April 29, 1969 G. HELLING 3,441,091

TOOL MOUNTING ASSEMBLY

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FIG. 1

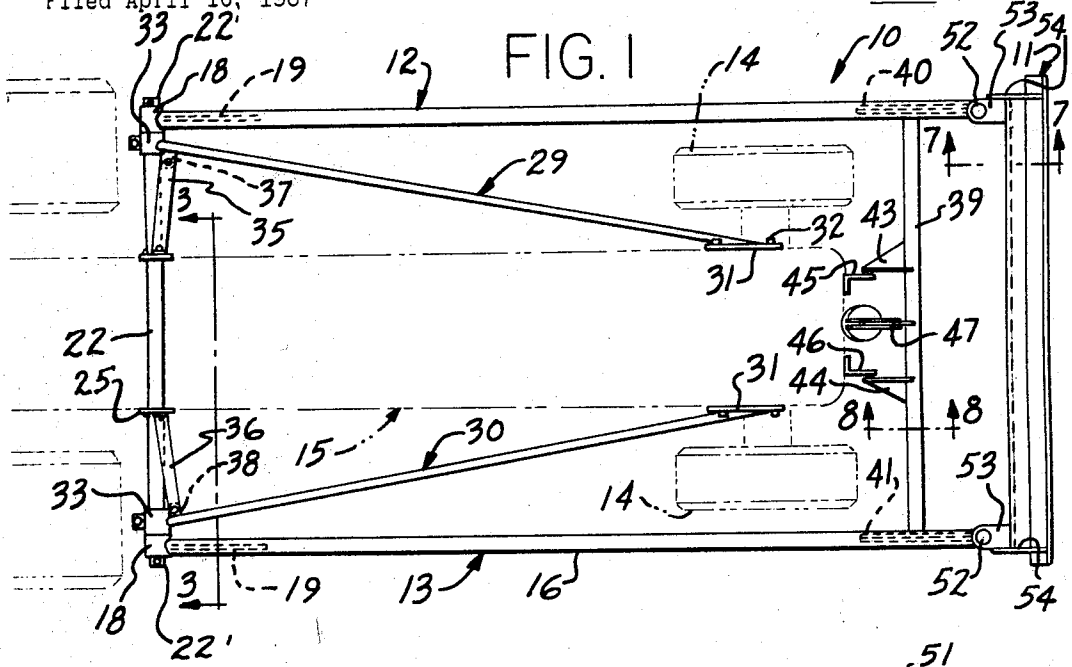


FIG. 2

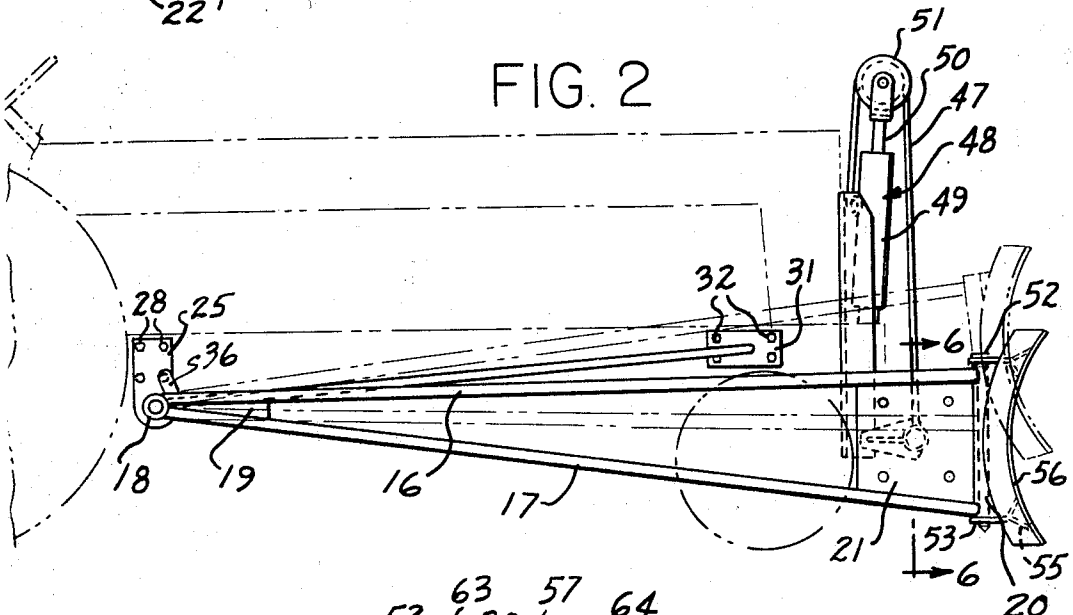
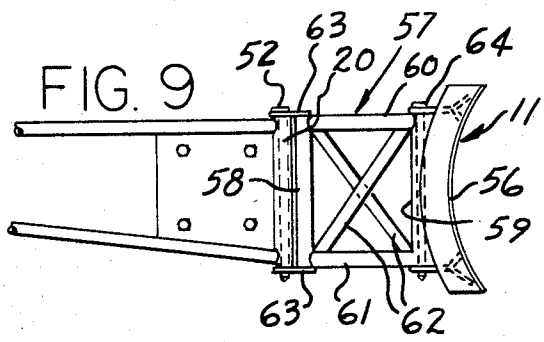


FIG. 9



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FIG. 7

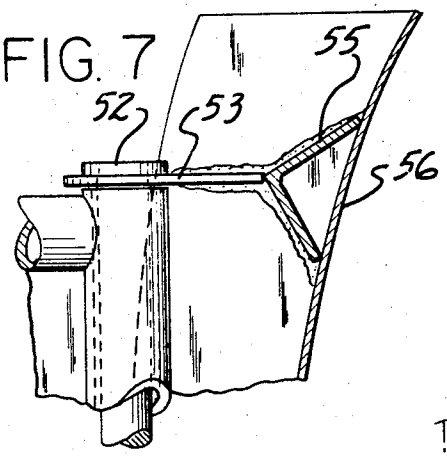


FIG. 8

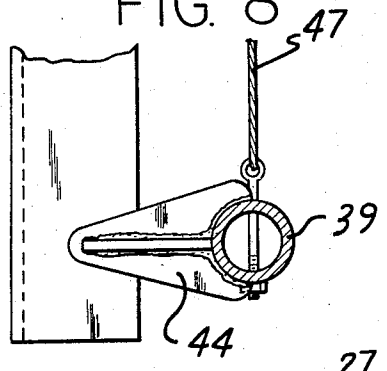
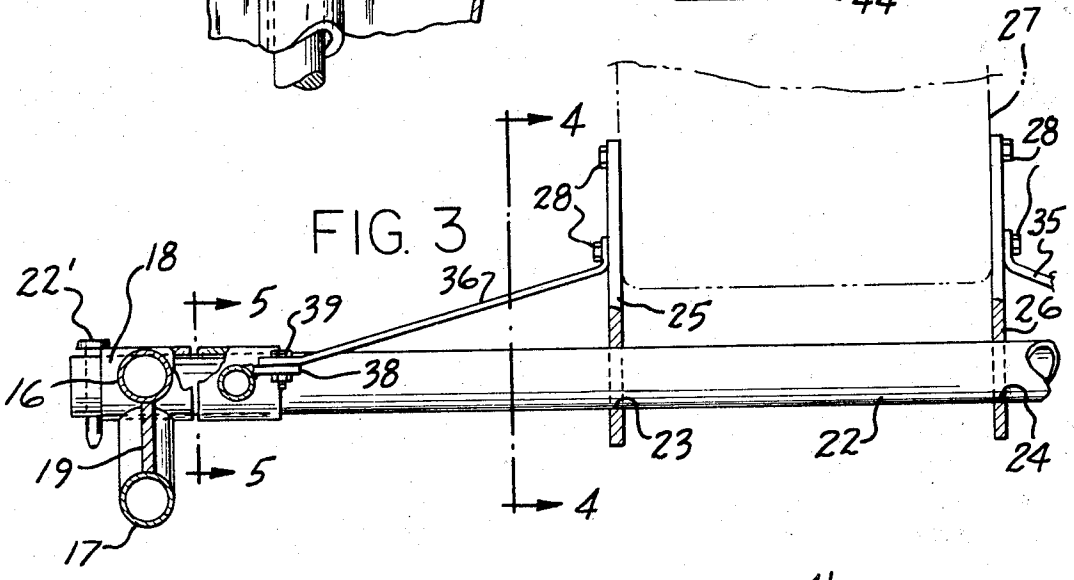


FIG. 3



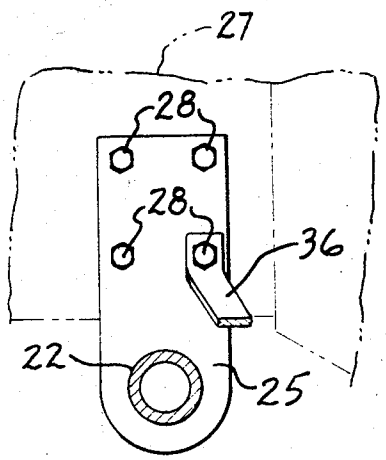


FIG. 4

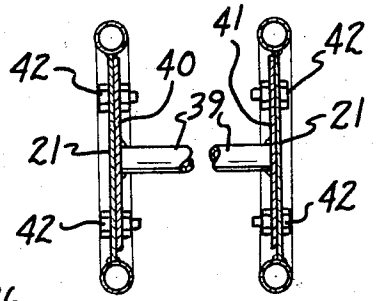


FIG. 6

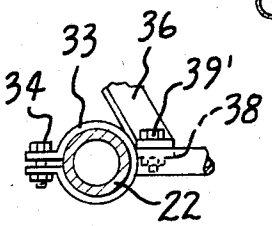


FIG. 5

United States Patent Office 3,441,091 Patented Apr. 29, 1969

3,441,091

TOOL MOUNTING ASSEMBLY

Glenn Helling, Alexander, N. Dak. 58831

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Int. Cl. E02f 3/76
U.S. Cl. 172—801 12 Claims

ABSTRACT OF THE DISCLOSURE

A tool mounting assembly capable of being mounted to the frame of a vehicle such as a tractor, in which a generally longitudinally extending arm is pivotally connected to transverse mounting means connected to the frame. A tool is capable of being connected to the ends of the arms opposite their connection to the mounting means; there are means secured to the frame and connected to the mounting means at each side of the frame outwardly of the attaching means for counteracting some of the forces transmitted to the mounting means from the tool through the arms.

This invention relates to a tool mounting assembly and in particular to a mounting assembly for a tool useful in plowing, grading, farming and the like.

It is a feature of the invention to provide an improved tool mounting assembly which is sturdy, versatile, economical to manufacture, and which has few and relatively lightweight components.

It is a feature of the invention to provide a tool mounting assembly having arms connected to mounting means at substantial distances outwardly from the place of attachment of the mounting means to the vehicle frame, wherein there are provided force counteracting means secured to the frame and connected to the mounting means at each side of the frame at substantial distances outwardly from the place of attachment of the mounting means to the vehicle frame.

Other features of the invention will become apparent from the following detailed description in which:

FIGURE 1 is a top plan view and FIGURE 2 is a side elevational view of a tool mounting assembly and a tool, shown in conjunction with a fragmentary portion of a tractor;

FIGURE 3 is a sectional view taken along line 3—3 of FIGURE 1;

FIGURE 4 is a sectional view taken along line 4—4 of FIGURE 3;

FIGURE 5 is a sectional view taken along line 5—5 of FIGURE 3;

FIGURE 6 is a sectional view taken along line 6—6 of FIGURE 2;

FIGURE 7 is a sectional view taken along line 7—7 of FIGURE 1;

FIGURE 8 is a sectional view taken along line 8—8 of FIGURE 1; and

FIGURE 9 is a fragmentary side elevational view.

Referring now to the drawings, there is depicted a tool mounting assembly generally indicated at **10** shown to mount a tool generally indicated at **11**. The tool **11** is shown to take the form of a blade.

The mounting assembly **10** is shown to include spaced apart arms **12** and **13** which are shown to be parallel to each other but this is not necessary. The arms can angle inwardly or outwardly as may be necessary or convenient depending primarily on the spacing of wheels **14** of the vehicle such as a tractor **15** with which the mounting assembly is used.

The arms **12** and **13** as disclosed in the present embodiment extend generally longitudinally with respect to the frame of the tractor **15**. The arms **12** and **13** are identical

in construction, each having a pair of tubular members **16** and **17** diverging from a hub or collar **18**. A triangular plate **19** is welded to the marginal ends of the tubular members **16** and **17** and to the hub **18**. The other ends of the tubular members **16** and **17** are welded to the marginal ends of an upstanding tubular member **20**. A trapezoidal plate **21** is welded to the tubular members **16** and **17** and to the upstanding tubular member **20**.

A generally transversely extending mounting member **22** having a tubular cross-section passes through apertures **23** and **24** in respective spaced apart brackets **25** and **26**.

The brackets **25** and **26** are attached to the frame and if desired, as in this instance, to the transmission casing **27** of the vehicle. The transmission casing is considered part of the frame for purposes of the present invention. The brackets **25** and **26** are attached to the transmission casing **27** by threaded fasteners **28**. To counteract the forces exerted by the arms **12** and **13** on the mounting member **22**, members **29** and **30** are provided. The members **29** and **30** are of tubular construction. The members **29** and **30** are welded at their one ends to brackets **31** at an acute angle and are threadably and removably secured to the frame of the vehicle **15** by threaded fasteners **32**. The other ends of the members **29** and **30** are welded to split collars **33** which are removably clamped to the member **22** by means of threaded fasteners **34**. Braces **35** and **36** are connected to the frame at their one ends by the threaded fasteners **28** and at their other ends by threaded fasteners **39'**. The bracket **37** is welded to the member **29** and to the collar **33**, whereas the bracket **38** is welded to the member **30** and to the collar **33**. Although the member **22** is not indicated as being secured against rotation or shifting, the collars **33** and braces **35** and **36** prevent such rotation or shifting.

A transversely extending tubular member **39** is connected, as by welding, to opposed plates **40** and **41**. The plates **40** and **41** are removably secured to respective plates **21** by threaded fasteners **42**. Disposed between plates **40** and **41** and secured to the member **39** as by welding are follower members **43** and **44**. The follower members **43** and **44** are guided by opposed vertically extending guides **45** and **46** so as to guide the arms **12** and **13** for vertical movement and to prevent the arms **12** and **13** or the tool **11** from shifting transversely. The arms **12** and **13** can pivot about the member **22** as indicated by the solid and phantom lines in FIGURE 2. A cable **47** is attached at one end to the frame of the vehicle **15**, and at the other end to the transverse member **39** (FIGURE 8). A piston cylinder mechanism **48**, secured to the frame of the vehicle **15** and operated by hydraulic fluid, has a cylinder **49** and a piston rod **50**. A pulley **51** is rotatably connected to the piston rod **50**. When the piston rod **50** is extended the arms **12** and **13**, the tool **11**, and the member **39** and the plates **40** and **41** are raised, and vice versa.

As indicated in FIGURES 1 and 2, the arms **12** and **13** are removably secured to the tool **11** by pins **52**. The pins **52** extend through apertures in brackets **53** and through the tubular members **20**. The brackets **53** are welded to ribs **54** and to angle irons **55** which are welded to the curved blade **56** of the tool **11**.

As shown in FIGURE 9, an upright section or extension **57** can be selectively pinned to one or the other of the arms **12** and **13** so as to angle the blade relative to the direction of travel of the vehicle **15**. The section **57** has a pair of parallel, spaced apart tubular members **58** and **59**, joined by upper and lower tubular members **60** and **61**. Braces **62** are welded at their ends to the corners of the rectangular section **57** formed by the members **58**, **59**, **60**, and **61**. Apertured plates **63** secured to opposed ends of the tubular member **58** straddle the tubular mem-

ber **20**. One pin **52** secures the section **57** to the arm **12** or **13** to which the section **57** is to be connected. The section **57** is secured to the tool **11** by means of a pin **64** passing through the apertured brackets **53** and the tubular member **59**.

Other embodiments and variations can be devised without departing from the spirit of the invention.

What is claimed is:

1. Tool mounting assembly capable of being mounted to a frame of a vehicle such as a tractor, comprising: mounting means extending generally transversely with respect to the frame, means for attaching said mounting means to the frame, a generally longitudinally extending arm connected to said mounting means at each side of said frame and spaced outwardly from said attaching means, a tool connected to the ends of said arms opposite their connection to said mounting means, and means secured to the frame and connected to said mounting means at each side of the frame outwardly of said attaching means for counteracting some of the forces transmitted to said mounting means from said tool through said arms, said counteracting means being secured to said frame and connected to said mounting means in substantially direct force opposition to said transmitted force exerted on said mounting means by said arms.

2. The invention as defined in claim **1**, wherein said counteracting means and said arm at each side of the frame are connected to said mounting means at substantial distances from said attaching means.

3. The invention as defined in claim **1**, said arms being pivotally mounted by said mounting means, means adjacent said tool for connecting said arms, and means acting on said connecting means for guiding said arms for movement in vertical planes.

4. The invention as defined in claim **1**, wherein said tool includes a generally transversely extending blade.

5. The invention as defined in claim **1**, wherein said mounting means includes a unitary member having a tubular cross-section.

6. The invention defined in claim **1**, wherein said arms are pivotally mounted by said mounting means.

7. The invention as defined in claim **1**, including means rigidly connecting said arms, said connecting means including a transversely extending member, said arms being pivotally connected to said mounting means, and means connected to said transversely extending member for pivoting said arms to selectively raise and lower said tool.

8. The invention as defined in claim **1**, wherein said arms are pivotally mounted by said mounting means, and said counteracting means is stationarily mounted with respect to the frame.

9. The invention as defined in claim **1**, including brace means connecting said counteracting means and the frame.

10. Tool mounting assembly capable of being mounted to a frame of a vehicle such as a tractor, comprising: mounting means extending generally transversely with respect to the frame, means for attaching said mounting means to the frame, a generally longitudinally extending arm connected to said mounting means at each side of said frame and spaced outwardly from said attaching means, a tool connected to the ends of said arms opposite their

connection to said mounting means, and means secured to the frame and connected to said mounting means at each side of the frame outwardly of said attaching means for counteracting some of the forces transmitted to said mounting means from said tool through said arms, wherein said counteracting means includes a pair of collars secured to the marginal ends of said mounting means and includes an elongated tension member secured to each respective collar and the frame.

11. Tool mounting assembly capable of being mounted to a frame of a vehicle such as a tractor, comprising: mounting means extending generally transversely with respect to the frame, means for attaching said mounting means to the frame, a generally longitudinally extending arm connected to said mounting means at each side of said frame and spaced outwardly from said attaching means, a tool connected to the ends of said arms opposite their connection to said mounting means, and means secured to the frame and connected to said mounting means at each side of the frame outwardly of said attaching means for counteracting some of the forces transmitted to said mounting means from said tool through said arms, wherein said counteracting means includes a first collar secured to said mounting means at one side of the frame, a second collar secured to said mounting means at the other side of the frame, a first tension member connected to said second collar and to the frame, first means connecting the frame and at least one of said first collar and said first tension member, and second means connecting the frame and at least one of said second collar and said second tension member.

12. Tool mounting assembly capable of being mounted to a frame of a vehicle such as a tractor, comprising: mounting means extending generally transversely with respect to the frame, means for attaching said mounting means to the frame, a generally longitudinally extending arm connected to said mounting means at each side of said frame and spaced outwardly from said attaching means, a tool connected to the ends of said arms opposite their connection to said mounting means, means secured to the frame and connected to said mounting means at each side of the frame outwardly of said attaching means for counteracting some of the forces transmitted to said mounting means from said tool through said arms, means connecting said arms, said connecting means including a transversely extending member, a plate secured to each end of said transversely extending member, and means for detachably connecting said plates to said arms.

References Cited

UNITED STATES PATENTS

2,559,816	7/1951	Alexander	172—804
2,630,638	3/1953	LeTourneau	172—807
2,695,467	11/1954	Woods	172—800
2,735,200	2/1956	Arps	172—807 X
2,749,630	6/1956	Nave	172—804

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U.S. Cl. X.R.

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