G. B. CAMPBELL.

DITCH DIGGING MACHINE.

APPLICATION FILED MAR. 31, 1920.

1,432,837.

Patented Oct. 24, 1922.

3 SHEETS—SHEET 1.

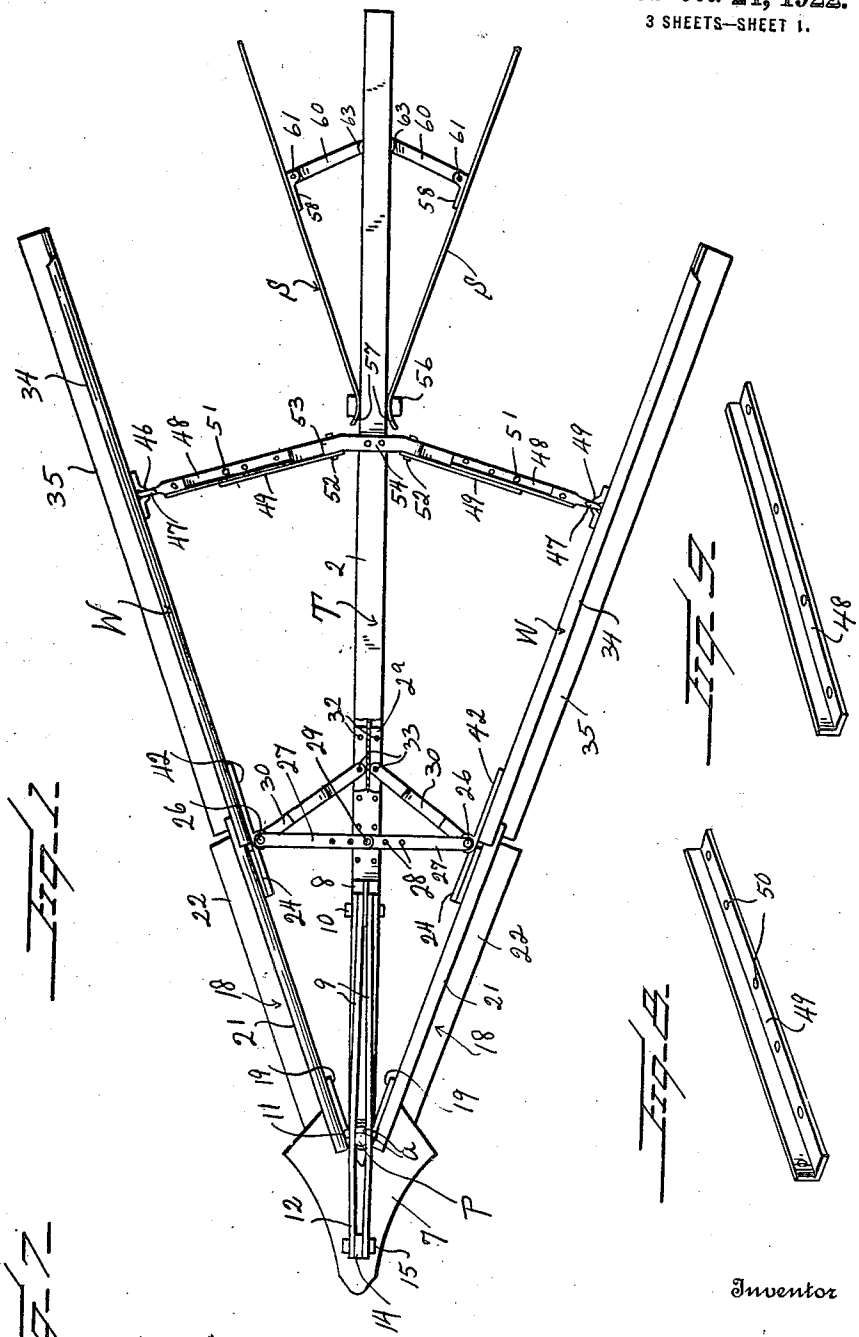


Fig. 1.

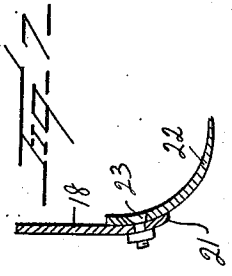


Fig. 2.

Fig. 3.

Fig. 4.

Inventor

G. B. Campbell

By Watson E. Coleman

Attorney

G. B. CAMPBELL.

DITCH DIGGING MACHINE.

APPLICATION FILED MAR. 31, 1920.

1,432,837.

Patented Oct. 24, 1922.

3 SHEETS—SHEET 2.

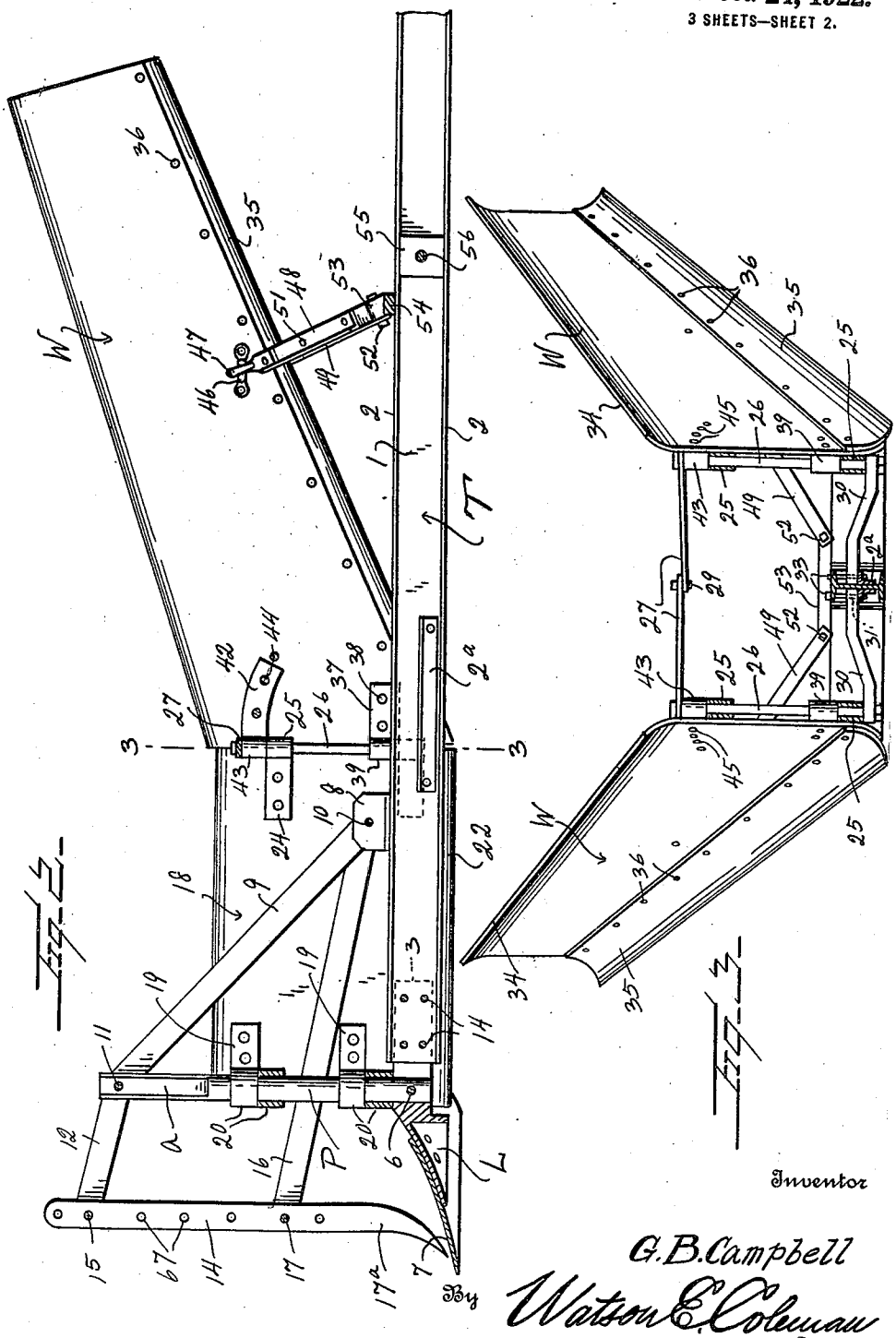


Fig. 2.

Fig. 4.

Inventor

G. B. Campbell

By Watson E. Coleman

Attorney

G. B. CAMPBELL.

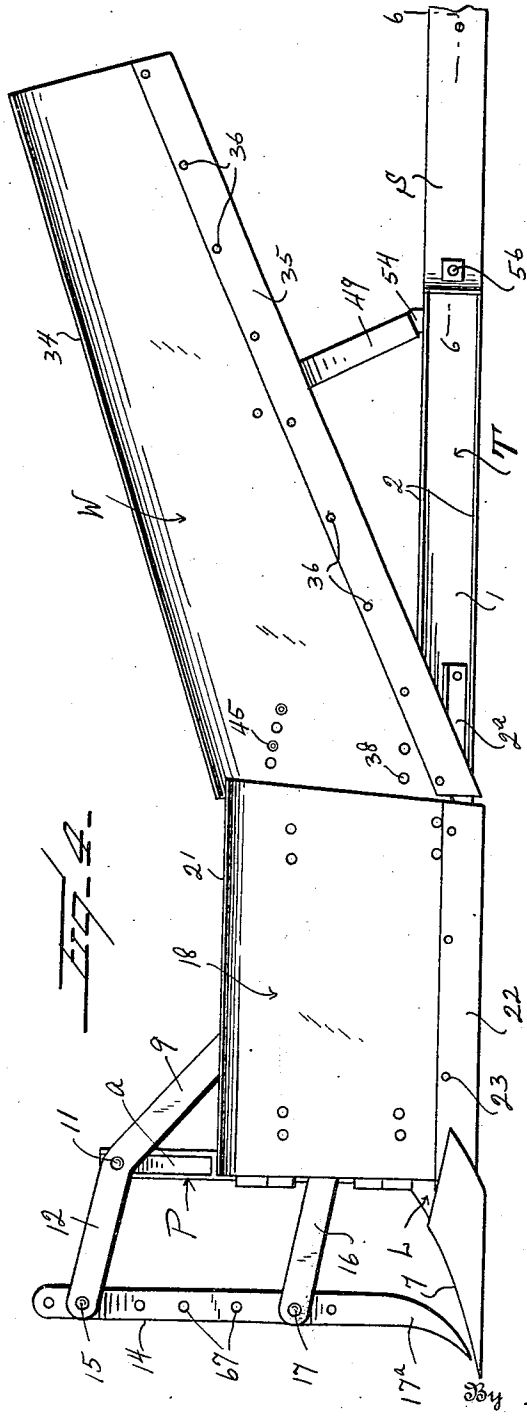
DITCH DIGGING MACHINE.

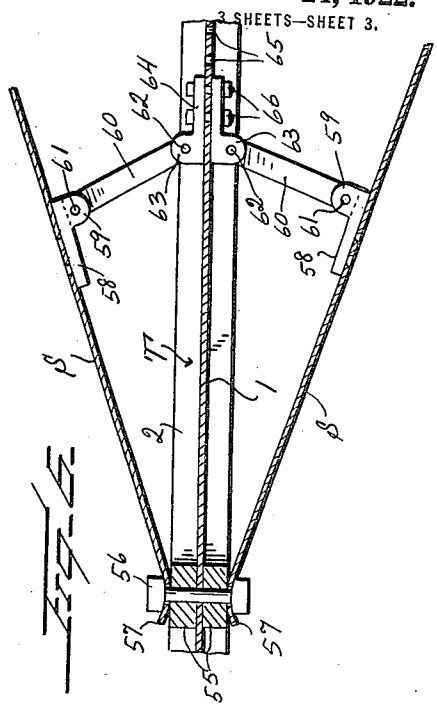
APPLICATION FILED MAR. 31, 1920.

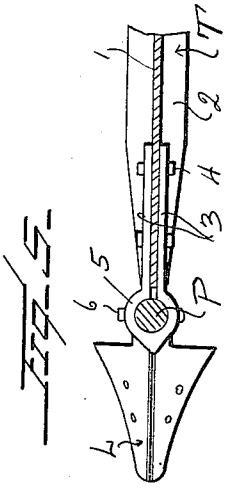
1,432,837.

Patented Oct. 24, 1922.

3 SHEETS—SHEET 3.







Inventor

G. B. Campbell

By Watson E. Coleman

Attorney

Patented Oct. 24, 1922. 1,432,837

UNITED STATES PATENT OFFICE.

GEORGE B. CAMPBELL, OF FORT MORGAN, COLORADO.

DITCH-DIGGING MACHINE.

Application filed March 31, 1920. Serial No. 370,212.

To all whom it may concern:

Be it known that I, GEORGE B. CAMPBELL, a citizen of the United States, residing at Fort Morgan, in the county of Morgan and State of Colorado, have invented certain new and useful Improvements in Ditch-Digging Machines, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to certain improvements in ditch digging machines and is primarily an improvement on a similar character of machine disclosed in my Patent No. 1,333,158, dated Mar. 9, 1920, and it is an object of the invention to provide a novel and improved device of this general character embodying a structure wherein all of the parts comprised therein may be formed of metal.

It is also an object of the invention to provide a novel and improved device of this general character including two laterally swinging wings operating to regulate the slope of the ditch banks and which wings are also capable of adjustment in a vertical direction.

An additional object of the invention is to provide a device of this general character embodying a front or plow carrying member having an elongated and rearwardly directed tail member and wherein laterally adjustable side wings are engaged with the front or plow carrying member, together with bracing means interposed between the wings and also interposed between the wings and the tail member.

Another object of the invention is to provide a device of this general character including novel and improved means whereby a pulling bar may be operatively engaged therewith and which bar operates to facilitate the functioning of the machine.

The invention consists in the details of construction and in the combination and arrangement of the several parts of my improved machine whereby certain important advantages are attained and the device rendered simpler, less expensive and otherwise more convenient and advantageous for use, as will be hereinafter more fully set forth.

The novel features of my invention will hereinafter be definitely claimed.

In order that my invention may be the better understood, I will now proceed to describe the same with reference to the accompanying drawings, wherein:

Figure 1 is a view in top plan of a ditch digging machine constructed in accordance with an embodiment of my invention;

Figure 2 is a longitudinal vertical sectional view taken through the device as shown in Figure 1 with certain of the parts in elevation;

Figure 3 is a sectional view taken substantially on the line 3—3 of Figure 2;

Figure 4 is a view in side elevation of my improved machine as herein embodied;

Figure 5 is a fragmentary horizontal sectional view, illustrating in detail the connection between the tail member, the post, and the lister holder;

Figure 6 is an enlarged sectional view taken substantially on the line 6—6 of Figure 4;

Figure 7 is a detail sectional view, illustrating the scraper or cutting blade carried by one of the side members:

Figure 8 is a view in perspective of one of the spreader or bracing members for a wing; and

Figure 9 is a view in perspective of a spreader member or arm for a wing and which coacts with the member or arm illustrated in Figure 8.

As disclosed in the accompanying drawings, T denotes an elongated tail member constituting an I-beam with the intermediate web 1 thereof vertically disposed with the flanges 2 thereof at the forward end of the member tapered toward the adjacent end thereof.

L denotes a lister holder, preferably of cast steel, and which has extending rearwardly therefrom the transversely spaced arms 3 adapted to engage the opposite side faces of the web 1 of the member T, and suitably secured thereto preferably by the bolts 4 so that the holder L can be readily applied or removed in accordance with the requirements of practice. The inner end portions of the arms 3 have their opposed faces cored or otherwise formed to provide a substantially vertically disposed sleeve 5 which receives the lower end portion of an upstanding post P. The portion of the post P within the sleeve 5 is keyed to said sleeve by the removable bolt 6 whereby the proper mounting of the post P is facilitated.

The holder L is positioned in advance of

and substantially longitudinally aligned with the tail member T and detachably engaged with said holder by the removable bolts 6 is a lister plow 7 of a conventional construction.

The post P is of metal and the upper portion of said post is provided with the flattened side faces *a*. Bolted or otherwise secured to the upper flange 2 of the tail member T and at a desired point inwardly of the forward end of said tail member is an upstanding plate or web 8. Arranged at opposite sides of said web or plate 8 are the lower extremities of the rigid brace straps 9 which are secured to said web or plate 8 through the medium of a bolt 10, or the like. The brace straps 9 extend upwardly and forwardly in parallelism and are secured by a bolt 11, or the like, to the upper end portion of the post P, said straps overlying the flattened side faces *a* of said post. The upper end portions of the straps 9 are continued by the forwardly directed extensions 12 in angular relation to the straps 9. Fitting between the outer or free extremities of the extensions 12 is the upper end portion of a vertically disposed pulling bar 14, said end portion of the bar 14 being secured to the extensions 12 by a bolt 15, or the like. The bar 14 is also of metal and the lower end portion extends between the forward extremities of the rigid brace straps 16 and are secured thereto by the bolts 17, or the like. The brace straps 16 extend rearwardly and have their opposite end portions secured to the upstanding web or plate 8 by the bolt 10, hereinbefore referred to. Intermediate portions of the brace straps 16 are sufficiently spread or separated to permit said brace straps to extend beyond opposite sides of the post P.

Arranged at each side of the tail member T is a vertically disposed side member or wing 18, comprising a metallic plate of desired configuration and dimensions, but preferably substantially oblong with its major axis longitudinally directed. The forward end portion of each of the side members or wings 18 has secured to the inner face thereof the longitudinally disposed straps 19, having their forward or outer end portions provided with the eyes 20 which surround the post P and whereby the member or wing 18 is capable of swinging movement in a lateral direction with respect to the tail member T.

The upper and lower longitudinal marginal portions of each of the members or wings 18 is extended outwardly on a predetermined curvature, as indicated at 21, the outwardly curved portion 21 serving as a deflector for the earth which may be loosened by the lister 7 during the operation of the machine. Secured to the outer face of the lower curved portion 21 of each of the wings or members 18 is a cutting or scraper blade 22, extending longitudinally of and substantially the entire length of said member or wing 18. The cutting or scraper blade 22 is detachably held to the wing or member 18 by the bolts 23, or the like, and said cutting member or scraper blade 22 is also suitably curved in cross section and in conformity with the lower curved marginal portion 21. The cutting or working edge of the blade 22 extends beyond the adjacent or lower longitudinal margin of the wing or member 18.

The rear end portion of each of the members or wings 18 has secured to the inner face thereof a pair of vertically spaced and longitudinally disposed straps 24. The outer ends of the straps 24 are provided with the inwardly extending eyes 25, through which are directed the vertically disposed rods 26, said rods being held in applied position by said eyes.

Operatively engaged with the upper end portion of each of the rods 26 is an inwardly directed spreader arm 27. The inner end portions of the arms 27 are in overlying relation and said inner end portions of the arms 27 are provided with a series of longitudinally spaced openings 28. A removable bolt 29, or the like, is adapted to be disposed through a pair of registering openings 28 in said arms whereby the side members or wings 18 are effectively maintained in a desired relative adjustment one with respect to the other and with respect to the tail member T and in accordance with the width of the ditch or lateral to be produced.

Operatively engaged with the lower end portion of each of the rods 26 is an end portion of an inwardly directed brace arm 30. The opposite end portion of said arm 30 is provided with the opening or eye 31 adapted to register with one of a plurality of longitudinally spaced openings 32 provided in an outstanding flange 2^a, extending outwardly from and longitudinally of the web 1 of the tail member T, and a bolt 33 is adapted to be disposed through said registering openings. By this means, an effective brace is provided for the lower marginal portion of each of the side members or wings 18 at the rear thereof and whereby the same are further maintained in their desired positions as may be required by the width of the ditch or lateral to be produced. The opposite end portions of each of the arms 30 are vertically offset one with respect to the other in order to assure the requisite assembly.

Coacting with each of the wings or side members 18 is a side wing W also formed of metal and having its upper and lower longitudinal marginal portions disposed outwardly, as at 34, on a predetermined curvature. Secured to the lower curved marginal portion 34 is a cutting member or scraper 35

extending the entire length thereof and detachably held thereto by the bolts 36, or the like.

Secured to the inner end portion of each of the wings W at the lower part thereof is a strap 37, preferably held in applied position by the plow bolts 38 and the outer end portion of said strap is provided with an eye 39 through which is directed a vertically disposed rod 26. The rod 26 is disposed through the eyes 25 carried by the outer ends of the straps 24 secured to the rear end portion of the adjacent side member or wing 18 and is supported thereby. The upper part of the inner portion of the wing W has adjustably engaged therewith a strap 42 provided with an eye 43 through which the rod 26 is also directed.

In the present embodiment of my invention, the strap 42 is arcuate and is provided with spaced openings 44 adapted to register with certain of the openings in the arcuate series of openings 45 produced in the wing W. By this means, it will be readily understood that the wing W can be readily swung laterally with respect to the tail member T and is also capable of a vertical swinging adjustment so that the incline of the wing W may be arranged as may best comply with the requirements or necessities of practice.

Secured to each of the wings W at a desired point intermediate its ends and adjacent its lower marginal portion is a wing eye 46 with which is engaged a hook member 47 secured to an end portion of a spreader arm 48. The spreader arm 48 preferably comprises an angle iron and has its inner end portion overlapping a second spreader arm 49. The arm 49 is also preferably an angle iron and one of the flanges thereof is provided with a series of longitudinally spaced openings 50 adapted to register with similarly formed openings in the first named arm 48 and to which is adapted to be engaged a bolt 51 or other removable member whereby said arms 48 and 49 may be adjusted longitudinally one with respect to the other to support a wing W in its desired adjustment about its coacting rod 26. The inner end portion of the rod 49 is engaged by a bolt 52 or the like with an upturned extremity 53 of a spreader lug 54 bolted or otherwise secured to the upper flange 2 of the tail member T at a desired point intermediate the ends of said tail member.

As is clearly illustrated in the accompanying drawings, each of the wings W is disposed upwardly and rearwardly on a predetermined incline in accordance with the depth of the ditch or lateral to be produced and said wings operate to make the proper slope of the ditch or lateral sides, pushing the dirt out at the proper angle and preventing the return of the dirt within the ditch or the lateral behind the ends or over the tops of the wings W. The wings W must be elevated higher for a deep ditch than when the machine is adjusted for its normal or shallow work.

It is thought to be obvious that the lateral adjustment of the wings W serve to regulate the slope of the ditch or lateral and that the wings can also be adjusted to throw more dirt on one side than the other and thereby giving more cutting surface on the side where the stronger bank is desired. It will also be obvious that by having one of the wings W lying closely adjacent to the member T, the dirt will be thrown to one side of the ditch. Should the device be working on a hillside, the bottom of a ditch can be made level and the embankment thrown up on the lower side of the ditch by closing the wing W on the high side.

Preferably at a point rearwardly of the spreader lug 54 and preferably in close proximity thereto, the filler blocks 55 are positioned at opposite sides of the web 1 and snugly fit between the flanges 2 of the tail member T. The blocks 55 are maintained in applied position through the instrumentality of the bolt 56 or the like. The bolt 56 is also directed through the curved end portions of the supplemental or tail wings S. Each of the wings S comprises an elongated plate of metal and the curved end portion 57 adjacent a filler block 55 permits said wing to be adjusted laterally with respect to the tail member T. Secured to the inner face of the supplemental or tail wing S, at a predetermined point intermediate its ends, is a casting 58 provided with a pair of vertically spaced lugs 59 between which extends an end portion of a spreader arm 60, said end portion being pivotally engaged, as at 61, with said lugs 59. The opposite end portion of the spreader arm is pivotally engaged, as at 62 between a pair of vertically spaced perforated ears 63 carried by a casting 64 and which casting is secured to the web 1 of the tail member T and adjustable longitudinally thereof through the medium of the series of longitudinally spaced openings 65 produced in said web 1 and whereby the casting or plate 64 may be arranged thereon in accordance with the requirements of practice. The casting or plate 64 is secured to the web 1 by a removable bolt 66, said bolt being common to the casting or plate 64 at opposite sides of the web 1 of the tail member T.

The supplemental or tail wings S are adapted to be adjusted relative to the tail member T so that during a working operation, the rear extremities of said wings S will contact with the sides of the ditch or lateral so that veering of the device is prevented.

The pulling bar 14 is provided with a series of longitudinally spaced openings 67 which afford means whereby a draft rigging may be adjustably engaged with said bar. With the draft rigging engaged with the lower portion of the bar 14, the plow 7 will cut a ditch or lateral of a depth less than should the draft rigging be engaged with the upper portion of the bar 14. In other words, the point of connection of the draft rigging with the bar 14 serves to regulate the depth of the ditch or lateral produced. The adjustable connection of the draft rigging with the bar 14 serves to properly compensate for the draft power applied and particularly when the number of draft animals may be either increased or decreased.

It has also been found of particular advantage to have the bar 14 continued by a downwardly disposed extension 17^a terminating at its lower end in close proximity to the lister plow or lay 7 with the forward vertical edge of said extension 17^a sharpened whereby said extension serves as a cutting element or divider.

From the foregoing description, it is thought to be obvious that a machine constructed in accordance with my invention is particularly well adapted for use by reason of the convenience and facility with which it may be assembled and operated, and it will also be obvious that my invention is susceptible of some change and modification without departing from the principles and spirit thereof, and for this reason I do not wish to be understood as limiting myself to the precise arrangement and formation of the several parts herein shown in carrying out my invention in practice except as hereinafter claimed.

I claim:

1. A machine of the class described comprising a post, side members engaged therewith, a digging implement carried by the post in advance of the side members, a rearwardly directed tail member connected to the post and positioned between the side members, a member secured at one end to the tail member inwardly of the post and extending to and connected to the upper end portion of the post, said member having an extension disposed in advance of the post, a second member engaged at one end portion to the tail member inwardly of the post and extending in advance of the post, and a vertically disposed pulling bar secured to the extension of the first named member and the adjacent end portion of the second named member.

2. A machine of the class described comprising a post, side members engaged therewith, a digging implement carried by the post in advance of the side members, a rearwardly directed tail member connected to the post and positioned between the side members, a member secured at one end to the tail member inwardly of the post and extending to and connected to the upper end portion of the post, said member having an extension disposed in advance of the post, a second member engaged at one end portion to the tail member inwardly of the post and extending in advance of the post, and a vertically disposed pulling bar secured to the extension of the first named member and the adjacent end portion of the second named member, the lower end portion of the pulling bar terminating in close proximity to the digging element to serve as a divider.

3. A machine of the class described comprising a post, side members engaged therewith, a digging implement carried by the post in advance of the side members, a rearwardly directed tail member connected to the post and positioned between the side members, a member secured at one end to the tail member inwardly of the post and extending to and connected to the upper end portion of the post, said member having an extension disposed in advance of the post, a second member engaged at one end portion to the tail member inwardly of the post and extending in advance of the post, and a vertically disposed pulling bar secured to the extension of the first named member and the adjacent end portion of the second named member, the lower end portion of the pulling bar terminating in close proximity to the digging element to serve as a divider, the forward edge of said lower portion of the bar being sharpened.

4. A machine of the class described comprising a post, side members engaged therewith for swinging movement, vertically disposed rods carried by the rear portions of the side members, coacting spreader arms engaged with the upper portions of the rods, a rearwardly directed tail member engaged with the lower portion of the post, arms operatively engaged with the lower portions of the rods, flanges extending outwardly from the opposite sides of the tail member, and means for connecting said last named arms at different points along the flanges.

5. A machine of the class described comprising a post, side members engaged therewith, a digging implement carried by the post in advance of the side members, a rearwardly directed tail member connected to the post and positioned between the side members, an upstanding plate carried by the tail member inwardly of the post, a member secured at one end to the plate and extending and connected to the upper end portion of the post, said member having an extension disposed in advance of the post, a second member engaged at one end portion to the plate and extending in advance of the lower portion of the post, and a vertically disposed pulling bar secured to the

extension of the first named member and the adjacent end portion of the second named member.

6. A machine of the class described comprising a post, side members engaged therewith, a digging implement carried by the post in advance of the side members, a rearwardly directed tail member connected to the post and positioned between the side members, an upstanding plate carried by the tail member inwardly of the post, a member secured at one end to the plate and extending and connected to the upper end portion of the post, said member having an extension disposed in advance of the post, a second member engaged at one end portion to the plate and extending in advance of the lower portion of the post, and a vertically disposed pulling bar secured to the extension of the first named member and the adjacent end portion of the second named member, the connection of the members with the plate being at a common point.

In testimony whereof I hereunto affix my signature.

GEORGE B. CAMPBELL.