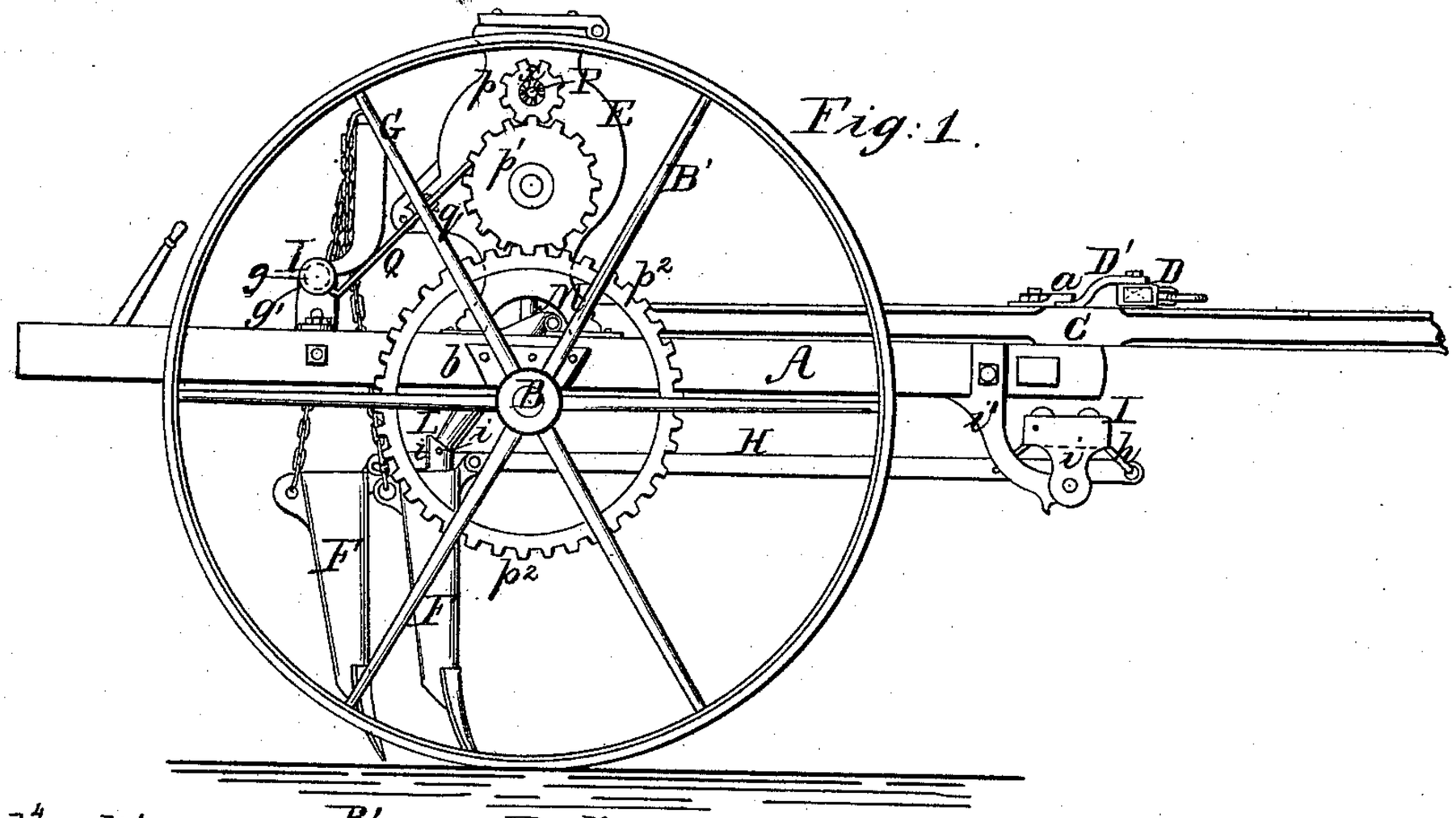
Sheet 1-2 Sheets.

D. Rentchler.

Grain Drill.

No. 113,564. Patented Apr. 11, 1871.

Fig: 1.



Witnesses;

Geo. P. Kuthe Jr.

Robert Burns

Inventor;

Daniel Rentchler

Sheet 2-2 Sheets.

D. Rentchler

Grain Drill

No. 113,564. Patented Apr. 11, 1871.

Fig: 5.

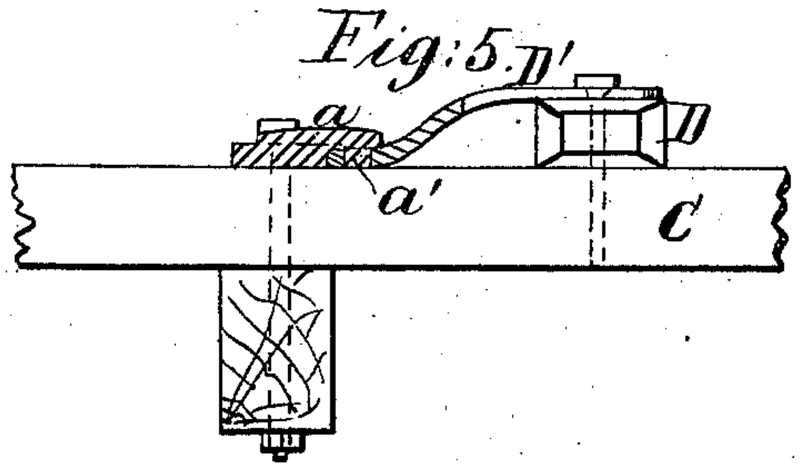


Fig: 6.

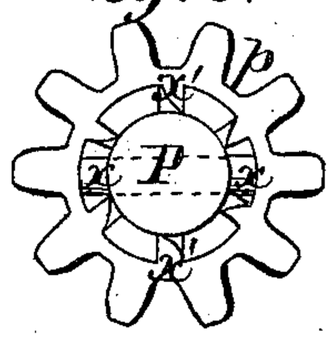


Fig: 7.

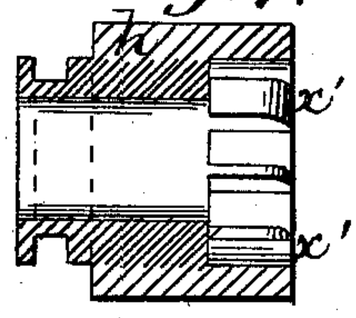


Fig: 8.

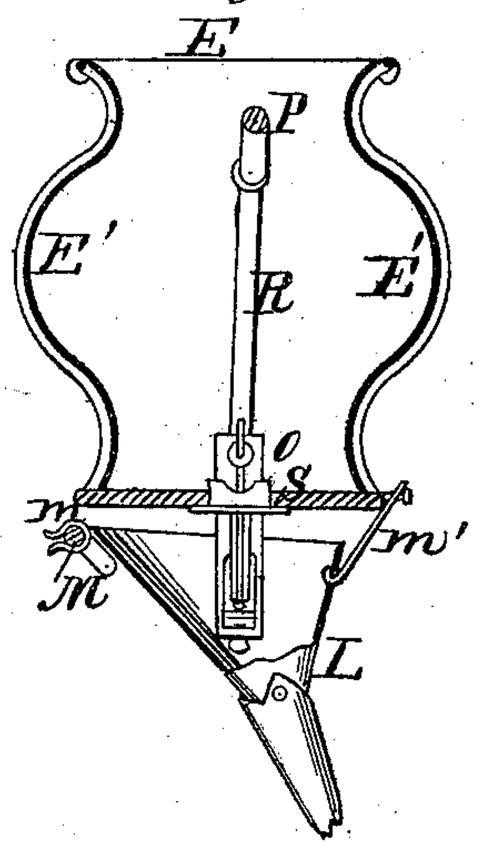


Fig: 9.

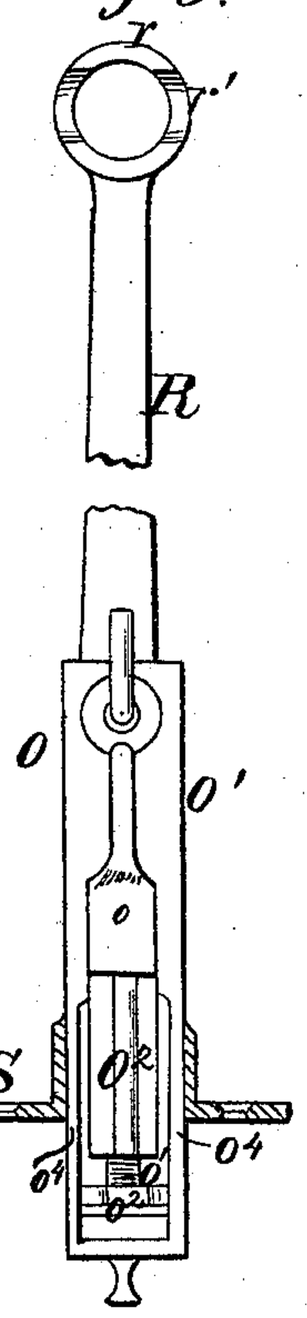


Fig: 10.

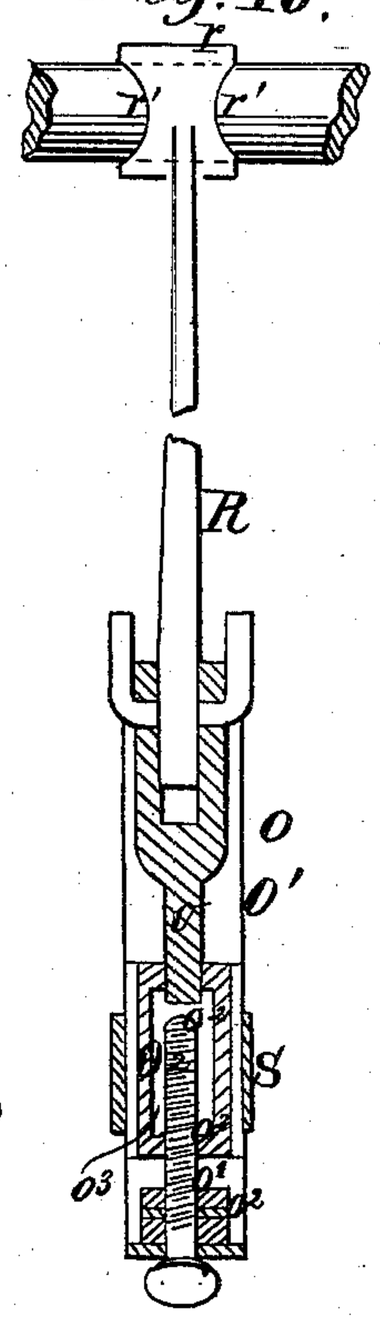


Fig: 11.

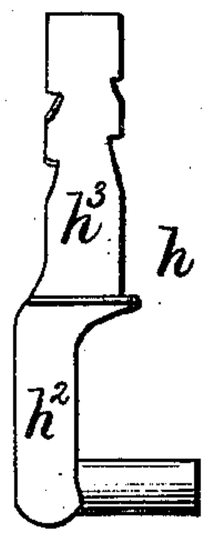
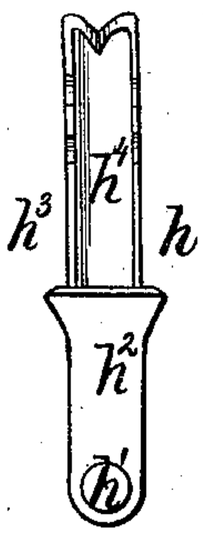
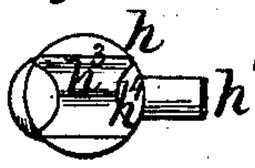


Fig: 12.



Witnesses:
George Gaithe Jr
Robert Burns.

Fig: 13.



Inventor.
Daniel Rentchler

UNITED STATES PATENT OFFICE.

DANIEL RENTCHLER, OF BELLEVILLE, ILLINOIS.

IMPROVEMENT IN GRAIN-DRILLS.

Specification forming part of Letters Patent No. **113,564**, dated April 11, 1871.

To all whom it may concern:

Be it known that I, DANIEL RENTCHLER, of Belleville, in the county of St. Clair and State of Illinois, have made certain new and useful Improvements in Grain-Drills; and I do hereby declare the following to be a full and true description thereof, reference being had to the accompanying drawing, and to the letters of reference marked thereon.

This invention refers to machines for planting grain of the various kinds; and the nature of the same relates, first, to the use of theaxle as a part of the main frame of the machine, and the method of connecting the tongue with the said axle and frame; secondly, to the construction and form of a grain-hopper having sheet-metal sides; thirdly, to the method of attaching the drag-bars and flukes and operating the same; fourthly, to the construction of the seed-funnels and their attachment and operation to cause them to follow the movements of the flukes, as may be desirable; fifthly, to the manner of operating the grain-feeding devices; and, lastly, to certain details of construction, all of which will hereinafter more fully appear.

To enable those skilled in these arts to make and use my said improvements, I will now more fully describe the same, referring to—

Figure 1 as a general side view; to Fig. 2 as a plan of the said grain-drill in its usual form; to Fig. 3 as an elevation of the devices for operating the drag-bars and flukes; to Fig. 4 as a sectional view of the axle attachment to the main frame and the devices for operating the funnels; and to the several figures on Sheet No. 2 as detail views, hereafter more particularly described.

I construct the frame A of my said drill usually of wood, resting upon the axle B by wheels B′.

The axle B is firmly secured by the bearing-blocks *b* to side timbers of said frame A, thus making the axle a part of said frame. The wheels B′ turn about the axle, and are guided thereon in the usual manner.

The tongue C is connected with the front of the frame A by a saddle-casting, *a*, and proper bolts, and rests by a cast bearing, *c*, on the axle. The hook-bolt *c*′ then secures all parts firmly, as more fully indicated in Fig. 4.

The double-tree D is pivoted at the bolt or hammer *d*, and the hammer-strap D′ passes down under a projecting lip of the saddle *a*, as shown in Fig. 1, and in detail sectional elevation at Fig. 5. A pin, *a*′, of the saddle *a* holds the hammer-strap.

Upon the sides of the frame A, I secure the feed-hopper E. The ends thereof are usually cast-iron plates, having feet secured by bolts to the frame A. The side of said hopper I form of sheet-metal (usually iron or zinc) plates E′, rolled or pressed into corrugated or waved form, as clearly shown in the detail sectional view, Fig. 8.

To give the plates E′ proper stiffness, a bead will usually be run on the top edge thereof, while the end will be secured properly to the end plates of the hopper. Said hopper has a bottom, (usually of wood,) through which the seed-distributing devices operate.

It is plain that by using metallic sides as well as ends in said hopper, the shrinkage and swelling, and consequent distortion, which render wooden-sided hoppers objectionable, are avoided, while the hopper itself is made lighter and stronger, and thus adds to the rigidity of the drill-frame.

Under the hopper are arranged the flukes F, suspended by chains, in the usual manner, from the lift-bar G. Said bar is pivoted to the frame A at *g*, and, when raised up by a proper lever, draws the flukes out of ground to the position shown in Fig. 1. The flukes attach, in the usual manner, to drag-bars H. These, at their forward ends, are forked, and are hooked upon the hooks or half-staples *h*.

The arrangement of the forks of the drag-bars is such that the operator is compelled to compress the same to enter the eyes of the forks upon the hooks, and the spring of the fork then secures the drag-bar in its position, as indicated in Fig. 2.

I prefer to construct the hooks *h* of malleable iron, in the form indicated in detail, Figs. 11, 12, and 13.

The eye of the drag-bar attaches to the prong h^1, and the stem h^2 is curved, as shown in Fig. 11, to bring the line of draft in the axis of

the base h^3. This base is driven into a wooden bar, as hereafter explained. A proper hole having first been made, the base, by its corners, takes hold upon the woody fiber, to prevent the staple or hook from turning as well as withdrawing. The grooves h^4 allow the wood cut or compressed by the corners to enter, thus preventing splitting of the bar when the hook is driven in.

The drag-bar staples may connect directly to a front bar of the drill-frame; but in order to operate the flukes from a right to a zigzag line, as may be desirable, in accordance with the nature of the ground, I have arranged them in the manner following:

The hooks *b* are driven, in a diagonal direction, into a bar, I, as shown in Figs. 1 and 2. Said bar is pivoted, by hinges *i*, to the brackets *i'*, secured to the frame. Connected to the hinge *i* is the gear-wheel *k*, operated by the rack K, which passes along the side of the frame A, and is thereon guided, and connects with the link k^1 and lever k^2. Said lever is pivoted at k^3, and, when operated by the band, assumes the positions shown in full and dotted lines in Fig. 3. A stop, k^4, limits the stroke at one end, and the lever, dropping to a nearly horizontal position, thus bringing the draft in the line of the pivot k^3, limits it in the other direction.

The bar I is pivoted in such position that at either end of its rocking movement the direction of the draft of both sets of drag-bars shall be in the line of the axis of rotation of the bar, thus avoiding the tendencies to shifting, and consequent strains, which would take place by the draft of the flukes upon the rock-bar in other positions thereof.

In order to pass the seed to the flukes F, whatever be their position, I arrange the seed-funnels L. These are usually sheet-iron or zinc tubes, wide at top and tapered to a knee, *l*, where the lower tube, L', joins the upper one by pivot-rivets *l'*, as seen in Figs. 3 and 8.

The shape of the tubes L L' is determined by their positions with regard to the feeding-pistons, as shown in Fig. 8, as well as by the interior size of the flukes, it being necessary that the tube L' and part of the tube L should pass into the fluke, when, by breakage of the wooden pin usually holding the fluke forward, the fluke cants back.

The ground end of the tube L' is cut inclined, so that soil cannot be held therein to choke the tube, as indicated in Fig. 3.

The funnel L is hinged to a crank-bar, M, by a spring-clamp, *m*, while in the rear it is suspended by a strap, *m'*, to the hopper E.

In order that said funnels L L' shall follow the flukes in their movement from a right to a zigzag line, (and always hold the proper positions for entering the flukes without cramping,) all said funnels are secured to the crank-curves on said bar M, said crank-curves being of such throw as to accommodate the movements aforesaid.

The crank-bar M has proper bearings on the frame A, and is turned by the wheel *n*, connecting with the rack k^5 of the bar K, before described as operating the flukes.

To cause the grain to pass to the funnels, as is desired, I use the feed-pistons O, operated by a crank-shaft, P, which is arranged in bearings at the top of the hopper E.

To operate said shaft, I connect therewith a gear-wheel, *p*, which is in engagement with the intermediate wheel, p^1, and this again connects with the gear-wheel rim p^2, secured to the wheel B'. The intermediate wheel, p^1, is secured by a sleeve-bolt in the end of the hopper E, and by its arrangement permits the use of a small wheel-rim, p^2, thus bringing the teeth nearer the axle and away from the greatest side vibrations.

It is of importance to cease the feed-motion as the flukes are raised out of the ground; and to accomplish this I arrange on the casting which connects the lift-bar G with its pivot *g* the cam-groove *g'*, into which a shifting-lever, Q, engages by a tappet or finger.

As the lift-bar is raised the cam *g'* causes the lever Q to move laterally, (on its pivot *q*,) and thus moves the wheel *p* toward the hopper end, and relieves the pin *x* on the shaft P from its engagement on the ridges *x'* of the gear-wheel *p*. These ridges are plainly indicated in the detail elevation and section of Figs. 6 and 7, respectively.

As the ridges *x'* are very near to each other, and are rounded to cause the pin *x* to enter between them readily, the readjustment for the continuance of the feed-motion is quickly made when the lift-bar G drops the flukes.

The detail construction of the feed-pistons is indicated in Fig. 9 in sectional elevation and in Fig. 10 in section. The pitman R connects the piston with the crank-shaft.

To avoid lateral play of the pitman, I have given the collar of the same a wide bearing, *r*, on the shaft; and to permit the separate pitmen to slide endwise to their places on the curved crank-shaft, as in Fig. 2 indicated. I cut recesses *r'* in the bearing-collars *r*, to reduce the width of bearing on the sides of the collars.

The pitman is guided by its connection with the piston O and the movement thereof vertically in the cup S, and the further guide achieved by the collars, as aforesaid, then suffices to prevent end-play on the crank-shaft. The piston O consists of a body-piece, O^1, and a slide, O^2. The latter, by its movement up or down on the center flange, *o*, forms a lesser or greater seed-opening in the manner usual in the piston-feed. The movement of the slide O^2 is regulated by a screw, o^1, and nuts o^2.

I do not claim any of the parts thus described, as they are well known; but I lay claim to the peculiar construction of the slide O^2 in such wise that its weight shall be reduced to a minimum, and the labor of fitting it upon the flange *o* shall be decreased. This I accomplish by coring said slide with a cavity, o^3, and giving a small bearing at o^4 against the flange

o. Said cavity o^3 allows chaff and dust to pass in without cramping the moving of the slide O^2, and the sides o^4 of the body O^1 being (below the flange *o*) arranged to give the slide O^2 a sufficient clearing, the dust and chaff may escape at these clearance-openings.

To avoid corrosion of the screw o^1 and nuts o^2, and rusting in, I make the screw o^1 of composition metal or brass, the nut being usually malleable or wrought iron; or the metal composition of the parts aforesaid may be reversed.

Having thus fully described my said invention, what I claim is—

1. The rock-bar I, hinged to the hangers *i*, and provided with hooks *h* and toothed wheel *k*, in combination with the drag-bars H, flukes F, and sliding toothed bar K, all constructed, arranged, and operating substantially as and for the purpose set forth.

2. The arrangement of the funnels L L′, crank-shaft M, clamps *m*, pinion *n*, and sliding rack-bar K, and the rock-bar I, pinion *k*, drag-bars H, and flukes F, all constructed and operating substantially as and for the purpose set forth.

3. The cam *g*′, lever Q, and sliding pinion-clutch *p* on the crank-shaft P, combined with the lift-bar G, hinged at *g*, the flukes F, and the chains by which they are suspended, whereby the feeding mechanism is thrown out of gear simultaneously with and by the raising of the flukes from the ground, all operating substantially as herein described.

4. The pitmen R, having a bearing, *r*, on the shaft P, when the bearing is provided with recesses *r*′, substantially as and for the purpose set forth.

5. The slide O^2, when made with a cavity, o^3, and bearings o^4, and combined with the flange *o*, substantially as herein shown and described, for the purpose set forth.

In testimony of said invention I have hereunto set my hand in the presence of witnesses.

DANIEL RENTCHLER.

Witnesses:

GEORGE P. HERTHEL, Jr.,

WILLIAM W. HERTHEL.