

No. 688,081.

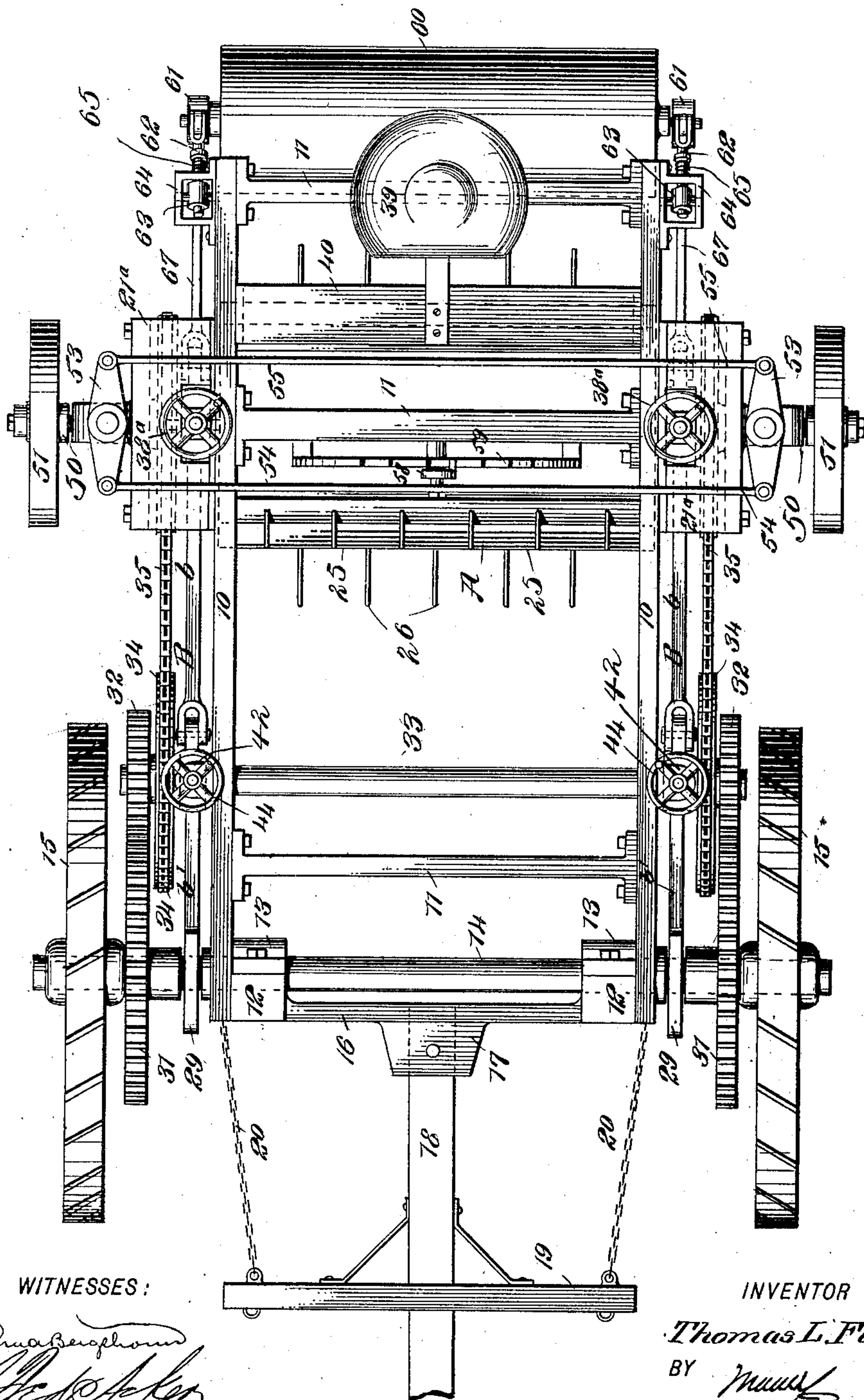
Patented Dec. 3, 1901.

T. L. FLYNN.  
HARROW.

(Application filed May 8, 1901.)

(No Model.)

3 Sheets—Sheet 1.



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**No. 688,081.**

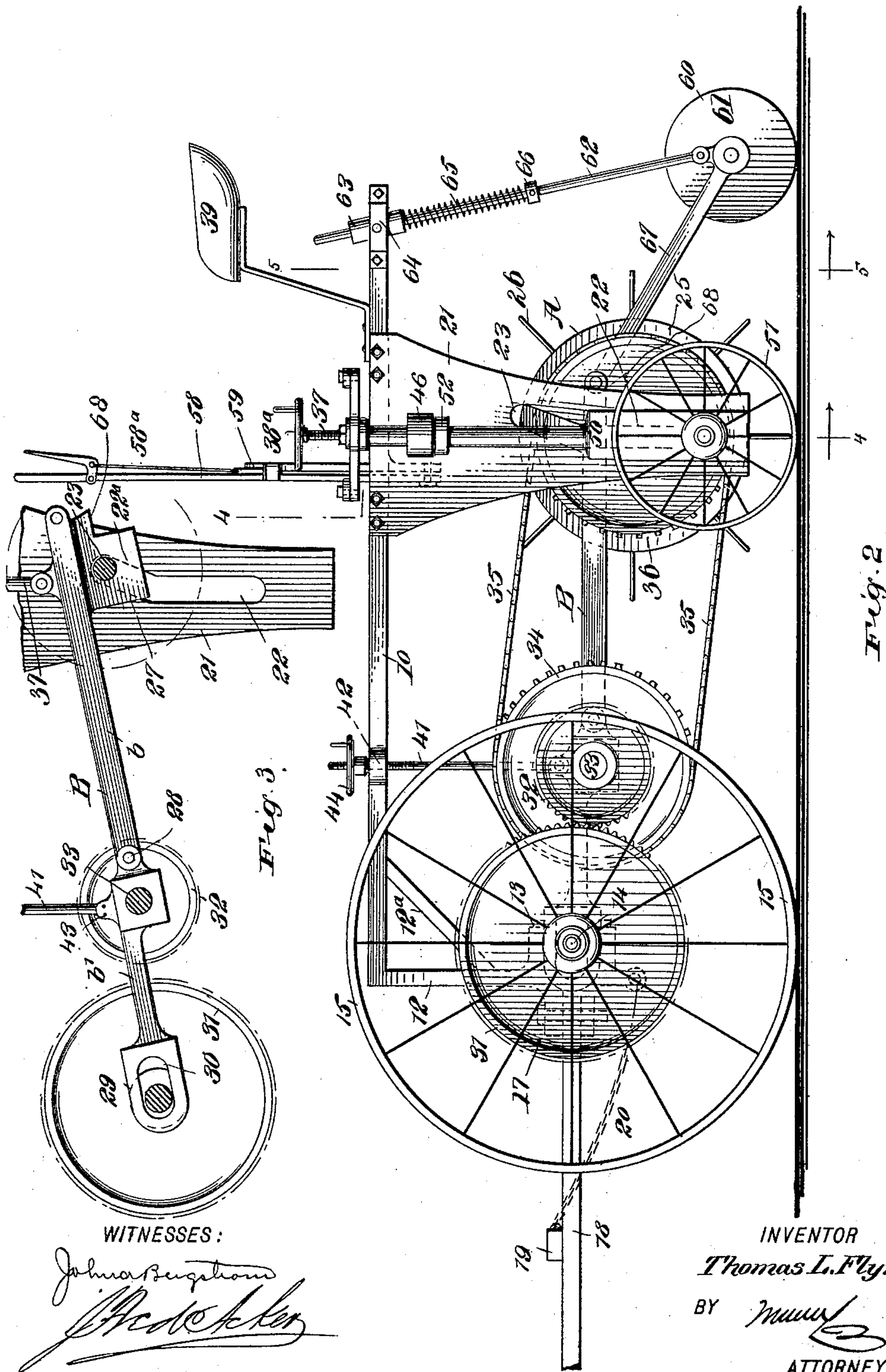
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**HARROW.**

(Application filed May 8, 1901.)

(No Model.)

**3 Sheets—Sheet 2.**



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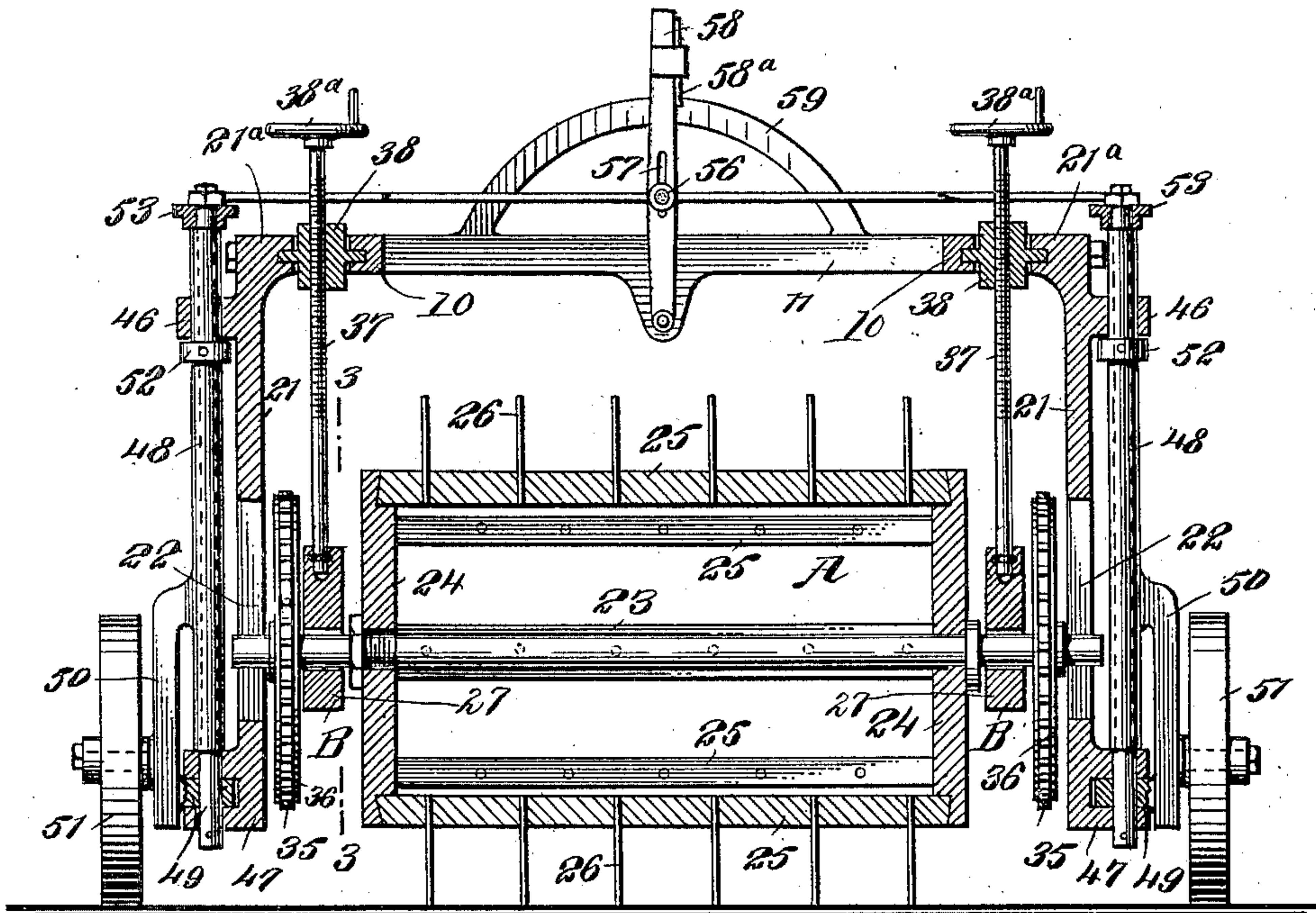


Fig. 4

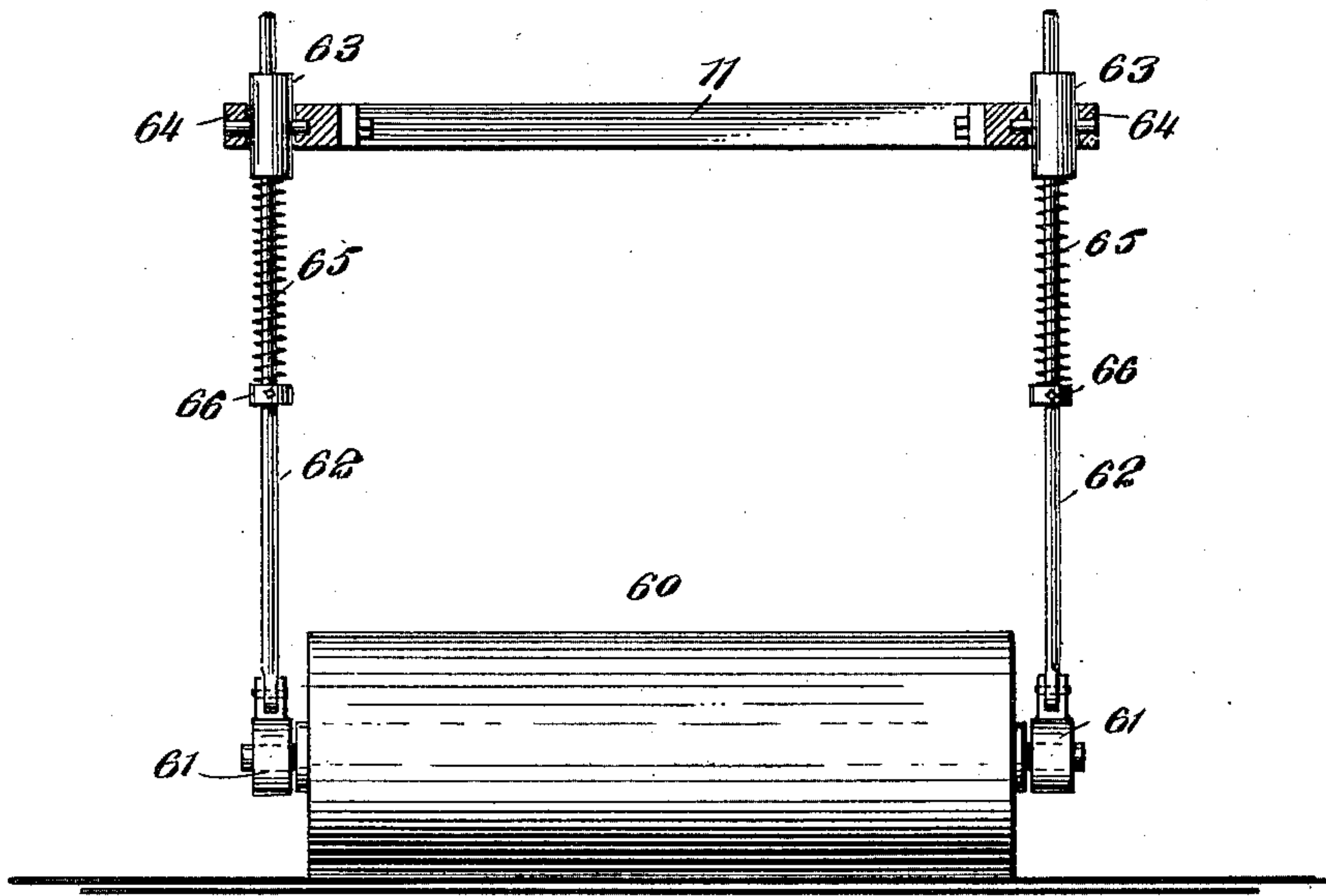


Fig. 5

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# UNITED STATES PATENT OFFICE.

THOMAS L. FLYNN, OF NEW YORK, N. Y.

## HARROW.

SPECIFICATION forming part of Letters Patent No. 688,081, dated December 3, 1901.

Application filed May 8, 1901. Serial No. 59,238. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS L. FLYNN, a citizen of the United States, and a resident of the city of New York, borough of the Bronx, in the county and State of New York, have invented a new and Improved Harrow, of which the following is a full, clear, and exact description.

The purpose of the invention is to provide a simple, durable, and economic form of harrow which will harrow and roll the ground at one operation and to provide a rapidly-moving harrow-frame driven from the axle of the machine, effecting a rapid and thorough pulverization of the ground.

A further purpose of the invention is to provide a novel and simple form of steering-gear under complete control of the driver and means whereby the harrow-drum and roller may be simultaneously raised and lowered and whereby when the harrow-drum is elevated it will be simultaneously thrown out of gear with the driving mechanism.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of the improved machine. Fig. 2 is a side elevation of the same. Fig. 3 is a detail section illustrating one of the carrying-arms for the harrow-drum axle and transmitting-gears, the transmitting-gears being shown out of mesh with the driving-gear, the section being taken practically on the line 3 3 of Fig. 4. Fig. 4 is a section taken practically on the line 4 4 of Fig. 2, and Fig. 5 is a section taken practically on the line 5 5 of Fig. 2.

The frame of the machine consists of two side bars 10, connected by any suitable number of cross-bars 11, as shown in Fig. 1, and downwardly-extending members 12, which are secured to the forward ends of the side bars 10, which members 12 at their lower ends carry bearings 13, in which the forward axle 14 is mounted to revolve, the axle being provided with supporting-wheels 15 at its outer ends of suitable diameter. The forward pend-

ent members 12 are connected at their lower ends by a front cross-bar 16, from which cross-bar a forward extension 17 is carried, and this extension receives a tongue 18, which is provided with the usual draft-tree 19, connected with the frame on the axle by means of chains 20. Pedestals 21, provided at their upper ends with horizontal members 21<sup>a</sup>, are bolted to the outer faces of the side bars 10 between the center of the frame and its rear extremity, and these pedestals 21 are provided with longitudinal slots 22, having upwardly and rearwardly inclined extensions 22<sup>a</sup> at their upper ends, as is best shown in Fig. 3. The ends of a shaft 23 are located in the slots 22 of the pedestals 21, and, as shown in Fig. 4, a drum A is secured to the said shaft 23, which drum consists of suitable heads 24, fast to the axle, and cross-bars 25, which connect the heads. These cross-bars 25 carry teeth 26 of suitable construction secured to the cross-bars in any approved manner.

Two shifting arms B are employed, located outside of the frame structure. One of these shifting arms is shown in detail in Fig. 3, and each shifting arm is preferably made in two sections—a rear section *b* and a forward section *b'*—the two sections having a hinged connection 28. At the rear end of the rear section of each shifting arm a downwardly-extending block 27 is made integral with the arm or is attached thereto, and the ends of the shaft 23 which project beyond the harrow-drum A are loosely passed through suitable openings in these blocks, as is best shown in Fig. 4. At the forward end of each shifting arm B a head 29 is formed, having a longitudinal slot 30 produced therein, and the forward axle 14 of the machine is passed through the slots 30 in the heads 29 of the said shifting arms, so that the forward ends of the shifting arms are supported by the forward axle 14, and the said arms have sliding movement on the said forward axle.

The harrow-drum A is driven by securing to the forward axle 14 outside of the frame, near each end, a gear 31, and these gears are adapted to mesh with pinions 32, secured upon the outer ends of the shaft 33, which shaft is held to turn in an enlarged portion of the forward section *b'* of each shifting arm B. The shaft 33 is provided also near each end out-



side of the frame with a sprocket-wheel 34, and these sprocket-wheels 34 are connected by chain belts 35 with sprocket-wheels 36, secured upon the shaft 23 of the harrow-drum between the pedestals 21 and the shifting arms B, as is shown in Fig. 4. The shifting arms are raised or lowered through the medium of rods 37, having a swivel connection with the rear members b of the shifting arms B, near their rear ends, and the upper portions of the rods 37 are threaded. The threaded portions of the rods 37 pass through nuts 38, which nuts are pivoted by means of suitable trunnions in the top sections 21<sup>a</sup> of the pedestals 21, as is shown in Figs. 1 and 4. At the upper end of each of the shifting rods 37 a hand-wheel 38<sup>a</sup> is preferably secured for the purpose of turning these rods, and the hand-wheels 38<sup>a</sup> are within convenient reach of the driver's seat 39, which seat is supported upon a foot-rest 40 by means of a suitable standard. The foot-rest extends from one side bar of the frame to the other, as is shown in Fig. 1.

It will be observed that when the rear ends of the shifting arms are raised to the position shown in Fig. 3 the shifting arms move not only upward at their rear ends, but likewise rearwardly as the shaft 23 of the harrow-drum enters the inclined extensions 22 of the slots in the pedestals, and at such time the shifting arms are carried bodily rearward and the pinions 32 are carried out of mesh with the gears 31 on the forward axle, thus stopping the revolution of the harrow-drum while it is elevated.

The shifting arms B are supported between their ends by rods 41, and these rods are passed up through bearing 42 at the outer side of the side bars of the frame, as shown in Fig. 2, the said rods being pivotally attached to the shifting arms at their lower ends. Their upper portions are threaded and hand-wheels 44 are located upon the upper threaded ends of the rods, and by adjusting the rods 41 the pinions 32 may have greater or less frictional engagement with the driving-gears 31. Sockets 46 are formed on the outer faces of the pedestals 21 near their upper ends, and at the lower portions of the said pedestals outwardly-extending knuckles 47 are provided. Vertical shafts 48 are passed at their lower ends through the knuckles 47 of the pedestals and through knuckles 49, which are located between the knuckles 47, which knuckles 49 are secured to vertical members 50, forming a portion of the lower parts of the shafts 48, as shown in Fig. 4. The stub-axles upon which the rear wheels 51 are mounted are secured to the said members 50. Thus it will be observed by turning the shafts 48 the rear wheels will be turned also and the machine may be steered. The shafts 48 are prevented from moving upward by placing collars 52 on the shafts below the sockets 46.

At the upper end of each shaft 48 a head-block 53 is secured at its center, and the ends

of these head-blocks are pivotally connected by rods 54 and 55. The forward rod 54 at its center is provided with a pin 56, which enters a slot 57 in a lever 58, fulcrumed upon one of the cross-bars 11, as is illustrated in Fig. 4, and the lever is provided with a thumb-latch 58<sup>a</sup>, which enters recesses in a rack 59, secured to the said cross-bar 11. Thus by moving the lever 58 to the right or to the left the machine may be made to travel in any desired direction.

At the rear end of the machine a roller 60 is located capable of traveling on the ground, and this roller when not needed is raised from the ground simultaneously with the elevation of the harrow-drum A. The roller 60 is provided with trunnions which are mounted in bearings 61, and these bearings are pivotally attached to arms 62, which arms extend up through sleeves 63, pivotally mounted in brackets 64 at the sides of the rear portion of the frame. Springs 65 are coiled around the arms 62, having bearing against the bottom portion of the sleeves and against collars 66, adjustable on the said arms 62, as is shown in Figs. 2 and 5. By adjusting the collars 66 the roller 60 may be made to bear with more or less pressure on the ground. Auxiliary arms 67 are attached to the bearings 61 for the roller-trunnions, as shown in Fig. 2, and these arms are pivotally connected with the rear ends of the shifting arms B just above inclined shoulders 68, formed at the upper rear portions of the pivot-blocks 27 for the arms, as is shown in dotted lines in Fig. 2 and in positive lines in Fig. 3. When the rear ends of the shifting arms B are raised, carrying the harrow-drum up with them, the roller 60 is also raised, as at the first upward movement of the rear portions of the shifting arms, the arms 67, connected with the roller, will bear upon the inclined shoulders 68. Consequently the auxiliary arms of the roller will be carried upward by the shifting arms, taking the roller 60 with them. The roller drops to the ground when the harrow-drum is lowered. Instead of the collars 66 being adjusted by set-screws said collars may be threaded on the arms 62.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a harrow, a wheel-supported frame, pedestals extending downward from the frame, shifting arms pivotally and slidably mounted upon one of the axles, a shaft carried by the shifting arms, having guided movement in said pedestals, and means for raising and lowering the shifting arms at that point where the shaft is guided by the pedestals, as described.

2. In a harrow, a wheel-supported frame, shifting arms pivotally and slidably mounted upon the axle of the said frame, pedestals extending downward from the frame and provided with longitudinal slots having inclined upper portions, a shaft passed through the said



slots in the pedestals, the shaft being carried by the shifting arms, a harrow-drum secured to the said shaft, means for rotating the shaft from an axle of the machine, and devices for raising and lowering that portion of the shifting arms carrying the shaft for the harrow-drum, as set forth.

3. In harrows, the combination, with a wheel-supported frame, and shifting arms pivotally and slidably mounted on the forward axle of the machine, said arms being constructed in pivotally-connected sections, of pedestals extending downward from the frame, provided with longitudinal slots therein, a shaft carried by the shifting arms and passed through the slots in the pedestals, a harrow-drum secured to the said shaft, a driven shaft also carried by the shifting arms, gear connections between the driven shaft and the forward axle of the machine, and a driving connection between the driven shaft and the shaft carrying the harrow-drum, and devices for raising and lowering the shifting arms, for the purpose described.

4. In harrows, the combination, with a wheel-supported frame, and shifting arms pivotally and slidably mounted on the forward axle of the machine, said arms being constructed in pivotally-connected sections, of pedestals extending downward from the frame, provided with longitudinal slots therein, a shaft carried by the shifting arms and passed through the slots in the pedestals, a harrow-drum secured to the said shaft, a driven shaft also carried by the shifting

arms, gear connections between the driven shaft and the forward axle of the machine, a driving connection between the driven shaft and the shaft carrying the harrow-drum, devices for raising and lowering the shifting arms, a roller, arms extending from the bearings of the roller, which arms are pivotally connected with the shifting arms, and a tension device connected with the said roller and having a rocking connection with the said frame, as described.

5. In harrows, the combination, with a wheel-supported frame, shifting arms pivotally and slidably mounted upon the axle of the said frame, pedestals extending downward from the frame, a shaft mounted in the shifting arms, a harrow-drum secured to said shaft, and means for raising and lowering that portion of the shifting arms carrying the shaft, of rocking bearings at the rear of the frame, a roller, arms extending from the bearings of the roller and connected with the shifting arms, tension-arms pivotally connected with the bearings of the roller and extending loosely through the rocking bearings, and springs adjustably located on the tension-arms, having bearing against the said bearings, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOMAS L. FLYNN.

Witnesses:

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