Sept. 30, 1958 C. W. SHIPLEY ET AL 2,853,811

RAILROAD SPREADERS

Filed Sept. 30, 1954 2 Sheets-Sheet 1

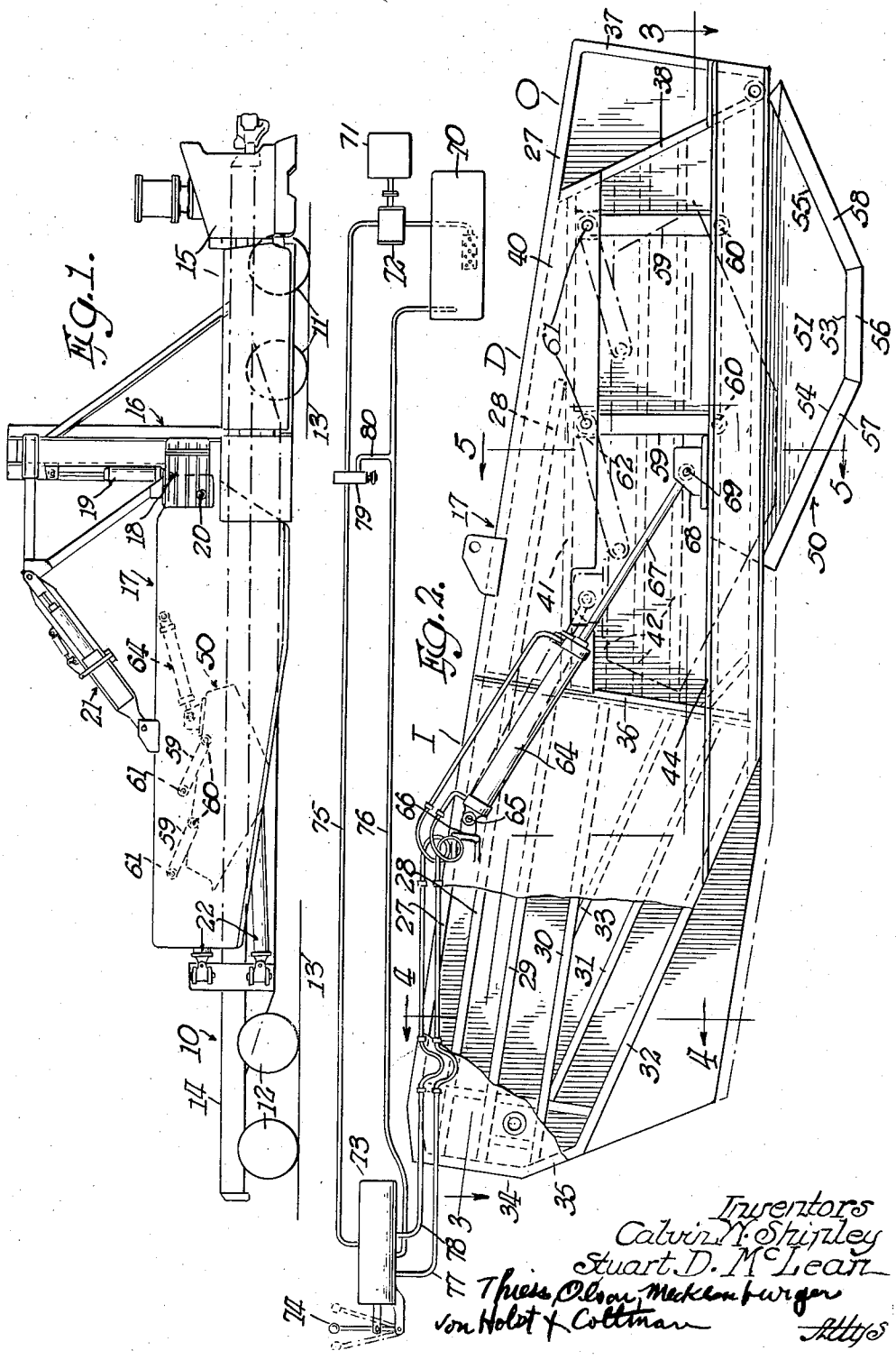


Fig. 1.

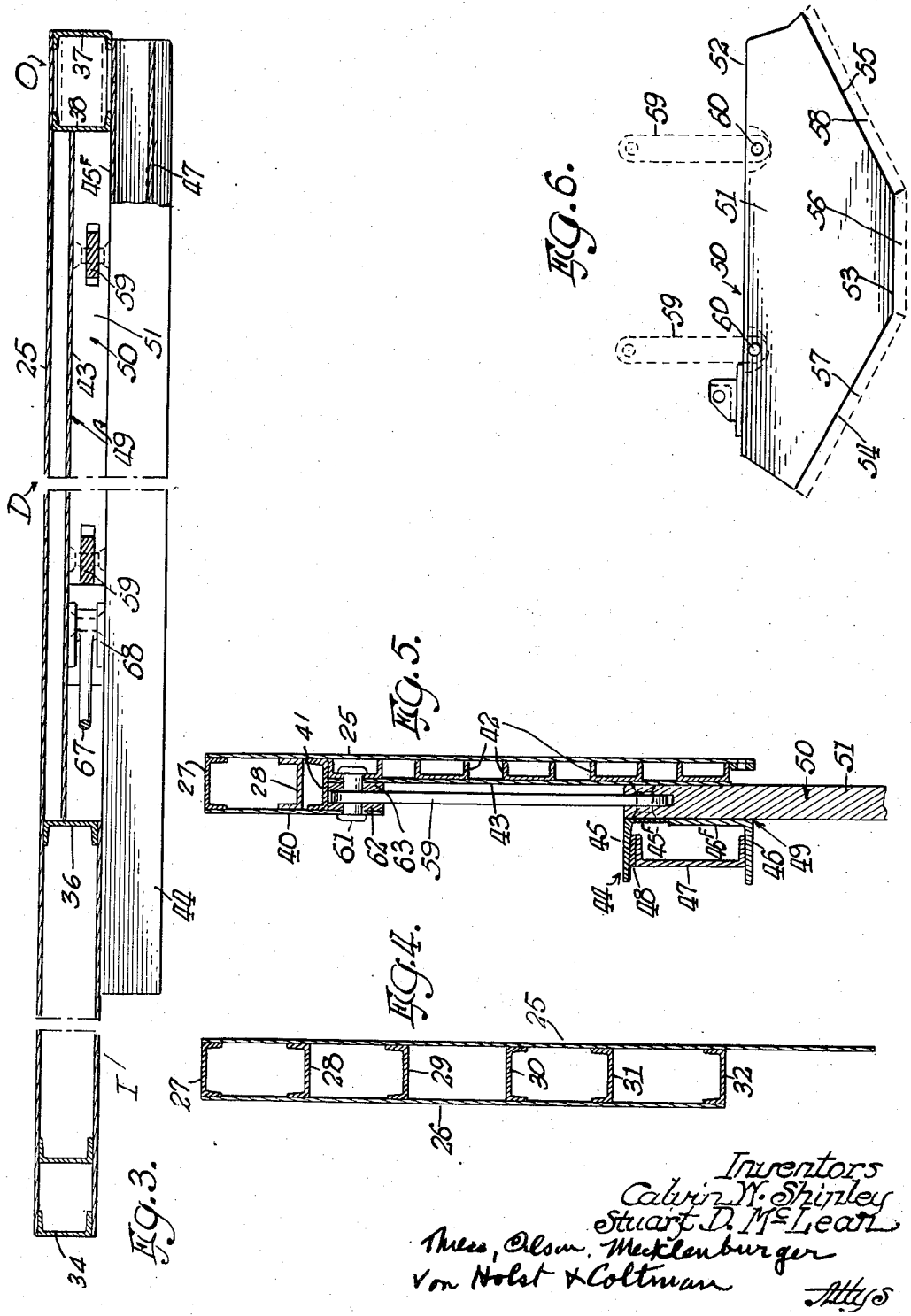
Fig. 2.

Inventors
Calvin W. Shipley
Stuart D. McLean
Thiess, Olson, Mackenburger
Von Holst & Cottman
Attys

Sept. 30, 1958 C. W. SHIPLEY ET AL 2,853,811

RAILROAD SPREADERS

Filed Sept. 30, 1954 2 Sheets-Sheet 2



Inventors
Calvin W. Shipley
Stuart D. McLean
Theis, Olson, Mecklenburger
Von Holst & Coltman
Attys

United States Patent Office 2,853,811 Patented Sept. 30, 1958

2,853,811

RAILROAD SPREADERS

Calvin W. Shipley, Munster, and Stuart D. McLean, Hammond, Ind., assignors to O. F. Jordan Company, East Chicago, Ind., a corporation of Indiana

Application September 30, 1954, Serial No. 459,241

10 Claims. (Cl. 37—105)

This invention relates generally to improvements in railroad spreaders, but relates more particularly to improvements in the main wing and in ditcher mechanism carried by the main wing.

Spreader main wing constructions, as heretofore designed, have been constructed of castings, which result in a heavy wing structure, and also one which cannot readily be modified to comply with the particular customer's specification. Fabrication and machining are also difficult and expensive.

Ditcher mechanism of this general type has also been in use heretofore, but is of such construction that it is open to certain objections. For example, such prior ditcher mechanism comprises many moving parts, including in some instances chain driven parts which, in practice, give trouble by premature breakage.

Again certain prior constructions are such that it is difficult to maintain lubrication of bearing surfaces; the ditcher actuating mechanism comprises screw threaded shafts which are subject to premature breakage, as well as being slow in operation.

In certain prior mechanism for this purpose the ditch section or blade has been of cast construction, subject to distortions which prohibited movement in close tolerances.

The general object of this invention is to provide a main wing and ditcher mechanism which shall be of simplified construction involving a lesser number of parts and one which, at the same time, shall be easier to construct and maintain.

A further object of the invention is to provide a main wing and ditcher construction which can be made lighter in weight without sacrificing the necessary strength.

Again, it is an object of the invention to provide a construction which will permit of greater tolerances in construction and operation and one in which the operating mechanism for the ditcher blade can be smaller in size, thereby permitting more clearance between the main spreader wing and the car body when the main wing is folded to the side of the car.

Other objects of the invention are to provide structure so designed that the accumulation of dirt and other foreign matter in the main wing cavity, when the ditcher member or blade is exposed, is minimized; to provide structure which will enable the ditch to be cut without disturbing the bank or berm, and to provide hydraulic operable means for actuating the ditcher member or blade in such manner that locking in increment positions is possible.

The above named objects of the invention, as well as other features, will more fully appear as the specification proceeds.

In the drawings:

Figure 1 is a side elevation of a railroad spreader, the main spreader wing of which is provided with a ditcher structure embodying the preferred form of the invention, the ditcher section or member appearing in its inoperative retracted position relative to the associated spreader wing.

Fig. 2 is a view in elevation, on a scale enlarged over that of Fig. 1, of the rear side of the main spreader wing, showing the ditcher member in its operative projected position and further schematically showing the hydraulic circuit for moving the ditcher section between its inoperative and operative positions relative to the spreader wing by which it is carried.

Fig. 3 is a horizontal sectional view through the spreader wing, as taken on the line 3—3 and on a scale over that of Fig. 2.

Figs. 4 and 5 are vertical sectional views through the spreader wing, on the scale of Fig. 3, as taken on the lines 4—4, 5—5 respectively of Fig. 2.

Fig. 6 is a view in side elevation of the ditcher blade, on the scale of Fig. 2 and will be more fully referred to later.

Referring now to that embodiment of the invention illustrated in the accompanying drawings, **10** illustrates as a whole a railroad spreader in the form of a car having front and rear sets of wheels **11** and **12** respectively, adapted to travel on the rails of a railroad track **13**.

The car has a deck **14** secured to the car underframe, which may be of conventional construction for cars of this type and which is, therefore, not shown in detail.

At the front of the car is a plow structure **15** which forms no part of the present invention. A suitable distance rearwardly of the front plow of the spreader is an upright post or column structure **16** and an associated main spreader wing **17**. It should be understood that a post or column structure and associated wing is provided on the opposite side of the car but since they are of like construction they have not been illustrated.

The main wing **17** is hingedly attached to the post or column **16** by a hinge **18**, thus adapting the wing to be swung outwardly and retracted by known or conventional means. Also, the wing may be raised and lowered under the control or actuation of the fluid cylinder or engine **19**. Additionally the main wing **17** is pivoted on a horizontal pivot **20**, on part of the hinge structure **18** so that the main wing can be swung upwardly and downwardly under the control of actuating mechanism **21** which may be of conventional or known construction.

Extending between the inner side of the main wing and the car body or frame are wing braces **22** which are or may be of conventional construction for holding the main wing in working position which will usually be outwardly of the car at an angle of the order of 20 to 45 degrees.

The main wing structure

The main wing **17**, as here shown, comprises inner and outer portions or parts I and O between which is located a portion D for the support and reception of the ditcher blade or member.

On the outer face of the wing and extending the full length thereof is a sheet metal plate member **25**, the inner side or face of portion I being constituted of a sheet metal plate member **26** connected to the plate **25** by means of a plurality of structural channel shaped members **27**, **28**, **29**, **30**, **31**, **32** and **33**, which extend generally lengthwise of the frame (see Figs. 2 and 4). Additionally there are upright channel members **34**, **35** and **36** which, in general, constitute the portion I into a box-like part or section. It will be understood that the plates and structural members and plates are secured together as by welding, so that an extremely rigid, strong structure results.

The end portion O of the main wing includes upright channel members **37** and **38** bounded at the top by channel member **27** which extends inwardly across the top of

the portion D and is an extension of the channel member 27 of section I.

The plate 25 is affixed to the channels 37, 38 and 39 and constitutes the outer face of the wing.

The construction of intermediate section D will be best understood by reference to Figs. 2, 3 and 5. It will be observed that the plate 25 forms the outer face of the section. The dimension of the top part of the section D from front face to rear face is the same as that of the section I. However, the inner plate 40 extends downwardly but partway terminating a short distance below the channel member 41.

Affixed to the face plate 25 and extending from the under side of the channel member 41 is a plurality of vertically spaced channel members 42 similar to the member 41, but arranged with the flange portions thereof in substantially perpendicular relation to the flange portions of the channel 41. Affixed to the base portions of the channels 42 is a plate member 43.

Extending longitudinally of the wing 17 along the bottom thereof is a beam-like structure designated as a whole by the member 44. It comprises upper and lower angle members 45 and 46 respectively, a channel member 47 and a filler plate 48 which are rigidly secured together, as by welding, to form a boxlike structure, as best shown in Fig. 5.

The end portions of the beam 44 extend across the lower parts of the sections I and O, the face parts 45^F and 46^F of angles 45 and 46 contacting the same and being secured permanently thereto.

As clearly appears from the foregoing, there is thus provided a recess portion on the rear side of the main wing intermediate the ends. The portions 45^F and 46^F of the beam structure being spaced from the plate 43 thus provide a vertical slot 49 for the accommodation of the ditcher blade 50.

The ditcher blade mechanism

The ditcher blade 50 comprises a heavy plate member 51 having a straight upper portion 52 and lower portions 53, 54 and 55, the contour of which is shaped generally to form a ditch of the general cross section desired. To the bottom of the blade 50 are secured removable wear plates 56, 57 and 58, shown in full lines in Fig. 2 and in dotted lines in Fig. 6.

The blade 50 is supported for swinging movement from the full line position to the dotted line position shown in Fig. 2 by means of a pair of links 59—59, the lower ends of which are pivotally secured in the upper part of the blade 50 by horizontally disposed pivot pins 60—60, the upper ends being pivotally secured by pivot pins 61—61 to the upper part D of the main wing 17, as best shown in Fig. 5.

The pivot pins 61—61 extend through the plate 40, filler plates 62—63, plate 43 and the base or web portion of the uppermost channel member 42, being headed at opposite ends to complete the assembly.

In order to swing the blade there is provided an hydraulic cylinder 64 pivotally secured at 65 to a bracket 66, secured to the inner side of the main wing. The piston rod 67, which is secured to a conventional piston member (not shown) in the cylinder 64, has its lower end secured to a bracket 68, by means of a horizontal pivot member 69. The bracket 68 is rigidly affixed to the upper part of the blade 50.

In the full line position (Fig. 2) the piston is at the lower end of the cylinder 64, at which time the blade 50 is also in its lowest position.

In order to cause movement of the piston longitudinally of the cylinder 64, means are provided to supply hydraulic fluid under pressure to one end or the other of the cylinder, depending upon which way it is desired the piston shall move. The means for supplying hydraulic fluid under pressure, and under the control of the operator is schematically illustrated in Fig. 2.

Referring to Fig. 2, 70 is an hydraulic fluid reservoir, and 71 a prime mover, connected to operate a pump 72.

A four way control valve 73 is provided, the spool of which may be shifted, by means of the control lever 74 which is mounted in a position on the car convenient for actuation by the operator.

75 is a fluid line connecting the pump 72 and valve 73. 76 is a return line connecting valve 73 and reservoir 70. Also extending between the valve 73 and the cylinder 64 are fluid lines 77 and 78.

The hydraulic control circuit is completed by the pressure relief valve 79 and the line 80 which is connected to the line 76 leading to the reservoir 70.

The valve 73 is of the spring pressed type operating to return the lever 74 to the full line position shown in Fig. 2 when ever it is released. At that time all valve ports are closed, thus locking the hydraulic fluid in the system except that when the pump 72 continues to operate relief valve 79 opens, permitting the pumped fluid to return to the reservoir through line 80.

Assume now it is desired to move the blade 50 upwardly, from any position excepting its uppermost position, the control lever 74 is swung to a dot and dash position which moves the valve control spool to connect lines 75 and 78. Lines 77 and 76 will also be connected. In this condition fluid under pressure will flow through line 78, moving the piston upwardly and retracting the piston rod 67, thus causing upward and inward swinging movement of the ditcher blade.

At the same time lines 77 and 76 were connected so that the fluid displaced by the upward movement of the piston can return to the reservoir.

If, at any time, it is desired to swing the blade 50 downwardly from any position other than its lowermost position the lever 74 is swung to the other dotted line position, Fig. 2, thereby connecting lines 75 and 77 so that fluid under pressure is supplied to the upper end of the cylinder 64, thus forcing the piston toward the lower end and projecting the piston rod 67 outwardly and downwardly. At the same time lines 78 and 76 are connected so that the fluid displaced by the downward movement of the piston can return to the reservoir.

From the foregoing it will be seen that the ditcher blade may be moved any desired distance between its extreme positions and there held against movement by the hydraulic fluid which is locked in that part of the system between the valve 73 and the hydraulic cylinder 64. In this way small increments of movement can readily be imparted to the ditcher blade 50 in order to cut a ditch of desired cross-sectional contour.

General remarks

From the foregoing it will be seen that the structure illustrated and described attains the objects and purposes outlined in the opening of the specification, as well as others.

The main wing, being fabricated of conventional structural shapes can be produced and assembled at relatively low cost to produce a light main wing of adequate strength. Furthermore, the structure is one which can be readily modified to meet the special requirements of individual customers.

It is believed the many advantages of the main wing and ditcher blade construction will be obvious without further comment.

We claim:

1. A railroad spreader main wing comprising an inner portion constructed of spaced outer and inner sheet metal plates and a plurality of structural metal members including separate top, bottom and intermediate members secured to and spacing them apart, and a ditcher blade receiving portion outwardly thereof which includes an outer plate member in the plane of the outer plate of the inner wing portion, a plate member substantially parallel to the inner plate of said inner wing portion but

being offset therefrom in the direction of the plane of the outer plate and extending throughout at least a part of the height of the wing, and a plurality of structural members interposed between and secured to said inner and outer plate members of the ditcher blade receiving portion, thereby providing a recess on the rear side of the wing for the reception of a ditcher blade.

2. The arrangement set forth in claim 1 which includes a beam extending along the bottom of the main wing, being secured to the inner side of the inner portion of the main wing and extending toward the outer end of the main wing, the outer side of the said beam being spaced from the adjacent inner plate of the ditcher wing portion thereby forming a vertically disposed slot in which a ditcher blade may be positioned for sliding guided movement.

3. A railroad spreader main wing comprising inner, outer and intermediate portions, sheet metal plate means in a common plane forming the outer face of said portions, sheet metal plate means forming the inner face of at least a part of the inner wing portion, and the upper part of the intermediate portion, said last mentioned plate means being substantially in the same plane, sheet metal means on the inner side of the intermediate portion extending below said upper part and being in a plane offset in the direction of the plate forming the outer face of the wing, structural metal members interposed between and secured to the outer and inner plates of said portions, and a metal beam structure extending across the bottom of the main wing and being secured to the inner side of the outer and inner wing portions and being spaced from the lower part of the intermediate wing portion, thereby forming a ditcher blade receiving slot.

4. The arrangement set forth in claim 3 in which the structural members interposed between the outer and inner plates are channel shaped members.

5. The arrangement set forth in claim 3 in which the structural members interposed between the inner and outer plates are channel shaped members and in which the web or base portions of the channel members in at least part of the intermediate portion are substantially at right angles to the web portions of channel members in other parts of the wing.

6. The arrangement set forth in claim 3 in which the structural members interposed between the inner and outer plates are channel members and in which the web or base portions of the channels in the lower part of the intermediate portion are parallel to the plane of the outer and inner plates, and web portions in the upper part of the intermediate portion are in planes perpendicular to the planes of said outer and inner plates.

7. The arrangement set forth in claim 3 in which the beam at the bottom of the wing comprises a plurality of structural members secured in assembled relation forming a boxlike section.

8. A railroad spreader main wing comprising inner, outer and intermediate portions, sheet metal plate means in a common plane forming the outer face of all of said portions, sheet metal plate means forming the inner face of at least a part of the inner wing portion and the upper part of the intermediate portion, said last two mentioned plate means being substantially in the same plane, sheet metal means on the inner side of the intermediate portion extending below said upper part and being in a plane offset in the direction of the plate means forming the outer face of the wing, means interposed between and bracing said inner and outer plates of said inner and intermediate portions in spaced relation thereby forming a ditcher blade receiving recess on the rear side of said intermediate portion, a metal beam structure extending across the bottom of the main wing, being secured to the inner side of the outer and inner wing portions and being spaced from the lower part of the intermediate wing portion thereby forming a ditcher blade receiving slot, a ditcher blade positioned in said ditcher blade receiving slot and having contoured lower cutting edge portions, and means mounting the ditcher blade for swinging movement between the lowermost operating position and positions inwardly and upwardly thereof whereby at least a portion of the ditcher blade structure, when swung inwardly and upwardly, is accommodated in the said recess of the intermediate wing portion, said mounting means also serving to maintain said contoured lower cutting edge portions at substantially the same angle relative to the horizontal during said swinging movement.

9. The arrangement set forth in claim 8 in which the means mounting the ditcher blade for swinging movement comprises a plurality of parallel links, the upper ends of which are pivotally secured to an upper portion of the wing structure intermediate its ends, and the lower ends of which are pivotally secured to the ditcher blade.

10. A railroad spreader main wing comprising inner, outer and intermediate portions, sheet metal plate means in a common plane forming the outer face of all of said portions, sheet metal plate means forming the inner face of at least a part of the inner wing portion and the upper part of the intermediate portion, said last two mentioned plate means being substantially in the same plane, sheet metal means on the inner side of the intermediate portion extending below said upper part and being in a plane offset in the direction of the plate means forming the outer face of the wing, means interposed between and bracing said inner and outer plates of said inner and intermediate portions in spaced relation thereby forming a ditcher blade receiving recess on the rear side of said intermediate portion, a metal beam structure extending across the bottom of the main wing, being secured to the inner side of the outer and inner wing portions and being spaced from the lower part of the intermediate wing portion thereby forming a ditcher blade receiving slot, a ditcher blade positioned in said ditcher blade receiving slot and having contoured lower cutting edge portions, and means mounting the ditcher blade for swinging movement between the lowermost operating position and positions inwardly and upwardly thereof whereby at least a portion of the ditcher blade structure, when swung inwardly and upwardly, is accommodated in the said recess of the intermediate wing portion, said mounting means also serving to maintain said contoured lower cutting edge portions at substantially the same angle relative to the horizontal during said swinging movement, and hydraulically operable means for imparting swinging movement to the ditcher blade, said means including an hydraulic cylinder pivotally mounted at its upper end to the spreader wing structure, having a piston movable longitudinally of the casing and a piston rod connected to the piston and projecting from the lower end of the cylinder, the outer end of the piston rod being pivotally connected to the ditcher blade whereby movement of the piston in one direction causes swinging movement of the ditcher blade downwardly and outwardly and movement of the piston in the other direction causes movement of the ditcher blade upwardly and inwardly, means for selectively supplying hydraulic fluid under pressure for actuating the piston including lines connected to opposite ends of said cylinder, and means for blocking the flow of fluid in said lines thereby locking the ditcher blade in selected position.

References Cited in the file of this patent

UNITED STATES PATENTS

1,353,927	McNeal	Sept. 28, 1920
1,718,550	Ferris et al.	June 24, 1929
1,742,326	Tellis	Jan. 7, 1930
1,818,750	Protzeller	Aug. 11, 1931
2,299,451	Austin	Oct. 20, 1942
2,491,797	Burns et al.	Dec. 20, 1949
2,594,727	Burggren	Apr. 29, 1952
2,777,220	Bates	Jan. 15, 1957