(No Model.)

3 Sheets—Sheet 1.

J. S. CORBIN.

COMBINED HARROW AND SEEDER.

No. 308,305. Patented Nov. 18, 1884.

Fig. 1.

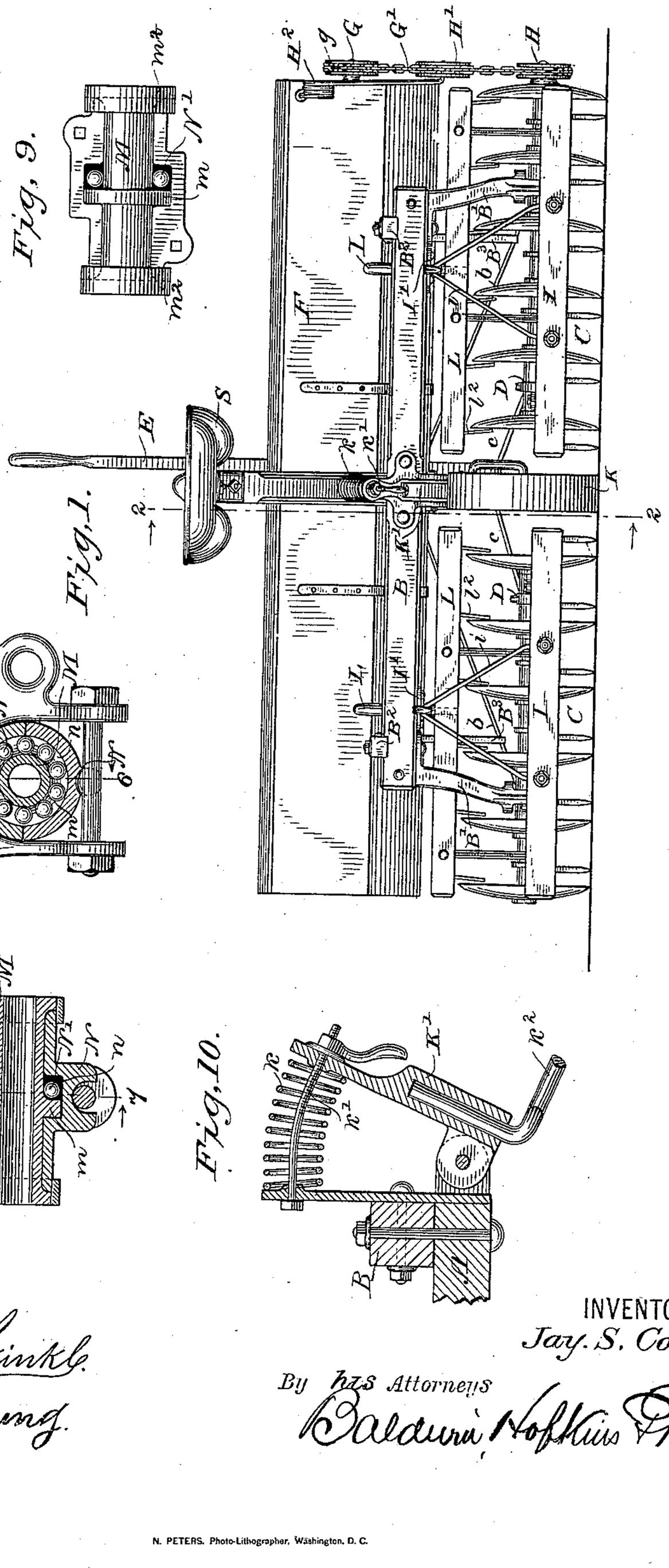

Fig. 8.

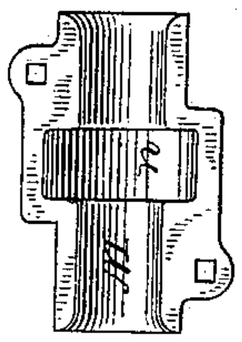

Fig. 9.

Fig. 7.

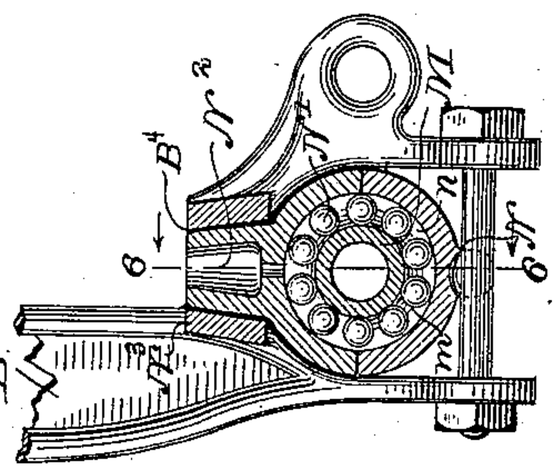

Fig. 6.

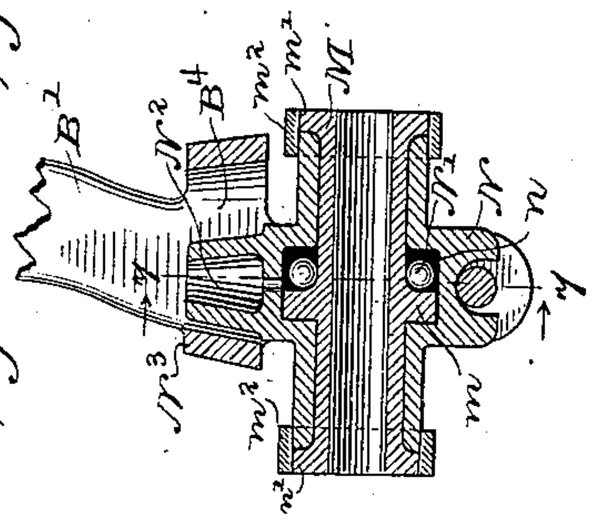

Fig. 10.

WITNESSES

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INVENTOR

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(No Model.) 3 Sheets—Sheet 2.

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Fig. 5.

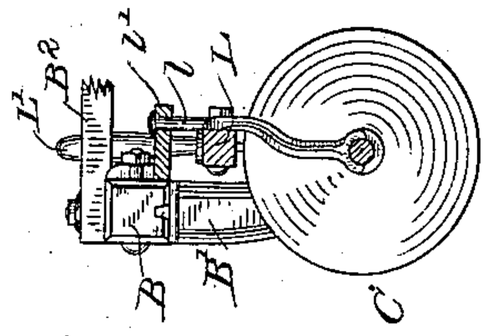


Fig. 2.

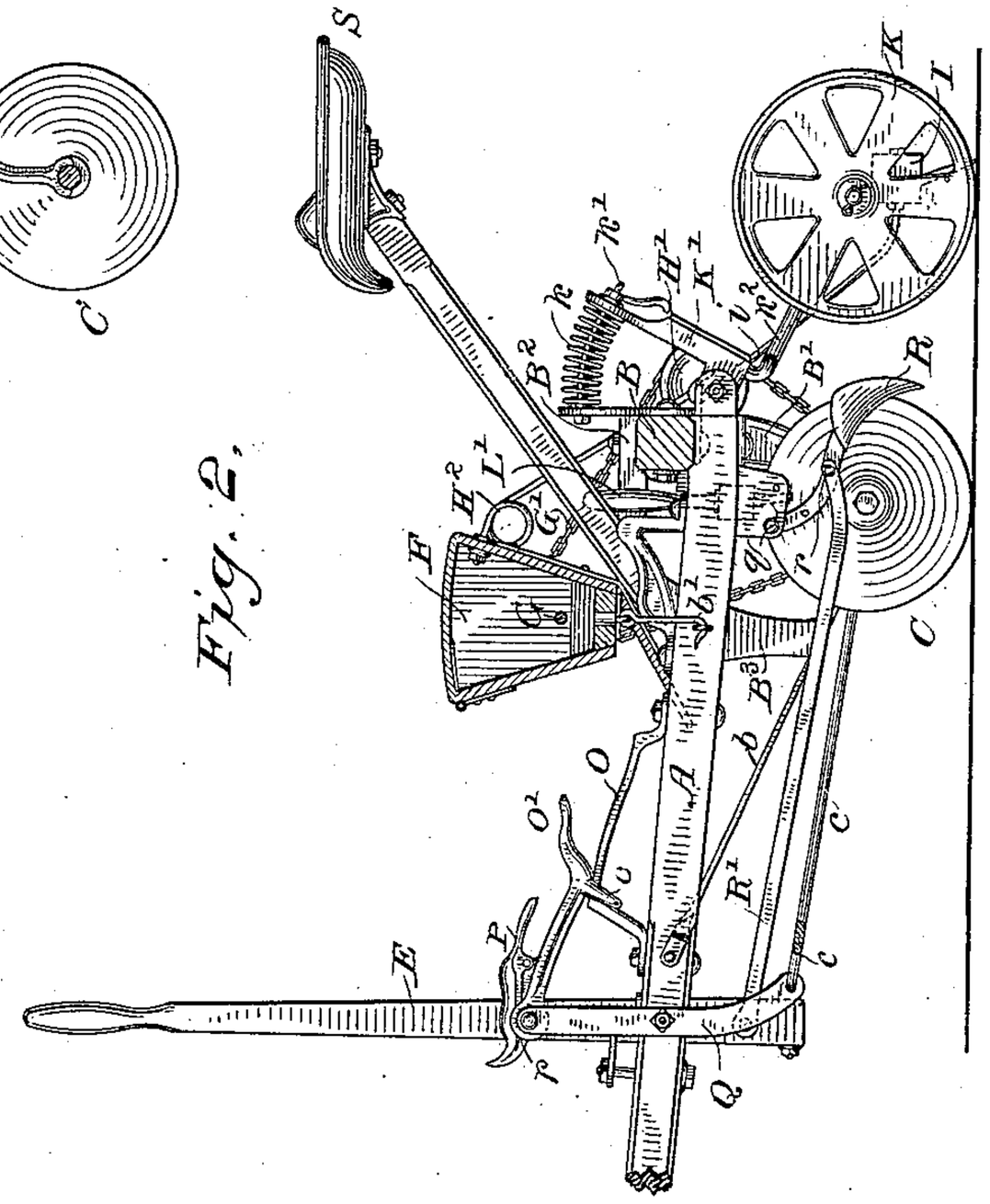


Fig. 4.

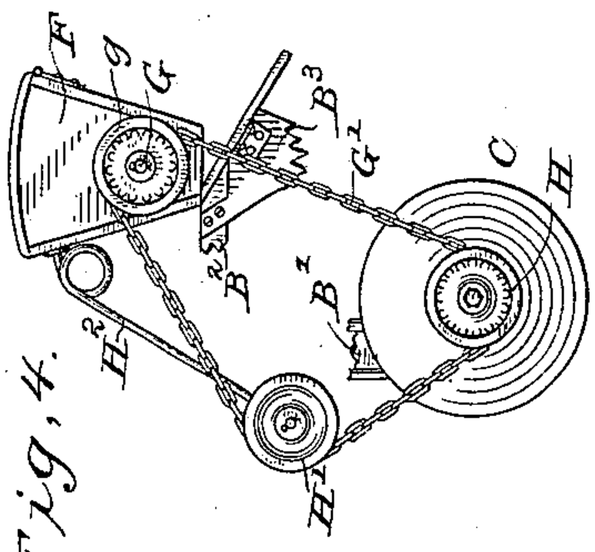
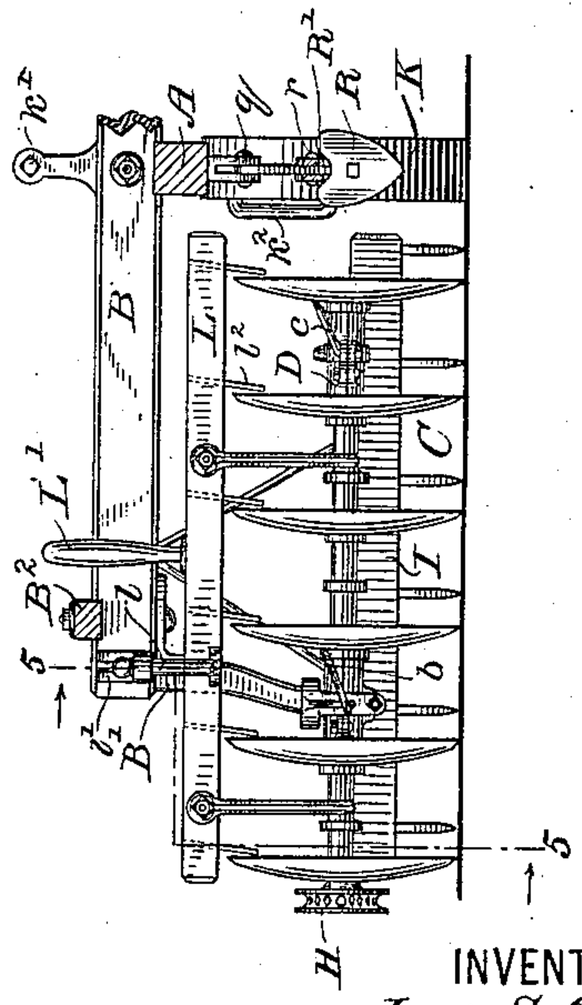


Fig. 3.



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(No Model.)

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Fig. 14.

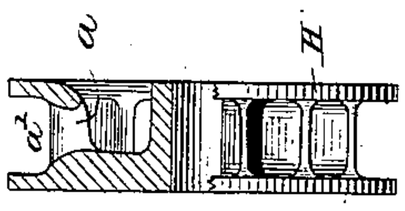


Fig. 13.

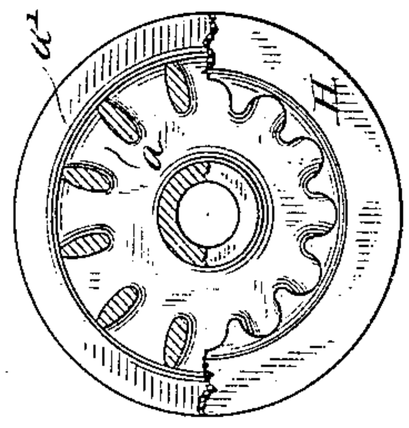


Fig. 16.

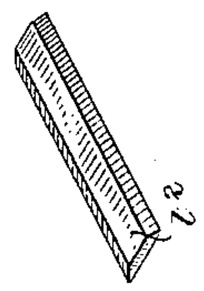


Fig. 15.

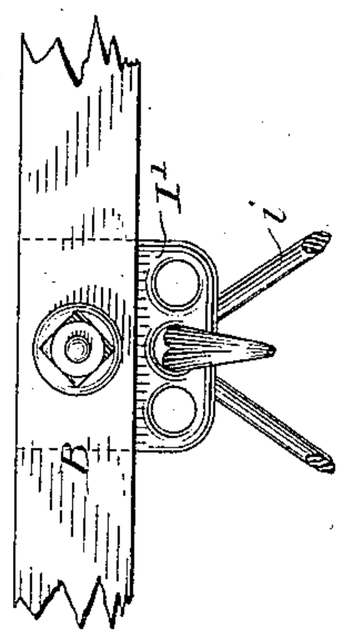


Fig. 17.

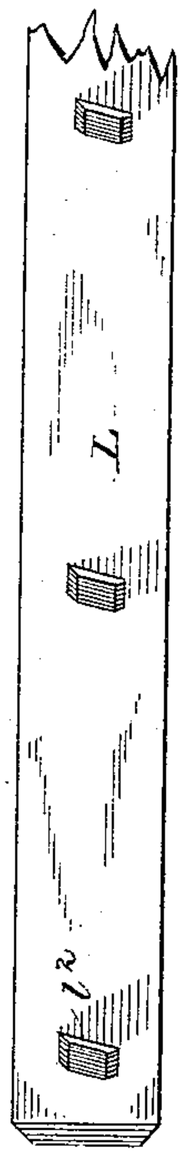


Fig. 11.

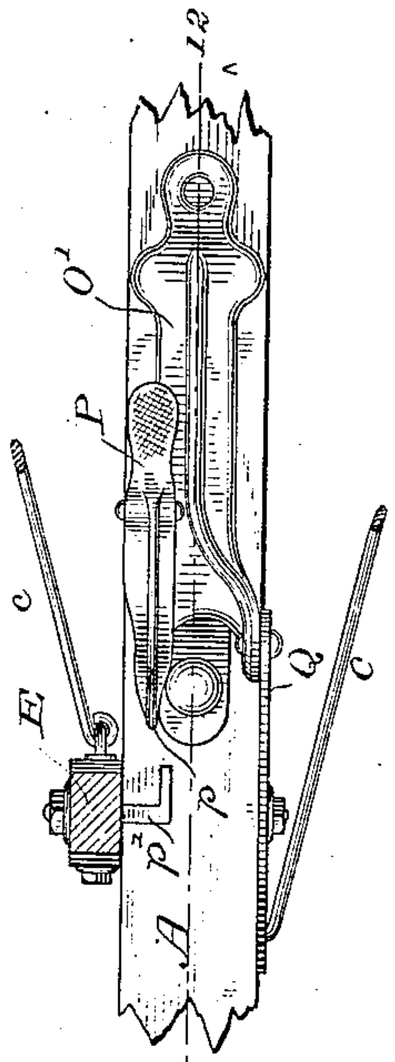
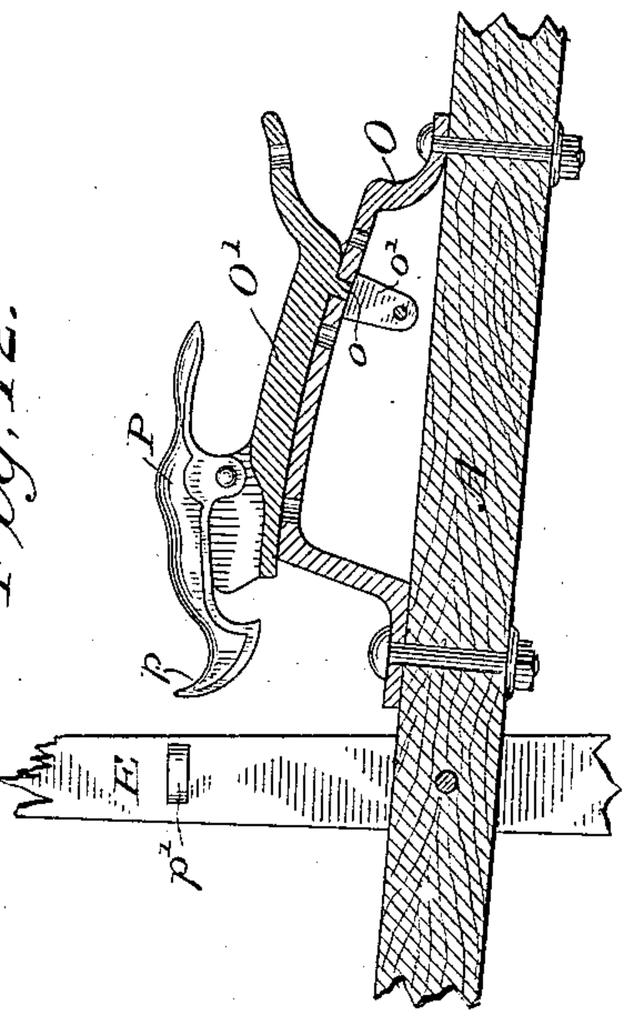


Fig. 12.



WITNESSES

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Geo. W. Young.

INVENTOR

Jay. S. Corbin.

By Attorney

Baldwin, Hopkins & Peyton.

UNITED STATES PATENT OFFICE.

JAY S. CORBIN, OF GOUVERNEUR, NEW YORK.

COMBINED HARROW AND SEEDER.

SPECIFICATION forming part of Letters Patent No. 308,305, dated November 18, 1884.

Application filed March 12, 1884. (No model.)

To all whom it may concern:

Be it known that I, JAY S. CORBIN, of Gouverneur, St. Lawrence county, New York, have invented certain new and useful Improvements in Combined Harrows and Seeders, of which the following is a specification.

My invention relates more especially to the well-known rotary-disk harrows; and it consists, primarily, in an improved organization of apparatus by which the ground is harrowed, seeded, and leveled at one operation and by one traverse of the machine over the soil.

My invention also consists in certain improvements in construction and general organization whereby the machine is made highly efficient in operation, and may readily be adjusted to meet the varying conditions of the soil and the requirements of the work to be done.

In the accompanying drawings, Figure 1 is a rear elevation of my improved machine; Fig. 2, a transverse section; Fig. 3, a front view of one of the gangs. Fig. 4 illustrates the manner of driving the seeder from the gang-shaft. Fig. 5 shows the manner of mounting the scraper-bars on the gangs. Fig. 6 is longitudinal section through my improved thimble and journal-box; Fig. 7, a transverse section of the same on the line 7 7 of Fig. 6. Figs. 8 and 9 are detail views of the interior of the box; Fig. 10, a detail sectional view showing the bracket to which the caster-wheel is attached. Fig. 11 is a detail plan view of a section of the tongue, showing the treadles and mechanism for adjusting the gangs and the central tooth. Fig. 12 is a section of the same on the line 12 12 of Fig. 11. Figs. 13 and 14 illustrate my improved chain-wheel. Fig. 15 shows the manner of attaching the leveler. Fig. 16 is a view of the scraper which I employ, and Fig. 17 is a view of the scraper-beam with scrapers therein.

The harrow illustrated is of the well-known type in which the disks are divided into two independent gangs placed on opposite sides of the central draft-line.

The main frame of the harrow is composed of a draft-pole or tongue, A, and a cross-beam, B. Each disk-gang C has its main bearing in a hanger, B′, carried on the cross-beam of the machine. The gangs are capable of being adjusted or swung horizontally on their bearings and of flexing or rocking vertically to conform to the undulations of the soil, as is well understood by those familiar with this class of machines.

The ordinary draft or stay rods *b* extend from the journals or bearings in the down-hangers B′, and are bolted to the tongue at a suitable point. Draft-rods *c* extend from the inner journals or bearings, D, of the gangs, and are connected with a vibrating lever, E, pivoted in the pole or tongue of the machine, by which the gangs may be swung upon their main bearings horizontally to vary their angle relatively to the line of draft.

The general principles of construction of the machine thus far described are usual and well known.

The seed-box F is supported centrally upon the draft-pole of the machine and near each end upon forwardly-projecting beams B^2, carried on the main cross-beam B, and supported by struts or braces B^3, which rest on the draft-bars *b*. The seed-box may be held down upon the pole, or rather upon the end of the seat-standard, which fits in a notch in the under side of the seed-box by an ordinary hook and eye, *b′*. The seed shaft or distributer G is actuated by a chain, G′, which works over a sprocket-wheel, *g*, on the end of the shaft G, and over a driving sprocket-wheel, H, carried on the end of one of the gang-shafts.

In order to hold the chain taut, so that the horizontal adjustment and vertical rocking of the gang will not disturb the actuation of the seeding devices, I pass the chain over an idler-pulley, H′, carried on the end of a spring-arm, H^2, and attached to the side of the seed-box. This spring-arm takes up the slack of the chain whenever any change in the position of the gang occurs.

The seeder may obviously be operated from both gang-shafts, if desired.

The seed-box is mounted upon the frame in such relation to the disk-gangs as to drop the seed in front of the disks. In order to smooth or level the soil after the seed has been deposited and covered by the disks, I employ a leveler, I, preferably in two sections, one arranged in rear of each disk-gang. The draft-rods *i* of each leveler, which preferably converge to a common hook, as illustrated in Fig. 15, are connected with the harrow-frame by

being hooked into eyes in a bracket, I′, carried on the cross-beam of the harrow.

The teeth shown in the leveler-bars are the ordinary straight spike-teeth, and are equal in number to the disks. The levelers should be placed in such relation to the disk-gangs that the spikes will follow in the spaces between the disks and level the furrows. In order to maintain this relation in the varying positions to which the disk-gangs may be adjusted, a series of eyes or apertures are formed in the brackets I′, so that the position of the leveler may be adjusted laterally relatively to the disk-gangs.

So far as the primary object of my invention is concerned—namely, the harrowing, seeding, and leveling of the soil in one operation—any other suitable leveler than that shown and described may, of course, be employed. It is also immaterial just what kind of seeding devices are employed, or how the seeding devices are driven, or what may be the organization of frame and disk-gangs and their method of adjustment, so far as the broad features of my invention are concerned.

In this class of machines where sprocket-wheels are employed the earth is liable to pack in the openings in the wheel and interfere with the proper running of the gear. In order to obviate this difficulty, I have made certain improvements in the structure of the wheel, which are clearly illustrated in Figs. 13 and 14. The main body of the wheel is of the usual sprocket construction; but in order to prevent the earth from packing in the depressions in the wheel, openings *a* are made, extending from the bottom of the groove *a′* to the side of the wheel. Any dirt or clogging matter, therefore, that finds its way into the groove or face of the sprocket-wheel will be pressed out by the chain through the opening *a*.

In some conditions of the soil the weight of the harrow is too great, especially where a seed-box is carried on the machine and interferes with the proper operation of the disks—that is, where the soil is light or soft the disks may be buried so deeply as to slide or cut through the soil without rotating properly. In order to obviate this, I provide a supplemental support or carrier-wheel for the machine, and in order to adjust the machine for the most satisfactory work in all kinds of soil I also provide a means by which the amount of weight thrown upon the disks may be varied. For this purpose I place a supporting or caster wheel, K, between the two disk-gangs, preferably as illustrated in Figs. 2 and 10, at the rear end of the pole of the machine. The standard or support in which the wheel has its bearing is mounted in a hinged bracket, K′. Between the upper end of the hinged bracket and the frame, or a suitable plate carried on the frame, a spring, *k*, is placed, which normally tends to force the bracket out and press the wheel K down upon the soil. This construction permits the wheel K readily to accommodate itself to irregularities in the surface of the ground; but in order to regulate the amount of weight thrown upon the cutting-disks a bolt, *k′*, is extended from the plate on the frame through the spring and hinged bracket and receives a nut, which may be screwed up to compress the spring and elevate the wheel K relatively to the cutting-disks and the ground.

In order to permit the carrying-wheel to swing freely horizontally when the machine is turning, its standard k^2 may be made to swivel horizontally in its seat or bearing in the pivoted bracket. Of course the location and means for adjusting this carrying-wheel, as well as the means for giving it the proper elasticity to conform to the irregularities of the soil, may be varied without departing from the broad principle of my invention.

In some soils or conditions of the soil scrapers are unnecessary, while in other soils their use is essential. In my improved machine, therefore, I have made the scraper-beams with their scrapers readily detachable and separable from the other parts of the machine, and so far as I am aware this has never been done heretofore.

The scraper-beams L are supported on the thimbles on the disk-gang shaft by forked standards or hangers, which depend from the beams and straddle the thimbles on the gang-shaft. (See Figs. 1, 3, and 5.) This leaves the beams free to be moved endwise to throw the scrapers into the concave faces of the disks. The scraper-beams are held in place between the hangers B′, in which the disk-gangs have their main bearings, and sliding pins *l*, carried in brackets *l′* on the cross-beam of the machine. Each scraper-beam is provided with a simple rigid handle, L′, which may be seized by the driver to reciprocate the beam endwise to free the disks from clogging matter. By removing the sliding pins *l* the scraper-beams and scrapers may be lifted from the machine without in any way affecting the other parts.

I form the scrapers proper, l^2, of such a shape that they may be readily reversed when worn. Figs. 16 and 17 show a convenient shape for this purpose. Such a shaped scraper is very efficient, and as it may be reversed when worn its use results in material economy.

In Letters Patent of the United States, granted to me March 13, 1883, I have shown an arrangement of anti-friction balls for receiving the end-thrust of the gang. My present invention contemplates the use of anti-friction balls for the same purpose, but is an entirely novel and improved organization.

The thimbles M, which separate the disks, are formed with collars or flanges *m* at or about midway of their length. The journal-boxes N are made in two sections and with an internal central annular enlargement or recess, *n*, for the reception of the flange or collar *m* on the thimble. The chamber *n* is of a greater width than the collar on the thimble, and between the thimble and one side of the chamber I place anti-friction balls N′. This

chamber serves as a suitable oil-receptacle, and is supplied from a proper oil-cup or opening, N^2, on the upper side of the journal-box. With this construction the end-thrust of the gang is received upon the central flange of the thimble, and the wear and friction are largely diminished by the interposed balls. With the balls placed in a central chamber and entirely protected they will not become clogged, but will act in the most efficient manner.

In order to prevent the entrance of dirt into the journal-box flanges *m' m'* are formed upon each end of the thimble. These flanges are formed with conical or tapering peripheries for the reception of correspondingly-shaped sand-bands, m^2. These bands are forced into position and securely held when the disks and thimbles are clamped on the shaft by the ordinary set-nut upon the end of the shaft.

A projection or lug, N^3, on the upper side of the journal-box, in which the oil-cup N^2 is formed, works in an elongated slot, B^4, in the hanger B', as clearly illustrated in Figs. 6 and 7. This stud abuts against the ends of the slot, and limits the vertical rocking of the gang.

The general construction of the journal-box and its connection with the hanger, other than what has above been specifically described, is ordinary and well-known and needs no further description. The inner journal-boxes of the disk-gangs are similarly formed, and as they are clearly illustrated in Figs. 3, 8, and 9, further description is unnecessary.

In harrows of the class herein illustrated—namely, those in which opposing gangs are arranged with the concave faces of the disks toward the central line of the machine—there is a tendency for earth and débris to clog between the adjoining disks of the opposing gangs. This clogging is best relieved by changing the angle of one gang without disturbing the other. This result has heretofore been accomplished by the use of an independent adjusting-lever for each gang. In my improved machine both disk-gangs may be simultaneously adjusted by a common lever, or one gang only may be swung by said lever to change its angle to the line of draft. This part of my invention is illustrated in Figs. 2, 11, and 12. A bridge or bracket, O, is bolted on the upper side of the tongue, just in rear of the lever E. A shoe, O', slides in the direction of the length of the pole on this bridge or bracket, and is provided with a lug, *o*, which engages with a series of apertures in the face of the bridge. A latch, P, is pivoted on the forward end of the shoe, and is provided with a hook or catch, *p*, which engages with a notch or loop, *p'*, on the lever E. A short lever, Q, pivoted on the tongue concentrically with the pivot of the hand-lever E, is pivoted to the shoe O', and is connected by a draw-bar, *c*, with the inner journal-box of one of the disk-gangs—the left-hand one viewed from the rear, as in Fig. 1. The opposite gang is connected by a similar draft-rod, *c*, directly with the lower end of the hand-lever E. The shoe O' and the latch P may readily be reached by the driver from the seat S on the machine.

When the hook *p* is engaged with the loop *p'* on the lever E, and the rear end of the shoe O' is thrown up by the driver so as to disengage the lug *o* from the aperture in the bridge, the shoe will slide back and forth as the hand-lever E is operated, and both gangs will simultaneously and equally be adjusted, and may be held in the desired position by sliding the shoe O' to the proper point for engagement with one of the series of apertures in the bracket O.

When the machine is at work and the hand-lever is drawn back toward the seat, the inner ends of the gangs will be advanced. If the space between the inner ends of the gangs should become clogged, the rear end of the latch P may be thrown up so as to disengage the hook *p* from the loop *p'* on the hand-lever, and then the hand-lever may be moved to change the angle of that gang only with which it is directly connected. The shoe O' is prevented from leaving the bracket O by two downwardly-projecting ears *o'*, which are connected below the top plate of the bracket O by a cross-pin.

I prefer this means of operating both gangs simultaneously, or one only, though doubtless other ways of alternately connecting and disconnecting the adjusting devices of one gang with an operating hand-lever common to both gangs may be devised without departing from the spirit of my invention.

In order to cut out the space between the inner ends of the gangs, so as to thoroughly cultivate the ground and uniformly treat the soil traversed by the machine, I employ a tooth, R, which is placed between the inner ends of the gangs just in front of the carrying caster-wheel K. This tooth, which may be of any of the ordinary types of cultivator-teeth, either rigid or elastic, is pivoted or carried on a standard, which is pivoted in a plate, *q*, on the under side of the tongue.

A connecting or adjusting rod, R', extends from the standard of the tooth to the lower end of the operating hand-lever E, so that when the inner ends of the gangs are drawn forward to set them at an angle to the line of draft the tooth R will be lowered into a position to act on the soil, and when the inner ends of the gangs are thrown back to bring the disks parallel with the line of draft for transportation the tooth will be elevated. The standard of the tooth may be provided with a series of pivoting-apertures, and the plate *q* may also be provided with a series of pivoting-apertures to afford an adjustment of the tooth. The pin *r*, which connects the rod R' to the standard of the tooth, is preferably a wooden break-pin, which will yield before the parts have been subjected to damaging strain.

In the organization shown the seeding devices may readily be removed from the ma-

chine without in any way disturbing the organization of the harrow proper.

I claim as my invention—

1. The combination, substantially as set forth, of the seeding devices, the disk gangs, and the leveling devices.

2. The combination, substantially as set forth, of the frame, the disk-gangs, the seeding devices arranged to drop the seed in front of the cutting-disks, and the leveling devices, which act on the soil in rear of the disks.

3. The combination, substantially as set forth, of the frame, independent gangs of cutting-disks arranged transversely to the line of draft of the machine on opposite sides of the central draft-line, means for varying the angles of said gangs, and an independently-vibrating leveler or clod-crusher arranged in the rear of each gang.

4. The combination, substantially as set forth, of the main frame, the disk-gangs arranged on opposite sides of the machine transversely to the line of draft, mechanism for changing the angle of the gangs relatively to the line of draft, a seed-box, and seeding devices carried on the main frame, mechanism for driving the seeding devices from one of the disk-gangs, and compensating devices acting on said driving mechanism to compensate for the variations in the position of the disk-gang.

5. The combination, substantially as set forth, of the main frame, the disk-gangs arranged on opposite sides of the central draft-line, mechanism for varying the angle of the gangs relatively to the line of draft, a seed-box and seeding devices carried on the frame, the sprocket driving-wheel on one of the gang-shafts, a similar wheel on the seed-shaft, and an elastic compensating pulley, over which the driving-chain passes.

6. The combination, substantially as set forth, of the disk-gang, the sprocket-wheel thereon, the driving-chain, and the dirt-discharge openings in the sprocket-wheel.

7. The combination, substantially as set forth, of the frame, a series of cutting-disks arranged transversely to the line of draft, and the vertically-yielding or elastic supporting-wheel.

8. The combination, substantially as set forth, of the main frame, the disk-gangs arranged on opposite sides of the central line of the machine transversely to the line of draft, and the supporting-wheel arranged between the inner ends of the disk-gangs.

9. The combination, substantially as set forth, of the frame, a series of cutting-disks arranged transversely to the line of draft, a supporting-wheel, and mechanism for varying the relation of the supporting-wheel relatively to the cutting-disks, but independently of any adjustment thereof, thus varying the amount of weight on the disks.

10. The combination, substantially as set forth, of the frame, the cutting-disks arranged transversely to the line of draft, the vertical yielding supporting-wheel, and mechanism for adjusting said wheel vertically relatively to the disks, but independently thereof.

11. The combination, substantially as set forth, of the frame, the cutting-disks, the supporting-wheel, the hinged bracket in which the standard of the supporting-wheel is mounted, and the spring which normally presses the wheel down upon the soil.

12. The combination, substantially as set forth, of the frame, the disk-gang, and the detachable or separable scraper-beam.

13. The combination, substantially as set forth, of the frame, the disk-gangs, and the detachable or separable scraper-beams supported on the gangs.

14. The combination, substantially as set forth, of the frame, the disk-gangs, the hangers in which the gangs have their bearings, the scraper-beams removably supported upon the disk-gangs, and the pins which retain the scraper-beams in position.

15. The combination, substantially as set forth, of a disk-gang and a scraper-beam supported so as to slide endwise directly upon the thimbles of the disk-gang.

16. The combination, substantially as set forth, of the scraper-bar with reversible scraper-teeth mounted therein.

17. The combination, substantially as set forth, of the thimble having the collar or flange intermediate of its length, the journal-box which envelops the sleeve and is provided with a recess or chamber in which the thimble works, and anti-friction balls placed in said chamber.

18. The combination, substantially as set forth, of the thimble, the journal-box, the conically-shaped flanges on the ends of the thimble, and the correspondingly-shaped sand-bands.

19. The combination, substantially as set forth, of the hanger B′, the disk-gang, the journal-box carried by the hanger, the lug or projection on the upper side of the journal-box, and the elongated slot in the hanger.

20. The combination, substantially as set forth, of the thimble having a flange intermediate of its length, the enveloping journal-box having a chamber in which the flange and anti-friction balls work, the conically-shaped flanges on the ends of the thimble, and the correspondingly conical sand bands.

21. The combination, substantially as set forth, of the frame, the disk-gangs arranged on opposite sides of the pole, a lever common to both gangs, by which their angle to the line of draft may simultaneously be adjusted, and mechanism for disconnecting one gang from said lever so that the other gang only will be affected by the vibration of the lever, for the purpose set forth.

22. The combination, substantially as set forth, of the frame, the disk-gangs arranged on opposite sides of the frame, the hand-lever directly connected with one gang, the supplemental lever with which the other gang is di-

rectly connected, and mechanism for locking said supplemental lever with the hand-lever to simultaneously operate both gangs, or disconnecting said supplemental lever from the hand-lever to operate one gang only.

23. The combination, substantially as set forth, of the frame, the disk-gangs arranged on opposite sides of the frame, the hand-lever, the adjusting-rod connecting said lever with one gang, the supplemental lever, and the rod which connects it directly with the other gang, the bracket O, shoe O′, latch P, and loop *p* on the hand-lever.

24. The combination, substantially as set forth, of the frame, the disk-gangs arranged on opposite sides of the frame, a lever for adjusting the angle of the gangs relatively to the draft-line, a cutting-tooth located between the gangs, and mechanism for automatically raising or lowering it as the gangs are adjusted.

25. The combination of the pole, the opposing gangs, and the adjustable cultivator or harrow tooth located between the gangs.

26. The combination of the gang, the scraper-beam, and the bifurcated standards which support the beam on the gang, substantially as set forth.

In testimony whereof I have hereunto subscribed my name this 29th day of November, A. D. 1883.

JAY S. CORBIN.

Witnesses:

JAMES YOUNG,

LLOYD B. WIGHT.