

AN IMPROVED PARALLEL RULER.

We give on this page an engraving of a novel parallel ruler recently patented by Mr. George Cousins, of Oswego, N. Y. It is intended for all of the purposes for which parallel rulers are commonly used, and in addition to this it may be used for duplicating designs, curves, etc.

The plate, A, which forms the body of the ruler, has formed in it two oppositely disposed segmental openings, whose straight sides form an angle of 45° with the beveled edges of the ruler. It has also several small circular apertures, which may be utilized in forming curved lines.

Parallel with one of the edges of the plate, A, a shaft, C, is journaled in suitable supports. On the ends of this shaft and outside of the bearings there are grooved wheels, D, which do not quite touch the surface on which the plate, A, rests.

To one of the wheels, D, is an arm, E, secured by the screw, F, as shown in Fig. 2, and in the groove of the same wheel there is a pin that strikes the stop which is secured to the plate, A, by the screw, I. This stop is arranged to engage the arm, E, also.

On the shaft, C, is placed a spiral spring, K, which returns the pin in the groove of the wheel to the stop on the plate, A, as indicated in Fig. 3.

The side of the wheel, D, is graduated so that the arm, E, may be adjusted at any required distance from the pin in the groove. This distance governs the space between the lines formed along the edge of the ruler.

In drawing parallel lines the arm, E, having been adjusted as already described, the shaft, C, is pressed down until the wheels, D, touch the paper on which the lines are to be made; this tips up the beveled edge of the plate, A. The instrument is now moved forward, by rolling the milled portion of the shaft under the fingers, until the arm, E, strikes the stop on the plate, A, when the plate is allowed to regain its former position and the line is drawn. In drawing the successive lines the operation is repeated.

Section lining is done along the straight edges of the segmental openings, and curved lines are formed along the curved sides of the openings. Various designs may be duplicated by fastening patterns to the plate, A, so that they will move with it.

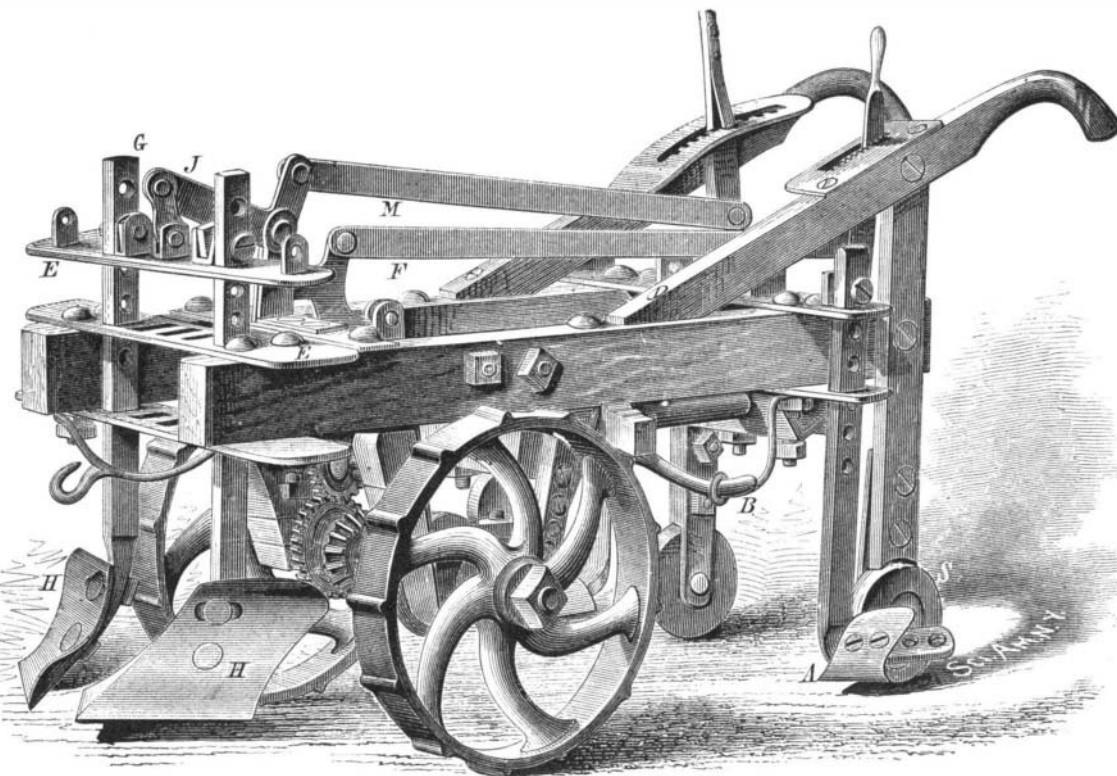
A COMBINED CHOPPER AND CULTIVATOR.

We give herewith an engraving of a new agricultural machine recently patented by Mr. John W. McMillan, of Brookhaven, Miss. This implement combines, in compact and usable form, a planter, chopper, cultivator, and a fertilizer distributor; in fact, it seems to be all that is required for the treatment of an entire cotton crop.

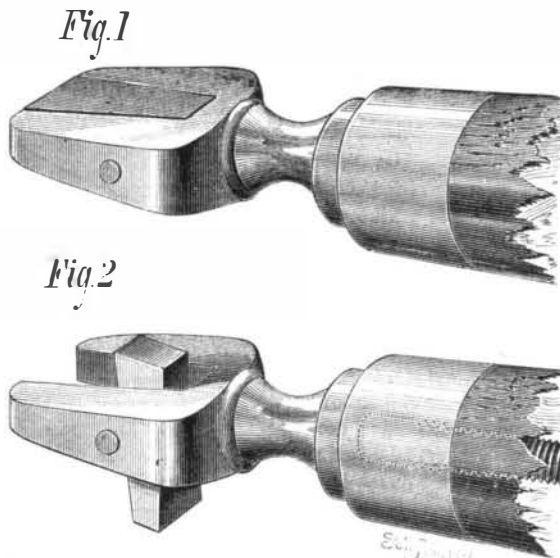
The machine, as will be noticed by referring to the engraving, carries two oppositely disposed plows, H, fixed to adjustable standards, G, guided by the plates, E, which are bolted to the forward end of the main frame. This frame is supported by two large wheels having corrugated or ribbed rims, and by two smaller wheels, S, which follow the small plows, A, at the rear of the machine. The standards are adjusted vertically by the hand lever at the rear of the machine through the rod, M, and angled lever, J. Behind the axle of the driving wheels there is a crank shaft which takes its motion through intermediate gearing from a bevel wheel on the axle.

This gearing may be thrown into and out of gear by means of the shorter lever at the rear of the machine, which communicates by a bar, F, with an angled lever connected with the movable portion of the gearing. The crank of the shaft referred to moves an arm, B, to which is attached a hoe whose motion is similar to that of the hand implement. The upper end of the hoe arm passes through a spring support, which allows the hoe to yield under undue strain.

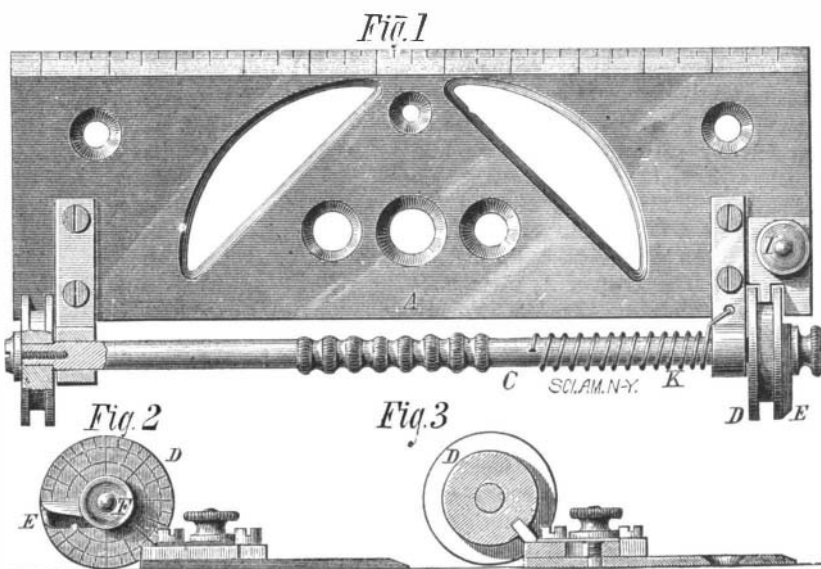
Plows and hoes of different sizes and shapes, and colters, and harrow teeth may be attached. The plows may be adjusted laterally and vertically, and the various parts are adjustable to suit different kinds of work. It is stated that the machine will "flat-break" land, ridge up and bar off, scrape and chop out cotton, as well as the most experienced hand. It is capable of distributing from 10 lbs. to 1,000 lbs., of fertilizer to the acre, and will easily perform the several operations for which it is designed.

**McMILLAN'S CHOPPER AND CULTIVATOR.****A NEW WHIFFLETREE HOOK.**

A novel and very simple device for securing traces to whiffletrees is shown in the accompanying engraving. Its

**SMITH'S WHIFFLETREE HOOK.**

construction is so clearly shown as to require very little explanation. The head of the pin in the end of the whiffletree is forked to receive a tapering tongue, whose pivot is arranged in relation to its center of gravity so that it will, by its own weight, assume a position at right angles with the

**COUSINS' PARALLEL RULER.**

pin as shown in Fig. 2. The trace is put upon the pin while the tongue is parallel with the head, as in Fig. 1; the tongue is afterward allowed to take the position shown in Fig. 2.

This invention was recently patented by Mr. Allen Smith, of Fort Randall, D. T., from whom further information may be obtained.

Phosphorus-Tin for Journal Boxes.

Ravene & Co., in Berlin, employ an alloy of tin and phosphorus for casting journal and axle boxes. It is easily fused,

ble, melts at 330° C. (626° F.), does not heat at all when in use, and hence requires but little, if any, lubricator, and as it is scarcely at all affected by acids, cheap oils can be used. A great advantage is that no mould is required in which to cast it. The axle is placed in the box, which is closed with boards on each side and well stamped down with clay, and the metal poured directly into the mould thus formed. When cold the shell is taken out and cleaned, the oil hole bored, and it is ready for use. If not overheated this metal shrinks very little, if any, on cooling, and hence fills the mould most accurately, so that by using this metal instead of rough coating there is a saving of the cost for mould, for pattern, for boring out, and for fitting. It is said to last longer than other castings, will bear as great pressure and greater speed. The price in Berlin is, for No. 0, containing 5 per cent of phosphorus, \$50 per 110 pounds; and for No. 1, containing 2½ per cent of phosphorus, \$22.50 per 110 pounds.

The same alloy of phosphorus and tin is also employed for the manufacture of phosphorus bronze with great advantage both as regards cheapness and convenience, so that phosphorus bronze can be made in that manner with but little more expense than common bronze.

MISCELLANEOUS INVENTIONS.

Mr. William Vogan, of Newcastle, Pa., has an improved gate, which may be opened and closed by the wheels of a passing vehicle, and is not liable to become clogged or frozen fast.

A grain registering device for hand measures, which is contrived so that the act of "striking off" the surplus grain will ring a bell and operate the recording mechanism, is the invention of Mr. L. C. Ives, of Indian Creek, Va.

Mr. J. F. Christian, of Nurnberg, Germany, has devised a button having the head and shank formed of two separate pieces, which may be readily put together or separated.

An improved vehicle spring, which is adapted to the bolsters of wagons, and has several advantages over the ordinary spring, has been patented by Messrs. R. MacKeller and B. Lent, of Peekskill, N. Y.

An improved middlings separator, which purifies the middlings (driving off the dust and other impurities) and separates them into different grades, is the invention of Mr. W. P. Anthony, of Chambersburg, Pa.

An improved Pavement, formed of two courses of planks crossing each other at right angles, a layer of coal tar and sand, irregular bois d'arc blocks set on end with their interstices packed with sand, the whole covered with coal tar, has been patented by Mr. Samuel L. Shellenberger, of Denison, Texas.

A novel guide for matching machines, intended to prevent the planer knives from splitting the edges of the boards and to guard against the breaking of the knives, is the invention of Mr. P. Cardiff, of Marshfield, Oregon.

An improvement in brick machines, invented by Mr. J. McL. Mitchell, of Dunlap, Iowa, is contrived so that while pressure is exerted on one set of bricks, the bricks previously pressed are discharged from the moulds.

A novelty in gate rollers, the invention of Mr. William Schwendler, of Appleton, Wis., consists of a flanged roller fitted to a screw pin by a ball joint, so that it may turn on its axis and also swing like a hinge.

A shuttle box motion for looms, in which springs are dispensed with, and an easy and sure movement is secured, is the invention of Mr. John Barker, of Whittenton (Taunton P.O.), Mass.

Mr. J. A. Novinger, of New Bedford, O., has an improvement in gravitating platform animal traps, which insures a renewal of the bait after each operation of the trap.

An improvement in reefing fore and aft sails, by Mr. J. L. Dickenson, of Hempstead, N. Y., saves time and labor in reefing, and brings the sail into proper shape for a storm sail. It has the advantages of a try sail, and insures the security of the gaff when the vessel rolls.

Mr. Valentine Cook, of New York city, has an improvement in beer coolers. The main feature of the invention is the device for strengthening the large shallow pans used in the process of beer cooling.

A sight for firearms, which combines the advantages of the different sights in general use, has been patented by Mr. W. Matthews, of Camp Bidwell, Cal.