Sept. 29, 1953 W. T. GRAHAM 2,653,532

PLOW WITH SNUBBER ATTACHMENT

Filed Nov. 12, 1948

Fig. 1.

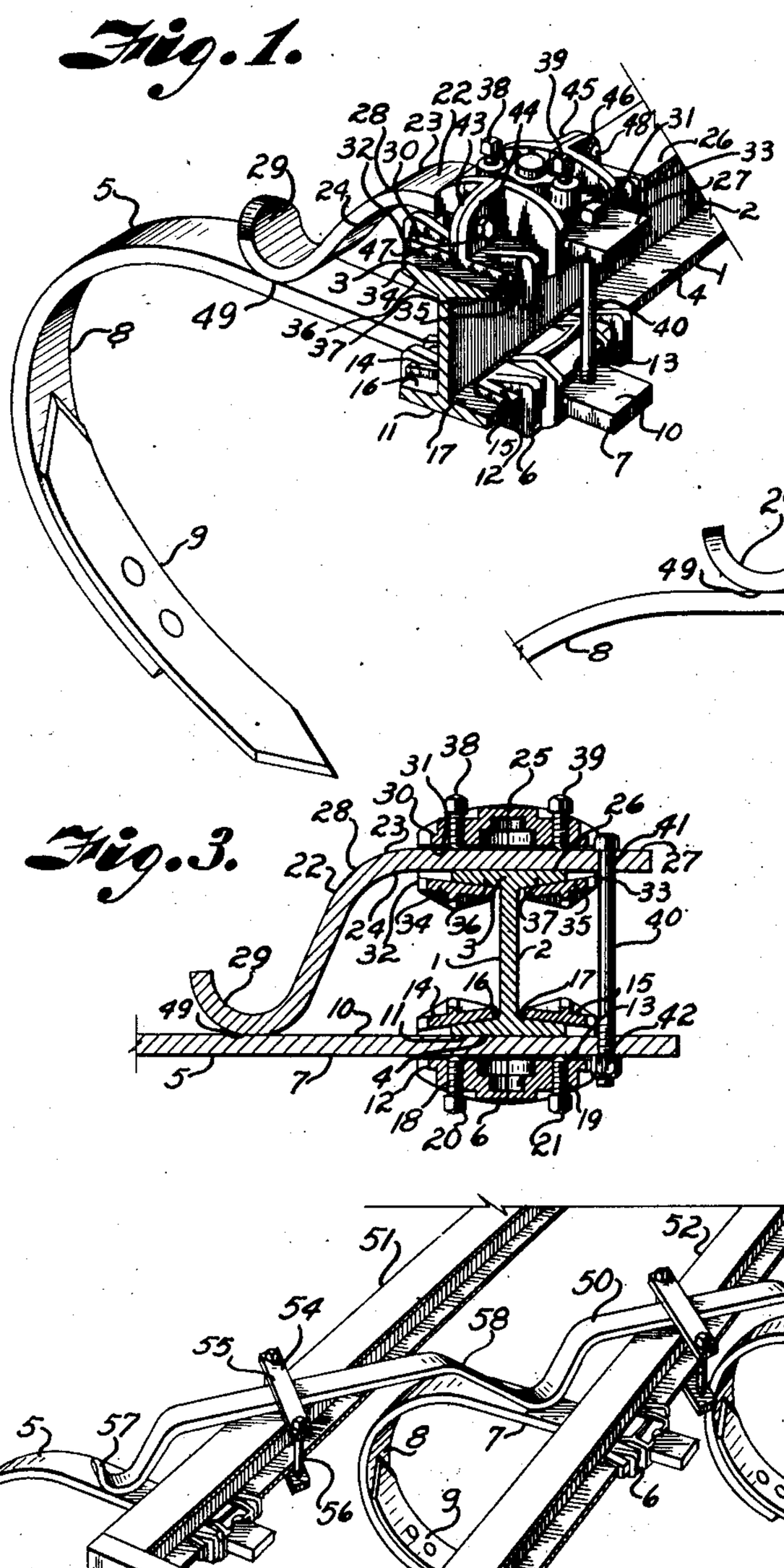


Fig. 2.

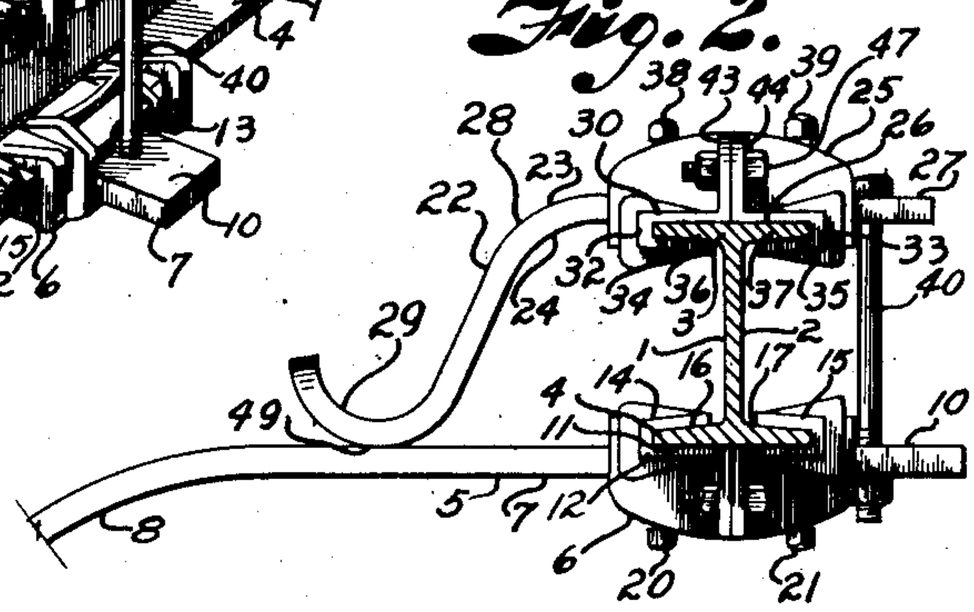
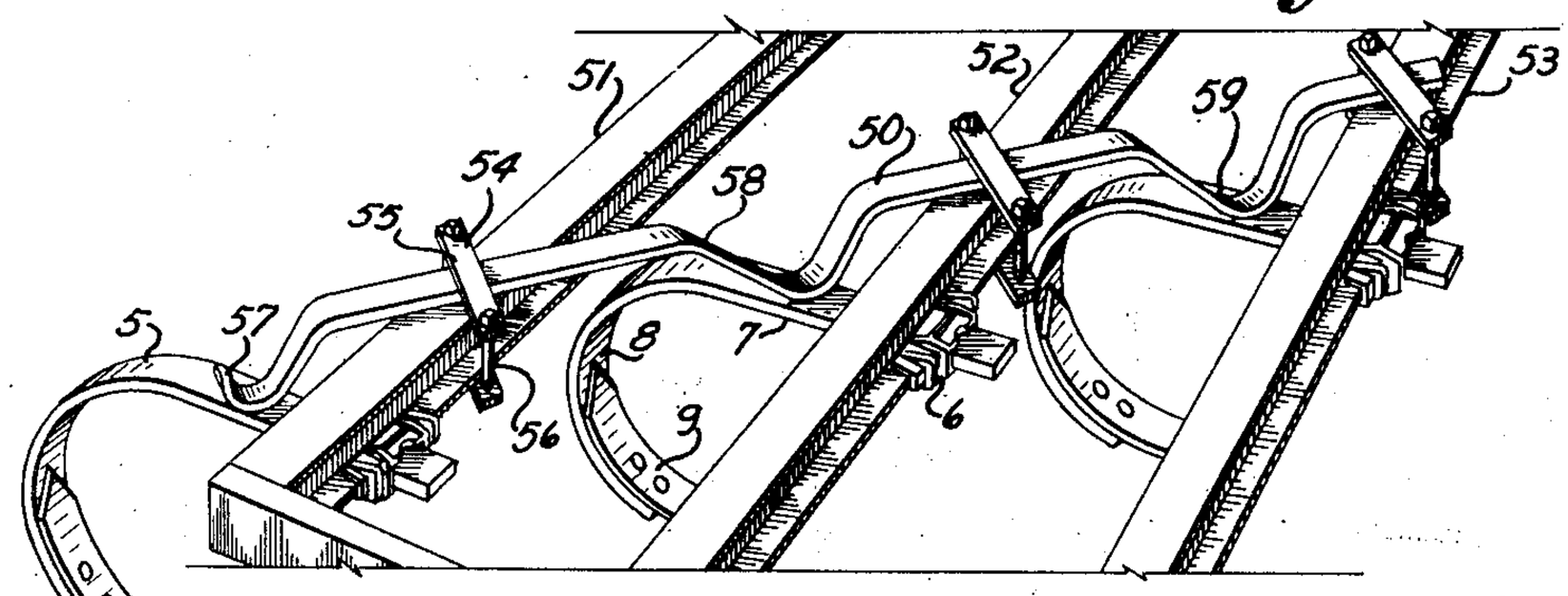


Fig. 3.

Fig. 4.



Inventor

William T. Graham

By Fishburn & Mullendore

Attorneys

Patented Sept. 29, 1953

2,653,532

UNITED STATES PATENT OFFICE

2,653,532

PLOW WITH SNUBBER ATTACHMENT

William T. Graham, Amarillo, Tex.

Application November 12, 1948, Serial No. 59,695

3 Claims. (Cl. 97—198.1)

1

This invention relates to plows of the type illustrated in the Noell et al. Patent No. 2,029,249, January 28, 1936, wherein ground working tools are carried from the plow frame by shanks that extend rearwardly of the frame members and curve downwardly and forwardly to carry ground working tools in a position to form alternate ridges and furrows. When such plows are operating in exceedingly hard ground or in fields having stones, roots or other obstructions, there is a tendency to spring the frame members on which the shanks are attached.

Therefore, the principal objects of the invention are to provide the frame members with overload springs or snubbers that are supported in position to retain action of the shanks within the elastic limits of the portions of the frame members to which the shanks are directly attached and distribute the thrusts to the upper portions of said members.

In accomplishing these and other objects of the invention hereinafter pointed out, I have provided improved structure, the preferred forms of which are illustrated in the accompanying drawing wherein:

Fig. 1 is a perspective view of a transverse frame member of a plow and a tool carrying shank equipped with an overload or snubbing spring in accordance with the present invention.

Fig. 2 is a fragmentary side elevational view.

Fig. 3 is a fragmentary central section.

Fig. 4 is a perspective view of a modified view of the invention.

Referring more in detail to the drawings:

1 designates one of the transverse members of a plow frame usually of I-beam shape and arranged with the web 2 vertical and the flanges 3 and 4 horizontal so that a tool carrying shank 5 is adapted to be attached transversely to the lower flange 4 by means of a clamp 6.

The resilient shank includes a substantially straight forward portion 7 extending under the lower flange 4 and a downwardly and forwardly curving rear portion 8 carrying a ground working tool such as a chisel 9. The shank is formed of bar stock of sufficient width and thickness to provide the required strength and provide bearing contact of the upper flat face 10 with the underface 11 of the I-beam flange 4 as shown in Fig. 1.

2

The clamp 6 is substantially rigid and includes a plate portion 12 having a through recess 13 of substantially the cross sectional shape of the forward portion of the shank to accommodate the shank therein. The sides of the plate portion on the respective sides of the recess 13 rather closely underlie the face 11 of the flange and carry transverse flanges 14 and 15 that overlie the upper faces 16 and 17 of the lower flange 4 on the respective sides of the web 2 as shown in Figs. 2 and 3.

Mounted in threaded openings 18 and 19 of the plate portion of the clamp are set screws 20 and 21 that are adapted to apply clamping pressure on the underface of the shank and draw the clamping flanges 14 and 15 against the flanges of the I-beam and the upper face of the shank against the underface 11 of the I-beam as shown in Fig. 3. When the clamp is thus engaged the shank is rigidly connected with the I-beam and when the plow is used in hard ground or fields having obstructions, the forces acting on the shanks tend to spring the lower flange of the I-beam.

To overcome this difficulty the upper flange 3 carries an overload or snubber spring 22 of flat spring leaf material to provide substantially flat upper and lower faces 23 and 24 to be respectively engaged between an anchoring clamp 25 and the flat upper face 26 of the flange 3. The spring may be of substantially the same width as the plow shank and of a length to provide a straight portion 27 which extends across the frame member in substantially parallel relation with the straight portion of the beam shank and a rearwardly downwardly curved portion 28 terminating in a reversely curved foot portion 29 that is adapted to bear lightly upon the upper face of the shank when the spring is rigidly secured by the clamp, the curvature of the foot being sufficient to maintain desired bearing contact upon movement of the shank. The clamp 25 may be of the same construction as the clamp previously described in that it comprises a plate portion 30 having a transverse passageway 31 to accommodate the forward end of the spring and side portions 32 and 33 which closely overlie the upper face of the flange 3. The side portions 32 and 33 carry transverse flanges 34 and 35 that engage the underfaces 36 and 37 of the flange 3 as

shown in Fig. 3. The straight portion of the spring 22 is retained in clamping contact with the upper face of the flange and the flanges 34 and 35 in contact with the underface of the flanges by clamping devices 38 and 39 similar to the set screws previously described. If desired, the forward ends of the shank and spring which project beyond the clamps may be interconnected by a tie bolt 40 that extends through suitable openings 41 and 42 in the ends of the spring and shank respectively.

In order to facilitate mounting of the clamps on the I-beam, they may be split transversely and provided with ears 43—44 and 45—46 that are drawn together by fastening devices 47 and 48.

In applying the snubber spring, the sections composing the upper clamp are applied to the upper flange 3 and secured together by the bolts 47 and 48. The overload or snubber springs are then applied by sliding the forward ends through the recesses of the clamps as shown in Fig. 3 and set screws 38 and 39 tightened to secure the spring in rigid contact with the upper flange of the supporting member of the frame. When in this position the rounded face 49 of the foot bears lightly on the upper face of the plow shank. Therefore, when the plow shank meets on obstruction or the action becomes too great tending to distort the lower flange, the overload or snubber spring comes into play and not only yieldingly resists or dampens the pumping action, but distributes the forces to the upper flange through the clamp 25 so that the upper flange cooperates with the lower flange in resisting forces that previously tended to distort the lower flange. This arrangement not only controls action of the resilient plow shank but also enhances attachment and reinforces the supporting member of the frame so as to prevent distortion and failure thereof.

In Fig. 4 is illustrated a modified form of snubbing spring in the form of a continuous bar 50 that extends across two or more of the transverse members 51, 52 and 53 of the plow frame. In this form the bar is secured diagonally of the frame by clamps 54, each comprising an upper bar 55 that extends across the upper face of the snubbing bar and a lower bar extending across the underface of the under flanges as shown in Fig. 4. The bars are drawn toward each other to retain the snubber in contact with the upper faces of the flanges by fastening devices such as bolts 56 which extend through suitable openings in the respective ends of the clamping bars. The snubber bar has a snubbing portion 57 at the outer end similar to the portions 28 and 29 of the snubber spring previously described and intermediate portions of the bars have depending portions 58 and 59 that are adapted to bear upon the next laterally adjacent plow shanks that are connected with the transverse members 52 and 53 as shown in Fig. 4. In this form of the invention, the action is substantially the same as the action of the overload or snubber springs previously described, however, the snubbing action is carried out by means of a single member.

From the foregoing it is obvious that I have provided an overload or snubbing spring that is adapted to act upon the plow shanks so as to limit tendency for the supporting members of a frame to be distorted and to distribute the thrust to all of the beam flanges.

What I claim and desire to secure by Letters Patent is:

1. In a plow, a frame having a transverse I-beam member provided with upper and lower flanges, a ground working tool having a shank portion extending transversely of the lower flange of the I-beam member, clamp means engaging the lower flange of the I-beam and shank portion for rigidly securing said shank portion to said I-beam member, a snubber having a shank portion extending transversely of the upper flange of the I-beam member and a downwardly and rearwardly extending portion in bearing contact with the shank of the ground working tool in rearwardly spaced relation to the I-beam member, clamp means engaging the upper flange of the I-beam member and shank portion of the snubber for rigidly securing said snubber shank portion to the upper flange of the I-beam member, and means tying the shanks together on the forward side of the I-beam member whereby forces applied by the ground working tool are partially distributed by the snubber to the upper portion of the I-beam member to reduce the tendency of said forces to bend the lower flange of the I-beam member.

2. In a plow, a frame having a transverse I-beam member provided with upper and lower flanges, a clamp on the lower I-beam flange, said clamp having a plate portion engaging the outer face of said lower flange of the I-beam member and provided with flanges engaging faces of the I-beam flange opposite the face engaged by the plate portion, said clamp having a channel shaped way extending transversely of the I-beam member, a ground working tool having a shank portion extending through the way of the lower clamp, means carried by the clamp and having bearing contact with said shank portion of the ground working tool for urging the shank in clamping contact with the lower flange of the I-beam member and said flanges of the clamp into engagement with the I-beam flange to rigidly support said shank, a snubber having a shank portion extending transversely of the upper flange of the I-beam member and a downwardly and rearwardly extending portion in bearing contact with the shank of the ground working tool in rearwardly spaced relation to the I-beam member, clamp means engaging the upper flange of the I-beam member and shank portion of the snubber for rigidly securing said snubber shank portion to the upper flange of the I-beam member, and means tying the shanks together on the forward side of the I-beam member whereby forces applied by the ground working tool are partially distributed by the snubber and tying means to the upper portion of the I-beam member to reduce the tendency of said forces to bend the lower flange of the I-beam member.

3. In a plow, a frame having a transverse I-beam member provided with upper and lower flanges, reversely arranged clamps on the upper and lower I-beam flanges, said clamps each having a plate portion engaging a respective outer face of a flange of the I-beam member and provided with flanges engaging faces of the I-beam flanges opposite the faces engaged by the plate portions, said clamps having channel shaped ways extending transversely of the I-beam member, a ground working tool having a shank portion extending through the way of the lower clamp, a snubber having a shank portion extending through the way of the upper clamp and a downwardly and rearwardly extending portion in bearing contact with the shank of the ground working tool in rearwardly spaced relation to the I-beam member, set screws carried by the clamps and

having bearing contact with said shank portions of the ground working tool and snubber respectively for urging the shanks in clamping contact with the flanges of the I-beam member and said flanges of the clamps into engagement with the I-beam flanges to rigidly support said shanks, and means tying the shank portions together on the forward side of the I-beam member whereby forces applied by the ground working tool are partially distributed by the snubber and tying means to the upper portion of the I-beam member to reduce the tendency of said forces to bend the lower flange of the I-beam member.

WILLIAM T. GRAHAM.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
197,703	Waterbury et al.	Nov. 27, 1877
355,302	Cook	Jan. 4, 1887
358,869	McKenzie	Mar. 8, 1887
367,845	Reid	Aug. 9, 1887
748,466	Bateman	Dec. 29, 1903
794,986	Kendig et al.	July 18, 1905
1,276,645	Gooding	Aug. 20, 1918
1,358,742	Hollman	Nov. 16, 1920
2,029,249	Noell et al.	Jan. 28, 1936

FOREIGN PATENTS

Number	Country	Date
11,012/27	Australia	Dec. 4, 1928