June 11, 1963 V. H. SHERVEN 3,093,141

MOBILE HAY STACK FORM

Filed March 13, 1961 2 Sheets-Sheet 1

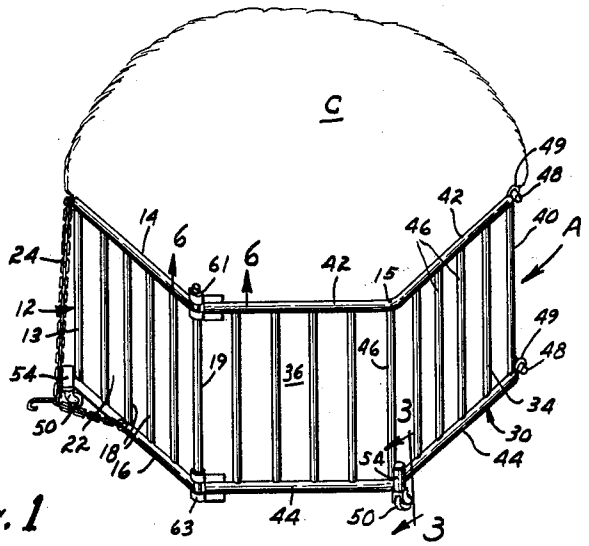


FIG. 1

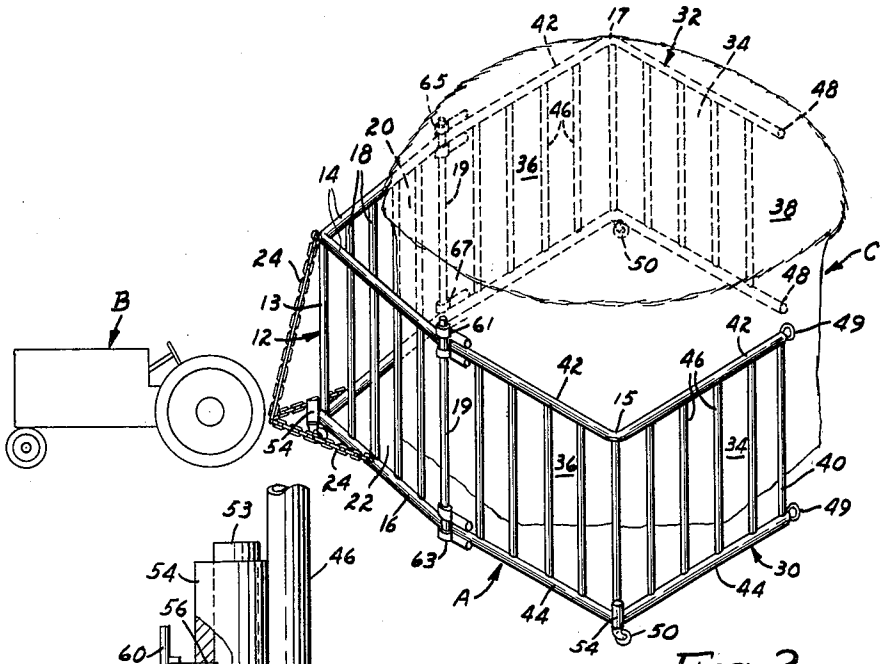


FIG. 2

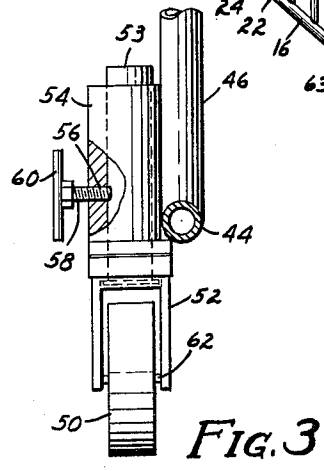


FIG. 3

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June 11, 1963 V. H. SHERVEN 3,093,141

MOBILE HAY STACK FORM

Filed March 13, 1961 2 Sheets-Sheet 2

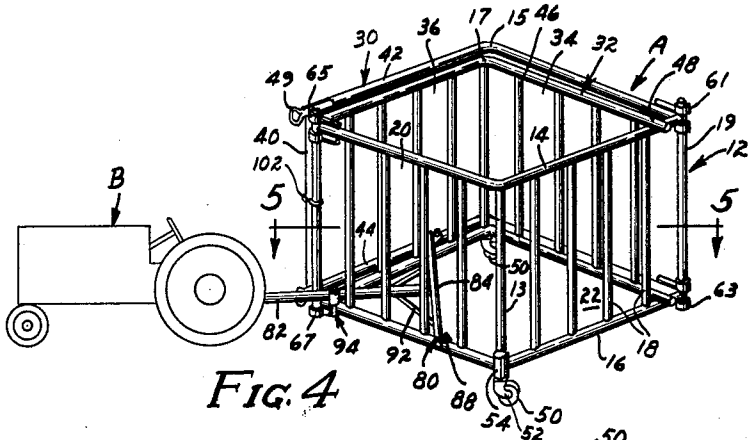


FIG. 4

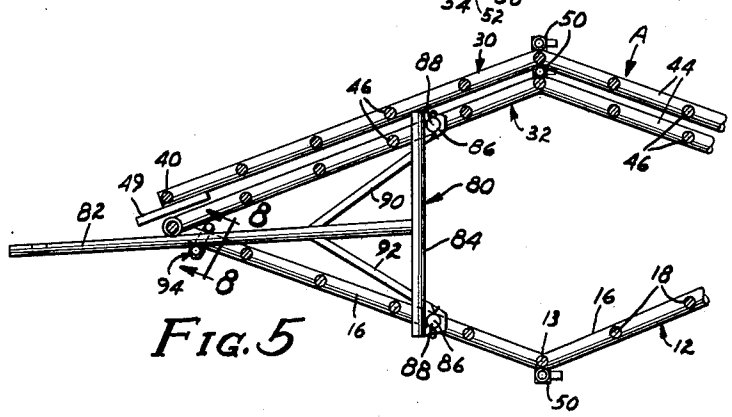


FIG. 5

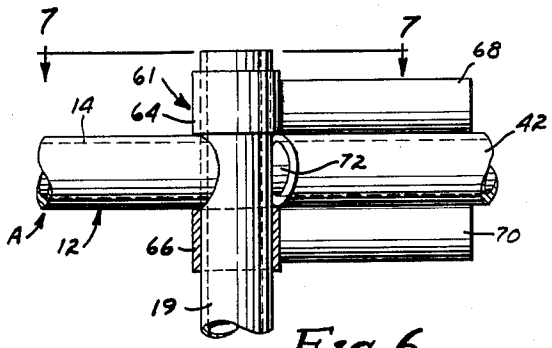


FIG. 6

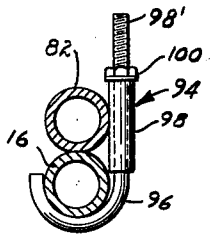


FIG. 8

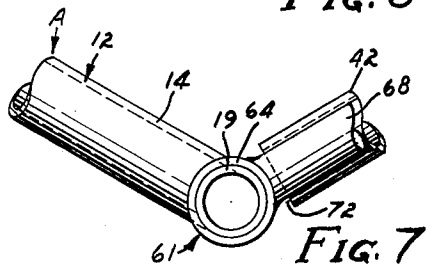


FIG. 7

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1

3,093,141

MOBILE HAY STACK FORM

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6 Claims. (Cl. 130—20)

This invention relates to a new and improved structure for the field stacking of hay and similar materials; in particular, the invention contemplates a novel hay stacking form adapted for ready movement away from the stack after it has been built up and the easy transport of the structure in a folded position from one field to another or upon roads, lanes and the like.

A stack form offers distinct advantages to the farmer. When stacking hay in the field without a form, it is necessary to use at least two men, one man being employed in building up the stack with hay while the other man is kept busy seeing that the stack assumes a proper shape. Experience has shown that a circular or poly-sided stack is the most efficient way of stacking as this method avoids losses due to moisture damage and wind erosion and does not leave the stack exposed to spoilage on sharp corners.

It is apparent that a rectangular form is generally unsuitable because of the necessarily sharp corners resulting therefrom, while perfectly circular forms are objectionable from the standpoint of initial cost due to the efforts made to reduce the corners to an absolute minimum. Moreover, providing such structures with easy folding and handy transport characteristics has often resulted in an overdesigned and impractical device quite beyond the reach of the average farmer.

It is, therefore, an important object of this invention to provide an improved hay stack form.

Another broad object of this invention is to provide an improved stack form adapted to facilitate the stacking of hay with a minimum of hand labor and in such a manner as to reduce losses due to moisture damage, wind erosion and spoilage on sharp corners.

Yet another object of this invention is to provide a novel hay stack form that may be readily pulled away from the hay built up therein and quickly folded into a nested position for transport.

Another object of this invention is to provide a mobile hay stack form which may be detachably secured to a tractor.

A further object of this invention is the provision of a device of the class described that is relatively inexpensive to produce, easy to operate, rugged in construction and extremely durable.

Still another object of this invention is to provide in a mobile hay stack form novel means for detachably securing said form to a tractor.

Another object of this invention is to provide in a mobile hay stack form novel means for selectively restricting the movement of the wheels carried by said structure.

A further object of this invention is to provide a new and improved mobile hay stack form adapted for travel over windrows of hay, furrows, rocks, hummocks and the like without disturbing the same and without damage to the structure.

These and other objects and advantages of the invention will become more fully apparent from a consideration of the following detailed specification, appended claims and attached drawings wherein a preferred embodiment of the invention is shown by way of illustration and not in a limiting sense.

In the drawings wherein like characters indicate like parts throughout the several views:

FIGURE 1 is a view in perspective showing the hay stack form in a stack encircling position;

2

FIGURE 2 is a view in perspective showing the hay stack form attached to a tractor and in a position ready to be pulled free of the stack;

FIGURE 3 is an enlarged fragmentary elevational view, partially in section, taken on the line 3—3 of FIGURE 1, illustrating the constructional details of the wheel locking means employed in the invention;

FIGURE 4 is a view in perspective showing the hay stack form attached to a tractor and in a nested transport position;

FIGURE 5 is an enlarged fragmentary top plan view of the hay stack form taken on the line 5—5 of FIGURE 4, illustrating the nesting arrangement of the structure and the tow bar means employed in transporting the same;

FIGURE 6 is an enlarged fragmentary view taken substantially along the line 6—6 of FIGURE 1, partially in section, illustrating the hinged connection between the fixed and the movable sections of the structure;

FIGURE 7 is a fragmentary top plan view taken substantially on the line 7—7 of FIGURE 6; and

FIGURE 8 is an enlarged elevational view, partially in section, taken substantially on the line 8—8 of FIGURE 5.

Referring now to the drawings, and more particularly to FIGURES 1 and 2 thereof, the invention designated in its entirety by the reference character A, is characterized by a central skeletonized frame 12 made up of horizontal members 14, 16 which are connected in vertically spaced relation by means of spaced vertical side members 18 and 19. Vertical members 18 and 19 are slender elongated bars or tubing spaced close enough so as to permit the hay to be stacked without spillage and yet far enough apart to minimize the overall weight of the structure. Frame 12 is constructed of two equal sides 20 and 22 that are angularly disposed 120 degrees apart. A flexible towing chain 24 or cable is secured to frame 12 at the top of the apex 13 thereof and at equidistant points on the lower horizontal members 16 for permitting a tractor B to pull the structure A away from the stack C, as shown in FIGURE 2.

Hingedly secured to each end of central frame 12 are a pair of wing sections 30 and 32. Sections 30 and 32 are in general identical to central frame 12, that is to say, each is equipped with sides 34, 36 angularly disposed to define a 120 degree vertex angle therebetween. Bringing the free ends 38, 40 of sides 34 together results in an enclosure. As shown in FIGURES 1 and 2, sections 30 and 32 are constructed of horizontal upper members 42 and lower members 44 connected together by spaced elongated vertical members 46. The free end 38 of section 32 is provided with spaced extending horizontal pins 48 integral with horizontal members 42, 44 which cooperate with mating eyelets 49 integral with the corresponding horizontal members 42, 44 of wing section 30 to close structure A into a hay receiving position. This position is indicated in FIGURE 1.

Wheels 50 are mounted upon the lower edge of lower horizontal members 16 and 44 of central frame 12 and wing sections 30 and 32 to provide mobility. As shown in FIGURES 1 and 2, wheels 50 are carried by structure A at the apexes 13, 15 and 17 of central frame 12, and wing sections 30, 32 respectively.

FIGURE 3 shows in detail the manner in which wheels 50 are secured to the lower edge of structure A. A yoke 52 is rotatably mounted by means of shaft 53 in a fixed hollow cylindrical support 54 which is secured, as by welding, to the lower frame member 44. Support 54 is drilled and tapped as at 56 to radially receive a hand operated set screw 58 having a hand wheel 60, which is used to turn screw 58 into engagement with shaft 53 and pre-

vent its rotation about a vertical axis. Wheel 50 is mounted upon an axle 62 carried by yoke 52.

The hinged connections 61, 63, 65, and 67 between wing section 30, 32 and central frame 12 are identical in every respect considering, of course, their relative locations. It is, therefore, felt that a discussion of the hinge detail pointed out in FIGURES 1, 6 and 7 will adequately describe the essential features of the corresponding hinges located elsewhere on the structure. As shown in FIGURE 6, the outside vertical member 19 of central frame 12 extends above the upper surface of horizontal member 14. Cylindrical hollow collars 64 and 66 are slipped over vertical member 19 and assembled immediately above and below the junction of horizontal member 14 and vertical member 19. Collars 64 and 66 have internal bores slightly greater than the outside diameter of vertical member 19 to allow the rotation thereof in a horizontal plane about the vertical axis defined by the longitudinal axis of member 19. A rigid connection between rotatable collars 64, 66 and the corresponding horizontal member 42 of wing section 30 is made by means of elongated hinge bars 68, 70 which are welded to collars 64, 66 respectively, and to the upper and lower surfaces of horizontal member 42, as shown in FIGURE 6. Clearance 72 is provided between the end of horizontal member 42 of wing section 30 and vertical member 19 of central frame 12.

Turning now to a consideration of the over the road transport features of the invention, FIGURE 4 illustrates the structure A detachably attached to a tractor E. Wing sections 30 and 32 are folded inwardly with respect to central frame 12 about their respective hinges 61, 63 and 65, 67 so that they nest in a form resembling a general parallelogram. Wing section 30 lies on the outer side of the resulting parallelogram opposite from central frame 12 with wing section 32 nested parallel to and closely adjacent wing section 30. Pins 48 of free end 38 of wing section 32 rest upon the upper surfaces of horizontal members 14, 16 of central frame 12 when the structure is in a nested position. Hinges 65 and 67 have enough tolerance so that a slight angular displacement of wing section 32 may take place without affecting the structural rigidity of the unit. In the nested position wheels 50 are attached to central frame 12 and wing section 30.

Removable towing means 80 characterized by an elongated longitudinal drawbar 82 and a transverse fastening member 84 is provided for hitching the nested structure A to tractor B. Fastening member 84 has spaced apertured plates 86 adapted to slidably receive upstanding mating pins 88 that are suitably arranged on the upper surfaces of lower horizontal members 16 and 44 respectively. Suitable cross bracing 90, 92 is provided between transverse member 84 and longitudinal drawbar 82. Intermediate the ends of drawbar 82 and at the point where drawbar 82 intersects member 16 adjustable clamping means 94 is provided. As shown in FIGURE 8, clamping means 94 includes a generally J-shaped member 96 threaded at the upper shank 98' thereof. A cylindrical hollow housing 98 adapted to receive member 96 is fastened, as by welding, to the exterior surface of longitudinal drawbar 82. A locking nut 100, threadedly engageable with member 96, secures clamping means 94 to lock the free end of drawbar 82 securely in position for transport of the unit. A circular latching member 102 made of spring material is used to bind together wing sections 30, 32 for transport.

The entire form A may be built of readily obtainable materials such as ordinary piping, channels, angles and other structural shapes. For example, the upper and lower horizontal members may be made of 21 foot lengths of 1¼" pipe while the vertical members may be constructed of 8 foot lengths of 1" pipe. The spacing between the vertical members may vary according to the type of hay to be stacked. It has been found that a spacing of 24 inches is adequate for most purposes. The capacity of the structure, made according to these specifications, is a stack of about six tons depending upon the hay and the way it is packed. The width of such a unit, when folded for transport, is less than 11 feet while the form, when opened for stacking, is approximately 21 feet across its widest point. Wheels 50 are preferably equipped with 4:00 x 8 pneumatic tires, which provides 16 inches of clearance above the ground thereby adding to the mobility of the form during travel over rough spots, windrows of hay, rocks and the like.

During its use, the form is placed in an extended enclosing hay receiving position while the stack is being built, as shown in FIGURE 1. When the stack is formed, wing sections 30 and 32 are pulled apart and moved away from the stack as shown in FIGURE 2. A tractor or other means is used to pull the form away from the stack to a new location. It can be seen that wing sections 30 and 32 are clear of the stack so that no harm is done to the hay during the pulling away of the form. For transporting the form along roads, through gates, or upon narrow lanes, the wing sections 30 and 32 are folded together as previously described and latched with latch member 102; towing means 80 is then attached to the form which may be pulled away to any new location. Towing means 80 provides considerable lateral support and structural rigidity when the form is in a nested transport position.

I claim:

1. A mobile six-sided form adapted for the field stacking of hay consisting of a mobile center section having two equal sides angularly disposed with each other at an angle of 120°, said sides having generally horizontal top and bottom supporting members and generally vertical elongated spaced members connecting said top and bottom members, a pair of side sections each being generally identical to said center section and hingedly attached for horizontal pivotal movement to opposite ends of said center section, means for locking the free ends of said side sections together whereby to form a hexagonal hay stacking enclosure, wheeled means on each of said side sections to facilitate the swinging of said side sections away from the stack built up within said form, said side sections being pivotal towards each other into closely spaced parallel relation and swingable about their respective pivot axes into a nested transport position with respect to said center section, at least one of the wheeled means on said side sections being adapted to be locked either in a transport or a hay stack departure position, and means for releasably locking said structure in a nesting position for transport.

2. In a mobile hay stack form, a first hay enclosing section having vertical sides of equal length angularly disposed 120° with respect to each other, a second hay enclosing section identical to said first section hingedly carried by said first section about a vertical hinge axis in register with an end thereof, a third hay enclosing section identical to said first and second sections hingedly carried by said first section about a vertical hinge axis in register with the end opposite the end carrying said second section, means for securing the free ends of said second and third sections together in a hexagonally-shaped hay receiving enclosure, wheeled means carried by each of said sections at the vertex between the sides thereof, said wheeled means including means for raising or lowering at least one of the wheels mounted on said second and third sections, and means for locking said second and third sections in closely spaced parallel relation with each other whereby to define with said first section a nested structure of reduced width for transport.

3. In a foldable mobile hay stacking form, a first hay encircling section, said section having angularly disposed side panels of equal length subtended by a vertex angle of 120°, a wheel carried by said first section at the juncture of the side panels thereof, towing means attached to said section at the center thereof, a second hay encircling

section generally identical to said first section mounted for horizontal pivotal movement about a vertical pivot axis coincident with an end of said first section, a wheel carried by said second section at the juncture of the side panels thereof, a third hay encircling section generally identical to said first and second sections mounted for horizontal pivotal movement about a vertical pivot axis coincident with an end of said first section opposite to the end mounting said second section, a wheel carried by said third section at the juncture of the side panels thereof, at least one of said wheels carried by second and third sections being mounted for vertical adjustment, means for securing the free ends of said second and third sections together when they are in a hexagonally shaped hay receiving position, and means for securing said second and third sections to each other in closely spaced parallel relation and to said first section for transporting said form in a nested position.

4. The structure of claim 3 wherein towing means is provided for transporting said form in a nested position, said towing means including a transverse member releasably attachable to said first and second sections when said sections are in a nested position, drawbar means engageable at its inner end with said transverse member and with its outer end with a tractor, and means carried by said drawbar means for releasably clamping said towing means to said first section.

5. A mobile foldable hay stacking form including a center hay supporting section having vertically arranged equal sides angularly disposed with each other at a vertex angle of 120°, a pivotal ground engaging wheel mounted between the sides of said center section, a first hay supporting wing section having vertically arranged sides equal in length to the sides of said center section, the sides of said first wing section being angularly disposed with each other at a vertex angle of 120°, said first wing section being mounted for horizontal pivotal movement about a vertical pivot axis generally coincident with an end of said center section, a ground engaging wheel mounted between the sides of said first wing section, a second hay supporting wing section having vertically arranged sides equal in length to the sides of said center section and said first wing section, the sides of said second wing section being angularly disposed with each other at a vertex angle of 120°, said second wing section being mounted for horizontal pivotal movement about a vertical pivot axis generally coincident with an end of said center section opposite to the end thereof mounting said first wing section, a ground engaging wheel mounted between the sides of said second wing section, at least one of said wheels mounted on said wing sections being movable out of a ground engaging position, means for clamping said center and said wing sections into a hay stack supporting position, and means for securing said wing sections into closely spaced parallel relation to each other and into a nested transport position with respect to said center section.

6. The mobile hay stacking form of claim 5 wherein first towing means is provided for moving said form away from a hay stack when said wing sections are pivoted away from each other and from the stack, and second towing means is provided for towing said form when it is in a nested transport position, said first towing means being attached to the center of said center section to allow said form to be moved upon three wheels, and said second towing means being attachable to said center and one of said wing sections, one of said wheels on said wing sections being vertically movable clear of the ground whereby to allow said form to be transported on two ground engaging wheels behind a tractor.

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