No. 800,710. PATENTED OCT. 3, 1905.

A. E. BISHMAN, DEC'D.

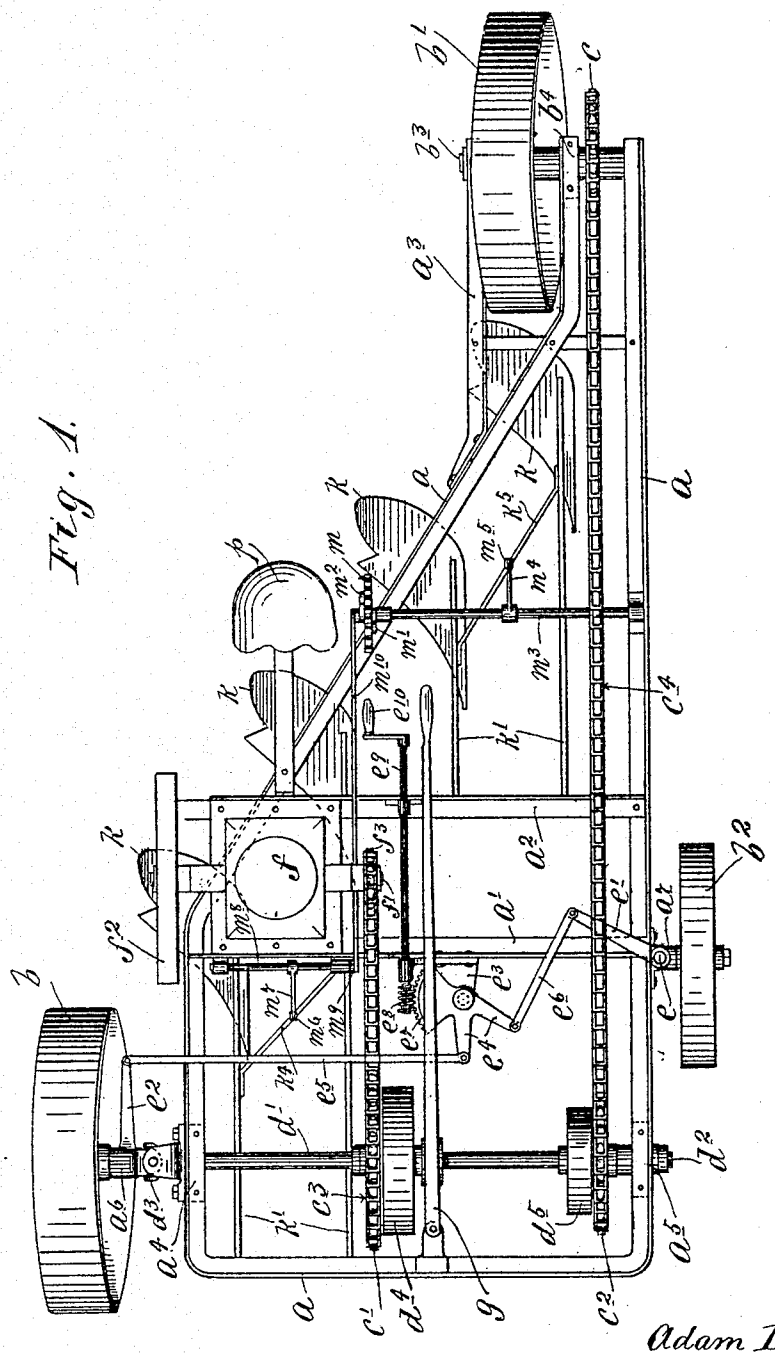
A. BISHMAN, ADMINISTRATOR.

TRACTION GANG PLOW.

APPLICATION FILED JAN. 30, 1903.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses.
A. H. Opsahl.
H. D. Kilgore

Adam Bishman
Adm. of the estate of
Adam E. Bishman, deceased,
By his Attorneys
Williamson & Merchant

ANDREW B. GRAHAM CO., PHOTO-LITHOGRAPHERS, WASHINGTON, D. C.

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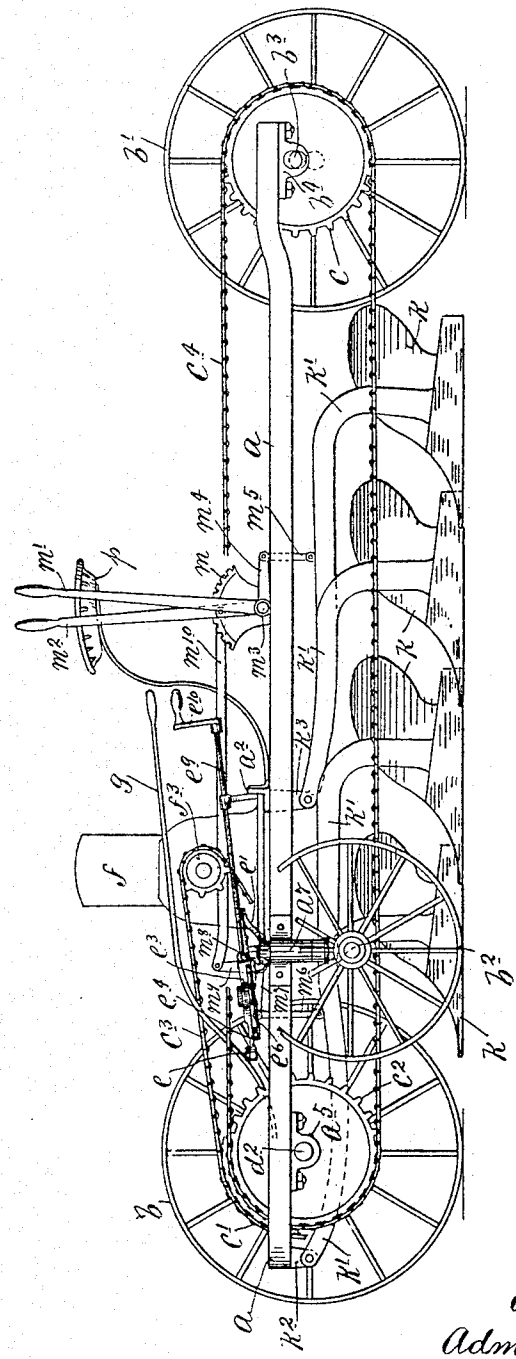
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3 SHEETS—SHEET 2.

Fig. 2



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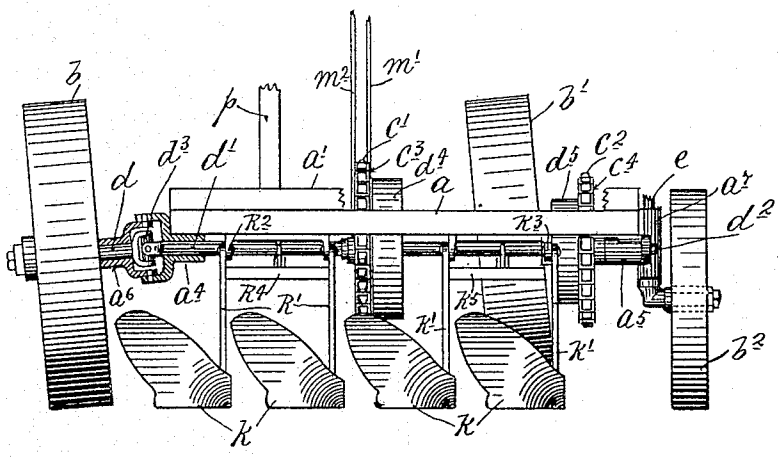
A. BISHMAN, ADMINISTRATOR.

TRACTION GANG PLOW.

APPLICATION FILED JAN. 30, 1903.

3 SHEETS—SHEET 3.

Fig. 3.



Witnesses.
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H. D. Kilgore.

Adam Bishman.
Adm. of the estate of
Adam E. Bishman
deceased.
By his Attorneys.
Williamson & Merchant

UNITED STATES PATENT OFFICE.

ADAM BISHMAN, OF OTISCO, MINNESOTA, ADMINISTRATOR OF ADAM E. BISHMAN, DECEASED.

TRACTION GANG-PLOW.

No. 800,710. Specification of Letters Patent. Patented Oct. 3, 1905.

Application filed January 30, 1903. Serial No. 141,220.

To all whom it may concern:

Be it known that ADAM E. BISHMAN, deceased, late a citizen of the United States, and resident of Otisco, in the county of Waseca, State of Minnesota, did invent certain new and useful Improvements in Traction Gang-Plows, and that ADAM BISHMAN, of the same place, as administrator of the estate of said ADAM E. BISHMAN, does hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention is especially directed to the improvement of gang-plows which are driven by a motor carried by the frame thereof, and has for its object to improve the same in the several particulars hereinafter noted.

The invention is illustrated in the accompanying drawings, wherein like characters indicate like parts throughout the several views.

Figure 1 is a plan view of the plow. Fig. 2 is a left side elevation of the same, and Fig. 3 is a front elevation of the plow with some parts broken away and with others sectioned.

The frame of the plow is preferably formed from angle-iron bent to form an approximately triangular and horizontally-extended skeleton a, which at its central portion is braced by a pair of transversely-extended tie-bars a' a^2 and at its contracted rear portion is provided with a supplemental section or bracket a^3. This frame is supported by two traction-wheels b and b' and by a loose ground-wheel b^2. The shaft b^3 of the rear traction-wheel b' is loosely journaled in suitable bearings b^4, secured on the rear portion of the main frame, and carries a large sprocket c, which receives motion from the said wheel b'. The forward traction-wheel b is rigidly connected to one section d of a sectional driving-shaft d d' d^2. The shaft-sections d and d' extend at an angle one to the other and are connected by a knuckle-joint d^3. The shaft-sections d' and d^2 are adapted to be connected in any suitable way, and, as shown, they are connected by pulley or drum like couplings d^4 and d^5. For the purposes of this case the detail of construction of these parts d^4 and d^5 need not be further considered. Said shaft-sections d' and d^2 are suitably mounted in bearings a^4 a^5 on the sides of the frame a. The shaft-section d is supported by an oscillating sleeve a^6, which is pronged to embrace the knuckle-joint d^3 and to form a pivotal connection with similar prongs of the bearing a^4. The shaft-section d' carries a large driving-sprocket c', and the shaft-section d^2 carries a similar driving-sprocket c^2.

The ground-wheel b^2 is loosely mounted on the laterally-projecting trunnion of a short vertically-disposed shaft e, which shaft in turn is loosely journaled in a bearing a^7, rigid on the left-hand side of the frame a. To the upper end of the shaft e is rigidly secured an arm e'. The oscillating bearing-sleeve a^6, which supports the wheel b, is provided with an arm e^2. To a bracket e^3, secured on the tie-bar a', is pivoted a bell-crank e^4, one arm of which is connected to the arm e^2 by a rod or link e^5 and the other arm of which is likewise connected to the arm e' by a rod or link e^6. The wheels b and b^2 are thus connected for parallel oscillating movements, so that they serve to steer the machine.

The bell-crank e^4 has a toothed segment e^7, which coöperates with a worm e^8, carried by a crank-shaft e^9, mounted with freedom for rotary but fixed against endwise movements on suitable bearings on the tie-bars a' a^2. At the rear end of the shaft e^9 is a handpiece or crank e^{10}, by means of which the said shaft may be turned in the act of steering the machine.

The character f indicates the motor, which may be any form of motor, but is advisably an explosive-engine.

The character f' indicates the crank or driving shaft of the engine, which at one end carries a fly-wheel f^2 and at its other end a small sprocket f^3. A sprocket-chain c^3 runs over the sprocket-wheels c' and f^3. A long sprocket-chain c^4 runs over the sprocket-wheels c and c^2. By these connections, as is obvious, the two traction-wheels b and b' are positively driven from the engine f.

The plows k, of which, as shown, there are four, are properly spaced laterally and are located one in advance of the other, figured from the land toward the furrow side of the machine. The said plows k have beams k', the two forward members of which are pivoted to lugs k^2 on the forward transverse portion of the frame a and the two rear members of which are in a similar manner pivoted to lugs k^3 on the transverse bar a^2. Again, the two forward plows have their beams tied together by a strap k^4, while the two rear plows likewise

have their beams tied together by a strap k^5. The plows are adapted to be raised and lowered independently in pairs by a device preferably constructed as follows:

The character m indicates a lock-segment which is rigidly secured to the frame a and with which coöperates a pair of lock-levers m' and m^2. The lever m' is rigid on the shaft m^3, mounted in suitable bearings on the main frame and provided with an arm m^4, which is connected by a short link m^5 to the strap k^5, which ties together and spaces apart the two rear plows. The strap k^4, which ties together and spaces apart the two forward plows, is connected by a short link m^6 to an arm m^7 of a rock-shaft m^8, mounted in suitable bearings on the tie-bar a'. At its inner end the rock-shaft m^8 has a vertically-projecting arm m^9, which is connected by a long link m^{10} to the intermediate portion of the lever m^2. As is evident, the plows may be raised and lowered in pairs and locked in different positions by the manipulation of the latch-levers m' and m^2.

The character p indicates the driver's seat, which is suitably supported from the main frame in position to bring the levers m' m^2 q and crank e^{10} all within easy reach.

The manner in which the machine may be steered and in which the plows may be raised and lowered has already been set forth. Of course either two or four plows may be thrown into action at any one time. In the drawings the machine is shown as if standing in a flat surface with the plows dropped onto such surface, but not below the same. The rearmost and left-hand plow, it will be noted, runs just in advance of the rear traction-wheel b', so that the said traction-wheel will run in the furrow formed thereby. The right-hand traction-wheel b is positioned outward of the forward or right hand the width of a furrow. Hence in making the first cut with the gang-plow this advance traction-wheel b will run on the surface of the ground; but thereafter it will run in the furrow formed by the left-hand plow on the previous cut. This traction-wheel, therefore, running, as it does, in the furrow cut on the previous trip, serves as a guide for properly directing or steering the machine. Both of the traction-wheels b and b' are set to work on an incline, so that they will resist the side draft or crowding action of the plow, and, furthermore, since they both run in furrows they insure the machine against being crowded laterally by the plows. It will also be seen that the two traction-wheels run in the same furrows, but on successive trips. After the traction-wheel b is traveled through the furrow, however, the right-hand plow turns the dirt or sod into the same. The ground-wheel b^2 runs over the surface of the ground, but has but very slight weight to support, since the machine is as nearly as practicable balanced on the two traction-wheels.

The gang-plow above described has been tried in the field and found to be efficient. It is of course capable of considerable modification within the scope of the invention as herein set forth and claimed.

By placing the traction-wheels both on an incline they are not only made to resist the side thrusts from the plows, but increased traction is also given to the said wheels, which is of course an important feature. It will also be noted that the plows in the two traction-wheels are located nearly in the same straight line traversing the machine at an angle. This brings the three wheels of the machine and the plows into a sort of a triangular arrangement and places the wheels where they are best adapted to perform the work for which they are intended.

What is claimed, and desired to be secured by Letters Patent of the United States, is as follows:

1. In a gang-plow, the combination with an approximately triangular frame, and a series of plows connected thereto, and located successively, one in advance of the other, from the land toward the furrow side of the machine, and a pair of power-driven traction-wheels, geared to rotate together and supporting said frame, the one mounted in the contracted rear extremity of said frame, back of the rear plow, and the other forward and outward of the most forward plow, substantially as described.

2. In a gang-plow, the combination with a frame and a series of plows connected thereto, and located, successively, one in advance of the other, from the land toward the furrow side of the machine, of three wheels supporting said frame, and located one just at the rear of the rear plow, one forward and at one side of the most forward plow, and the other at the opposite side of the machine, from the latter-noted wheel, and serving to steady the machine, and the two last-named wheels connected for parallel movement in the steering action, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ADAM BISHMAN,
Administrator of the estate of Adam E. Bishman, deceased.

Witnesses:
JOHN MOONAN,
EDNA LEARY.