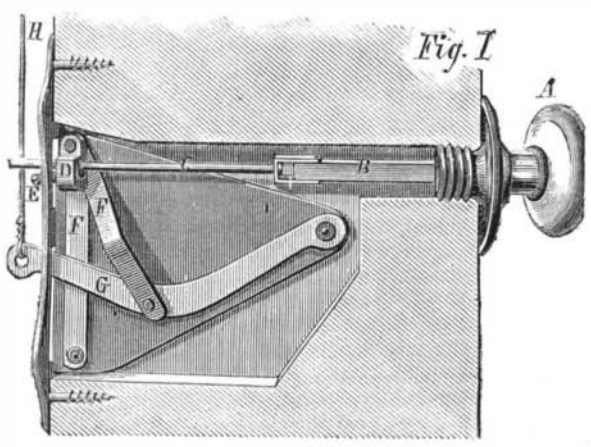


FOOT POWER BUZZ SAW.

BELL PULL AND BELL.

The bell pull, illustrated in Fig. 1 of our engraving, is designed to do away with the vexations attending the use of the ordinary street door pull. The engraving shows how the pull is attached to the door casing, and the whole arrangement will be understood from the following: By pulling the knob, A, motion is communicated through the shank, B, and





the extension wire, C, to the toggle, D, to which the wire, C, is made fast by the screw, E. This draws the top ends of the levers, F F, forward, and forces the lever, G, downward, thereby pulling the wire, H, which rings the bell. The wire, C, is cut off to the right length when adjusted. In the arrangement shown, the return of the knob to its original position is effected by the spring attached to the striking apparatus of the bell; when required, it may be effected by an independent spring attached to the pull. This bell pull insures reliable action with a very short pull on the knob. It is applicable to all kinds of bells, is easily put on in place of the old pull, and does not require a new knob.

In Fig. 2, the improved bell, the working parts are partly concealed by the bell. Suffice it to say that the lever, I, by an ingenious arrangement of levers, operates upon the striker both in its descent and recoil. Consequently two strokes are insured for each pull. It is not liable to be strained or broken by hard or sudden pulls.

Patents on the foregoing were obtained through the Scientific American Patent Agency, Nov. 7 and Dec. 26, 1871. For further information address the inventor and manufacturer, A. L. Swan, Cherry Valley, N. Y., or E. J. Swan, Laporte, Ind.

Lead Pencils.

A lead pencil is in itself a small affair, but considered as a manufactured product, it rises into much importance. To start a first class factory, with improved machinery and stock of well seasoned wood, requires a capital of about $100,000; ground covered is about half an acre, chiefly occupied by drying houses for the storage of red cedar. The Florida red cedar is mostly used in this country and in Europe—some "iben" wood, as the Germans call it, or English yew, is used in Germany—white pine is occasionally used for a common grade of a carpenter's pencil.

The "lead" of the pencils is the well known graphite or plumbago; the best of this is the natural, found in a pure state in masses large enough to cut into strips. Of this there is but one mine now up to the standard, which is in Asiatic Siberia, and pencils made from this graphite are all one grade, and pay here 50 cents per gross special, and 30 per cent *ad valorem* duty. The Cumberland mines in England were the first discovered, but are now almost exhausted. What was formerly refuse in cutting the graphite is now ground, cleaned and refined, and then mixed with a fine clay.

In mixing the clay and graphite, great care must be taken in selecting and cleaning the clay and getting the proper proportions; the mixture, with water, after being well kneaded, is placed in a large receiver and strongly compressed and forced out through a small groove at the bottom, in the shape of a thread of the thickness and style required—either square, octagon, or round. This thread, or lead wire, is cut in bars of the proper length (done by little girls), and then straightened, dried at a moderate heat, and packed in airtight crucibles and placed in the furnaces; the grade of the lead depends upon the amount of heat it is exposed to, the amount of clay used in mixing, and the quality of the plumbago. The coloring of the lead is by various pigments.

The wood, after being thoroughly seasoned, is cut in thin strips and dried again, then cut into strips pencil length. These strips are grooved by machinery, then carried on a belt to the glueing room, where the lead is glued in the groove, and then the other half of the pencil glued on. After being dried under pressure, they are sent to the turning room and rounded, squared, or made octagon, by a very ingenious little machine, which passes them through three sets of cutters and drops them ready for polishing or coloring—the former is done on lathes by boys, and the latter by a machine which holds the brush and turns the pencils fed to it through a hopper. After the pencil is polished, it is cut the exact length by a circular saw, and the end is cut smooth by a drop knife, the pencil resting on an iron bed.

The stamping is done by a hollow die, which is heated; the gold or silver foil is then laid on the pencil which rests in an iron bed, and the die is then pressed on it by a screw lever. The pencils are then ready to go to the packing room, whence they find their way to all parts of the civilized world at prices ranging from two dollars to twenty dollars per gross.—*American Exchange and Review.*

New Carriage Mountings.

These mountings, such as shaft, whiffletree, and pole tips, the nuts and rivets for top props, hub bands, etc., are made, as is usual, of iron, brass, or white metal, and are coated with hard rubber or gutta percha, leaving exposed, to be plated with gold or silver, a small portion for ornament. A whiffletree tip, for instance, has the "dragon tongue" and the neat bead at the base plated with gold or silver, and the remainder is coated with the hard rubber. A beautiful contrast between the highly polished metal and the brilliant jet black surface of the hard rubber is produced. It has more the appearance of an article of jewelry than one intended for hard service on a carriage. In addition to their beauty, these articles combine the important feature of durability. The surface of the hard rubber will not become scratched or dented as readily as metal, even malleable iron. It will not easily chip off, indeed can hardly be broken off with a hammer; and we are informed that it does not tarnish by exposure to the weather, and will not lose its color from the same cause. They are as strong as the same articles now in use, the hard rubber coating being only a little thicker than the ordinary close plate. When the ornamental parts become tarnished, they can be cleaned or replated without injury to the rubber portion.

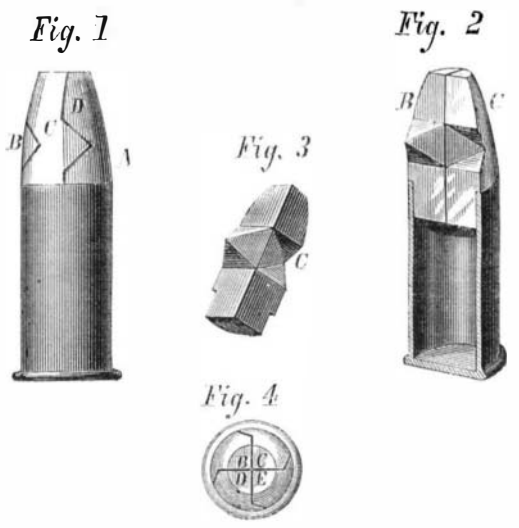
During the last few years, the public taste has been for showy gold and silver mountings, but there is a growing desire for something more quiet, which shall be at the same time rich and elegant; and our more prominent carriage builders are already using leather covered handles, prop nuts, etc. In Paris, rich gold and silver mountings, and the bright, gay inside linings of former years, have given way to things more sober, owing somewhat, no doubt, to the wide-spread affliction in that unfortunate nation. In the matter of price, we understand that the rubber mountings are of about the same expense as the best plated ones.—*The Hub.*

PROJECTILE FOR FIREARMS.

This improvement relates to that class of projectiles which are formed in sections. Hitherto the parts have been so constructed that, when fitted together, they were free to move one upon the other, and hence the slightest obstacle to the flight of the ball might cause separation of the sections and frustrate the purpose of the missile.

To remedy this defect, the inventor forms the sections as represented in our engraving, where Fig. 1 is a side view of the missile attached to a metallic cartridge case. Fig. 2 is a longitudinal section of Fig. 1, showing sections in perspective. Fig. 3 is a perspective view of one of the sections, and Fig. 4 is the top of the missile.

The missile, A, is thus composed of four parts, shown respectively at B, C, D and E, which are each provided with an angular projection and depression so that they will fit together and make a complete whole when in the gun barrel.



In this way bands are dispensed with, and the ball can be handled, even carelessly, without displacing its parts.

Further information can be obtained of the inventor, Mr. Carlos Maduell, of New Orleans, by whom patents of January 9, 1872, and reissue of March 19, 1872, were obtained through the Scientific American Patent Agency. Post office address, lock box 893, New Orleans, La.