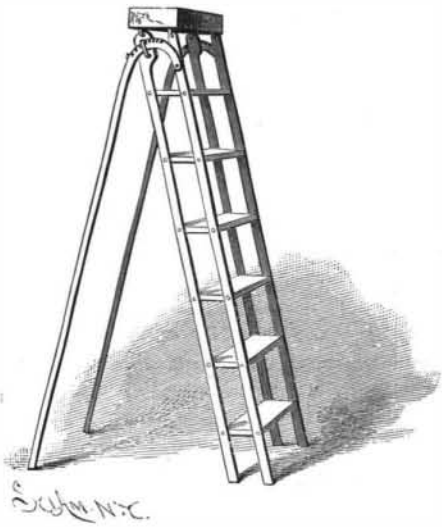


**IMPROVED AUTOMATIC STEP LADDER.**

The step ladder herewith illustrated is so constructed that the steps will be held in a horizontal position, no matter at what angle the ladder may be placed. The two pairs of side bars are pivoted to the ends of the steps and to the under surface of the platform, as clearly shown in the engraving. This construction allows all the steps to remain parallel with each other and with the floor, while the bars may be inclined at any required angle. Near the upper ends of the front bars are pivoted the upper ends of the legs, which are curved on a semicircle and pass through staples inserted near the upper ends of the rear side bars. The curved part of the legs is



**MACNIDER'S IMPROVED AUTOMATIC STEP LADDER.**

serrated to engage with the staples and hold the legs and bars in any position in which they may be adjusted. A stop pin limits the rearward motion of the legs. As the legs are swung on their pivots to adapt the ladder for use, the side bars will swing over and the steps will maintain their horizontal position independently of the inclination of the bars. The platform is preferably inclosed by side pieces, to form a convenient receptacle for brushes, etc.

This invention has been patented by Mr. Q. Mac-

nal slots, inclined away from the buffer, and to the slot is fitted a latch having, near its center, trunnions, which may be placed in any pair of diagonal slots, according to the thickness of the door. The weight of the latch is so distributed that, normally, the end next the door will project above the plate and into the path of the door. The door check is secured to the floor with the buffer at the point where it is desired to arrest the door when opened, and the trunnions of the latch are placed in a pair of the slots, so as to leave a space between the end of the latch and the buffer, about equal to the thickness of the door. When the door is opened, it glides over the latch, as shown in the sectional view, Fig. 2; and when the door has passed the latch, the lighter end of the latter rises in front of the edge of the door, and holds it in an open position, as shown in Figs. 1 and 3. The latch is operated by gravity alone, and the check is not therefore liable to derangement.

This invention has been patented by Messrs. W. A. Hinkle and F. C. Jeffery, of Galveston, Texas.

**IMPROVED WHEEL CULTIVATOR.**

The main frame is bow shaped, and to it is attached the tongue. Hinged to the main frame, upon bolts, are the axle frames, which are each provided with a wheel, and each is formed with a square frame that reaches in front of the axle on which the wheel is placed. Each axle frame is formed with an upwardly inclined arm, which acts as a lever for holding the gang bars in position, and the rear inner corner of each frame is connected to the upper portion of the main frame by a coiled spring, which serves to counterbalance the axle frame and prevent it from tilting. The gangs are duplicates of each other, each being provided with three sets of curved knives. The rear knives are curved outward, while the central and upper knives are curved inward, so they will counteract the side draught of the rear ones.

The knives are so arranged that all the ground traversed by the gang will be tilled. The sets of knives are secured rigidly to suitable cross pieces, attached to the main frames of the gangs, which are bolted to the rear ends of the gang bars. Each gang is provided with a handle, by which the plowman can hold and control the cultivator as it is drawn over the ground. The connections of the gangs to the gang bars are vertically adjustable, so that the penetration of the knives may be regulated. The gang bars are connected to yokes, hinged to the main frame below the axle frames, each by a vertical bolt which passes through any one of a series of holes made in the yoke. The bars swing on their bolts, while the yokes turn upon their horizontal bolts, so that a universal connection is thus formed for connecting the gangs with the main frame, which gives the gangs perfect freedom and enables the plowman to fully control them.

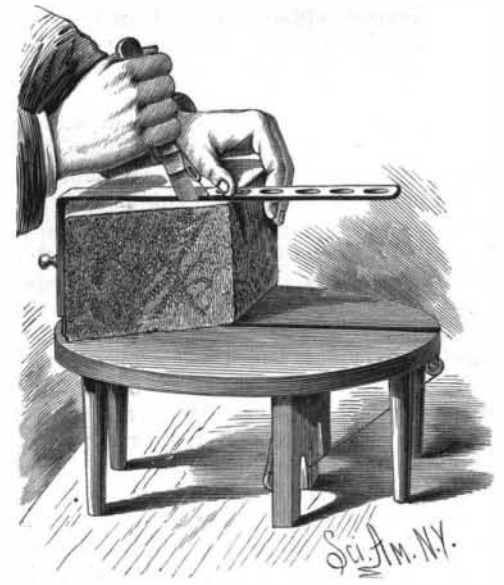
The series of holes in the yokes permit of lateral adjustment of the gangs to suit the width of rows to be cultivated. The knives can be set at different angles to the frame, up or down, independently of each other, and as the weight of the main frame comes in front of the axle, the gang bars are forced downward, so as to cause the cutters to penetrate the ground. In this manner the knives themselves carry a part of the weight of the frame, while the coiled springs exert a downward pull upon the frame. The combined downward action of the weight of the frame and the springs upon the gangs may be regulated as required. Upon the rear end of the tongue are secured hooks, on which the gangs can be supported when the cultivator is being transported to or from the field.

This invention has been patented by Mr. Joseph C. Schwaller, of Halbur, Iowa.

**CHEESE CUTTER.**

By means of this device, which is the invention of Mr. Samuel P. Hodgen, of Pittsfield, Ill., a full cheese can be divided into two parts and slices cut from either, without crumbling or hacking the cheese. To the front end of one of the halves of the platform, which is divided by a central slot, is secured an upright on which an angular guide or gauge is vertically adjustable. One end of a spring cord is secured to the under side of the platform, and is led, parallel with the slot, over a grooved pulley at one end, then around a pulley on a cross piece placed on the under side of the platform, at right angles to the slot, and the other end is connected with a knife. When a cheese is to be halved, it is placed upon the platform, and the gauge is adjusted until its horizontal arm rests on top of the cheese. The knife blade is then inserted in the bottom of the cheese, on the back side of the cross piece, and drawn to the back edge of the platform, then up the back edge,

along the front edge of the gauge, down the front and along the slot to the starting point. By then pulling on the wire, which follows the movement of the knife, and is guided in the slot, the inner part of the cheese is cut. The cutting of halves of the cheese is done from the center to the edge, and down in line with the gauge



**HODGEN'S CHEESE CUTTER.**

and slot, either by the use of the knife or wire, or of both combined. The knife cuts mainly through the crust part of the cheese, the inner, soft part being cut by the wire, which is kept taut by the spring, so that it will follow the cut started by the knife point.

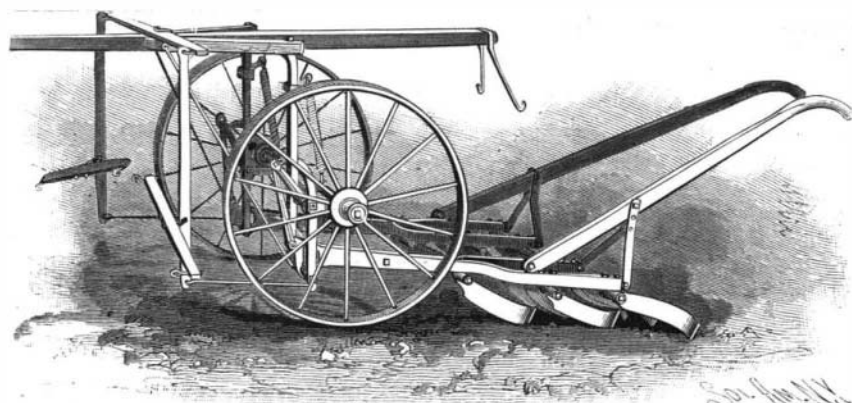
**COMPRESSED AIR GREASE CUP.**

The great merits of the grease cup shown in the accompanying sectional view are its simplicity of construction and its automatic and continuous feed. It is designed for the manipulation of grease or "dope," a composition which, for some purposes, is superior to oils. This cup feeds the grease continuously till emptied, and requires no attention whatever beyond the mere filling from time to time.

The cup, A A, is provided with a regulating valve, E, above the outlet orifice, a. B is a hollow cap, provided with an air tight piston, C, with hydraulic packing. The operation is as follows: The cap being removed, the piston is drawn in to supply air to the air chamber, F. The packing of the piston and the inside of the cap are slightly greased, to reduce the friction to a minimum. The piston is then replaced in the mouth of the cap, when the cup is filled completely with grease. The cap is then screwed down the entire length of the threads. As the piston, C, located within the cap, is forced inward, it is evident that a quantity of air will be confined and compressed in its rear, in the chamber, F. It will be seen, therefore, that upon the opening of the regulating valve, E, sufficiently to permit the proper amount of grease to escape, the compressed air in the rear of the piston is allowed to expand, exerting a constant and even pressure upon the grease to force it from the cup, this action being automatic. As the attendant has absolute control of the outflow of the contents, by means of the valve, the economy and convenience of the cup are assured. This cup, according to its size, will manipulate its contents in from six days to two months. No matter in what position the cup may be placed, the grease is always forced to the bearing, making it most valuable for loose pulleys.

Any further information may be obtained from Mr. John C. Grout, 17 Newberry & McMillan Building, Detroit, Mich., who is the sole manufacturer of these cups.

We are pleased to learn that Professor Samuel P. Langley, of the Allegheny Observatory, Pittsburg, has received from the Royal Society of London the Rumford medal for meritorious discoveries in light and heat. The medal is of solid gold, 260 pennyweights, and is accompanied with a facsimile of itself in silver.

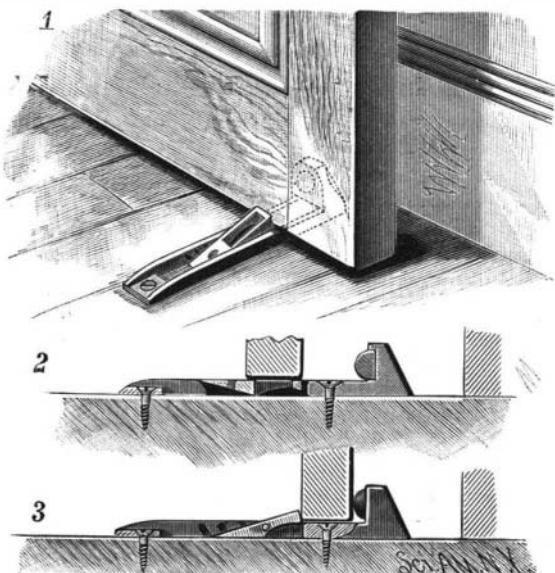


**SCHWALLER'S IMPROVED WHEEL CULTIVATOR.**

nider, of Belleville, Ontario, Canada, who will furnish all further particulars.

**IMPROVED DOOR CHECK.**

This simple device is for arresting the motion of a door while being opened and for fastening it in an open position. The base plate is formed with a longitudinal slot extending through the greater portion of its length, and has at one end a right angled arm, formed with a chamber for receiving an elastic buffer. In opposite walls of the slot are formed series of diago-



**HINKLE & JEFFERY'S IMPROVED DOOR CHECK.**