W. BERNDT.

GANG PLOW.

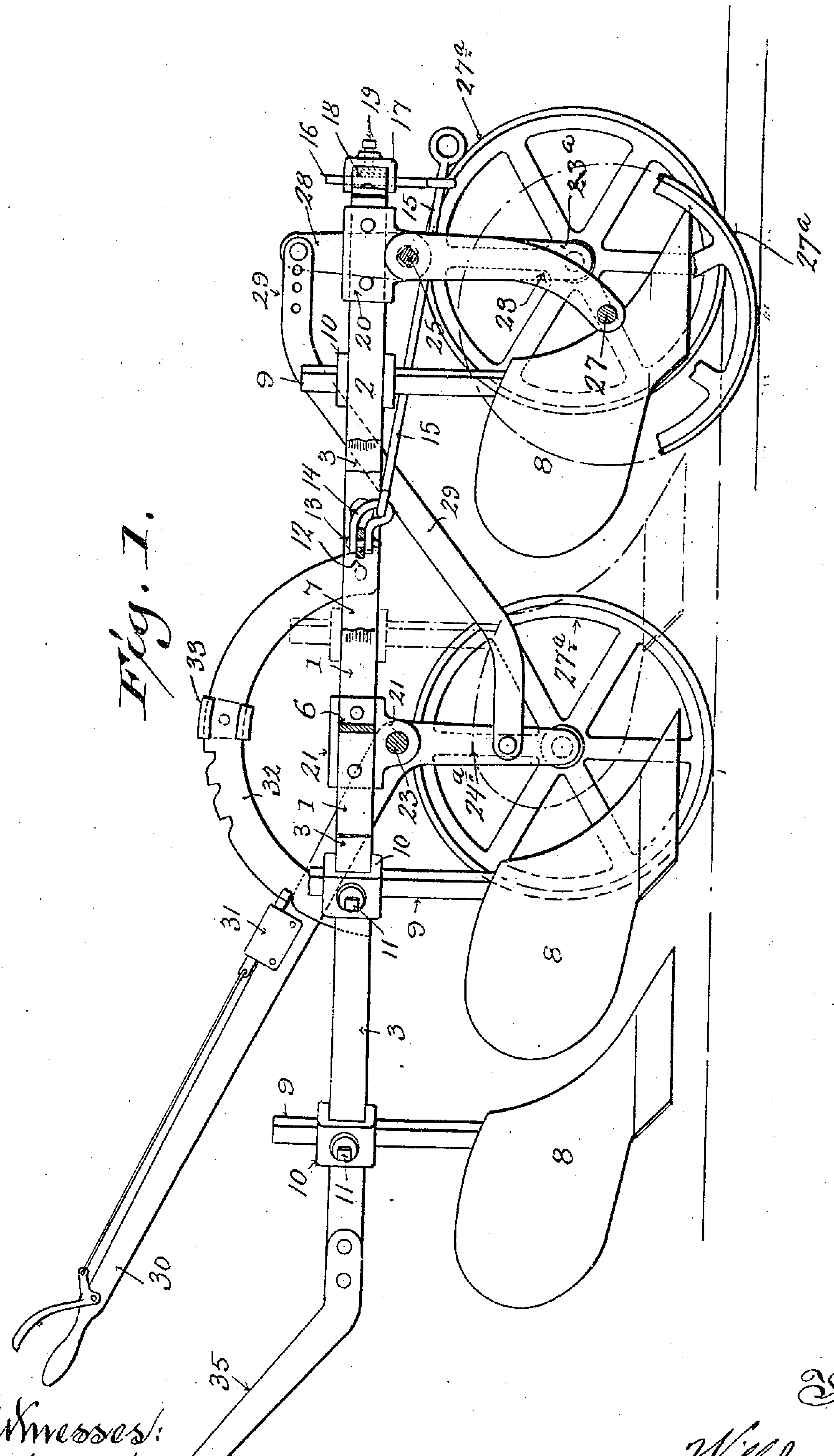
APPLICATION FILED OCT. 11, 1909.

976,338.

Patented Nov. 22, 1910.

3 SHEETS—SHEET 1.

Fig. 1.



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3 SHEETS—SHEET 2.

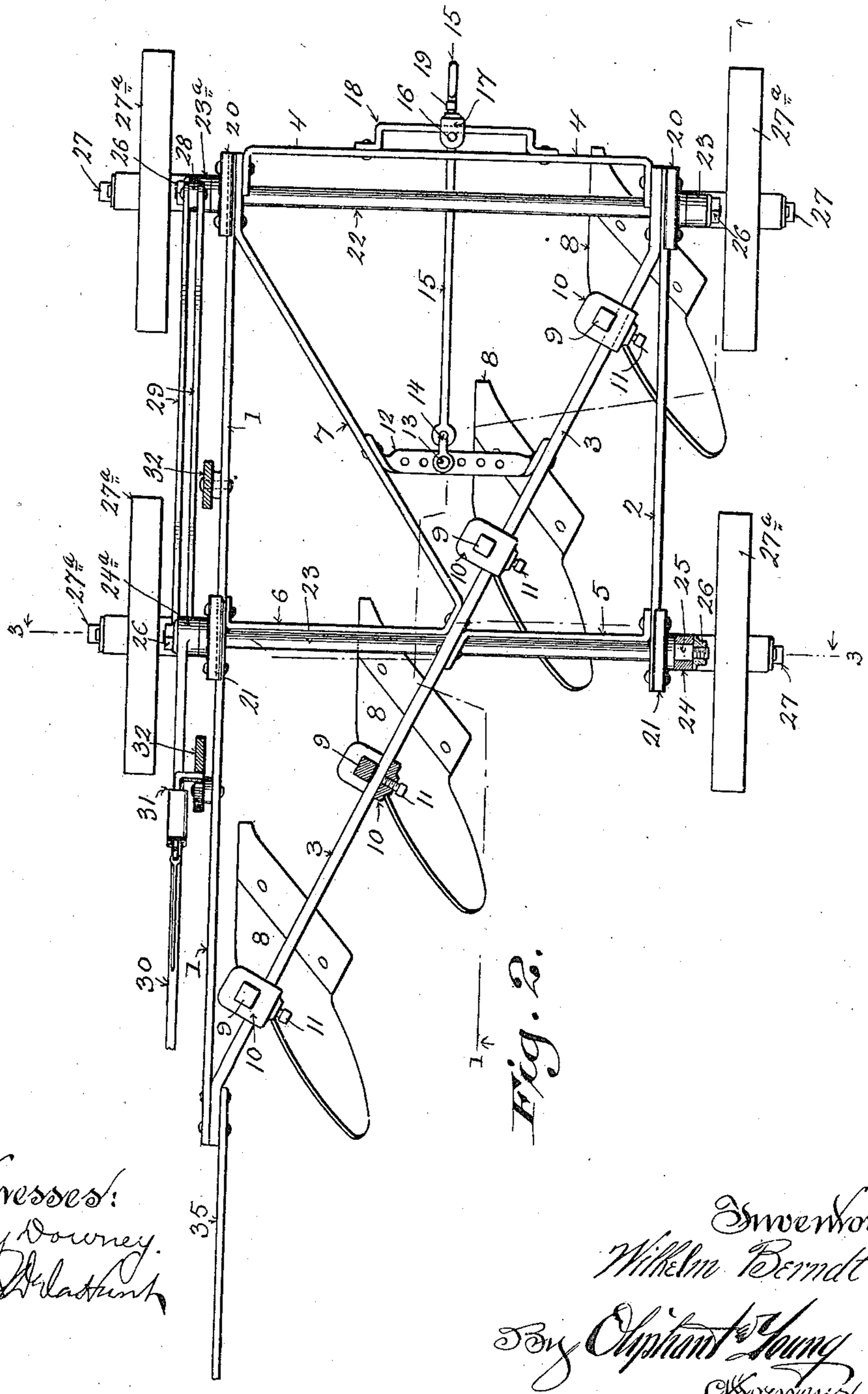

Fig. 2.

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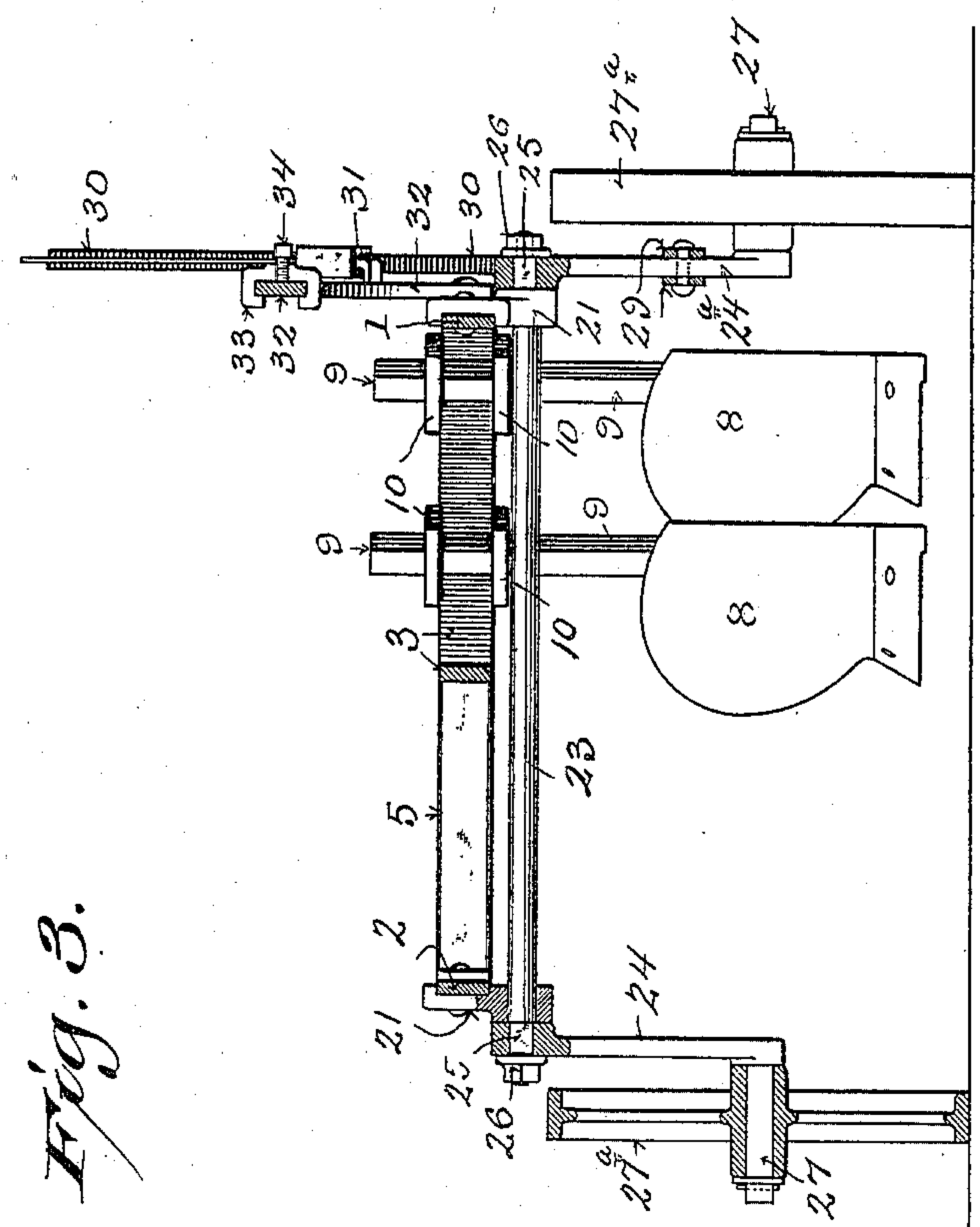
3 SHEETS—SHEET 3.

Fig. 3.



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UNITED STATES PATENT OFFICE.

WILHELM BERNDT, OF HAVEN, WISCONSIN.

GANG-PLOW.

976,338. Specification of Letters Patent. Patented Nov. 22, 1910.

Application filed October 11, 1909. Serial No. 521,982.

To all whom it may concern:

Be it known that I, WILHELM BERNDT, a citizen of the United States, and resident of Haven, in the county of Sheboygan and State of Wisconsin, have invented certain new and useful Improvements in Gang-Plows; and I do hereby declare that the following is a full, clear, and exact description thereof.

The object of my invention is to provide a simple, economical and effective gang-plow, its arrangement and construction being such, that a supporting frame for the series of plows is mounted upon cranked axles carrying truck-wheels, whereby the plows are raised or lowered by means of a system of levers, to facilitate manipulation of the machine and render lighter drift of the same in its operation.

The invention therefore consists in various novel structural features and combination of parts as are fully set forth hereinafter with reference to the accompanying drawings and subsequently claimed.

In the drawings: Figure 1 represents a partially sectional elevation of a gang-plow embodying the features of my invention, the section being indicated by line 1—1 of Fig. 2, this view of the machine being shown with the plows elevated for transportation with the truck-wheels resting upon a road-bed having high and low planes that are indicated by parallel lines under said truck-wheels, the road-bed being so shown to obviate the necessity of projecting the machine in perspective, which would result if said machine were illustrated upon a flat road-bed; Fig. 2, a plan view of the same with parts broken away and parts in section to better illustrate the details, and Fig. 3, a cross-section of the plow as indicated by line 3—3 of the preceding figure.

Referring by numerals to the drawings, 1 and 2 indicate the side bars of a frame, the side bar 1 being upon the "land-side" and is approximately twice the length of the opposite side bar.

A plow-beam 3 extends obliquely from forward end of the side bar 2 to the rear end of the side bar 1 and is secured to the respective bars by suitable bolts or rivets. The side bars are cross-connected at their forward ends by a strut 4 and further braced by a strap 5, which strap is secured to the rear end of the side-bar 2 and the plow-beam 3 intermediate of its ends. A similar brace strap 6, which forms a lateral continuation of the first named strap, also intersects and is connected to the plow-beam and opposite side bar 1, there being an oblique extension 7 on this strap, the end of which extension is bolted or otherwise secured to the front end of said side-bar 1.

By the construction described, a rigid, light, frame is produced, which frame is adapted to carry a series of plows 8, of any desired type. These plows are each provided with a standard 9 that is rectangular in cross-section and arranged to fit and have vertical adjustment in squared apertures of the upper and lower jaws of a clip 10, which clip in turn is adjustably mounted upon the plow-beam. One face of each plow standard, is in frictional engagement with the plow-beam, as shown, and each clip 10, carries a set-bolt 11 in screw-threaded engagement therewith. After the plows are all adjusted to the desired elevation and also adjusted longitudinally upon the beam, to obtain the desired width of cut, the set-bolts are each tightened against the adjacent beam face. Thus the jaws of each clip cause a draw upon the standard fitted therein and the plows are thereby frictionally locked to the beam, in their respective locations, being spaced apart at equal distances in echelon.

The draft-gear consists of a strap 12, that is secured to the beam and the oblique strap extension 7, being provided with a series of apertures, to any one of which is fitted a keeper stud 13 of a link 14, whereby the line of draft relative to the plows may be shifted in a lateral direction. A draw-bar 15 is connected to the link and arranged to pass through the eye of a vertically disposed hanger, the shank 16 of which is adjustably fitted in a clip 17 that is similar in construction to the retaining clips of the plow-beam, being secured to a stirrup 18 by means of a bolt 19, whereby the draw-bar is both vertically and horizontally adjustable. The stirrup 18 is secured to the strut 4 of the plow-frame and the draw-bar is provided with an eye to which may be attached the usual double-tree.

Bearing brackets 20 are secured to the frame side-bars adjacent to forward corners of the same, there being a similar pair of brackets 21 fitted to said side-bars, one of which brackets is secured to the rear end of side-bar 2, while the companion bracket of this set is secured to side-bar 1 at a point

intermediate of its ends. Hung in the two sets of brackets are front and rear shafts 22, 23[b] respectively. The front shaft carries a pair of arms 23, 23[a], and the rear shaft a similar pair of arms 24, 24[a], which arms together with their respective shafts constitute cranked axles.

The arms are secured to the shafts by means of squared apertures, that engage squared shanks 25 of said shafts, said arms being held in position thereon by nuts 26, which nuts are in screw-threaded engagement with reduced extension of the aforesaid shafts as shown. The opposite or lower ends of each set of arms are provided with spindles 27 projecting therefrom, upon which spindles, front and rear truck-wheels 27[a] are mounted.

The forward arm 23[a] has an upwardly extending leg 28, that is adjustably connected to arm 24[a] of the rear cranked axle, by parallel links 29, through which links oscillatory motion is imparted to the forward cranked-axle by means of a hand-lever 30, the said lever being extended from the arm 24[a] as clearly shown in Fig. 1. The hand-lever 30 carries a detent 31 that is adapted to engage any one of a series of notches in a sector 32, which sector is secured to the side-bar 1 of the frame. The sector 32 carries an adjustable stop-plate 33 arranged to be locked at a predetermined point upon said sector by a set-screw 34, whereby movement of the hand-lever is limited in one direction, due to the engagement of its detent with said stop-plate.

Arm 23 of the forward cranked axle is preferably of greater length, as shown in Fig. 1, than the companion, in order that its truck-wheel can assume a relatively lower position than the remaining truck-wheel when in operation, it being understood that this truck-wheel travels in the furrow and gages the depth of cut of the plows.

A stilt 35 is secured to the rear end of side-bar 1, in connection with the plow-beam 3, for the convenience of the operator in controlling, or guiding the machine.

From the foregoing description it will be seen that plows and frame may be raised or lowered by manipulating the hand-lever, said lever being shown in the drawings in its extreme rearward position, in which position the plows are elevated for transporting the machine to or from work. If the hand-lever be moved forwardly, until its detent engages the stop-plate, it will be seen that the rear cranked axle will move rearwardly in an arc of circle about the shaft, causing the frame to descend and thus place the plows in their working position. Owing to the link connection 29, the front arms 23, 23[a], will move forward simultaneously with the movement of the rear arms, causing a spread of the truck-wheels whereby a parallel lowering movement of the entire frame is effected. By the spreading action of the wheels, the relation of the load upon said wheels is not changed or shifted as would be the case if the truck wheels were moved in the same direction. Thus the draft is rendered more uniform.

As shown in Fig. 1, the position of the spindle 27 of the longer front arm 23 is rearwardly set, relative to the spindle of its companion arm 23[a], and thus when the frame is lowered for plowing the mechanism will assume a position parallel to the ground, due to the fact that the long arm 23 will not rise as high as its companion arm, and consequently its wheel 27[a] will be proportionately lower than the opposite wheel, to accommodate its travel in the furrow last cut, while said opposite wheel travels upon the unbroken top-soil. The above described effect is obtained by swinging the arms 23 and 23[a] through approximately 45° of the arc of a circle. The plow, as shown in Fig. 1, is raised from its working position, in which position said plow if traveling upon a level surface would be slightly canted, but when dropped to its working position its frame would be approximately horizontal. Owing to the fact that the arms of the front and rear wheels are connected by link 29 upon opposite sides of the shafts 23 and 25, which shafts are the axis of said arms, the same will be moved in opposite directions when the plow is lowered and thereby said plow-frame will drop in a direct vertical plane as the wheels are spread apart. This feature is especially advantageous when it is desired to lift the plow from its engagement with the soil when in its working position as, owing to this arrangement, the wheels will be drawn together and thus lift the plows straight out of the ground, which can be easily effected by the hand leverage, there being no power required or expended in moving the weight of the plow-frame horizontally when the same is elevated.

It is obvious that, owing to the offset position of the front wheel 27[a] carried by arm 23, that when the plows are lifted for transportation as shown, the truck will travel upon the two rear wheels and the lowest front wheel, which, as stated, is offset from its companion, but as there is no particular strain upon the machine when not working, the effect of traveling upon three wheels is not material, it being essential, however, that said machine should travel upon four wheels in its working position in order to reduce the draft to a minimum.

The travel of the plow upon all four wheels in its working position is due to the fact that its front and rear land-side truck-wheels rotate upon the unbroken ground. The front furrow-side truck-wheel, being on a lower plane, will travel in the last one of

the previous cut furrows, which furrow is filled by the land-slice cut by the first plow 8 located adjacent to the front furrow-wheel. Consequently the rear furrow-side wheel of the plow will travel upon the upturned face of the furrow-slice that is thrown into the furrow directly forward of said rear wheel.

I claim:

1. In a gang-plow comprising a frame having a series of plows secured thereto; the combination of front and rear crank axles mounted upon the frame, truck-wheels carried by the axles, a leg extending upwardly from the front axle, a link connecting the leg above said front axle and crank portion of the rear axle below the same, a hand lever carried by the crank portion of the rear axle, a detent secured to the hand lever, and a toothed sector secured to the frame for engagement with the detent.

2. In a gang-plow comprising a frame having a series of plows secured thereto; the combination of brackets secured to the frame, front and rear crank axles mounted in the brackets, one of the front axle cranks being of greater length than its companion, truck-wheels carried by the axles, a leg extending upwardly from the front cranked axle, a link connecting the leg above the axle and crank portion of the rear axle at a point below said axle, a lever carried by the crank portion of the rear axle, and means for locking the lever to the frame.

In testimony that I claim the foregoing I have hereunto set my hand at Haven in the county of Sheboygan and State of Wisconsin in the presence of two witnesses.

WILHELM BERNDT.

Witnesses:

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