(No Model.) 2 Sheets—Sheet 1.

A. F. McMILLAN & T. GORMLEY.

GANG PLOW.

No. 490,210. Patented Jan. 17, 1893.

Fig. 1

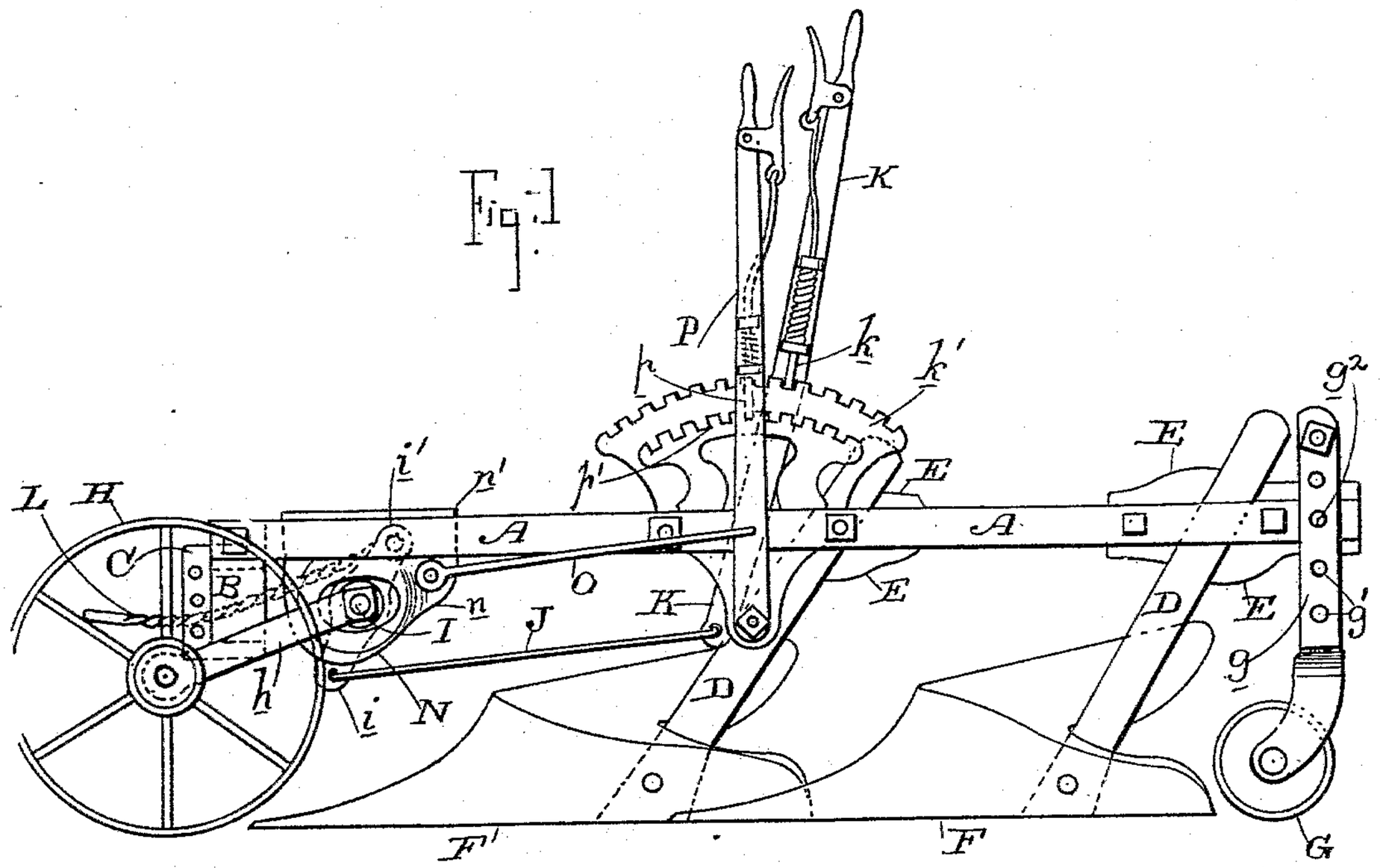
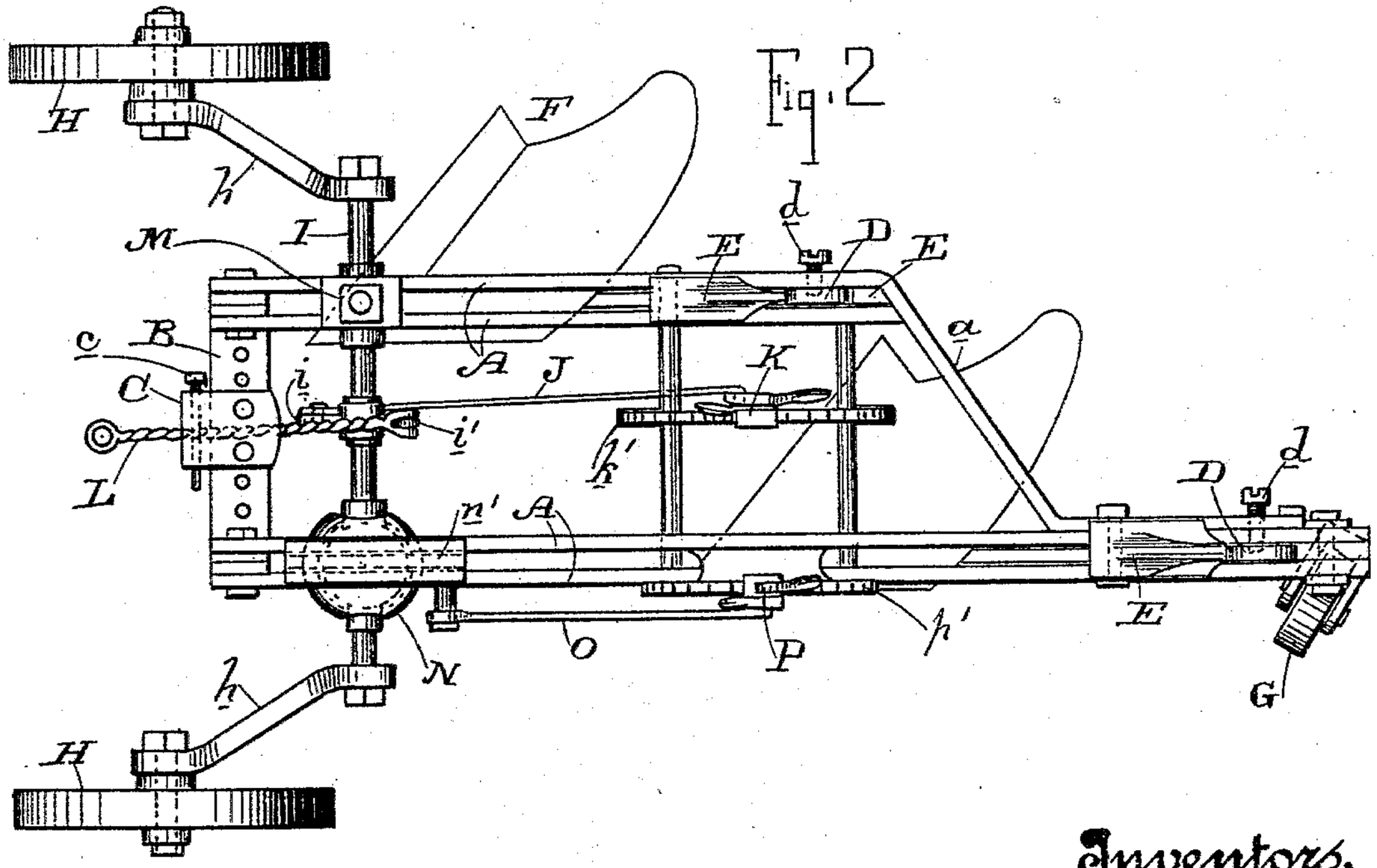


Fig. 2



Witnesses,
G. H. Howse
J. A. Bayless

Inventors,
Alfred F. McMillan
Thomas Gormley
By Dewey & Co.
Attys.

(No Model.) 2 Sheets—Sheet 2.

A. F. McMILLAN & T. GORMLEY.

GANG PLOW.

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Fig. 3

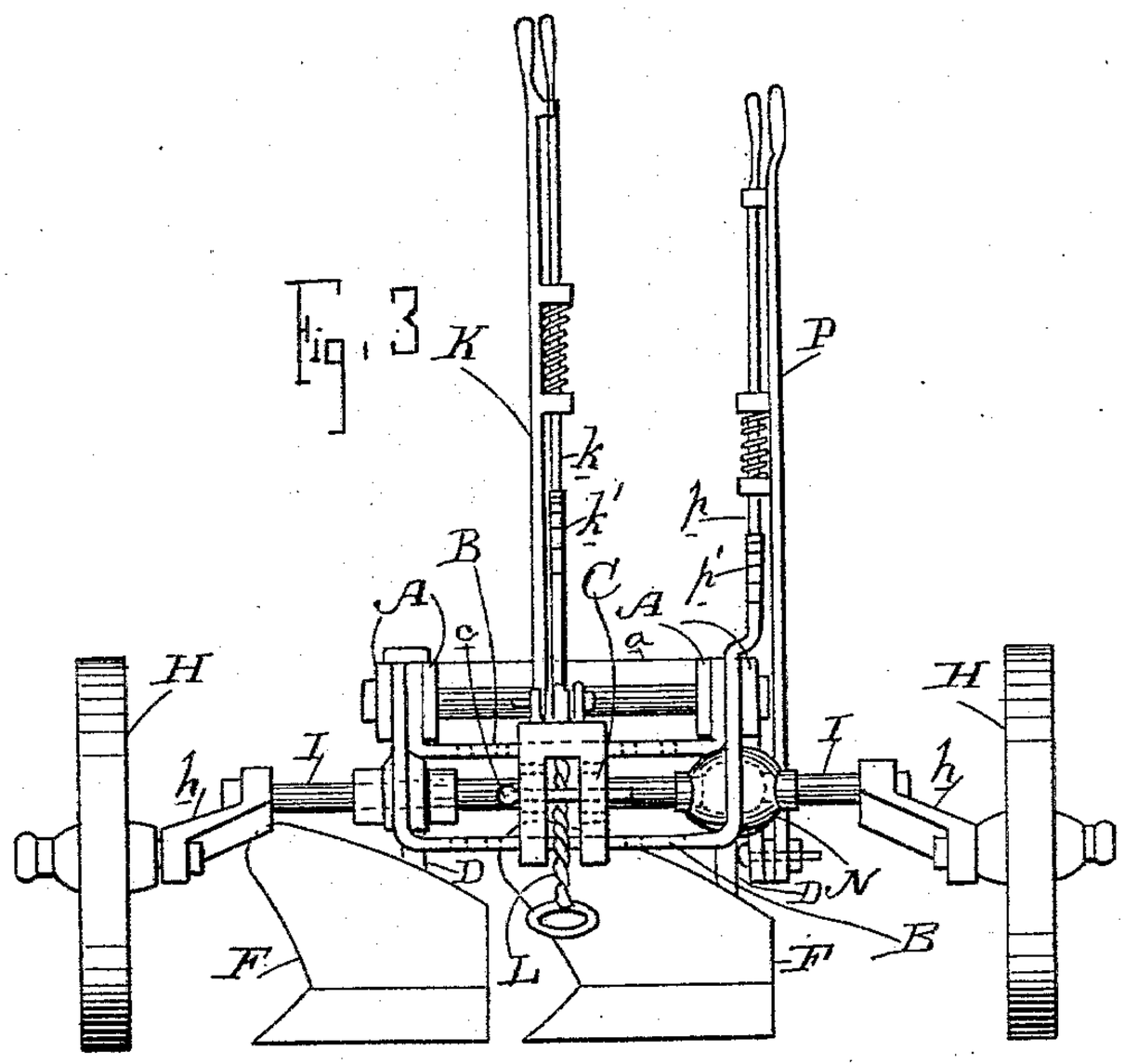


Fig. 4

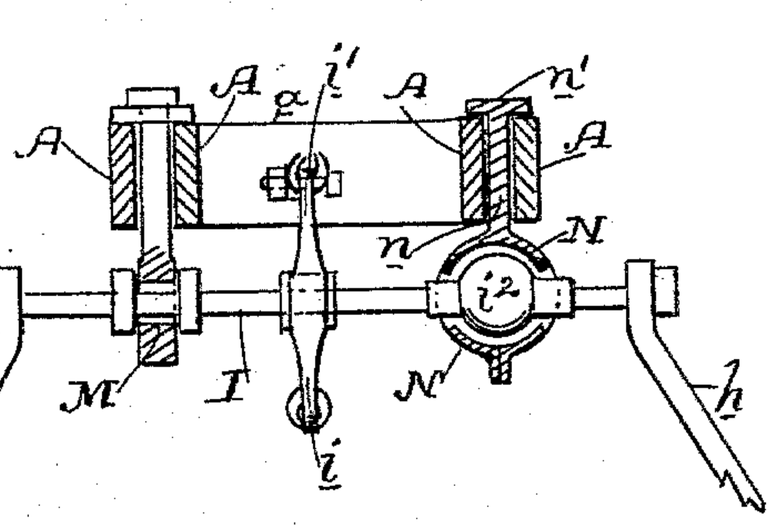


Fig. 5

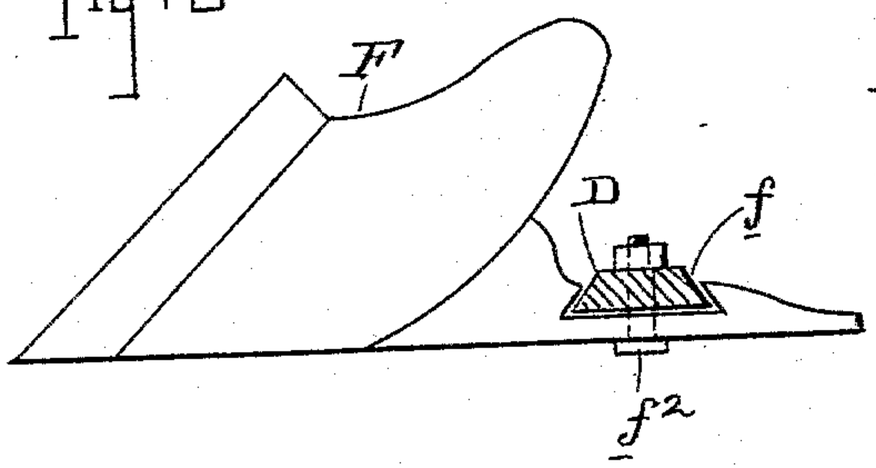
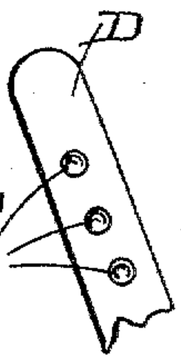


Fig. 6



Witnesses;
J. B. Towse
J. A. Bayless

Inventor,
Alfred F. McMillan
Thomas Gormley
By Dewey & Co.
Attys

UNITED STATES PATENT OFFICE.

ALFRED FREDERICK McMILLAN AND THOMAS GORMLEY, OF BENICIA, CALIFORNIA.

GANG-PLOW.

SPECIFICATION forming part of Letters Patent No. 490,210, dated January 17, 1893.

Application filed September 9, 1892. Serial No. 445,450. (No model.)

To all whom it may concern:

Be it known that we, ALFRED FREDERICK MCMILLAN and THOMAS GORMLEY, citizens of the United States, residing at Benicia, county of Solano, State of California, have invented an Improvement in Gang-Plows; and we hereby declare the following to be a full, clear, and exact description of the same.

Our invention relates to the general class of gang plows, and it consists in the novel features of construction, arrangement and combination which we shall hereinafter fully describe and specifically point out in the claims.

The general object of our invention is to simplify and cheapen the construction of gang plows, at the same time making them strong, durable and easily adjusted.

Particular objects and advantages will appear in connection with the description of the several features of the plow.

Referring to the accompanying drawings for a more complete explanation of our invention,—Figure 1 is a side elevation of our plow. Fig. 2 is a plan of same. Fig. 3 is a front view. Fig. 4 is a cross section in the plain of the axle I. Fig. 5 is a plan of one of the plow bottoms showing the dovetail connection of the shank or standard therewith. Fig. 6 is a view of the upper end of one of the plow standards D.

The frame of the plow is composed of longitudinal parallel straight bars A arranged on edge in pairs, the members of each pair being spaced or separated from each other, and secured together by means we shall presently describe. These pairs of bars are connected to form the frame by having one member of one of the pairs bent at its rear end diagonally, as shown at *a*, over and bolted to the adjacent pair. In this way any number of pairs of bars may be put together to constitute the frame to carry any number of plows. At their forward ends these pairs are connected by a cross frame B consisting of an upper and a lower bar, both perforated to receive in varying positions the adjustable clevis C which is itself perforated in vertical series whereby its clevis bolt *c* may be raised up or down to suit the draft.

D are the plow standards. These consist of perfectly straight single pieces as shown. They extend downwardly at a forward inclination, their upper ends passing through in the space between the members of each pair of the frame bars A, and in this space they may be set up or down to adjust them vertically by means of set screws *d* which pass through the bars and fit in socket seats *d'* in the standards. These standards are held in the inclined position shown by means of the inclined faced abutment or clamp blocks E, one of which bears against the back edge of the standard, and the other bears against its front edge. These blocks are fitted in the space between the members of the pairs of bars A and are bolted rigidly therein. They extend above and below the bars to get a long and firm bearing on the standards.

F are the plow bottoms having in their rearwardly extending frogs or land-side arms a dove-tailed groove *f*, into which the lower end of the shank or standard is dove-tailed, and is secured therein by a single bolt f^2. The rear end of the frame is carried by a swivel or steering wheel G, the stirrup of which is pivoted to a vertical clip *g* fitted to the sides of the frame and adjustable up and down thereon by means of a series of holes *g'* adapted to receive a cross-bolt g^2. The forward end of the frame is carried upon wheels H. These wheels are mounted on cranks *h* carried by an axle I. This axle has a downwardly extending crank arm *i* and an upwardly extending crank arm *i'*.

To the downwardly extending crank arm is attached a connecting rod J, the rear end of which is connected with a pivoted lever K having a pawl *k* engaging a rack *k'*. By moving this lever the axle will be rocked and the cranks turned to raise and lower the plow as desired; but in order to effect this result by the power of the horses we have connected with the uprising crank arm *i'* the draft chain or cable L which extends forwardly through the clevis and with which said chain or cable the team is to be suitably connected. Now, as long as the lever is held by its pawl, the draft of the team is steady on the plow and does not affect the axle; but when it is de-

sired to lift the plows out of the ground, the pawl of the lever is released from its rack whereupon the horses in pulling will, through the draft chain and the crank arm i', rock the axle so as to turn the cranks downwardly and thereby raise the frame. In implements wherein this power application is not desired the draft connection is, as usual, made with the clevis instead of with the crank. The axle I is not only mounted on the frame so that it can rock axially, but also in such a manner that it can be turned horizontally to an angle with its transverse plane. This mounting is as follows:—The axle near one end is mounted in a swivel bearing M carried by the main frame. At its other end it is provided with a ball journal i^2 which is mounted in a corresponding bearing socket N formed in the lower portion of a sliding plate n which extends up through between the members of one pair of bars A, and has an enlarged top n' resting and adapted to slide upon said bars. With this plate n is connected a rod O, the rear end of which is connected with a lever P having a pawl p engaging rack p'. By operating this lever, the plate n is moved back or forth and through its ball and socket connection with the axle the latter may be turned to an angle on either side of its normal transverse plane, whereby the wheels are thrown out of transverse line with each other. This is for the purpose of working the plow up to the land, when by any reason, as on a slight incline or side hill, the plow tends to work away from the land. This connection of the axle with the frame is a simple and effective one in which the friction is reduced to the minimum. The frame made in this way is simple, economical and durable. It provides for making it as extensive as required to carry any number of plows. This result, as before mentioned, is accomplished by adding more pairs of bars and connecting them by bending diagonally the rear end of one member of one pair over to and bolting it to the adjacent pair. Arranging the bars of the frame in pairs, the members of which are separated, provides for the easy and effective attachment of plow standards between the members of each pair, permitting them to be vertically adjusted therein and set in any position desired, being held at the proper inclination by the abutment or clamping blocks which find secure seats between the members of the pairs of bars.

The inclination of the plow standard, in connection with its construction as a straight flat bar, provides for the maximum clearance over the tops of the plow bottoms and between them and the frame above. A point of great advantage is in the connection of these standards with the plow bottoms. This connection is of the most simple but effective and strong character. It is effected by means of a single bolt, as mentioned, in connection with the dove-tailed joint between the standard and plow bottom, which forms a proper and stable attachment even with the use of but a single bolt. The means for vertically adjusting the rear end of the plow are simple and easily operated. The land gage mechanism for turning the axle and wheels to an angle is simple and effective while the rocking axle by which the plows are raised and lowered may be operated either by hand or by the power of the team as may be desired.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is—

1. In a gang plow, the combination of the pairs of separated straight bars, the inclined plow standards passing through the space between the members of the pairs of bars, the fixed inclined faced abutment or clamp blocks seated in said space and bearing against the forward and back edges of said standards, the set screws in said bars and the series of sockets in the standards with which the screws engage whereby said standards may be vertically adjusted, substantially as herein described.

2. In a gang plow, the combination of the frame having the spaced pairs of bars, the inclined standards passing between said bars and secured therein, the abutment or clamp blocks seated between said bars and bearing on the edges of the standards, the plow bottoms having a dove-tailed connection with the lower ends of the standards and a single bolt completing said connection, substantially as herein described.

3. In a gang plow, the combination of a frame, a rocking crank axle mounted on said frame, wheels carried by said axle, the means for rocking said axle to raise and lower the plows, consisting of a crank arm on said axle and a draft connection from said arm to the team, and means for holding said axle against the strain of the draft and relieving it to permit the draft to turn it when necessary, substantially as herein described.

4. In a gang plow, the combination of a frame, a rocking crank axle mounted on said frame, wheels carried by said axle, the means for rocking said axle to raise and lower the plows, consisting of a crank arm on said axle and a draft connection from said arm to the team, and the means for holding said axle against the strain of the draft and relieving it to permit the draft to turn it when necessary, consisting of a crank arm on the axle, a lever with pawl and rack connection and a connecting rod between said lever and crank arm, substantially as herein described.

5. In a gang plow, the combination of a plow-carrying frame, a crank axle having wheels, a vertical pivotal connection between one end of said crank axle and the frame, a sliding ball and socket bearing between the other end of said crank axle and the frame, and a lever and connections for moving said

ball and socket bearing back and forth to turn the axle to an angle with the frame, substantially as herein described.

6. In a gang plow, the combination of a frame, the crank axle having wheels, the swivel bearing connecting one end of the crank axle with the frame, the sliding plate on the other side of the frame having a ball and socket connection with the other end of the axle, a lever with pawl and rack connection, and a rod connecting said lever with the sliding plate, substantially as herein described.

In witness whereof we have hereunto set our hands.

ALFRED FREDERICK McMILLAN.
THOMAS GORMLEY.

Witnesses:
PHILIP FRANCIS QUINN,
R. M. HORTON.