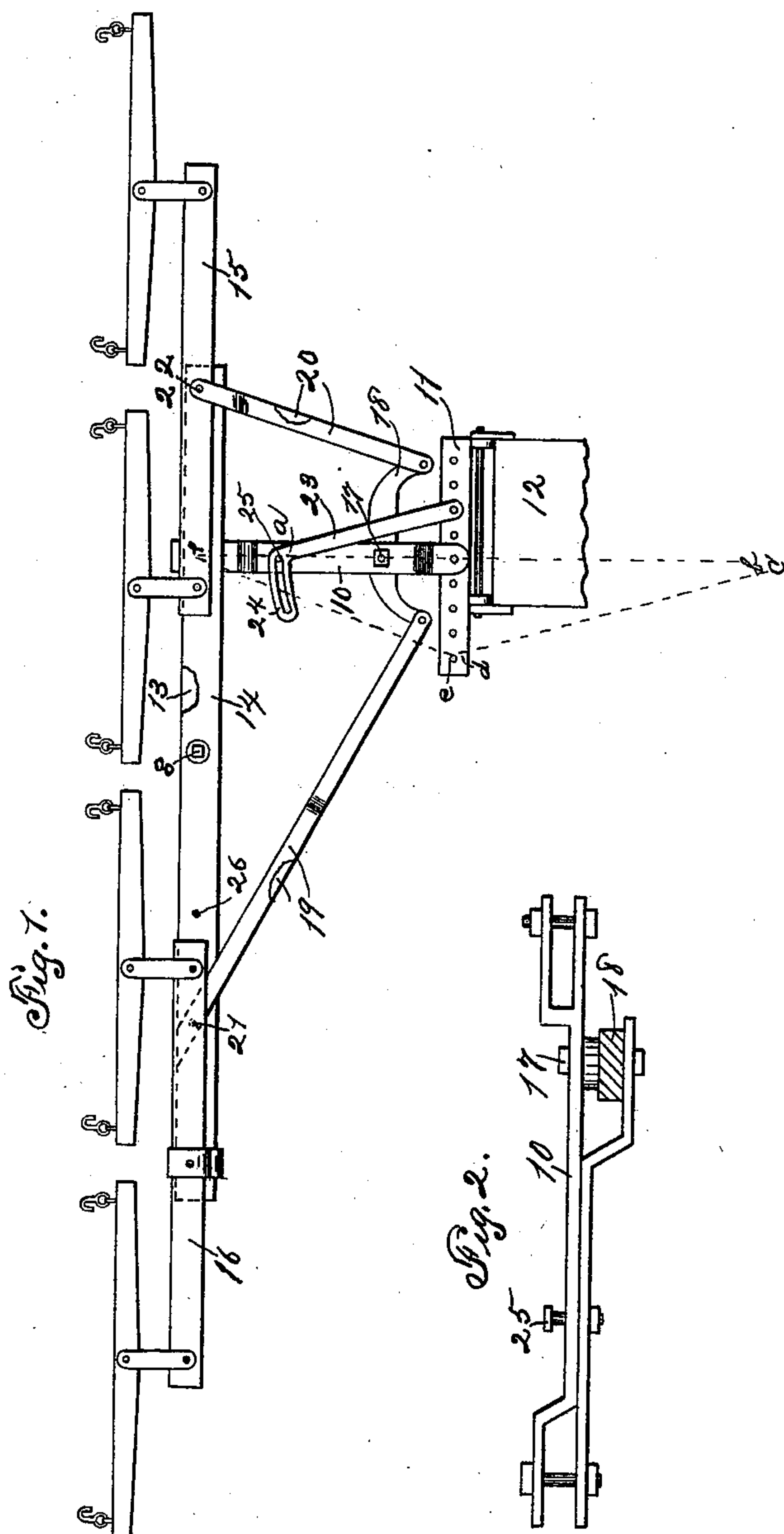


(No Model.)

J. W. GAMBLE.  
DRAFT EQUALIZER.

No. 561,076.

Patented May 26, 1896.



Witnessed:  
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J. G. Cooper

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by J. H. Sweet  
his Atty.

# UNITED STATES PATENT OFFICE.

JOSEPH W. GAMBLE, OF DES MOINES, IOWA.

## DRAFT-EQUALIZER.

SPECIFICATION forming part of Letters Patent No. 561,076, dated May 26, 1896.

Application filed November 10, 1893. Serial No. 490,612. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH W. GAMBLE, a citizen of the United States of America, and a resident of Des Moines, in the county of Polk and State of Iowa, have invented a new and useful Draft-Equalizer for Plows, of which the following is a specification.

This invention relates to the provision of draft mechanism whereby to more easily and efficiently operate gang and sulky plows, and should be read in connection with my Patent No. 505,398, granted to me by the United States September 19, 1893.

This invention also employs some of the features of my Patent No. 472,448, granted April 5, 1892.

In my Patent No. 505,398 I show and describe a draft-equalizer in which the draft is applied at two points to a plow-clevis, said two points being some distance apart on the clevis and there being a hinge in said clevis between said two points. The clevis of the Patent No. 505,398 was relatively long, was secured at one end to the plow-beam, and extended laterally over the unplowed ground a considerable distance, and a brace extended rearwardly from the center of the clevis to an attachment to the plow-beam at considerable distance from the front of said beam. There were two eveners mounted approximately at the ends of the clevis, and draft mechanism connected each of the eveners to the motive power. One of the eveners was located on the equalizer-tongue and the other evenner was on the land end of the clevis, and a brace connected the latter said evenner with the forward end of the equalizer-tongue, thus making a third line of draft from the land-end evenner forward and toward the plowed ground to steer the plow out of the land to the desired degree.

While in Patent No. 505,398 there were three lines of draft, two for drawing and one for steering the plow, in my present invention there is only one. Instead of two eveners, as in that patent, this invention employs only one evenner, and that is on the tongue. The present invention employs a rigid relatively short plow-clevis instead of the hinged bracket-clevis of the patent. In the patent I show and describe two points of attachment to the plow-clevis, and in the present instance I de-

sire to claim two points of attachment, but with this distinction: In the patent both points of attachment were draft-points, whereas in this invention only one point is a draft-point, the other point of attachment being for the purpose of steering the plow by limiting the flexure of the tongue in one direction.

In view of one of the combinations herein-after claimed it is deemed expedient to explain that the short bar at the forward end of the tongue is employed to limit the movement of the long evenner-bar laterally of the tongue and at the same time provide for a movement of the evenner-bar longitudinally of the tongue, thereby rendering the connection between the tongue and evenner-bar flexible.

My invention consists, further, in the construction, arrangement, and combination of parts hereinafter set forth, pointed out in my claims, and illustrated by the accompanying drawings, in which—

Figure 1 is a plan view of the equalizer and the forward end portion of a plow-beam, portions being broken away to show the lower parts. Fig. 2 is a side elevation of the main tongue, showing the evenner in section mounted therein.

For the purpose of rendering the meaning of the following description clear it is deemed advisable to explain in advance thereof what is meant by certain expressions employed therein. By "draft center" is meant the neutral or equatorial point on which the force of the motive power hinges and the axis of oscillation of said force. By "lines of force" is meant the direction between the source of each force and the point of application thereof. By "line of draft" is meant the direction between the apex of the lines of force and the point of application of said force to the "resistance." By "resistance" is meant the force applied by the soil to the plowshare. By "line of resistance" is meant the divergent direction assumed by the plowshare during its advancement, resultant from the aforesaid resistance. By "line of advancement" is meant the direction in which the motive power, plow, and operator move along the surface of the earth.

The dotted lines *a b* indicate the line of advancement; *c*, the point where the resistance is applied; *c d*, the line of resistance com-



monly found in the operation of plows; *e f*, the line of draft as commonly found in the operation of plows, and *c f* the alined lines of resistance and draft as employed in this invention.

In the construction of the equalizer as shown the numeral 10 designates a main tongue adapted for connection with a horizontal lateral plow-clevis 11, detachably connected to the forward end of the plow-beam 12, said tongue being normally in alinement with said beam. Pivotally connected by one end to the forward end of the tongue 10 is a brace-bar 13, the opposite end of said brace-bar being pivotally connected to the central portion of an evener-bar 14 at the draft center, to the opposite ends of which evener-bar are pivotally connected two independent whiffletrees 15 16, said two whiffletrees being employed only when four horses are worked abreast. Pivotally mounted upon a bolt 17, forming the apex of the lines of force and the point of application of said force, and vertically positioned in the rear portion of the tongue 10, is an evener 18, the long arm of the evener being on the "furrow" side of said tongue. If desired, the evener 18 may be pivotally mounted on the pin employed to secure the tongue 10 to the clevis 11. Draw-rods 19 20 connect the opposite end portions of the evener 18 with the evener-bar 14 at the points 21 22, respectively. Detachably connected at its rear end to the plow-clevis 11 is an auxiliary tongue 23, the point of attachment between said auxiliary tongue and clevis being in this instance on the furrow side of the main tongue, or, in other words, on the side of said main tongue adjacent to the furrow made by the preceding "round" of plowing. Thus when a plow is employed which turns the soil to the right the point of attachment between the auxiliary tongue and clevis will be to the right of the main tongue, and vice versa.

The forward end portion of the auxiliary tongue is provided with a laterally-extending slotted arm 24, which arm is secured to the forward portion of the main tongue 10 by means of a bolt 25, passed through the slot in said arm and through the said main tongue. In this instance when draft is applied to the whiffletrees the lines of force are converged and applied directly to the plow-clevis through the main tongue. Were this done without using the auxiliary tongue the plow would swerve into the land by reason of its side draft and drag sidewise through the ground, the tongue flexing toward the furrow and out of alinement with the plow-beam. By supplying the auxiliary tongue on the furrow side of the main tongue said auxiliary tongue resists by its thrust the tendency of the main tongue to flex relative to the plow-beam and maintains the rigidity of the connection and proper alinement of the beam and main tongue.

It will be observed that both the main and

auxiliary tongues may be adjusted laterally relative to the plow-beam, thus paralleling the line of draft to the line of resistance and varying the tendency of the plows to take more or less "land."

By the employment of the laterally-sliding connection between the main and auxiliary tongues the plow may be turned "square," or, in other words, the motive power may be turned into a position at an angle to the plow and the said plow rotated in a fixed position, the axis of rotation being the point of the outer plow.

In the manufacture of these equalizers the tongues may, if desired, be rigidly connected or cast in one piece; but in such an instance some other device must be substituted for the slotted arm if it be yet desired to turn square corners, such as a slot in the rear portion of the auxiliary tongue, or a device analogous thereto.

When it is desired to employ only three horses abreast, a singletree is substituted for the whiffletree 16 and the draw-rods 19 are attached to the evener-bar at the point 26.

The arrangement just suggested provides a greater space between the outer and middle horses than between the middle and furrow horses, thereby giving the outer horse greater leverage than either of the others, thus equalizing the weight applied to the horses without in any manner affecting or altering the application of force to the plow-clevis or the steering functions of the auxiliary tongue. It is obvious that bolt-holes should be provided in the draw-rods 19 to register with a hole in the bar 14 at the point indicated, as 26, and maintain the bar 14 approximately at right angles to the plow-beam.

It will be observed that by the employment of the rigid connection between the tongues and plow-beam the line of draft and the line of resistance are brought into alinement on a line parallel with the line of advancement, and such alinement is sustained so long as the plowing is continued or until a "corner" is reached and a "turn" is desired to be made.

I claim as my invention—

1. In an equalizer, the combination of a main tongue adapted for attachment to a plow-clevis; an auxiliary tongue located on one side of the main tongue and adapted for attachment to the main tongue at one end and to the plow-clevis at the other end, the clevis being inflexible between the points of attachment of the tongues, an evener mounted on said main tongue, an evener-bar, draw-rods connecting said evener-bar to said evener and connections between the evener-bar and the forward end of the main tongue.

2. In a plow-equalizer, the combination of a main tongue adapted for attachment to a plow-clevis, whereby the plow is drawn, an auxiliary tongue forming an auxiliary connection between said main tongue and clevis, whereby the plow is steered, a laterally-slid-



ing connection between the main and auxiliary tongues, whereby the plow is allowed to turn readily, and draft mechanism connected to said main tongue, whereby the main tongue  
5 draws the plow and the auxiliary tongue resists, by compression, flexure of the main tongue in one direction relative to the plow-beam.

10 3. In an equalizer, the combination of a main tongue adapted for attachment to a plow-clevis, an auxiliary tongue located on the furrow side of the main tongue and adapted for attachment to the main tongue at one end and to the plow-clevis at the other end, the  
15 clevis being inflexible between the points of attachment of the tongues, an evener mounted on said main tongue, an evener-bar, draw-rods connecting said evener-bar to said evener, and flexible connections between the evener-bar  
20 and the forward end of the main tongue.

4. In an equalizer the combination of a

main tongue, an auxiliary tongue located on the furrow side of the main tongue and forming an auxiliary connection between the main tongue and plow-clevis, an evener mounted 25 upon the main tongue, a brace-bar pivotally connected at one end to the forward end of the main tongue, an evener-bar pivotally connected to the opposite end of the brace-bar, draw-rods connecting the furrow end of said 30 evener to the furrow end of said evener-bar, draw-rods connecting the opposite end of said evener with the opposite end portion of the evener-bar, the latter said draw-rods being formed and arranged for manual adjustment 35 with the said evener-bar.

In testimony whereof I have hereunto set my hand in the presence of two witnesses.

JOSEPH W. GAMBLE.

In presence of—

JOHN A. CAMP,  
S. C. SWEET.