

**PRUNING AND GRAFTING IMPLEMENT.**

The tool shown in the engraving is designed for grafting and pruning, the knives being changeable, so that it may be readily adapted to either purpose.

The main portion, A, of the tool contains a toggle joint, B, connected with the sliding bar, C, which carries the knife. A lever, D, pivoted to the part, A, is connected by a link with the toggle joint, B, completing an arrangement of levers capable of moving the knife with great force as the handles of the implement are brought together.

The part, A, is bent to form a support for the limb to be cut, and the support is lined with wood or soft metal to prevent injury to the knife.

The knife represented in the engraving is V-shaped, and the cut made by it is shown in the little detail view. This form of cut is made in grafting. This tool is the invention of Mr. Charles M. Kingsbury, of Tama City, Iowa.

**IMPROVED HARDENING TONGS.**

The annexed engraving represents an improved implement for holding and manipulating steel articles during the process of hardening. It consists in a pair of tongs having T-shaped jaws, provided with pointed pins which bear upon opposite sides of the article, and prevent it from twisting out of shape when it is plunged into the water to cool, while it allows the water to completely surround the article and cool it as readily as it would if it were plunged in the usual way. One of the jaws is movable and is capable of adapting itself to tapering surfaces.

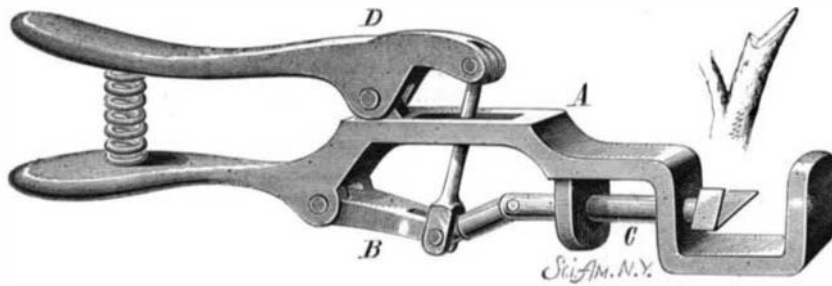
This implement is the invention of Biel Le Doyt, deceased. The patent is issued to Mary M. Taylor, administratrix, Mansfield, Mass.

**TYING-IN MACHINE.**

The tying-in machine shown in the accompanying engraving is the invention of Messrs. J. P. Binns and J. Shackleton, and is made by Messrs. Greenwood & Batley, of Albion Works, Leeds, England. It is designed for tying-in the new warp to the old in weaving operations, or connecting each end or thread of the new to the ends or threads of the old warp, so as to allow them to be drawn through the mails or eyes in the healds or harness and sley or reed. Until the present time this operation of tying-in has been done altogether by hand, either by taking the two ends of each thread separately and tying them together, or, as in the manufacture of fine goods having a light and elastic warp, by twisting them together. The object is satisfactorily effected by the machine, working entirely automatically and by power, making a secure knot, and thus performing with accuracy and dispatch what was previously a tedious hand operation. The machine, well illustrated by the engraving, has a suitable framework, on one side of which is placed the warp beam with the new warp upon it, and on the other side the healds or harness and sley or reed, with a portion of the old warp in them, the ends or threads being secured to rails, and extending across or lapping over each other sufficiently to allow for the forming of the tie. A carriage is mounted upon the framework, sliding upon rails or rods, and capable of being moved laterally or crosswise of the warp threads. The framework also supports a rotary horizontal driving shaft, which the carriage slides upon, and which carries and gives rotary motion to a barrel having several cams attached to it for operating the various levers which control the movements of the machine. This carriage supports a vertical reciprocating slide bar carrying a needle

or hooker by which the threads are seized and placed in position to be tied together, the bar receiving its motion from one of the cams already referred to and a suitable lever. Another barrel or hollow shaft is supported on this carriage, receiving rotary motion from the driving shaft,

pushing the loop off of the boss, drawing the threads tight against the holding of the needle, and forming the knot. The knotted threads are removed by a finger, the next threads are in turn taken up, and the operation is continued until the whole of the warp is tied in. A self-acting stop motion is attached which stops the machine should a knot be missed, thus securing good work, and insuring that all the ends of the new warp are attached separately to those of the old.

**NOVEL PRUNING AND GRAFTING IMPLEMENT.**

and on one side of it is a boss. A sliding finger is mounted on the outside of the barrel, carrying a cam at one end, and a reciprocating sliding needle within the barrel is operated by another cam and lever. Intermittent motion is given to the carriage across the warp by a screw shaft which is worked by a ratchet wheel and catches. Knives are furnished for cutting the ends or threads of the warp, at the time required, to the proper length for tying together. There are four horizontal shafts, each carrying a half flange or

press, and provides it with a lever attachment, by which it is rotated and caused to take up or wind on the ropes connected with the follower.

Mr. Martin W. McCortney, of Mount Pleasant, Mich., has patented a single cylinder double acting force pump for wells, of novel construction, having its valves and connections fitted in a simple and durable manner, and so as to be readily accessible.

An improvement in that class of drag saw machines in which the saw is attached to a lever that is pivoted in a frame and vibrated by a hand lever, has been patented by Mr. William N. Kyle, of Edinburgh, Ind.

An improved windmill, patented by Mr. Ratti Lorenzo, of Loyalton, Cal., consists of vanes affixed to a carriage adapted to move freely on an incline attached to the pivoted head of the mill, and extending backward parallel to the face of the wheel, whereby, when a strong wind is blowing, the carriage is forced out on the incline, and by the greater leverage thus obtained it carries the wheel nearer to the wind, and thus lessens the speed; but when a lighter wind is blowing the carriage descends the incline, lessening the leverage and permitting the wheel to come around in opposition to the wind.

An improvement in parallel vises, patented by Mr. Niels P. Ringstad, of Mankato, Minn., consists in connecting the jaws with links pivoted to a central slotted guide, in which a traveler is held and pivoted to one pair of the links, whereby, when the jaws are screwed open or shut, the links, turning on their pivots, compel the moving jaw to move in a line parallel to the stationary jaw.

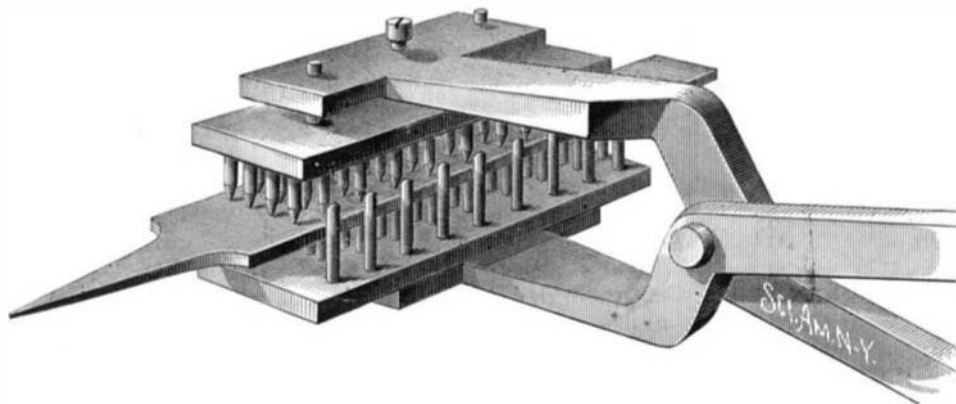
Mr. Alexander McDonald, of Toronto, Ontario, Canada, has patented an improved brake for children's carriages, which is simple, readily applied, and capable of holding the carriages securely, preventing them from moving when left alone.

An improvement in that class of water elevators in which a well bucket is attached to a rope or chain plying over a

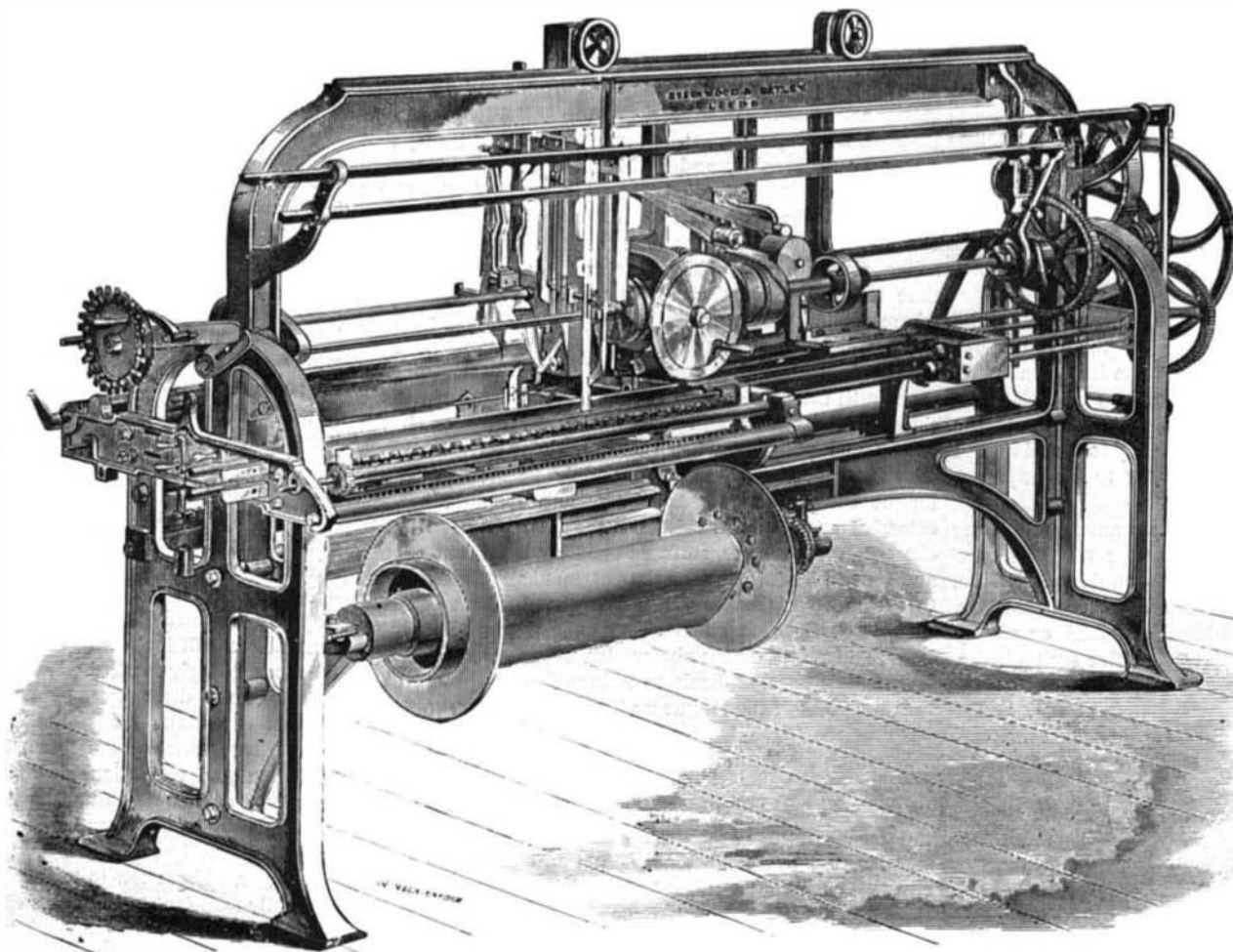
windlass provided with a crank for rotating it, has been patented by Mr. James C. Barrett, of Marion, N. Y. This is an improvement upon that for which the same inventor received Letters Patent of the United States No. 41,410.

Mr. Frederick Stedman, McBride's, Mich., has patented improved journal boxes for the machine known as "Hall's shingle machine," which is so constructed as to allow the shafts to play freely as the gear wheels are thrown out of and into gear, and which may be adjusted vertically and horizontally, as may be desired.

An improved machine for forming carriage shackles has been patented by Mr. Stratton M. Rowell, of Port Chester, N. Y. The invention consists in the construction of peculiar bending dies, which cannot be described without engravings.

**HARDENING TONGS.**

finger for freeing and separating the warp threads. These shafts are geared together at one end, and intermittent rotary and reciprocating motion is imparted to them by means of a cam with lever and rod, working in connection with ratchets and catches, and operating the screw bushes or bearings of the shafts. In the framework of the machine are two guide pins for the vertical needle to pass and draw the warp threads between after being cut, keeping them together and holding them while the finger on the rotary band turns them around a curved groove in the boss on the end of the barrel to form the loop. When the loop is formed, the sliding needle within the barrel draws the ends of the threads through the loop, and a lever is brought into operation,

**TYING-IN MACHINE.**