

A. P. Thayer

Steam Plow

N^o 40,717

Patented Nov. 24, 1863.

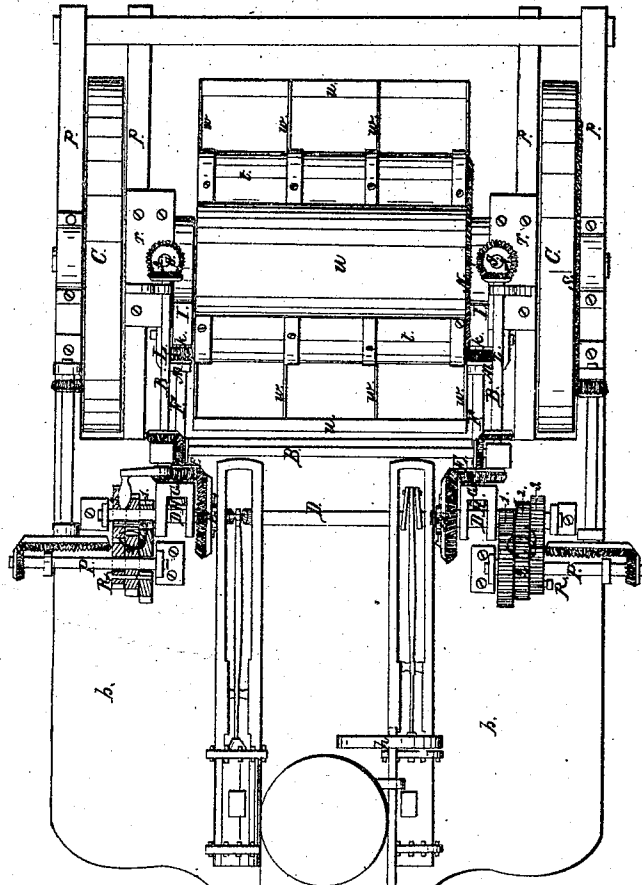


Fig. 1.

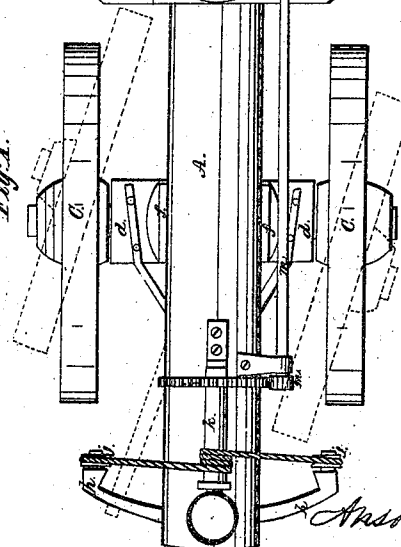


Fig. 2.

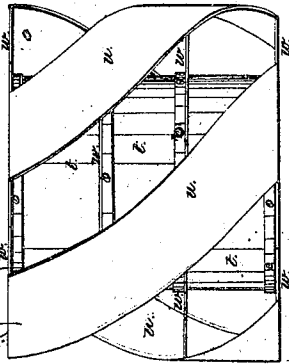


Fig. 3.

Witnesses:
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Fig. 3.

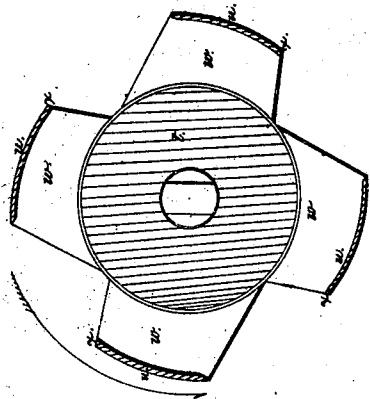


Fig. 4.

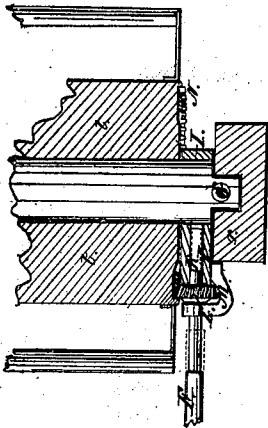


Fig. 2.

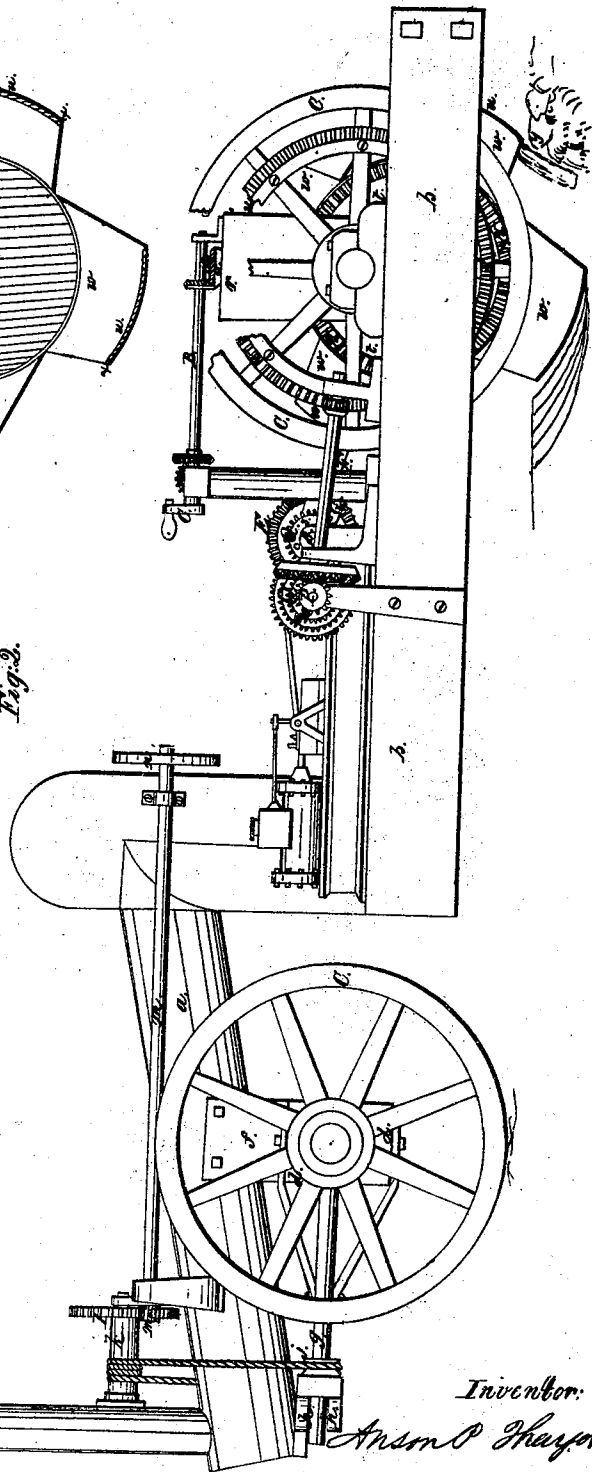
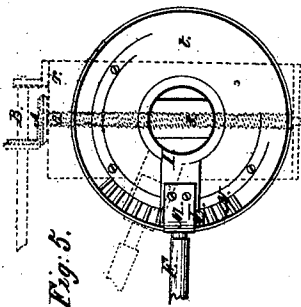


Fig. 5.



Witnesses:

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UNITED STATES PATENT OFFICE.

ANSON P. THAYER, OF SYRACUSE, NEW YORK.

IMPROVEMENT IN STEAM-PLOWS.

Specification forming part of Letters Patent No. 40,717, dated November 24, 1863.

To all whom it may concern:

Be it known that I, ANSON P. THAYER, of the city of Syracuse, in the county of Onondaga and State of New York, have invented a new and Improved Machine for Plowing and Pulverizing the Soil; and I do certify that the following is a full and exact description thereof, reference being had to the accompanying drawings and the letters of reference marked thereon—

Figure 1 being a plan view of my machine, showing one set of the gear-wheels for changing the speed of the plow, in section. Fig. 2 is a side elevation, one of the driving-wheels being broken to show the post *r* and attachments more perfectly. Fig. 3 is a vertical transverse section of the cylinder and spades. Fig. 4 is a longitudinal section of the cylinder and coupling *I* transverse of the post *r*, showing the axle, the attachment of the shaft *F* to the coupling *I*, and the slot of the post *r*, in which the end of the axle of the cylinder moves. Fig. 5 is an end view of the cylinder and coupling *I*, the red lines indicating the position of the post *r*, the screws *s*, and the coupling *I* when the cylinder is lowered to a working position. Fig. 6 is a plan view of the cylinder, showing the spades attached spirally, so that one spade commences to cut before the preceding one has ceased to cut.

The nature of my invention consists of a mechanical device for the application of steam-power to plowing and cultivating the soil by means of a rotating cylinder having attached upon its periphery plows or spades, by means of which the soil is cut into thin slices and carried to the rear of the machine, where it is deposited bottom side up in a pulverized state.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

I construct a steam-boiler of the form shown in the drawings and marked *a*, which is attached to the platform or frame-work of the car *b*, and suspended upon the four wheels *c* in such manner as to equalize the weight as nearly as possible upon each of the said wheels.

I construct the front axle, *d*, in any ordinary manner, connecting it and the bridge *f* upon which the boiler rests at the center of the axle

longitudinally and vertically. To this axle *I* attach a tongue, *g*, firmly braced upon the upper and lower sides of the axle, the front end of which I make to traverse in a slot or guides, *h*, formed of two or more bars of iron and made fast to the front end and lower side of the boiler, and curved to the arc of a circle having for its radius a line drawn from it to the center of the said axle. At each end of the guides *I* attach a grooved pulley, *j*. Upon the top and front end of the boiler *I* attach a shaft, *k*, and wheel *l*. To this wheel *I* connect a pinion and line-shaft, *m n*, the shaft running to the rear end of the boiler, where it has a hand-wheel, *n*, for guiding the car. *I* wind a rope several times around the shaft *k*, and each end over one of the grooved pulleys, thence attaching them to the end of the tongue *g*. The object of this device is to obtain a greater leverage power in guiding the car, taking the strain from the connection of the bridge *f* and axle *d*, thereby admitting of the weight of the car being equally distributed upon all the wheels and traveling over uneven ground with greater facility.

I construct the platform, of either wood or iron, of a depth of about half the radius of the wheels, and of any convenient size. To the body of the platform *I* attach a frame-work of beams, *p p p p*, running back a proper distance beyond the periphery of the driving-wheels. Two of each of these beams are on each side of the car and sufficiently distant from each other to admit of the driving-wheels to travel freely between them.

I construct the axles of the two driving-wheels independent of each other and of sufficient length to admit of suspending the beams from the ends of the said axles. At the rear *I* connect a cross-beam supporting the whole firmly together. Upon the inside of this frame-work and at the center of the driving-wheels *I* attach, on each side, an iron post, *r r*, having on their inner sides a slot in a vertical position. *I* arrange a horizontal shaft with each end in one of these slots, and a screw, *s s*, through each end of the shaft, running from top to bottom of the posts, to cause the shaft to traverse from top to bottom of the posts, say, about two feet or more, if desired. Upon the shaft *I* ar-

range a cylinder, *t*, as seen in Fig. 1, or any other suitable arrangement for attaching and revolving the spades, to which cylinder I attach the spades or plows.

I construct four sets of spades, *u u u u*, at equal points of the circumference of the cylinder, projecting from twelve to sixteen inches from the periphery of the same, and in the form of a sector of about one-eighth of the circumference of a circle and equal in length of the cylinder. These spades are made of cast steel or iron plates of about one-fourth of an inch in thickness. They are attached to the cylinder by supports *w* of the same material, secured to the spades at the ends and at three or more equidistant points from the ends, and bolted to the cylinder in circumferential lines. The supports *w* are so fitted to the spades that the back part of the same, *x*, Fig. 3, are drawn toward the center of the cylinder from a true circle as much as the spade is moved forward while it is traveling through one cut.

I construct upon the upper end of the screws *s s* collars, holding them firmly to the iron posts *r*. Upon the top of the screws I arrange the small gear-wheels *A*, connecting through the shafts *B* with the hand-crank *C*.

To the main driving-shaft *D*, I connect the bevel-wheels *E E* and shafts *F F*. These shafts I suspend upon the driving-shaft *D* by means of the couplings *G G*. Upon the ends of the shafts *F F*, I place a tight collar, holding them in the couplings. I also construct upon the shaft on which the cylinder revolves the couplings *I I*, which are bored at the ends *K*, admitting the other ends of the shafts *F* after passing through the small bevel-wheels *L L*, which, together with their keys, are so constructed as to admit of the shafts *F* sliding freely. I attach to the ends of the couplings *I* knee-pieces *M M*, which pass behind the wheels *L L*, holding them always against the ends of couplings *I*. This arrangement admits of raising the cylinder upon a straight line and keeping the gearings *E E* and *L L* always in working position. The small bevel-wheels *L L* work into large segment-wheels upon the cylinder revolving the same, as seen at *N*, Fig. 2.

Upon the main shaft *D* and counter-shaft *P*, I arrange three or more pairs of gear-wheels, *Q*, two of which, 1 and 3, are keyed fast upon the main shaft and one, 2, is also keyed fast upon shaft *P*, the others being loose when not held fast by the pin *R*. The pin *R* being put into and through a hole bored in either of the loose wheels opposite to holes bored in the wheels that are keyed fast, transmits the motion through each set respectively, thus changing the relative motion of the cylinder and driving-wheels. The object intended to be secured by this arrangement is enabling the spades to cut finer cuts in hard soils and larger cuts in softer soils without changing its velocity, the cylinder being constantly kept at the same speed, but that of the driving-wheels

being increased or diminished, as the nature of the soil requires.

I construct the large bevel-wheels *S*, Fig. 2, upon the arms of the two driving-wheels of the car and the small wheels and intermediate shaft for communicating the power from the engines for propelling the car over the ground.

I construct the engines of any ordinary kinds, of small size, and attach them to the platform, as shown, of rapid motion, reducing the same by means of the small and large gearing to the proper speed of the driving-wheels—say two hundred revolutions of the engines to two or four of the driving-wheels per minute.

I construct the body of the car so as to carry water for the supply of the boiler, fuel being carried, upon the sides of the vertical portion of the boiler, in boxes resting upon the platform.

The front end of the boiler is depressed so much below the water-level as will admit of going up or down any ordinary hill without running off the tubes at either end.

The operation is as follows: Motion being communicated by the steam-engines through the main shaft *D*, the car begins to move and the cylinder to revolve while it is suspended above the ground by the screws *s s*. The operator, by means of the hand-crank *C*, proceeds to lower the spades to a working position. The first cuts are thin, but increase in depth until the desired depth of cutting is obtained. The cylinder revolves in the same direction as the driving-wheels, and having been screwed down to the proper depth, it cuts in thin slices upon a true circle—say three, six, or nine inches long at top, according to the motion given by the wheels *Q*—thinning down to a point at the bottom in the form of a wedge bent to the circle described by the edge of the spades, and from two feet to two and a half long from heel to point, according to the size of the spades. These slices, when so cut, lie inside of the spades, and are carried therein until the spades have arrived at or near a vertical position in the rear of the machine *Y*, Fig. 2, when they slide out and fall to the ground, that which was the top before being cut going out first, falling to the bottom, and being covered up. When it is desired to travel over the road the wheels *E E* are slipped out of gear and the cylinder ceases to revolve.

The operator guides the car by means of the hand wheel *z*.

The forward axle is made sufficiently short to admit of the two front wheels traveling upon the unplowed ground, whereby only one of the hind wheels travels over that which has been plowed.

It will be observed that the operator, standing at his place in rear of the boiler and between the engines, has perfect control of the entire machine without moving from his place.

I claim—

1. The spades constructed and operating in the manner set forth.
2. The couplings *G G* and *I I*, operating in

combination with the wheels E E and L L and shafts F F, the screws s s, and slotted posts r r, for the purpose of raising and lowering the cylinder t and spades u in a vertical line, and admitting the gearings E E and L L to be in a working position at all points, as described.

3. The wheels Q, in combination with the shaft D and counter-shafts P P, for the purpose set forth.

4. The slotted frame h or guides, in combination with the grooved pulleys j and tongue g, for the purposes described.

ANSON P. THAYER.

Witnesses:

WILLIAM BRADLEY,
JAMES BAKER.