

(No Model.)

D. MANUEL.
ROTARY HARROW.

No. 298,008.

Patented May 6, 1884.

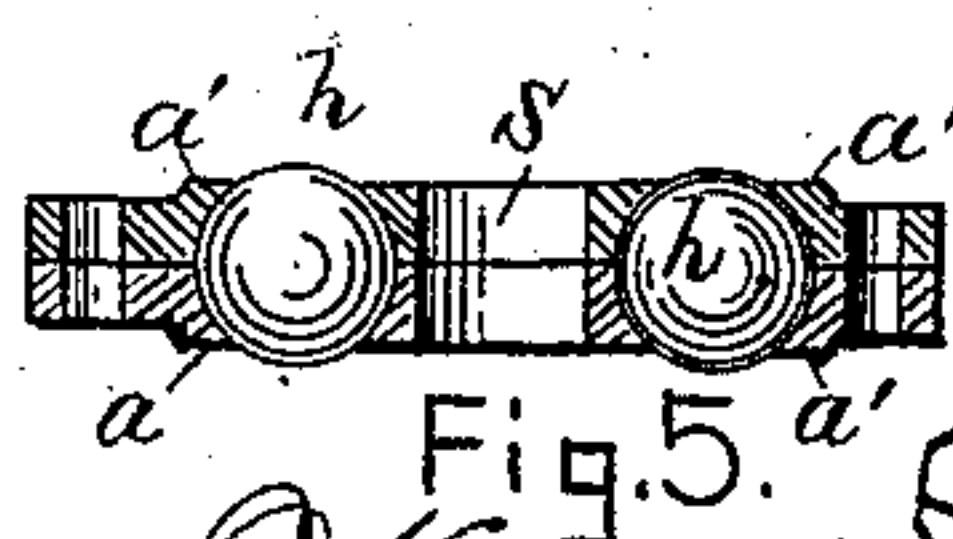
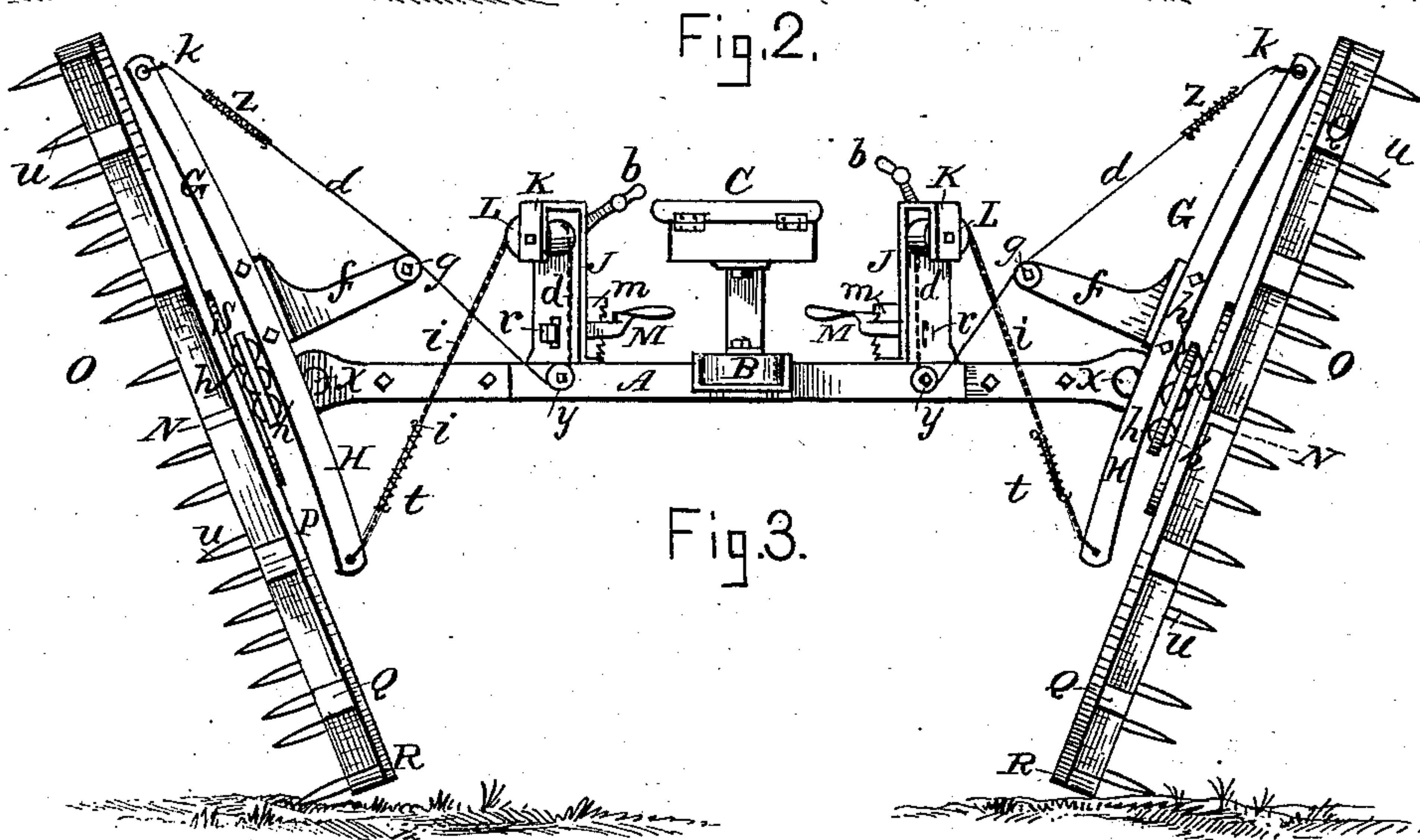
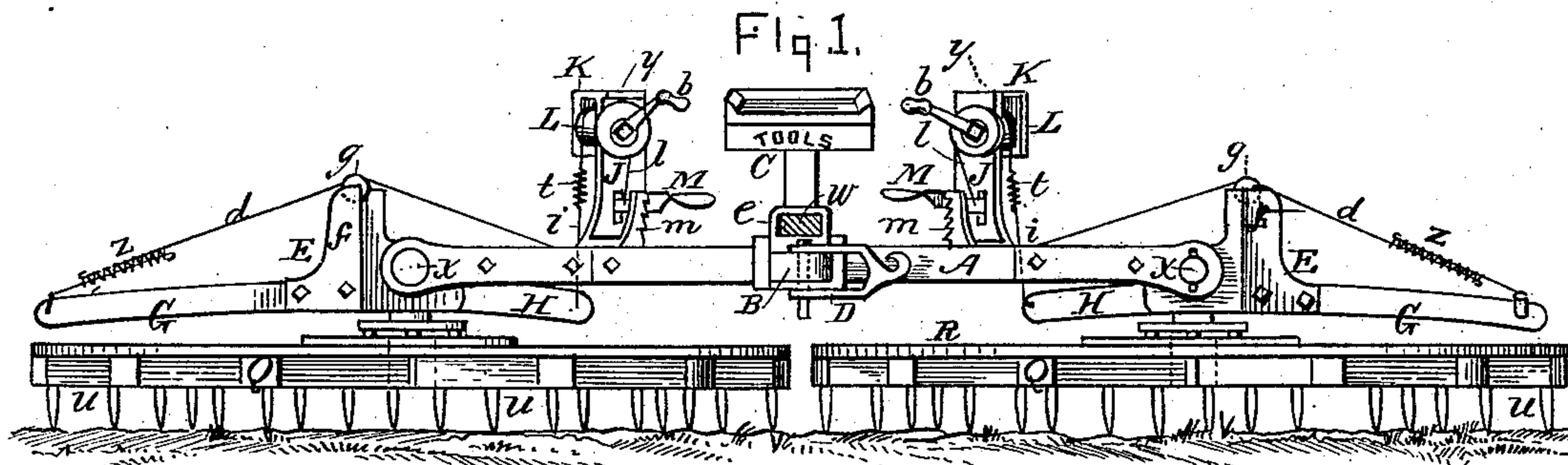
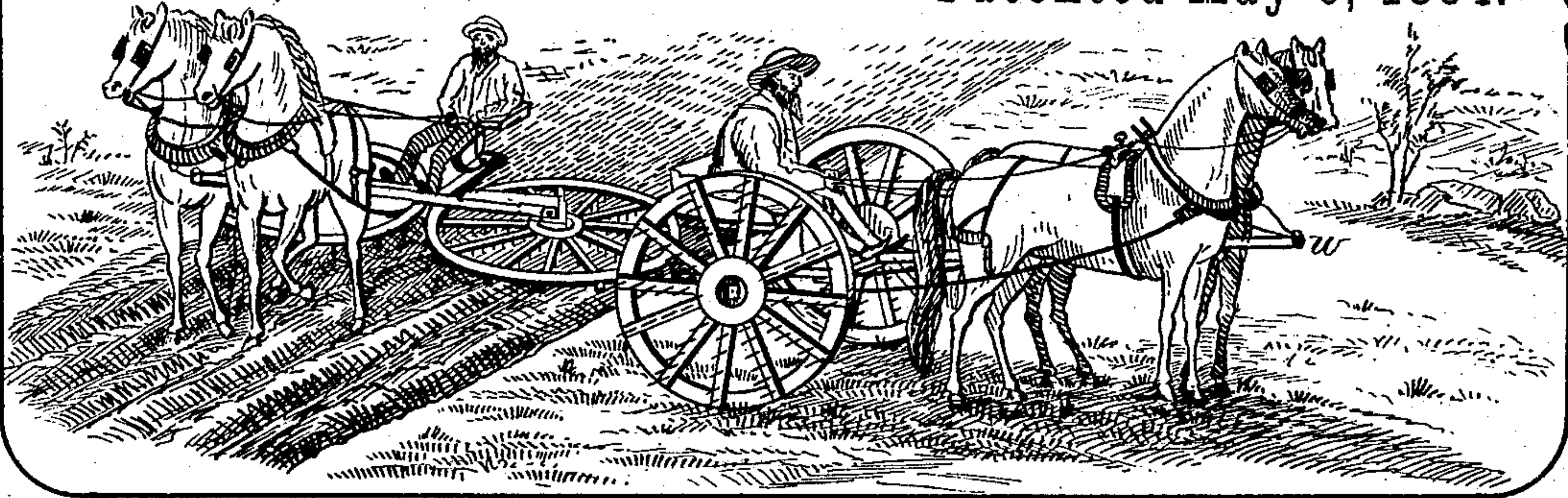


Fig. 5.

Witnesses.
H. E. Kemick,
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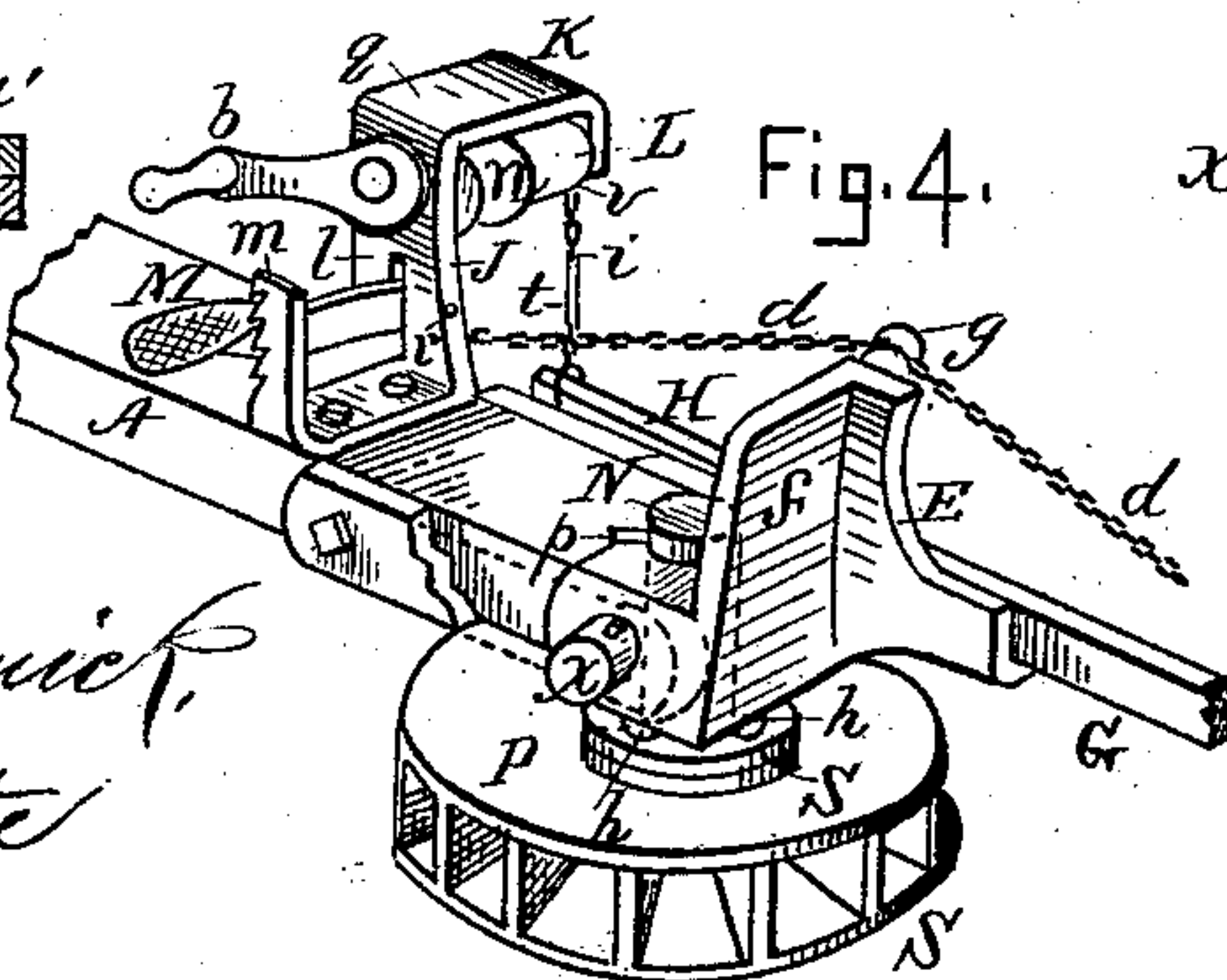


Fig. 4.

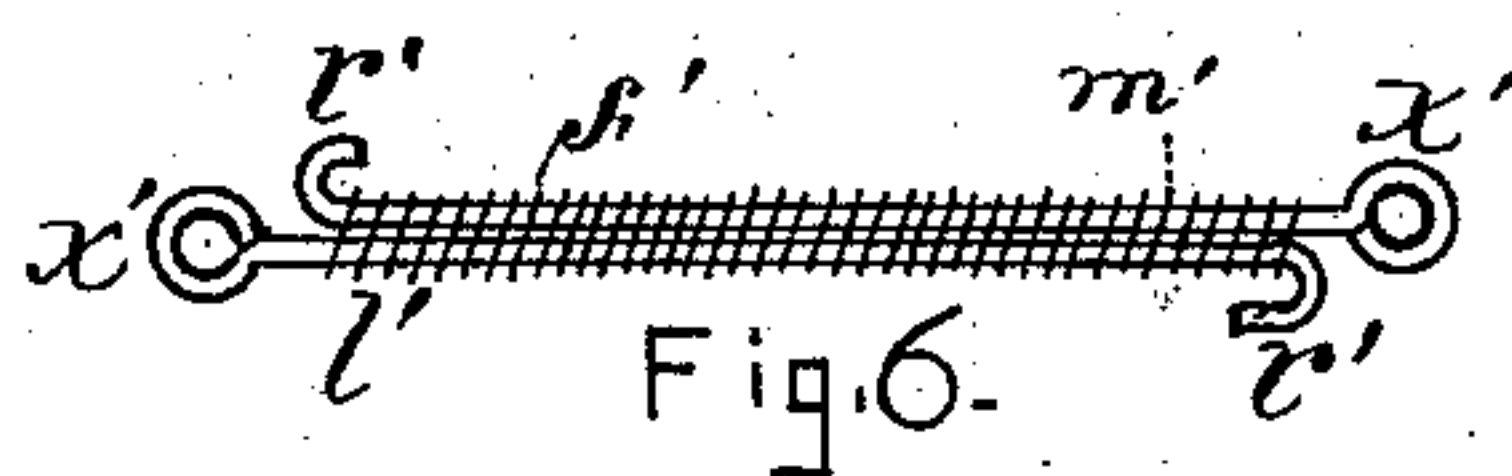


Fig. 6.

Inventor.

David Manuel,
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UNITED STATES PATENT OFFICE.

DAVID MANUEL, OF HYDE PARK, MASSACHUSETTS, ASSIGNOR OF SEVEN-EIGHTHS TO BENJAMIN E. PHILLIPS, LAWRENCE A. BOYLAN, GEORGE HAIGH, WILLIAM H. JULIAN, JOHN H. MONAHAN, AND HERBERT C. SOMES, ALL OF SAME PLACE.

ROTARY HARROW.

SPECIFICATION forming part of Letters Patent No. 298,008, dated May 6, 1884.

Application filed July 27, 1883. (No model.)

To all whom it may concern:

Be it known that I, DAVID MANUEL, of Hyde Park, in the county of Norfolk, State of Massachusetts, have invented a certain new and useful Improvement in Harrows, of which the following is a description sufficiently full, clear, and exact to enable any person skilled in the art or science to which said invention appertains to make and use the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is an isometrical perspective view, representing my improved harrow in use; Fig. 2, a front elevation; Fig. 3, a rear elevation, representing the wheels or harrows proper partially elevated; Fig. 4, a perspective sectional view, showing the hub and elevating mechanism; Fig. 5, a vertical longitudinal section of the washer, and Fig. 6 a view of the spring.

Like letters of reference indicate corresponding parts in the different figures of the drawings.

My invention relates to that class of rotary harrows which are provided with means for converting them into sulkies; and it consists in a novel construction and arrangement of the parts, as hereinafter more fully set forth and claimed, by which a more effective device of this character is produced than is now in ordinary use.

In the drawings, A represents a cross-bar; B, the tongue, which is arranged at right angles and centrally secured to the bar, being provided at its rear end with the spring-seat C and at its forward end with the hook D.

Pivoted at *x* to either end of the bar A there is a head-stock, E, provided with an upwardly-projecting arm, *f*, carrying the pulley or sheave *g*, and with the horizontally-arranged arms G H.

Projecting upwardly from the bar or body A, on either side of the seat C, there is a standard, J, provided at its upper end with the horizontally-projecting arm K and at its lower end with the vertically-arranged serrated bar *m*.

Journaled horizontally in the upper end of each of the standards J there is a windlass or

crank-shaft, L, provided with the drums or pulleys *v n*.

Disposed around the pulleys *v* there is a cord or chain, *i*, provided with a spring, *t*, and connected at its lower end with the arm H, and around the pulley *n* a cord or chain, *d*, provided with a spring, *z*, which cord passes under a sheave or pulley, *y*, on the bar A, thence over the pulley *g* to the outer end of the arm G, where it is firmly secured, as shown at *k*.

Pivoted on the standard J, as shown at *r*, there is a treadle, M, adapted to engage the teeth of the bar *m*, and provided with a cord or chain, *l*, which passes upwardly, and is wrapped around the windlass or crank-shaft L outside the standard J, the upper end of said cord or chain being secured to the pin *q* in the arm K. A short axle, N, is journaled vertically in each of the head-stocks E, being secured at its upper end by the axle-pin *p*, and carrying at its lower end the wheel O, the hub P of said wheel having a series of radial spokes, Q, provided with harrow-teeth *u*, and connected or secured at their outer ends to the ring or band R, resting on their upper sides, the wheel being adapted to turn freely on said axle and said axle also adapted to turn freely in the head-stock. The wheels being erected or the harrow converted into a sulky, it may be readily driven into the field, as shown in Fig. 1.

When it is desired to lower the wheels or place them in a horizontal position for use, the treadles M are elevated to loosen the cords *l*, and the cranks *b* turned to wind up the cords *i* on the pulleys *v*, and unwind the cords *d* from the pulleys *n* on the shafts or windlasses L, thereby elevating the arms H and depressing the arms G to bring the wheels O O into the position shown in Fig. 2, after which the treadles M M are pushed down to their fullest extent and caused to engage the serrated bars *m*, thereby acting to "brake" or prevent the crank-shafts L from turning, and firmly securing the wheels O in a horizontal position in a manner that will be readily understood by all conversant with such matters without a more explicit description. When it is desired to elevate the wheels and convert the

harrow into a sulky, the treadles M are again released or disengaged from the bars *m*, and the cranks *b* turned to elevate the arms G and depress the arms H, until said arms are brought into a vertical position and the axles N into a horizontal position, or to coincide with the longitudinal axial line of the body A. A pole, *w*, is inserted in the loops or bands *e*, in the usual manner, and the horses hitched by an ordinary double whiffletree to the hook D when the harrow is in use. By very slightly elevating the outer edges of the wheels by means of the windlasses L, they will be caused to press the harrow-teeth into the ground to a greater extent at their inner edges than at their outer edges, and hence the wheels will revolve from the front inwardly as the harrow is drawn over the ground, and vice versa, thus enabling the work of harrowing to be very effectively performed.

Disposed around each of the axles N and between the hubs P and head-stocks E there is a washer, S, provided with small friction-balls *h*, to reduce the area of the bearing-surfaces between the hubs and head-stocks. The balls are held in position in the body of the washer by means of annular flanges *a' a'*, in such a manner as to revolve freely as the washers turn on the axles N.

The springs *z t* on the cords *d i* are constructed as shown in Fig. 6, and consist of an ordinary coiled spring, *f'*, provided with two rods, *m' l'*, each of said rods having a hook, *r'*, at one end and an eye, *x'*, at the other, the hook on one of the rods being arranged adjoining the eye of the opposite rod, and vice versa, and the spring coiled around both rods, so that when the rods are pulled in opposite directions by their respective cords the springs will be compressed and act expansively to prevent the cords from breaking by a sudden

strain, and also to take up the slack cord as the wheels of the harrow pass over uneven ground.

I do not confine myself to the use of springs constructed in any special manner, as ordinary coiled springs or springs of any other suitable character may be employed, if desired; neither do I confine myself to confining the balls *h* in the washer S, as described, or to securing or "braking" the windlasses L by the treadles M, as other means may be employed for these purposes.

Having thus explained my invention, what I claim is—

1. In a rotary harrow, the bar A, provided with the standard J, having the arm K, the shaft L, provided with the pulleys *n v*, and crank *b*, the treadle M, provided with the chain *l*, and the chains *i d*, for raising, lowering, and securing the wheel O, substantially as described.

2. In a rotary harrow, the head-stock E, carrying the wheel O, and provided with arms G H, and upwardly-projecting arm *f*, in combination with the chains *i d*, and means for drawing and releasing the latter, the arm *f* acting as a lever, against the outer end of which the chain *d* operates in raising and lowering the wheel O, substantially as described.

3. The combination, substantially as set forth, of a bar, arms horizontally pivoted to the outer ends thereof, short axles attached to said arms, wheels on said axles provided with harrow-teeth, a winding mechanism, and elastic extensible cords connecting said arms with said winding mechanism.

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Witnesses:

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