

PATENT SPECIFICATION

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(54) METHOD OF ASSEMBLING A TRACTOR-BOWL SCRAPER COMBINATION TO FACILITATE PASSAGE OF THE COMBINATION BETWEEN WORK SITES, A BRACKET FOR USE IN SUCH A METHOD, AND A TRACTOR BOWL SCRAPER COMBINATION WHEN SUCH BRACKETS ARE INCORPORATED THEREIN

(71) We, CATERPILLAR TRACTOR CO., a corporation organised and existing under the laws of the State of California, United States of America, of 100 N.E. Adams Street, Peoria, State of Illinois 61602, United States of America, do hereby declare the invention, for which we pray that a Patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

Tractor-bowl scraper combinations pose a shipping problem, such as when they are delivered to a job site or customer on a railroad flat car or are driven on a public highway. In particular, the width of such combinations require special shipping techniques to comply with certain governmental regulations. For example our U.S. Patent No. 3,015,173 discloses the detachment and placing of the draft arms of the bowl scraper in the bowl thereof to reduce the width thereof for shipping purposes. In addition, such patent discloses the use of a bracket which is secured between a draft tube and apron of the bowl scraper.

An object of this invention is to facilitate the preparation for transport of a tractor-bowl scraper combination and to provide an improved, economical and non-complex rigid bracket for use in such preparation of a tractor-bowl scraper combination.

According to one aspect of the invention we provide a tractor-bowl scraper combination of the type having the bowl of the bowl scraper connected to a tractor by a coupling comprising a laterally extending draft tube disposed longitudinally between said tractor and said scraper bowl, a pair of draft arms each having a first end thereof detachably mounted interiorly on said scraper bowl, two transport brackets, the brackets being detachably connected between the second ends of said draft arms and said draft tube.

According to a further aspect of the invention we provide a bracket comprising longitudinally spaced first and second end portions integrally connected together in offset relationship by an intermediate portion, and mounting means formed at each of the first and second end portions of said bracket and adapted to respectively attach said bracket to an end of a draft arm and to a draft tube of a tractor-bowl scraper combination.

According to yet another aspect of the invention we provide a method of preparing for transport between work sites a tractor-bowl scraper combination of the type having a draft tube and a pair of draft arms interconnecting the bowl of a bowl scraper to a tractor said method comprising the steps of removing said draft arms from said bowl and said draft tube, attaching a first end of each draft arm interiorly on a respective sidewall of said bowl and connecting a second end of each draft arm to said draft tube.

Other features of this invention will become apparent from the following description and accompanying drawings wherein:

FIG. 1 is a side elevational view of a wheeled tractor-bowl scraper combination shown in an operating condition;

FIG. 2 is a view similar to FIG. 1, but showing the wheeled-tractor-bowl scraper combination rearranged in a transport condition in accordance with the invention;

FIG. 3 is an enlarged isometric view of a bracket according to the invention utilized to maintain the combination in its FIG. 2 transport condition; and

FIGS. 4 and 5 are enlarged sectional views taken in the direction of arrows IV-IV in FIG. 1 and V-V in FIG. 2, respectively.

FIG. 1 illustrates a wheeled tractor-bowl scraper combination 10 comprising a two-wheeled tractor 11 connected to the bowl of a bowl scraper 12 by a gooseneck 13, a 90

laterally extending draft tube 19 and a pair of laterally spaced draft arms 14 (one shown) of the bowl scraper 12. Each draft arm has a first end mounted exteriorly on a sidewall 15 of the bowl of the bowl scraper, by a standard trunnion assembly 16 (FIG. 4). The second end of each draft arm carries an annular flange 17 attached to a like flange 18 (FIG. 3) of the laterally extending draft tube 19 by circumferentially disposed cap screws 20.

The bowl scraper further comprises a pair of lift cylinders 21 (one shown) supported on draft tube 19. The cylinders function in a conventional manner to selectively raise or lower attached bowl of bowl scraper 12. A conventional apron 22 is pivotally mounted within the bowl to selectively open or close the front open end thereof by means of a cylinder, partially shown at 23, a lift frame 24 and a link 25.

When it is desired to transport this wheeled tractor-bowl scraped combination to a remote location, such as by a railroad flat car or by driving it on a public highway at a relatively high speed (e.g., 30 m.p.h.), workmen will proceed to rearrange the tractor-bowl scraper combination to its FIG. 2 transport condition. Firstly, apron 22 and the front of the bowl are raised above the position the draft arms 14 will occupy as shown in Fig. 2. The draft arms 14 are then detached from the bowl and draft tube 19 by releasing trunnion assemblies 16 and cap screws 20. Each draft arm is flopped-over 180 degrees about its longitudinal axis and is reassembled in the tractor-scraper bowl combination with the first end remounted interiorly on a respective sidewall 15 by trunnion assembly 16 (FIG. 5).

A second end of each draft arm is connected to a lateral end of draft tube 19 by a vertically disposed bracket 26. As more clearly shown in FIG. 3, the bracket comprises longitudinally spaced first and second end portions 27 and 28, respectively, integrally connected together in offset relationship by an intermediate portion 29. The first and second end portions of a bracket are substantially disposed in parallel planes each substantially coincident with the faces of flanges 17 and 18, respectively. Each end of the bracket has mounting means formed thereat, such as circumferentially disposed holes 30 and 31 which align with underlying holes 32 and 33, respectively, formed in flanges 17 and 18.

Cap screws 20 can thus be utilized to attach the ends of the bracket to the flanges. Semi-circular cut-outs 34 and 35 may be formed on each end of the bracket to provide guide means, conforming to an inner radius of flanges 17 and 18, to precisely align holes 30 with underlying holes

32 and holes 31 with underlying holes 33. The bracket may further comprise a pair of triangular reinforcing gussets 36 and 37 secured to portions 28 and 29 thereof and a lifting hole 38 in said second end portion 28.

Upon transport of the tractor-bowl scraper combination to its job site or the like, the above procedure may be reversed. In particular, brackets 26 would be removed from the draft arms and draft tube and the draft arms reattached to the scraper bowl as shown in FIG. 1.

WHAT WE CLAIM IS:—

1. A tractor-bowl scraper combination 80 of the type having the bowl of the bowl scraper connected to a tractor by a coupling comprising

a laterally extending draft tube disposed longitudinally between said tractor and said scraper bowl,

a pair of draft arms each having a first end thereof detachably mounted interiorly on said bowl, and

two brackets, the brackets being detachably connected between the second ends of said draft arms and said draft tube.

2. A tractor-bowl scraper combination as claimed in claim 1 wherein each of said draft arms has its first end pivotally mounted interiorly on a respective sidewall of said bowl.

3. A tractor-bowl scraper combination as claimed in claim 1 or 2 wherein said brackets each extend vertically downwardly from said draft tube to the second ends of the draft arms.

4. A tractor-bowl scraper combination as claimed in claim 1, 2 or 3 wherein each of said brackets comprises first and second end portions integrally connected together in offset relationship by an intermediate portion, said first end portion being connected to an annular flange secured on the second end of a respective draft arm and said second end portion being connected to an annular flange secured on a respective end of said draft tube.

5. A tractor-bowl scraper combination as claimed in any preceding claim further comprising an apron movably mounted on said scraper bowl to normally close an open forward end thereof, said apron being disposed in a raised open position above and and rested upon said draft arms.

6. A tractor-bowl scraper combination substantially as described with reference to figures 2, 3, 4 and 5 of the accompanying drawings.

7. A bracket comprising longitudinally spaced first and second end portions integrally connected together in offset relationship by an intermediate portion, and mounting means formed at each of the first and second end portions of said

laterally extending draft tube 19 and a pair of laterally spaced draft arms 14 (one shown) of the bowl scraper 12. Each draft arm has a first end mounted exteriorly on a sidewall 15 of the bowl of the bowl scraper, by a standard trunnion assembly 16 (FIG. 4). The second end of each draft arm carries an annular flange 17 attached to a like flange 18 (FIG. 3) of the laterally extending draft tube 19 by circumferentially disposed cap screws 20.

The bowl scraper further comprises a pair of lift cylinders 21 (one shown) supported on draft tube 19. The cylinders function in a conventional manner to selectively raise or lower attached bowl of bowl scraper 12. A conventional apron 22 is pivotally mounted within the bowl to selectively open or close the front open end thereof by means of a cylinder, partially shown at 23, a lift frame 24 and a link 25.

When it is desired to transport this wheeled tractor-bowl scraped combination to a remote location, such as by a railroad flat car or by driving it on a public highway at a relatively high speed (e.g., 30 m.p.h.), workmen will proceed to rearrange the tractor-bowl scraper combination to its FIG. 2 transport condition. Firstly, apron 22 and the front of the bowl are raised above the position the draft arms 14 will occupy as shown in Fig. 2. The draft arms 14 are then detached from the bowl and draft tube 19 by releasing trunnion assemblies 16 and cap screws 20. Each draft arm is flopped-over 180 degrees about its longitudinal axis and is reassembled in the tractor-scraper bowl combination with the first end remounted interiorly on a respective sidewall 15 by trunnion assembly 16 (FIG. 5).

A second end of each draft arm is connected to a lateral end of draft tube 19 by a vertically disposed bracket 26. As more clearly shown in FIG. 3, the bracket comprises longitudinally spaced first and second end portions 27 and 28, respectively, integrally connected together in offset relationship by an intermediate portion 29. The first and second end portions of a bracket are substantially disposed in parallel planes each substantially coincident with the faces of flanges 17 and 18, respectively. Each end of the bracket has mounting means formed thereat, such as circumferentially disposed holes 30 and 31 which align with underlying holes 32 and 33, respectively, formed in flanges 17 and 18.

Cap screws 20 can thus be utilized to attach the ends of the bracket to the flanges. Semi-circular cut-outs 34 and 35 may be formed on each end of the bracket to provide guide means, conforming to an inner radius of flanges 17 and 18, to precisely align holes 30 with underlying holes

32 and holes 31 with underlying holes 33. The bracket may further comprise a pair of triangular reinforcing gussets 36 and 37 secured to portions 28 and 29 thereof and a lifting hole 38 in said second end portion 28.

Upon transport of the tractor-bowl scraper combination to its job site or the like, the above procedure may be reversed. In particular, brackets 26 would be removed from the draft arms and draft tube and the draft arms reattached to the scraper bowl as shown in FIG. 1.

WHAT WE CLAIM IS:—

1. A tractor-bowl scraper combination 80 of the type having the bowl of the bowl scraper connected to a tractor by a coupling comprising

a laterally extending draft tube disposed longitudinally between said tractor and said 85 scraper bowl,

a pair of draft arms each having a first end thereof detachably mounted interiorly on said bowl, and

two brackets, the brackets being detachably connected between the second ends of said draft arms and said draft tube.

2. A tractor-bowl scraper combination as claimed in claim 1 wherein each of said draft arms has its first end pivotally 95 mounted interiorly on a respective sidewall of said bowl.

3. A tractor-bowl scraper combination as claimed in claim 1 or 2 wherein said brackets each extend vertically downwardly 100 from said draft tube to the second ends of the draft arms.

4. A tractor-bowl scraper combination as claimed in claim 1, 2 or 3 wherein each of said brackets comprises first and second 105 end portions integrally connected together in offset relationship by an intermediate portion, said first end portion being connected to an annular flange secured on the second end of a respective draft arm and said second end portion being connected to an annular flange secured on a respective end of said draft tube.

5. A tractor-bowl scraper combination as claimed in any preceding claim further 115 comprising an apron movably mounted on said scraper bowl to normally close an open forward end thereof, said apron being disposed in a raised open position above and and rested upon said draft arms.

6. A tractor-bowl scraper combination substantially as described with reference to figures 2, 3, 4 and 5 of the accompanying drawings.

7. A bracket comprising longitudinally 125 spaced first and second end portions integrally connected together in offset relationship by an intermediate portion, and mounting means formed at each of the first and second end portions of said 130





2