

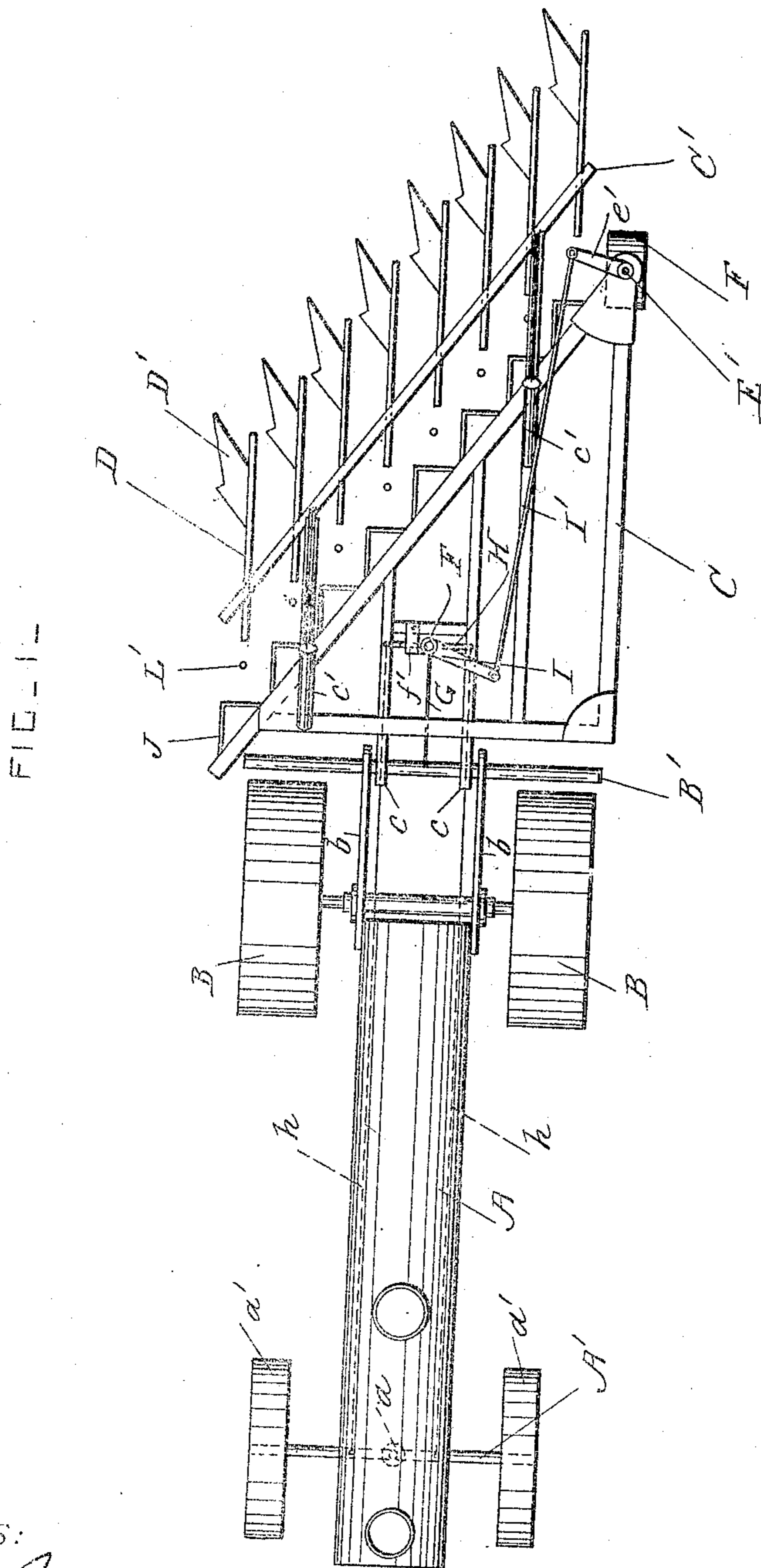
No. 818,219.

PATENTED APR. 17, 1906.

G. A. ANDERSON.  
GANG PLOW.

APPLICATION FILED NOV. 21, 1905.

5 SHEETS—SHEET 1.



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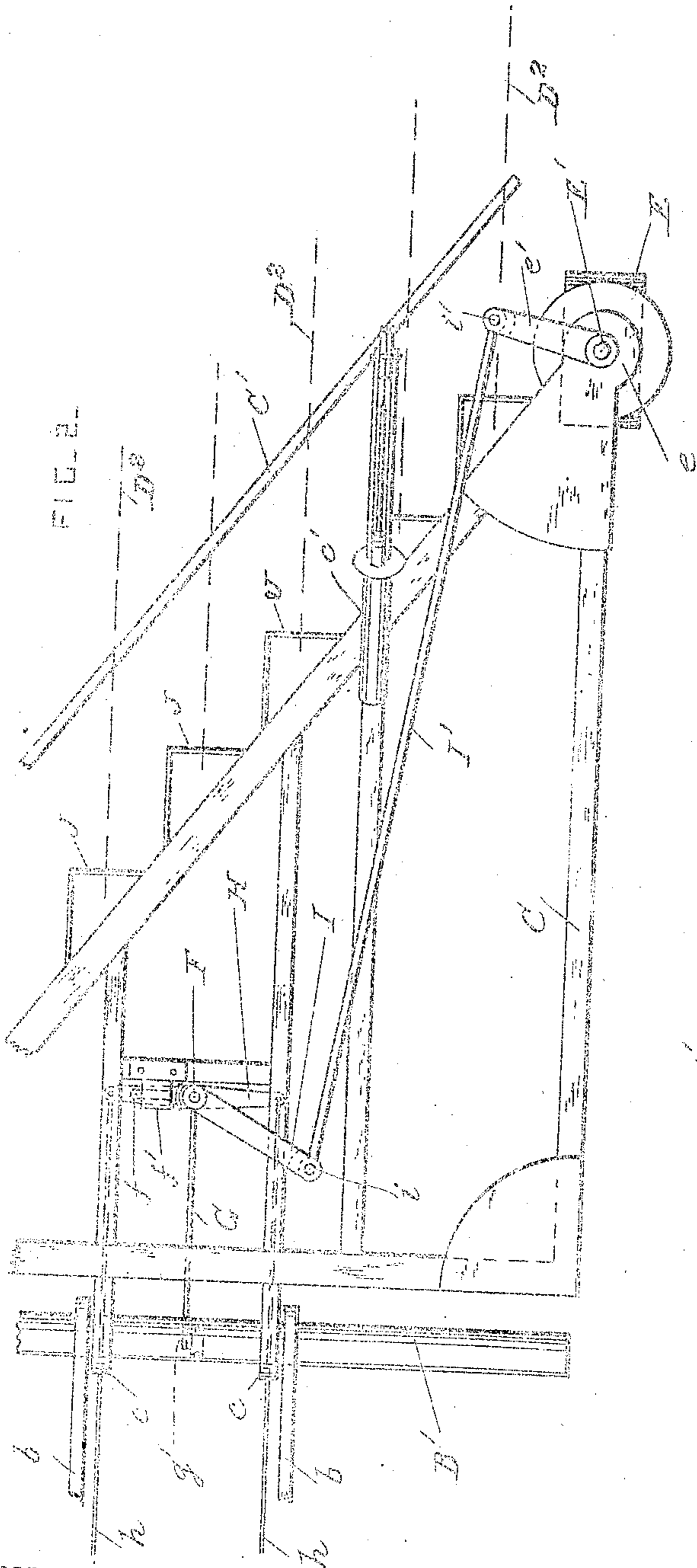


FIG. 2.

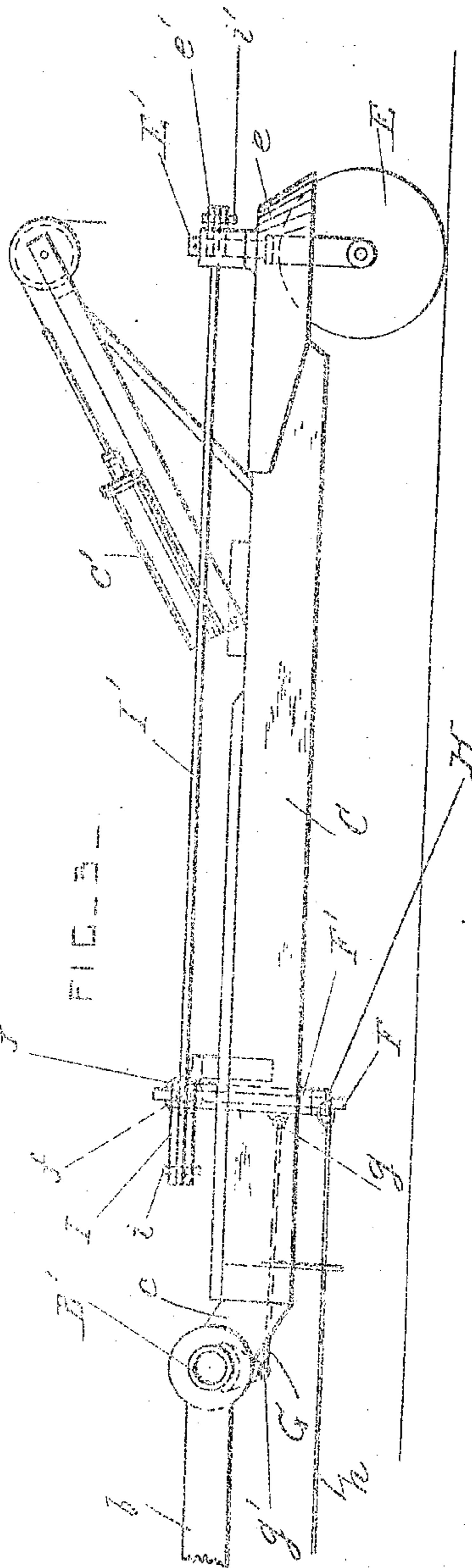


FIG. 3.

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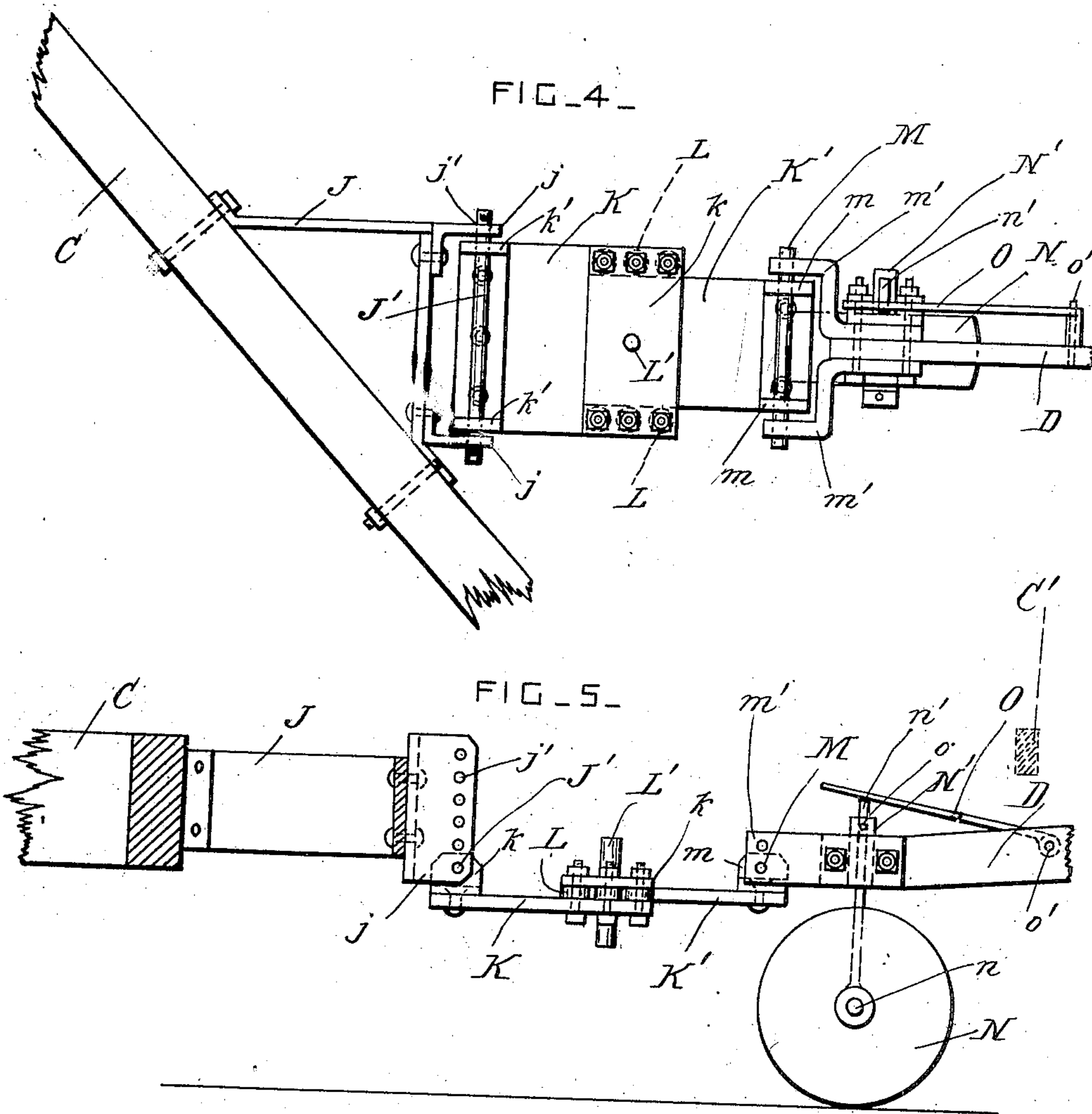
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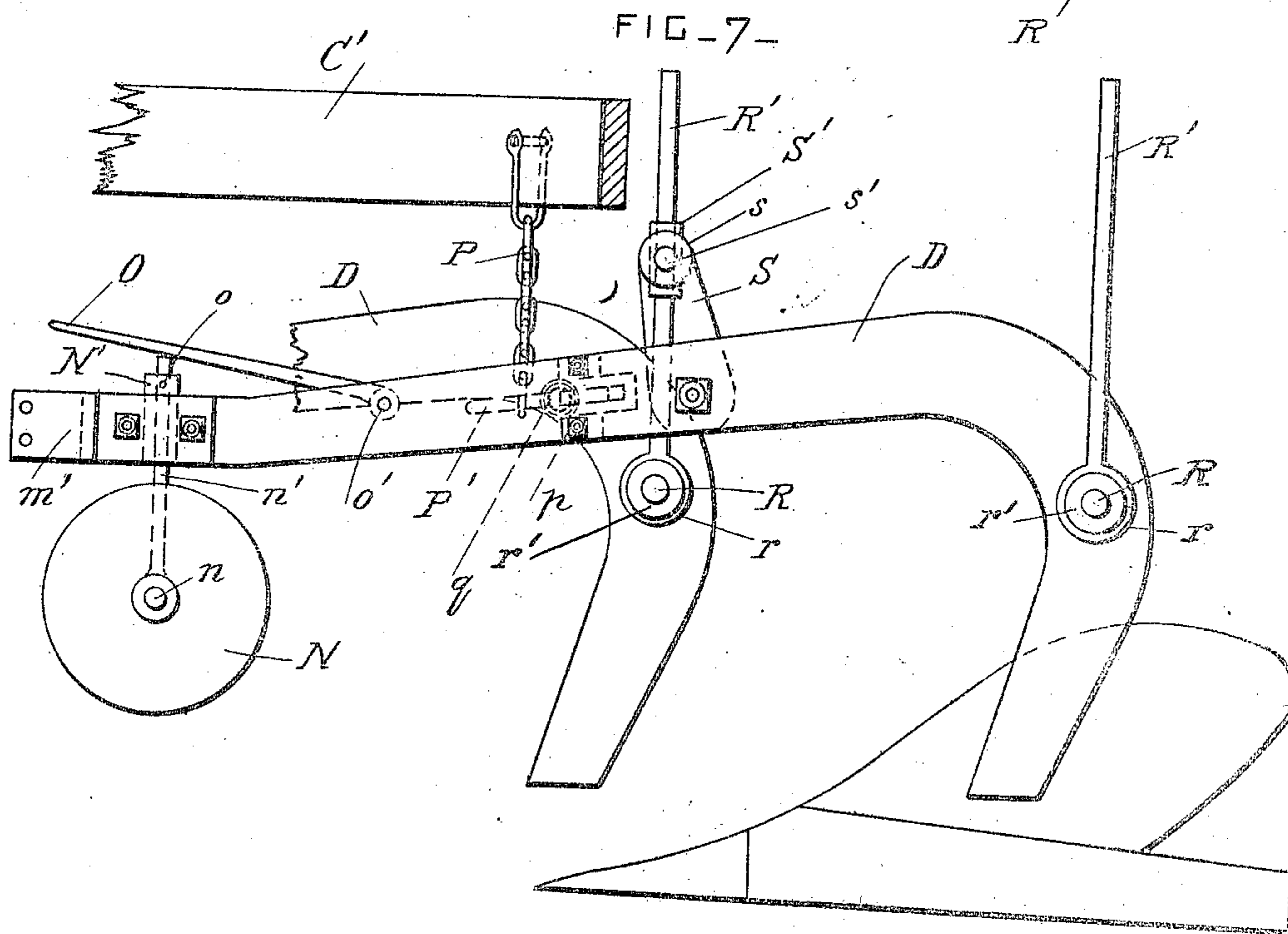
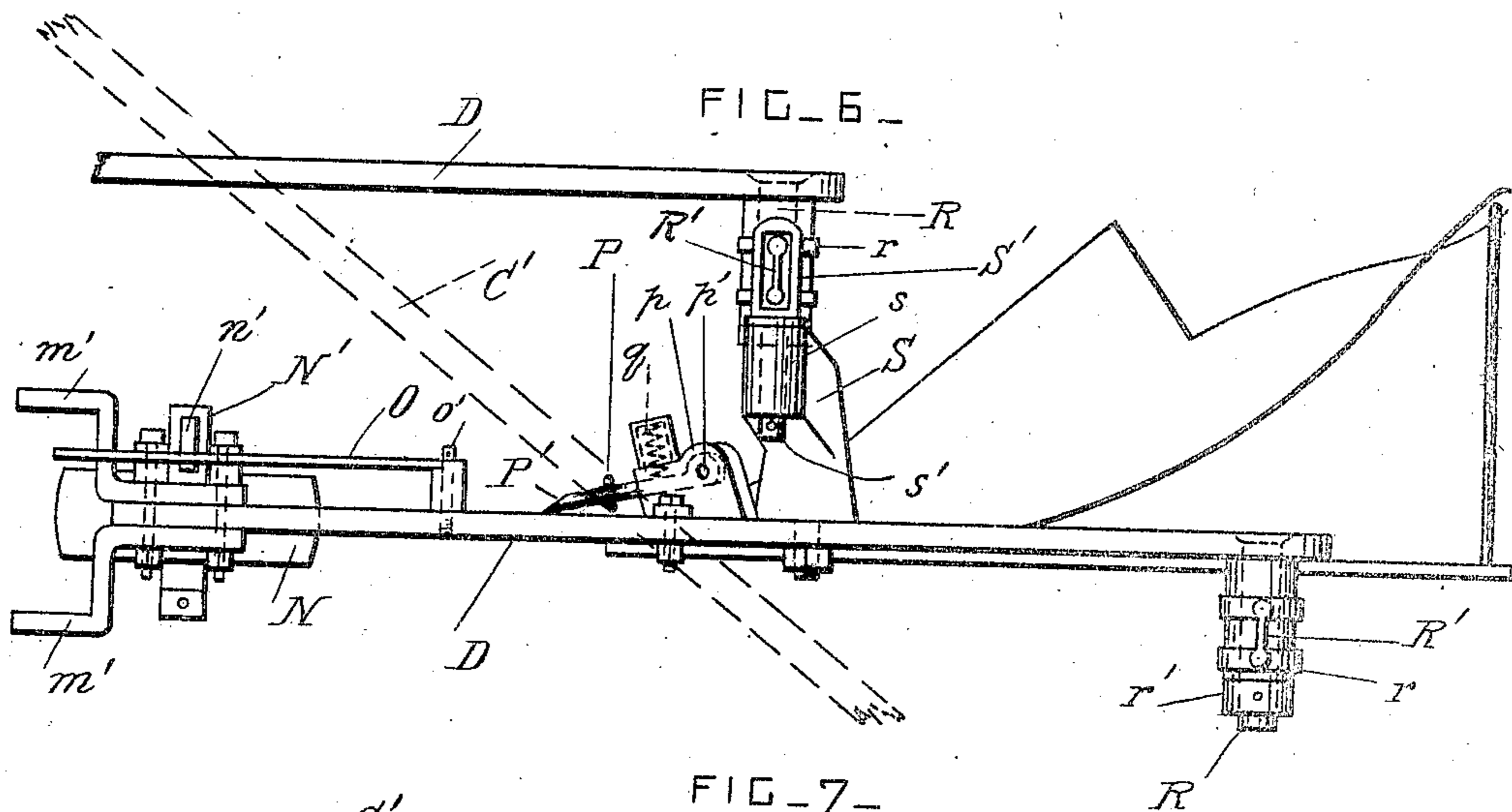
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5 SHEETS—SHEET 4.



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5 SHEETS—SHEET 5.

FIG. 8.

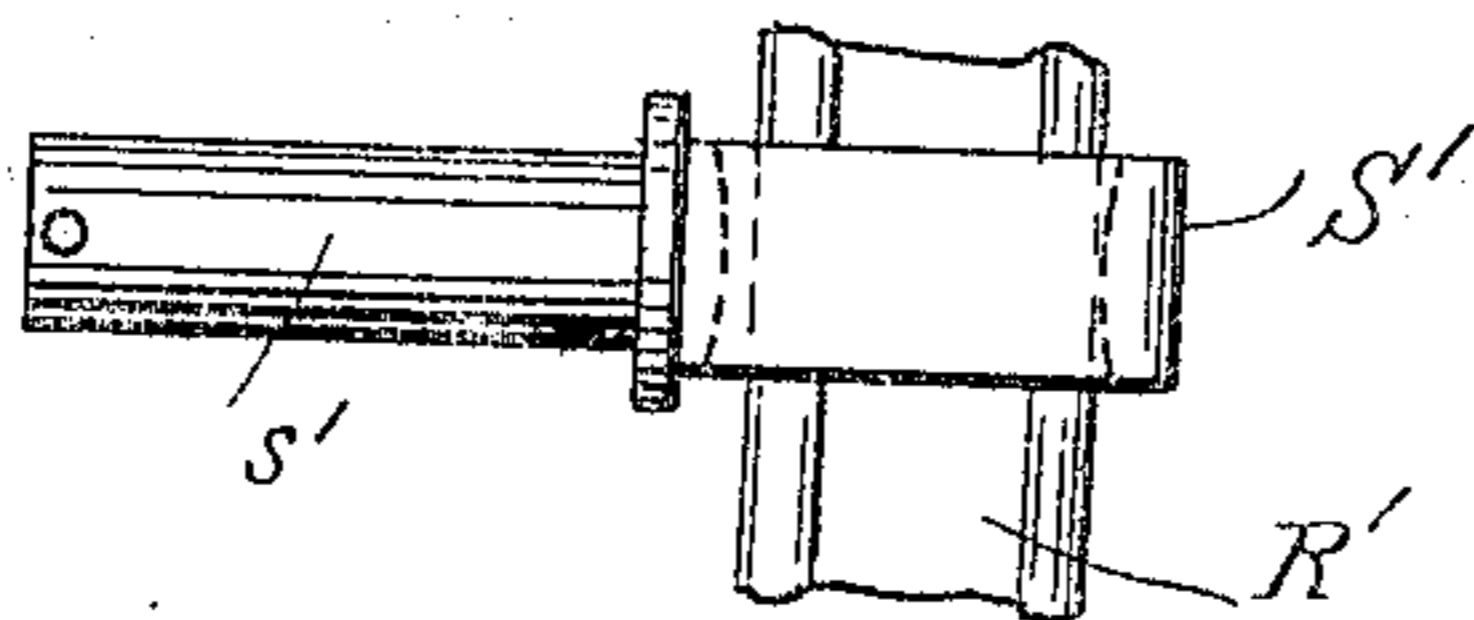


FIG. 9.

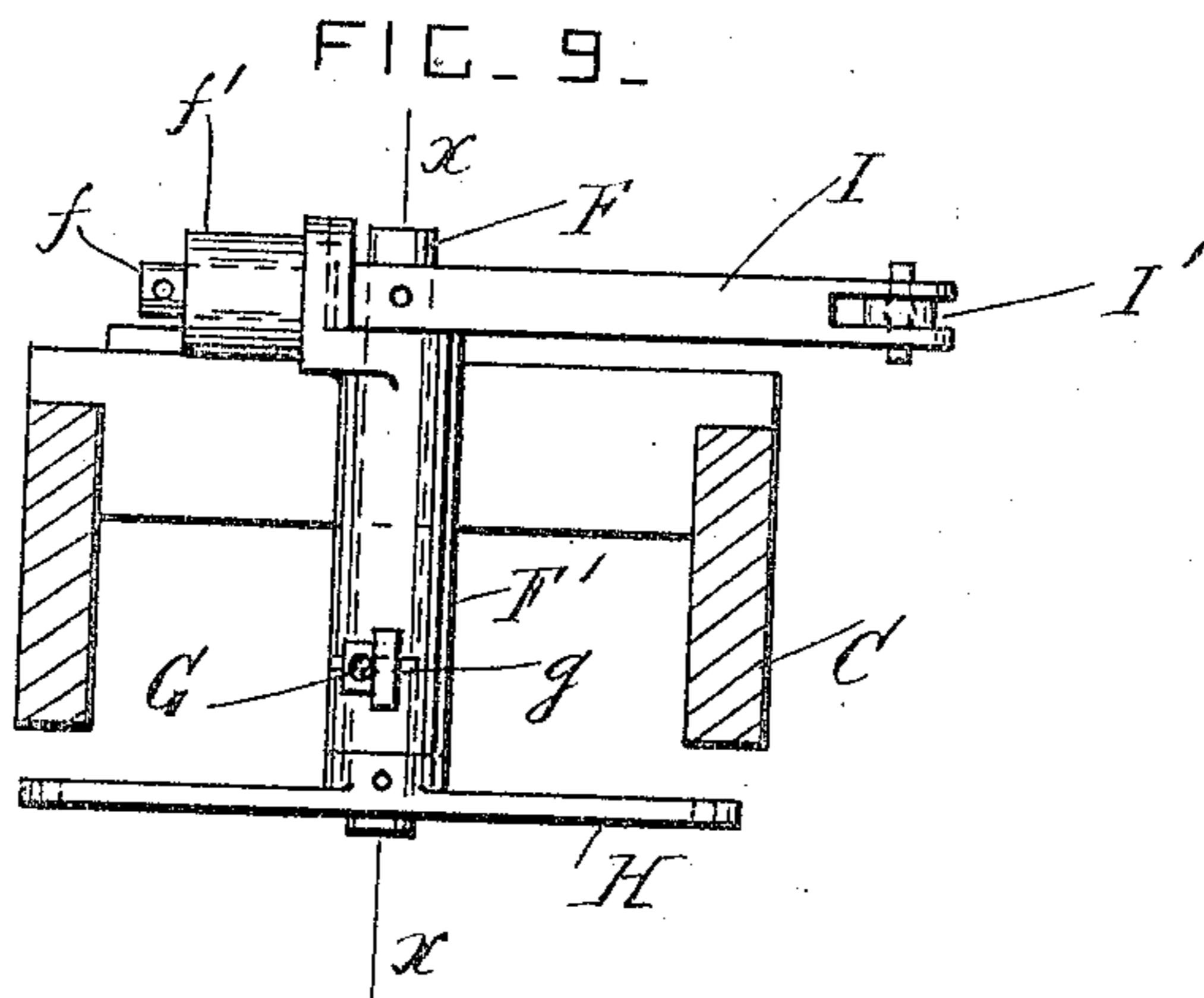
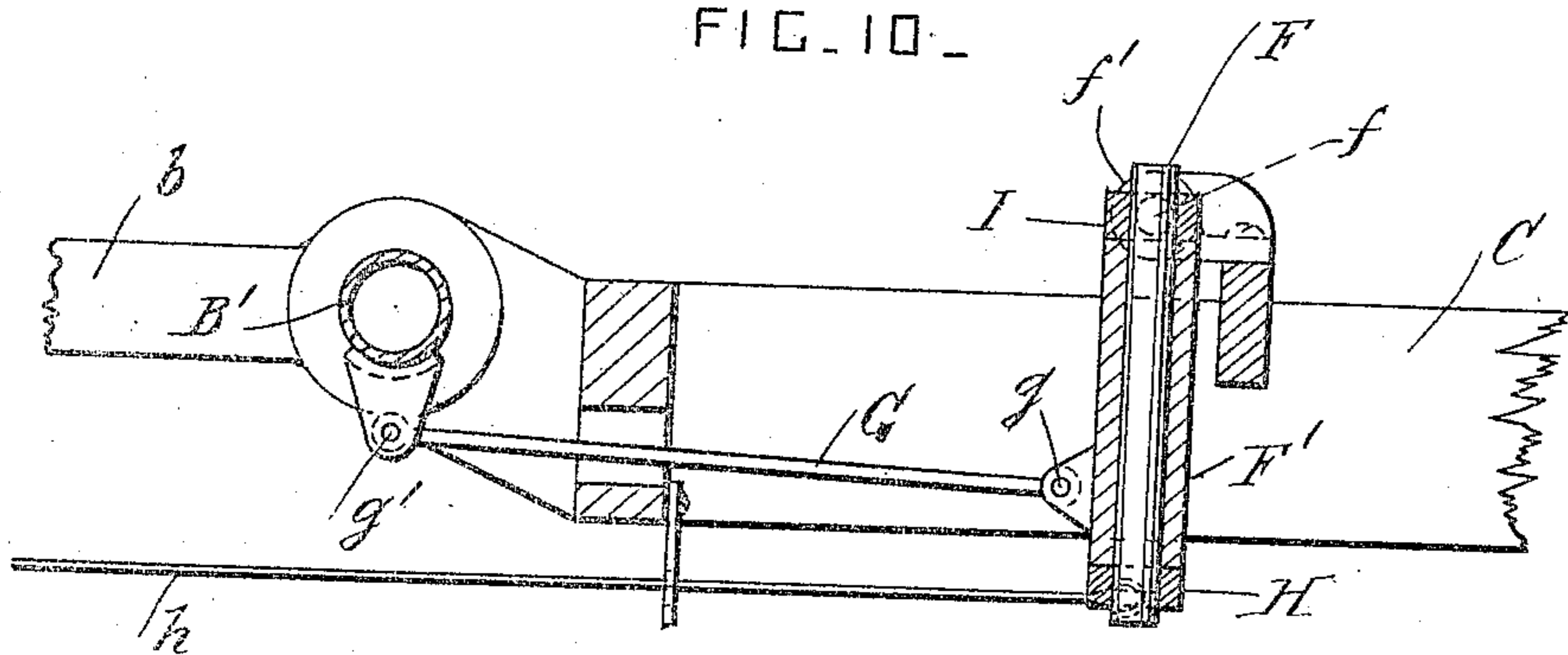


FIG. 10.



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# UNITED STATES PATENT OFFICE.

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TO THE GEISER MANUFACTURING COMPANY, OF WAYNESBORO, PENN-  
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## GANG-PLOW.

No. 818,219.

Specification of Letters Patent.

Patented April 17, 1906.

Application filed November 21, 1905. Serial No. 288,361.

*To all whom it may concern:*

Be it known that I, GUSTAF ARVID ANDERSON, a citizen of the United States, residing at Waynesboro, in the county of Franklin and State of Pennsylvania, have invented certain new and useful Improvements in Gang-Plows; and I do 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 relates to gang-plows which are operated by traction-engines; and it consists principally of a novel and improved mechanism for operating the steering-wheel at the rear of the plow-frame from the steering-axle at the front end of the traction-engine, and it further consists in the means for connecting the plows together and to the plow-frame, as hereinafter fully described and claimed.

In the drawings, Figure 1 is a plan view in outline of a traction-engine and gang-plow constructed according to this invention. Fig. 2 is a plan view of the steering mechanism carried by the plow-frame and drawn to a larger scale. Fig. 3 is a side view of the steering mechanism. Fig. 4 is a plan view showing the connection of one of the plow-beams with the plow-frame and showing also the gage-wheel. Fig. 5 is a side view of the same. Fig. 6 is a plan view showing the connection of two adjacent plow-beams with each other and the connection of one plow-beam with the lifting-beam. Fig. 7 is a side view of the same. Fig. 8 is a detail view of the eye S', drawn to a larger scale. Fig. 9 is a detail end view of the rock-shaft and its connections. Fig. 10 is a vertical section taken on the line *xx* in Fig. 9 and showing also the radius-rod.

A is the boiler of a traction-engine of any approved construction.

A' is the steering-axle, mounted on a pivot *a* at the front end of the traction-engine, and *a'* represents the steering-wheels.

B represents the traction-wheels of the traction-engine, and B' is the draft-beam supported crosswise behind the traction-wheels by a frame *b*, which is secured to the boiler.

C is the plow-frame provided at its front

end with arms *c*, which are pivoted to the draft-beam B'.

C' is the lifting-beam, which is operated by means of steam-cylinders *c'* and intermediate connections of approved construction which are carried by the plow-frame.

D represents the plow-beams provided with plows D'. The plow-beams are supported from the lifting-beam C', as will hereinafter be more fully described. The plow-frame is triangular, and at its rear end or apex it is provided with a steering-wheel E. This wheel is journaled in a suitable bracket having a vertical shaft E', which is journaled in a bearing *e* on the plow-frame. An arm *e'* is secured to the upper end of the shaft E' for operating the steering-wheel.

F is a vertical rock-shaft which is journaled in a vertical sleeve F'. The sleeve F' has a pivot or trunnion *f*, which projects laterally from its upper end portion, and this pivot is pivoted in a bearing *f'*, which is rigidly secured to the plow-frame. The rock-shaft is preferably arranged on the center line of the boiler and gang-plow in the middle part of the plow-frame.

G is a radius-rod provided at one end with a pin *g*, by means of which it is pivoted to a lug on the lower part of the sleeve F', and *g'* is a pin at the other end of the said rod, which pivots it to a lug on the beam B', which is secured to the boiler.

H is a cross-bar which is secured to the lower end of the shaft F, and *h* represent two connections which extend between the ends of the cross-bar H and the front axle A' on opposite sides of its pivot. The connections *h* are preferably wire ropes, but any other form of connections, such as rods or chains, can be used, and they may be provided with turn-buckles and springs in the usual manner. These flexible connections cause the rock-shaft to follow the movements of the steering-axle as the said axle is moved to guide the engine around curves.

I is an arm secured to the upper end of the rock-shaft F.

I' is a connecting-rod, one end of which is pivoted to the arm I by a pin *i* and the other end to the arm *e'* by a pin *i'*. The arms I and *e'* are set at certain angles and are made of a certain length, found by experiment, so that

the steering-wheel E of the gang-plow which supports the rear end of the plow-frame is moved to the best possible advantage to correspond with the movement of the steering-wheels  $a'$  at the front end of the engine.

The radius rod G causes the shaft F to rock back and forth on the pivot  $f$  as the engine passes over rough ground. This motion, however, does not affect the action of the steering-wheel E, because the arms I and  $e'$  and their connecting-rod are arranged in substantially the same horizontal plane as the center of the pivot or trunnion  $f$ . In other words, although the engine-frame and the plow-frame are pivoted together the radius-rod G always holds the flexible connections  $h$  at the same degree of tension or tautness, and when the two frames are moved pivotally in passing over rough ground the sleeve F' and rock-shaft F are rocked upon the pivot  $f$ . This rocking motion of the sleeve may vibrate the arm I slightly in a vertical direction, but not sufficiently to cause a longitudinal movement of the rod I, which controls the steering-wheel E.

Each plow-beam D is connected with the diagonal member of the plow-frame by a wooden pin connection, which breaks and releases the plow-beam when the plow strikes a rock or stump.

J is a bracket which is secured to the diagonal member of the plow-frame and provided at its front end with angle-shaped lugs  $j$ , each having a vertically-arranged series of holes  $j'$ .

K is a horizontal guide-plate provided with lugs  $k'$  at its rear end which are pivoted to the lugs  $j$  by a pin  $J'$ , which engages with the various holes  $j'$  and permits the distance of the guide-plate above the ground to be adjusted.

K' is a slidable draw-plate which slides between the guide-plate K and a plate  $k$ , which is secured above the guide-plate by means of bolts and distance-pieces L, so that a broad guide-socket for the plate K' is formed, which prevents the said plate from twisting or moving in any other direction than a longitudinal one.

L' is the pin of hard wood or other suitable material, which is arranged vertically in holes in the plates K, K' and  $k$  and which normally connects the plow-beam to the plow-frame. The slidable plate K' has lugs  $m$  at its rear end, which are pivoted by a pin M to brackets  $m'$  on the front end of the plow-beam D. The dotted lines  $D^2$  in Fig. 2 indicate the center lines upon which the plow-beams D are arranged. The brackets  $m'$  are provided with a plurality of holes for the pin M, so that the position of the plow-beam may be adjusted vertically.

N is a gage-wheel which supports the front end of the plow-beam. This wheel is jour-

naled on a pin  $n$  carried by a rectangular bar  $n'$ , which is slidable vertically in a socket N'. This socket is secured to the plow-beam, and  $o$  is a pin for securing the bar in the socket after its vertical adjustment has been effected.

O is a guard-finger having its rear end pivoted to the plow-beam behind the socket N' by a pin  $o'$ . This guard-finger is arranged in an upwardly and forwardly inclined position, and its front end portion rests on top of the bar  $n'$ . The lifting-beam C' is arranged over the guard-fingers O, and the guard-fingers prevent the upper end portions of the bars  $n'$  from catching against the lifting-beam when the wooden pin L' breaks and the plow remains stationary. When one or more of the wooden pins L' break, the plows connected to such pins remain stationary. The engine continues its forward movement and drags along the frame C and the lifting-beam C', together with the chains P. The chains P slide out of engagement with the fingers P', and the lifting-beam C is thereby detached from the stationary plow-beams D and is carried off, the said plow-beams and plows being left behind. The plow-beams D are suspended from the lifting-beam C' by means of chains P or other equivalent flexible connections.

P' is a tooth pivoted to a bracket  $p$  by a pin  $p'$ . The tooth is arranged in a downwardly and forwardly inclined position, and  $q$  is a spring supported by the said bracket and pressing the front end portion of the tooth against the side of the plow-beam. The tooth P' engages with one of the links of the supporting-chain, and when the wooden pin L' breaks and the plow remains stationary the link draws off from the tooth and the plow is released from the lifting-beam. In order to hold the plows at the desired distances apart and permit them to separate when the wooden pin L' breaks, the adjacent plow-beams are coupled together.

R is a pin which projects laterally from one plow-beam, and R' is an upwardly-projecting arm having an eye  $r$  at its lower end, which is pivoted on the pin R. A collar  $r'$  prevents the eye from sliding off the said pin. S is a bracket which is secured to the next adjacent plow-beam and which is provided with a bearing  $s$  at its upper end, which is arranged above the level of the plow-beam.

S' is a loop-shaped guide or eye which is slidable longitudinally or lengthwise on the arm R'. This guide is provided with a pin  $s'$ , which is journaled horizontally in the bearing  $s$ . This arm and guide hold the plow-beams at a fixed distance apart, and when the wooden pin of one plow-beam breaks the said arm and its guide turn on their pivots and the arm is withdrawn longitudinally from the guide.

When the steering mechanism of the gang-

plow is provided with a pivoted rock-shaft, as hereinbefore described, the cross-bar H is always kept at the same distance from the front steering-axle independent of the swinging motion of the plow-frame with respect to the traction-engine and when the outfit travels over rough and rolling ground. The roughness of the ground, therefore, does not affect the steering connections h, which if the rock-shaft were not pivoted would be torn asunder when the front wheels of the traction-engine and the steering-wheel of the plow-frame are relatively higher than the traction-wheels and would become too slack for steering purposes when the unevenness of the ground raises the traction-wheels relatively above the aforesaid wheels.

What I claim is—

1. The combination, with a traction-engine provided with a steering-axle, of a gang-plow frame pivotally connected with the said traction-engine and provided with a steering-wheel; a sleeve having its upper end pivoted to the said frame, a radius-rod connecting the lower part of the said sleeve with the traction-engine, a rock-shaft journaled in the said sleeve, a cross-bar secured on the lower end of the said rock-shaft, connections between the said rock-shaft and steering-axle; and connecting mechanism between the upper end of the said rock-shaft and the said steering-wheel.

2. The combination, with a traction-engine provided with a pivoted steering-axle, of a gang-plow pivotally connected with the said traction-engine and provided with a rock-shaft for operating its steering-gear, a radius-rod operatively connected with the said rock-shaft and traction-engine and moving the said rock-shaft to a limited extent in a longitudinal plane, an operating-bar on the said rock-shaft, and connections between the said operating-bar and steering-axle.

3. The combination, with a traction-engine provided with a steering-axle, of a gang-plow frame pivotally connected with the said traction-engine, a vertical rock-shaft supported by the said frame, an operating-bar secured to the said rock-shaft and movable in a horizontal plane, connections between the said bar and axle, a steering-wheel provided with a vertical operating-shaft and mounted in the said frame, an arm secured to the said shaft and projecting in one direction, an arm secured to the said rock-shaft and projecting in the opposite direction, and a rod connecting the two said arms.

4. The combination, with a gang-plow frame provided with a steering-wheel, of a sleeve having its upper end pivoted to the said frame, means for limiting the movement of the said sleeve lengthwise of the said frame, a rock-shaft journaled in the said sleeve, an

operating-bar secured to the lower end of the said rock-shaft, and connecting mechanism between the upper end of the said rock-shaft and the said steering-wheel.

5. The combination, with a gang-plow frame provided with a steering-wheel, of a shaft for operating the said steering-wheel mounted vertically in the said frame and provided with an arm at its upper end, a sleeve having its upper end pivoted to the said frame, means for limiting the movement of the said sleeve lengthwise of the said frame, a rock-shaft journaled in the said sleeve and provided with an operating-bar on its lower end and an arm on its upper end, and a rod connecting the two said arms.

6. The combination, with a plow-frame, of a guide-plate provided with a rectangular socket and having its front end pivotally connected with the said frame, a draw-plate slidable in the said socket, a pin of soft material connecting the said plates, and a plow-beam pivoted to the said draw-plate.

7. The combination, with a plow-frame, of a guide-plate having its front end pivotally connected with the said frame, a plate and distance-pieces secured above the said guide-plate and forming a socket at its rear part, a draw-plate slidable in the said socket, a pin of soft material connecting the said guide-plate and draw-plate, and a plow-beam pivoted to the said draw-plate.

8. The combination, with a plow-beam, and a lifting-beam detachably connected thereto; of a socket secured to the said plow-beam, a bar adjustable vertically in the said socket, a gage-wheel carried by the said bar, and a guard-finger carried by the said plow-beam and extending between the said lifting-beam and the upper end of the said bar.

9. The combination, with a plow-beam, and a lifting-beam detachably connected thereto; of a socket secured to the said plow-beam, a bar adjustable vertically in the said socket, a gage-wheel carried by the said bar, and a guard-finger pivoted to the said plow-beam with its free end portion resting on the top end of the said bar.

10. The combination, with a plow-beam, of a bracket secured to one side of the plow-beam, a finger pivoted to the said bracket and arranged in a downwardly and forwardly inclined position, a spring which presses the front end portion of the said finger toward the plow-beam, a lifting-beam, and a flexible connection secured to the said lifting-beam and provided with a link which engages with the said finger.

11. The combination, with two plow-beams, of a pin which projects laterally from one of the said plow-beams, an arm pivoted on the said pin, a bracket secured to the other said plow-beam and provided with a bearing

which projects above the plow-beams, and a pin pivoted in the said bearing and provided with an eye which is slidable longitudinally on the said arm.

- 5 12. The combination, with two plow-beams, of an arm pivotally connected with one of the said plow-beams, a bracket secured to the other said plow-beam, and a guide-eye

slidable longitudinally on the said arm and pivotally supported by the said bracket. 10

In testimony whereof I have affixed my signature in the presence of two witnesses.

GUSTAF ARVID ANDERSON.

Witnesses:

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DANIEL S. BEARD.