

(No Model.)

2 Sheets—Sheet 1.

W. McCUNE.  
COMBINED HARROW AND PULVERIZER.

No. 559,191.

Patented Apr. 28, 1896.

Fig. 1.

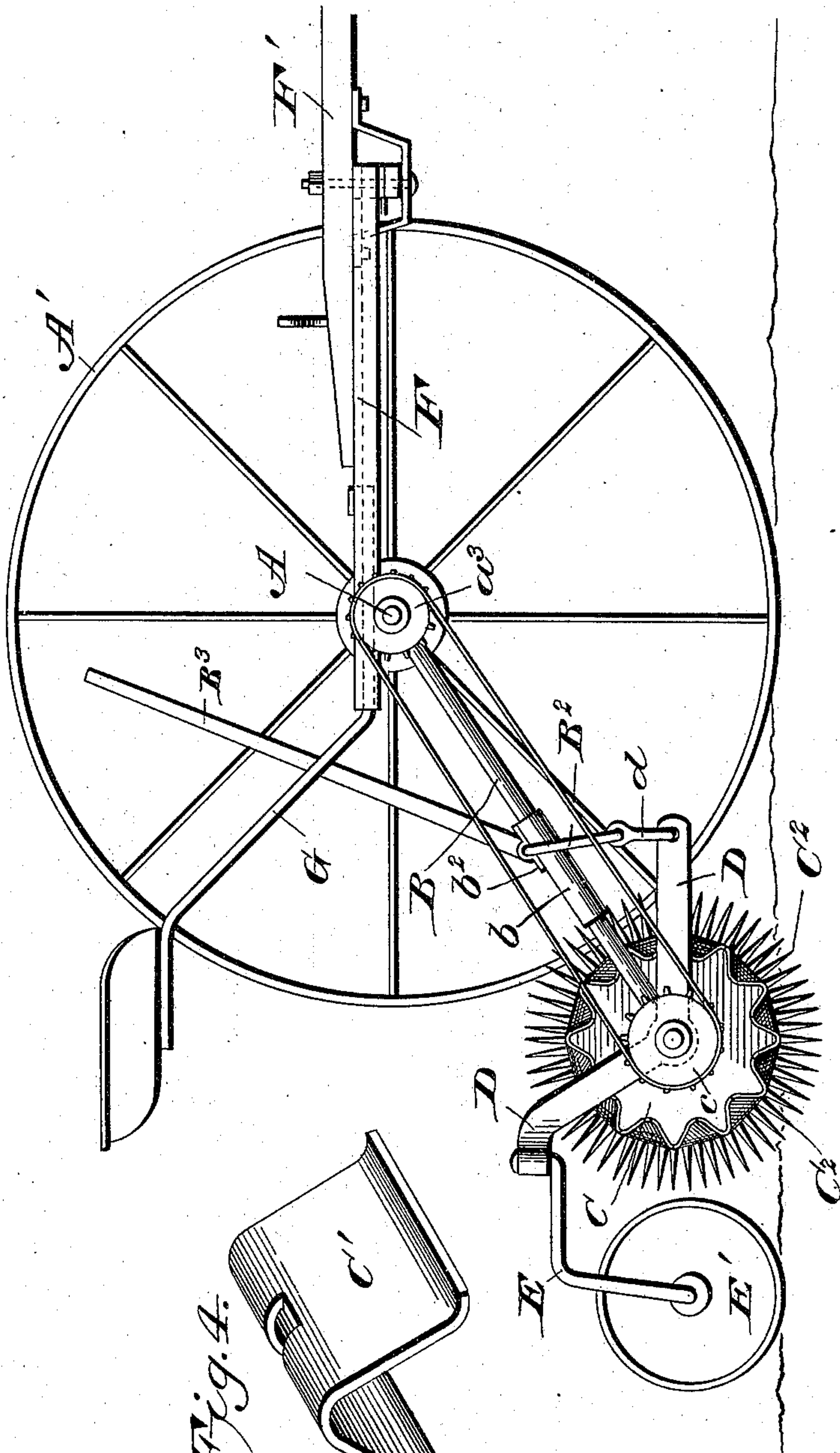
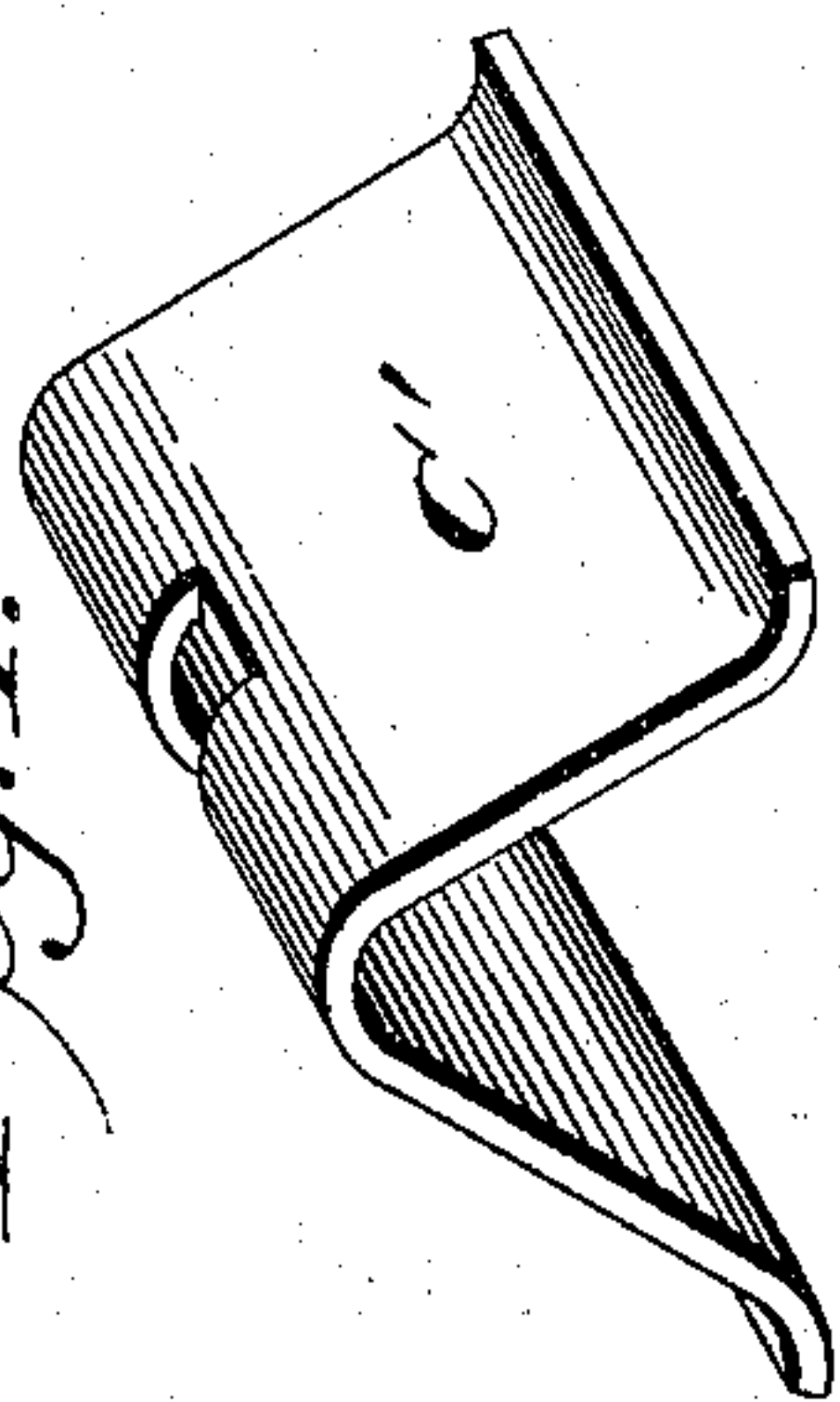


Fig. 4.



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by *[Signature]* Attorney

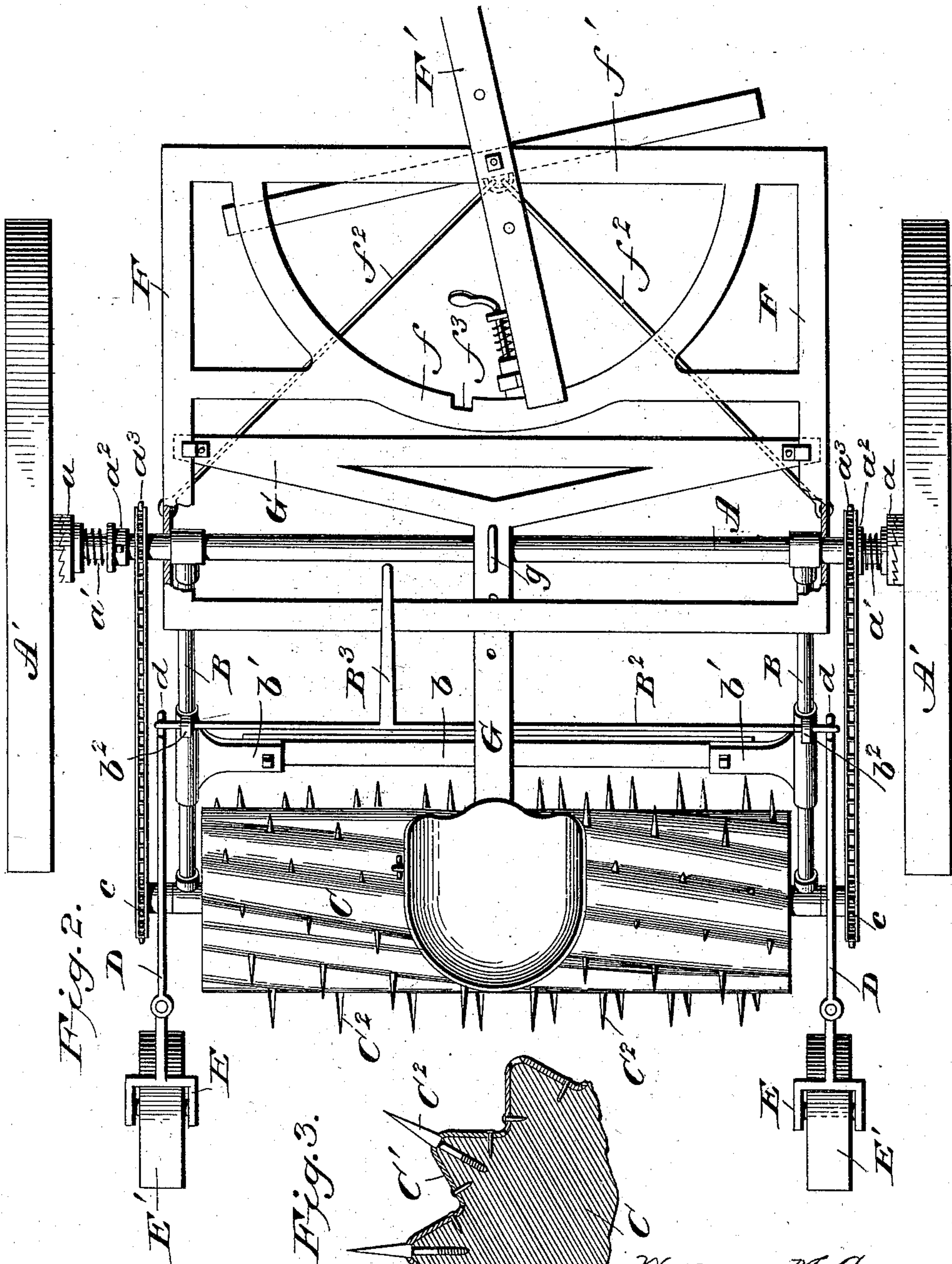
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# UNITED STATES PATENT OFFICE.

WILLIAM McCUNE, OF CARTHAGE, MISSOURI.

## COMBINED HARROW AND PULVERIZER.

SPECIFICATION forming part of Letters Patent No. 559,191, dated April 28, 1896.

Application filed October 31, 1895. Serial No. 567,498. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM McCUNE, a citizen of the United States of America, residing at Carthage, in the county of Jasper and State of Missouri, have invented certain new and useful Improvements in a Combined Harrow and Pulverizer; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The object of my invention is to provide an agricultural implement of improved construction mounted on supporting-wheels the axle of which is geared to a roller having a spirally-corrugated surface provided with teeth, the gearing being such that the roller will drag and slowly turn to thoroughly break up the clods and pulverize the soil and the roller-carrying frame being pivotally connected to the axle and provided with caster-wheels, which are attached to bell-crank levers, by which the roller is lifted and supported above the ground.

The invention consists in the construction and combination of the parts, as will be herein-after fully set forth, and particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is side elevation of a harrow and pulverizer constructed in accordance with my invention. Fig. 2 is a plan view. Fig. 3 is a detail sectional view showing the manner of attaching the teeth to the roller, and Fig. 4 is a detail perspective view of one of the plates which hold the teeth in place.

A designates the axle, which is journaled to the main frame so as to turn freely in its bearings, said axle being provided with clutch-sections  $a$ , which are held in engagement with clutch-faces on the inner ends of the hubs of the supporting-wheels  $A'$  by springs  $a'$ , which bear against collars  $a^2$ , carried by the axle. By this arrangement the axle is turned only when the machine is drawn in a forward direction.

B designates the roller-carrying frame, which is preferably made of tubular metal

and is provided at its forward end with sockets, through which the axle A passes, and at its rear end with sockets, through which pass the shaft or stub-axes of the roller C. The side pieces of the frame B are connected to each other at an intermediate point by a cross-bar  $b$ , attached at its ends to castings  $b'$ , provided with sockets, which embrace the side pieces, the castings being rigidly connected to the side pieces by set-screws, as shown. The castings  $b'$  have apertured lugs  $b^2$  formed thereon, through which passes a rock-shaft  $B^3$ , provided with an operating-lever  $B^3$ .

The stub-axes of the roller C are provided at their outer ends with sprocket-wheels  $c$ , which are geared to the axle A by means of sprocket-chains which pass over sprocket-wheels  $a^3$  thereon. The sprocket-wheels  $c$  are removably connected to the stub-axes, so that others can be placed thereon to change the rotation of the roller C with respect to the supporting-wheels  $A'$ . Upon the stub-axes are mounted bell-crank levers D, the forward ends of which are connected to the crank ends of the rock-shaft  $B^3$  by links  $d$ , and the rear end of said bell-crank levers are connected to supports E, which carry rollers or caster-wheels  $E'$ .

By the construction hereinbefore described it will be noted that when it is desired to transport the machine from place to place the roller C can be elevated above the surface of the ground by depressing the lever  $B^3$ , which rocks the shaft  $B^3$  and throws the weight of the parts upon the caster-wheels  $E'$ .

The main frame F of the machine is provided at its forward end with a segment  $f$ , which extends rearward from the front cross-bar  $f'$  of the frame, and to the front cross-bar the draft-tongue  $F'$  is attached by a king-bolt, the rear end of the tongue bearing upon the segment. Brace-rods  $f^2$  extend from the tongue to the rear end of the main frame, as shown. The segment  $f$  is provided with a notch  $f^3$  with which a spring-catch, carried by the rear end of the tongue, engages when said tongue is parallel with the line of draft. The spring-catch is provided with a projection by which it is manipulated to throw it out of engagement with the notch, so as to allow the tongue to swing around in turning the machine.



G designates the frame which supports the driver's seat, and this frame is provided in front of the axle with a cross-bar which engages with the side pieces of the frame F, being connected to the axle by a U-bolt *g*, a number of perforations for the U-bolt being provided, so that the seat can be adjusted to suit the weight of the driver.

The roller C may be made of wood or iron and is provided with spiral grooves which form spiral projections. When the roller is made of wood, the spiral projections are reinforced by metal plates C', which are of such shape that they will abut against each other and cover the surface of the roller. The plates are provided centrally with apertures through which the teeth C<sup>2</sup> pass, the teeth being inserted in the roller before the plates are attached, so that said plates will hold them in position. The shank of the teeth is threaded to engage threaded aperture in the roller, while the projecting part is rectangular to engage the rectangular aperture in the plates to prevent said teeth turning.

In operation the roller C turns as the implement is drawn across the field, but is not rotated at the same rate of speed as the supporting-wheels A', so that it will act as a harrow and also level the soil.

I am aware that prior to my invention it has been proposed to provide a harrow and pulverizer actuated from the axle of the supporting-wheels, the gearing being such that the toothed roller turned at a greater rate of speed than the driving-wheels, an attempt being made by this construction to provide an implement which would pulverize the soil; but it is obvious that in a device thus constructed a comparatively small number of teeth could be used, and there would be an entire loss of the drag action similar to that of an ordinary drag-harrow.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a harrow and pulverizer, the combination with a wheel-frame, of a frame B pivoted or hung at its forward end on the axle of the wheel-frame, a spirally-grooved and

toothed roller C journaled in the lower end of the frame B, and gearing substantially as shown connecting the roller C to the axle of the wheel-frame; together with bell-crank levers D mounted on the ends of the axle of the roller, said levers carrying caster-wheels at their rear ends which are adapted to rest upon the ground, and a rock-shaft supported upon the frame B and having crank ends connected to the forward ends of the bell-crank levers, the parts being organized substantially as shown and for the purpose set forth.

2. In a harrow and pulverizer, the combination with a wheel-frame, of a frame B consisting of side pieces or tubes connected at their forward ends to couplings loosely mounted on the axle of the wheel-frame; a transverse bar adjustably secured to the side pieces and carrying bearings, *b*<sup>2</sup>; a spirally-grooved and toothed roller C journaled in the lower ends of the side pieces of the frame B, and gearing connecting the roller C to the axle of the wheel-frame; together with bell-crank levers mounted on the ends of the shaft of the roller C, caster-wheels carried by the rear ends of the bell-crank levers, and a rock-shaft journaled in the bearings *b*<sup>2</sup> and having crank ends which are connected to the forward ends of the bell-crank levers, the parts being organized substantially as shown, and for the purpose set forth.

3. The roller C having a spirally-grooved face, teeth carried by the roller, and plates C' having apertures through which the teeth pass, substantially as shown and for the purpose set forth.

4. The roller C having a spirally-grooved face, teeth carried by the roller and provided with rectangular portion, and plates C' having rectangular apertures which engage the teeth, said plates being secured to the face of the roller, substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM McCUNE.

Witnesses:

LEANDER GREEN,  
E. W. MCFARLAND.