No. 626,059. Patented May 30, 1899.

S. H. & D. GARST.

HARROW.

(Application filed Mar. 7, 1898.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

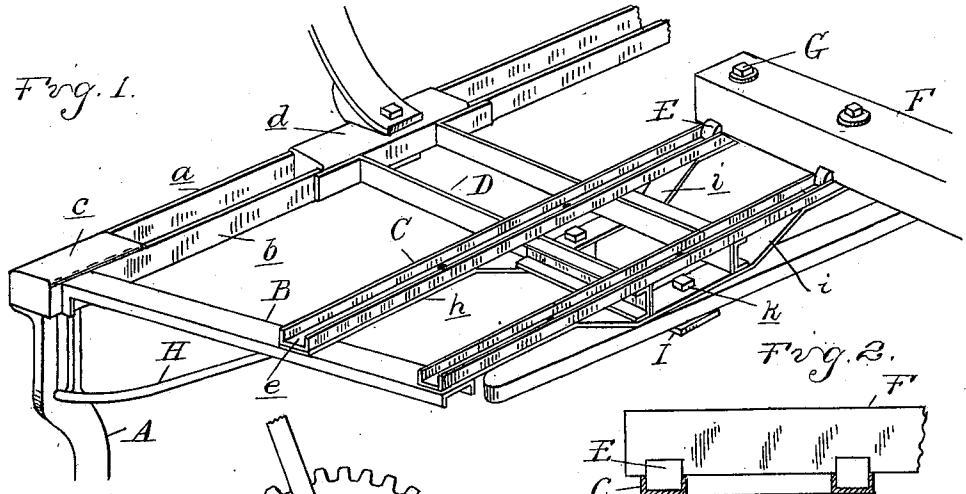


Fig. 2.

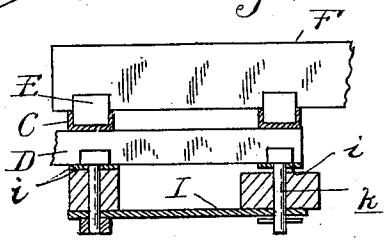


Fig. 3.

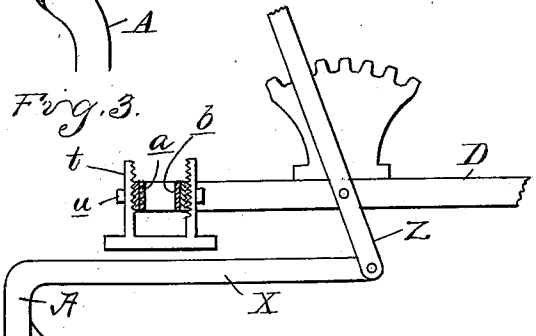
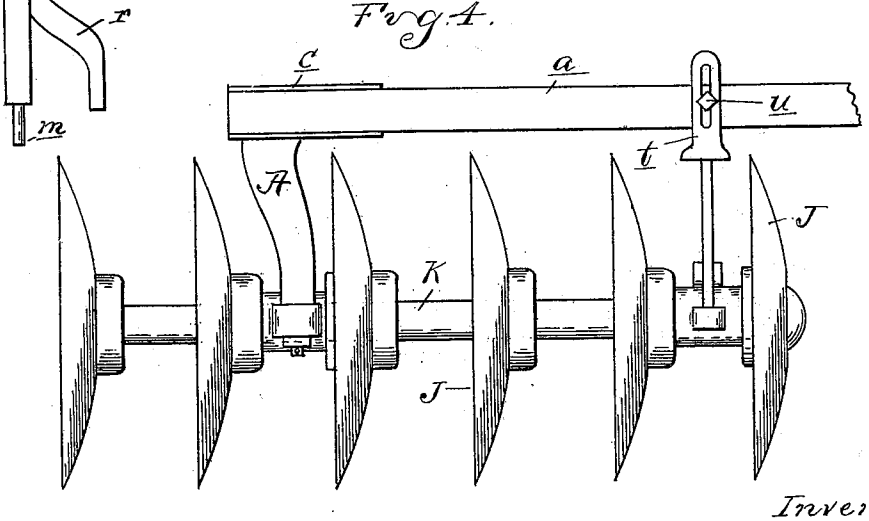


Fig. 4.



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(No Model.) 2 Sheets—Sheet 2.

Fig. 5.

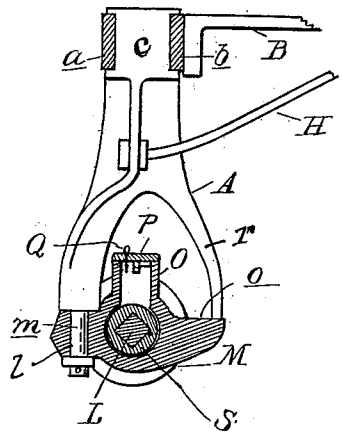


Fig. 6.

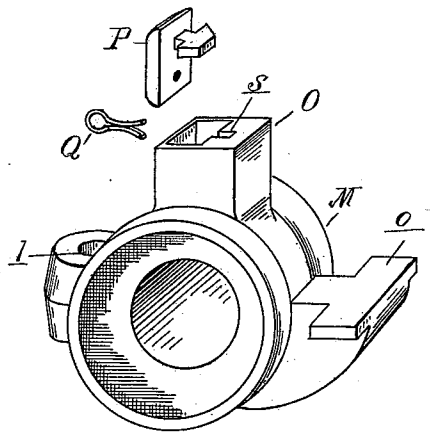
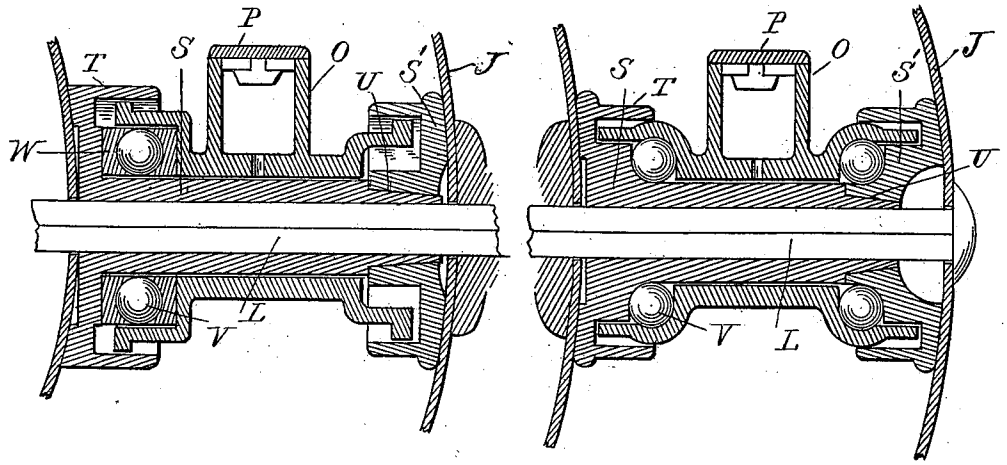


Fig. 7.



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UNITED STATES PATENT OFFICE.

STEPHEN H. GARST AND DUDLEY GARST, OF DETROIT, MICHIGAN, ASSIGNORS TO THE AMERICAN HARROW COMPANY, OF SAME PLACE.

HARROW.

SPECIFICATION forming part of Letters Patent No. 626,059, dated May 30, 1899.

Application filed March 7, 1898. Serial No. 672,848. (No model.)

To all whom it may concern:

Be it known that we, STEPHEN H. GARST and DUDLEY GARST, citizens of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Harrows, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention consists in the construction of a harrow, and particularly in the following particulars: in the construction of the frame, which is given a new form, strengthened, lightened, and cheapened, with improved means for adjusting the pole to different points for draft; in the construction of the standard which connects the frame and disk gang and in the construction of the disk gang itself, and in the construction, arrangement, and combination of the various parts, all as more fully hereinafter described, and shown in the accompanying drawings, in which—

Figure 1 is a perspective view of the frame of the harrow. Fig. 2 is a longitudinal central section through the front portion of the frame, showing the draft connection. Fig. 3 is a section illustrating the construction of the draft-bar and its stop. Fig. 4 is a rear elevation of one of the disk gangs and the frame. Fig. 5 is a vertical section through one of the standards. Fig. 6 is a perspective view of one of the collars or sleeves to which the standard is connected; and Fig. 7 is a longitudinal section through the gang, showing the construction of the bearings, the intermediate disks being omitted.

The rear or main beam of the frame we make up from the two bars *a* and *b*, which are separated by and connected to opposite sides of the heads *c*, (on the upper end of the standards E A,) and a central block *d*. Projecting forwardly from this rear or main beam are the side beams B, which slightly converge toward the front and are connected by the cross-beams C. These cross-beams are made up of two members—the upper straight member *e* and the lower member *h*—the ends of which are straight and rest directly upon the members B, and the middle portion *i*, which is bent down to form a truss for the cross-beams.

D are central or middle beams which extend from the rear beam and pass between the upper and lower members of the cross-beams and act as struts for the truss formed by the members of those beams.

The upper member *e* of the cross-beams is preferably a channel-bar, and in it are adapted to fit and rest the blocks E, which are secured to the under side of the pole F. The pole may be secured in the middle or at either side thereof by sliding the blocks E along and securing the pole by means of bolts G, passing through the pole and the cross-bar at the point where it is desired to secure it. The trusses of the cross-beams prevent the "weaving" or straining of the frame when the pole is located at one side of the center, while the inclined or converging beams B further stiffen the frame when in use against the strains to which it is subjected.

H are tie-rods which connect the frame with the standards.

I is a tie between the two truss members *i*, the forward bolt *k*, passing therethrough, being used to support the evener, and thereby carry the strain or pull well back into the frame.

The disks J are separated by spacing-sleeves K and the whole gang is clamped together by means of the bar L passing through them all and having end clamping means, such as a suitable head and nut.

Each gang is connected to the frame by the standard A, which is connected to a collar, sleeve, or box M. This box has on one side an aperture *l*, through which the pin *m* on the lower end of the standard passes and on which the gang turns as a pivot in adjusting it to different angles in the line of draft. In front the box has a face or bearing *o*, on which rests an arm or projection *r* on the standard, this supplemental bearing acting to reduce the breaking strain on the pin without interfering with the adjustment of the gang at any desired angle to the line of draft. The box is provided with an integral hollow upwardly-projecting cup O, which forms an oil or dope cup for the bearing. This cup has a partial cap thereon, in which is a slot *s*. The cap P has a T-shaped lug on the under face, which may be engaged with this slot by a sliding engagement, and when thus engaged the cap

cannot be lifted off except by a reverse sliding movement. This we prevent by inserting a split pin Q through the cap.

The sleeve within the box M is of the construction shown in Fig. 7 and comprises the two sections S S', each provided with overhanging dust-flanges T and which have an inclined or tapered connecting-face, as shown at U, so that the clamping rod or bar L acts to clamp these two parts together. The inner sleeve and the box are provided with suitable ball-races, in which run the balls V, or we may, and preferably do, provide the bearing in the box to which the standard A connects with rings W, freely turning between the sleeve and box and having races in which the balls run, this construction being for the purpose of giving a bearing, formed by the rings themselves, in case a ball or balls should break and lock the ball-races together, as sometimes happens. The inner ends of the gangs are connected by a similar box or bearing M with the draft-bars X, except that we may use but one set of balls in the main box. These boxes, to which the draft-bars connect, are provided with bearings in front and rear of the gang-axle, and the draft-bar is provided with the same pin *m* and arm *r* as are found in the standards A and for the same purpose. The draft-bars are connected to suitable adjusting-levers Z, the construction of which and the locking means therefor need not be described.

The stop for the upward movement of the inner end of each gang we form by means of the U-shaped bracket *t*, the arms of which are slotted and embrace the rear member of the frame, and the same may be vertically adjusted by means of the bolt *u*, which passes through the slots in the arms of the bracket and through the rear beam of the frame.

What we claim as our invention is—

1. In a disk harrow, the combination with the disk-standards, heads thereon, a main rear beam comprising metal bars connecting these heads on opposite sides, an intermediate block between these bars, a forwardly-tapering frame secured to the forward bar of this main rear beam and braces from this frame back to the standards.

2. In a disk harrow, a metal frame comprising a rear beam, forwardly-extending side beams, and cross-beams, comprising an upper straight member, a lower member having straight end portions, and central depressed or truss portions, and central forwardly-extending beams extending between the truss and straight members of the cross-beams, and acting as struts for the trusses formed thereby.

3. In a disk harrow, the frame comprising a main rear beam, forwardly-extending side beams converging slightly toward the middle, two trussed cross-channel beams connecting the side bars, the channels therein opening upwardly, the pole, blocks on the pole fitting the channels in the cross-beams, and means for securing the pole at various points on the cross-beams.

4. In a disk harrow, the combination of the frame comprising longitudinal beams and trussed cross-beams, a pole and means for securing it at the middle or at either side of the middle of the frame.

5. In a disk harrow, the combination with a standard and its sleeve, of a journal for the disks in said sleeve, rings loosely placed between said sleeve and journal, and balls between said rings, substantially as and for the purpose set forth.

6. In a disk harrow, the combination of the disk gang, the frame, a standard with which the gang has a pivotal connection, and bearings on the standard and gang independent of the pivotal bearing adapted to relieve the breaking strain on the pivot and without retarding the pivotal action of the gang.

7. In a disk harrow, the combination of the disk gang, a collar or sleeve thereon, a standard having a pivotal engagement with the collar on one side of its axis, an arm or extension on the standard to the opposite side of the collar, and a shoulder or face on which said arm bears and on which it slides in the turning of the gang for the purpose described.

8. In a harrow, the combination of the rotating disk gang, the standard and the stationary sleeve connected to the standard, of the box O formed on said sleeve having a partial cap provided with a slot *s* of the cap P provided with the downwardly-extending T-shaped head, the stem of which is adapted to engage in said slot, and means for preventing the endwise movement of the cap to disengage from the slot, such as the split pin Q substantially as described.

9. In a disk harrow, the combination with a standard and its sleeve, of a journal for the disks in said sleeve, leaving an annular space between the sleeve and the journal, rings W freely movable in said space and having opposing concave faces forming a ball-race, and balls in said race, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

STEPHEN H. GARST.
DUDLEY GARST.

Witnesses:
R. H. LOGAN,
F. G. BEACH.