May 8, 1956 B. G. SELVAGE 2,744,735

COMBINED WHEELBARROW AND MIXER

Filed Nov. 23, 1953 4 Sheets-Sheet 1

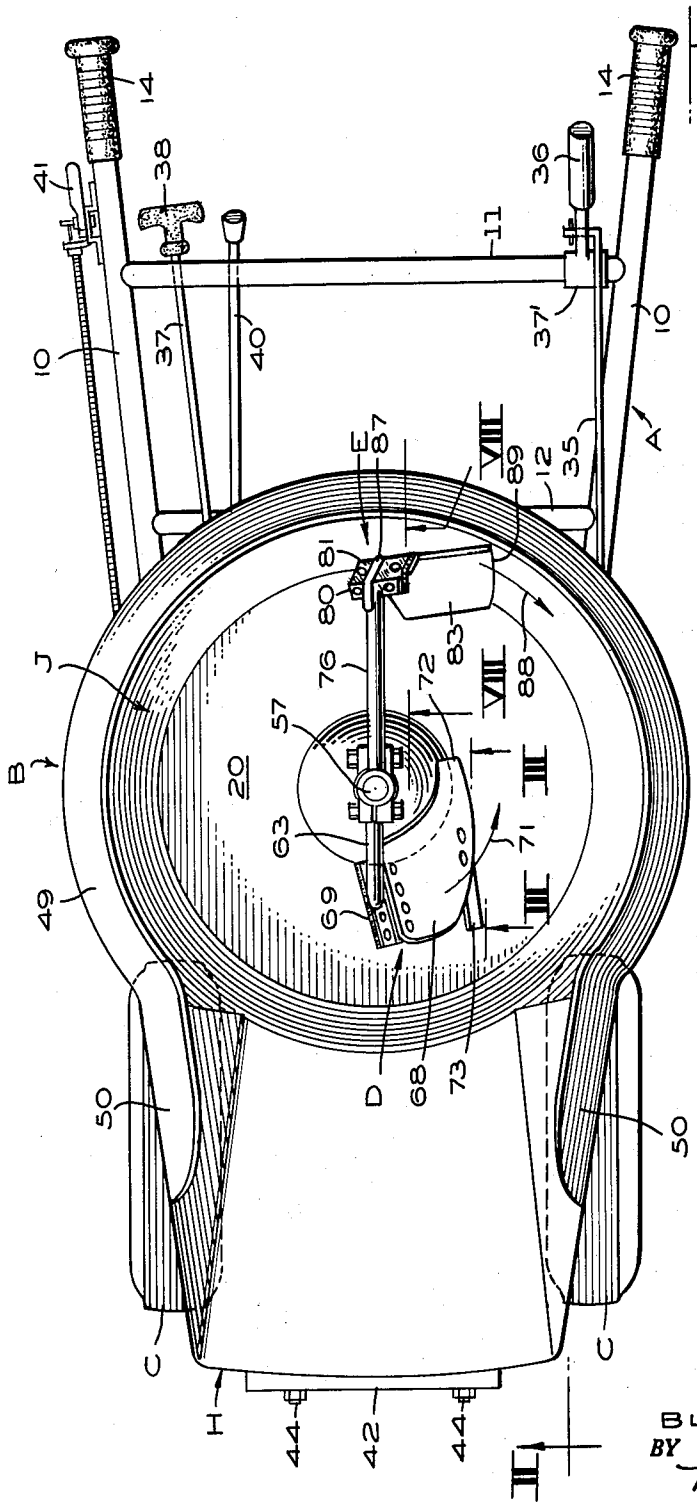


FIG. 1.

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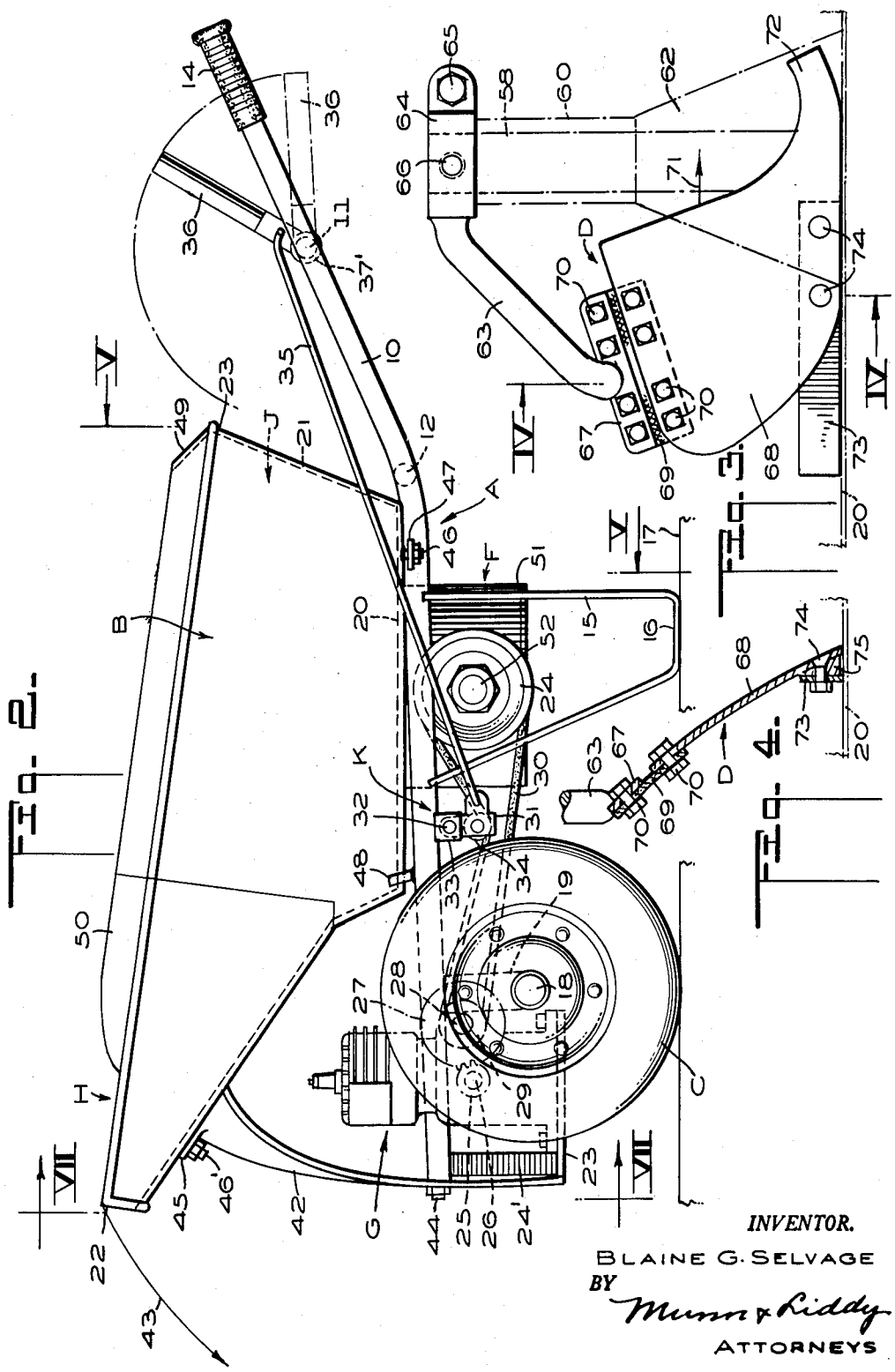


Fig. 2.

Fig. 3.

Fig. 4.

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COMBINED WHEELBARROW AND MIXER

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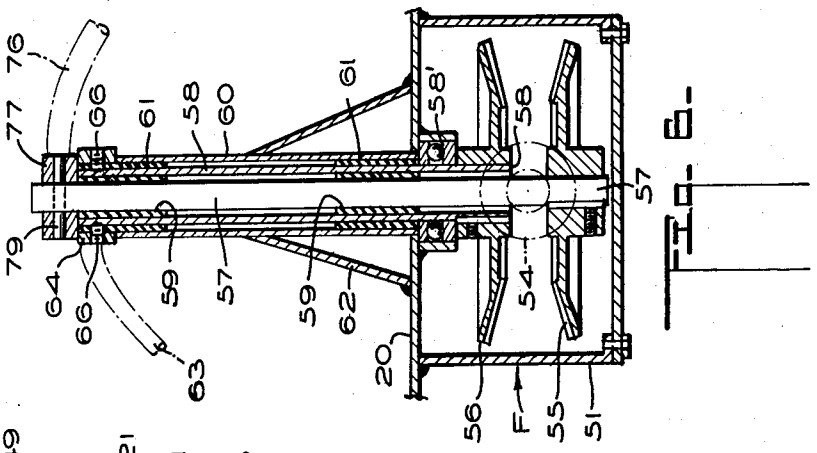


FIG. 6.

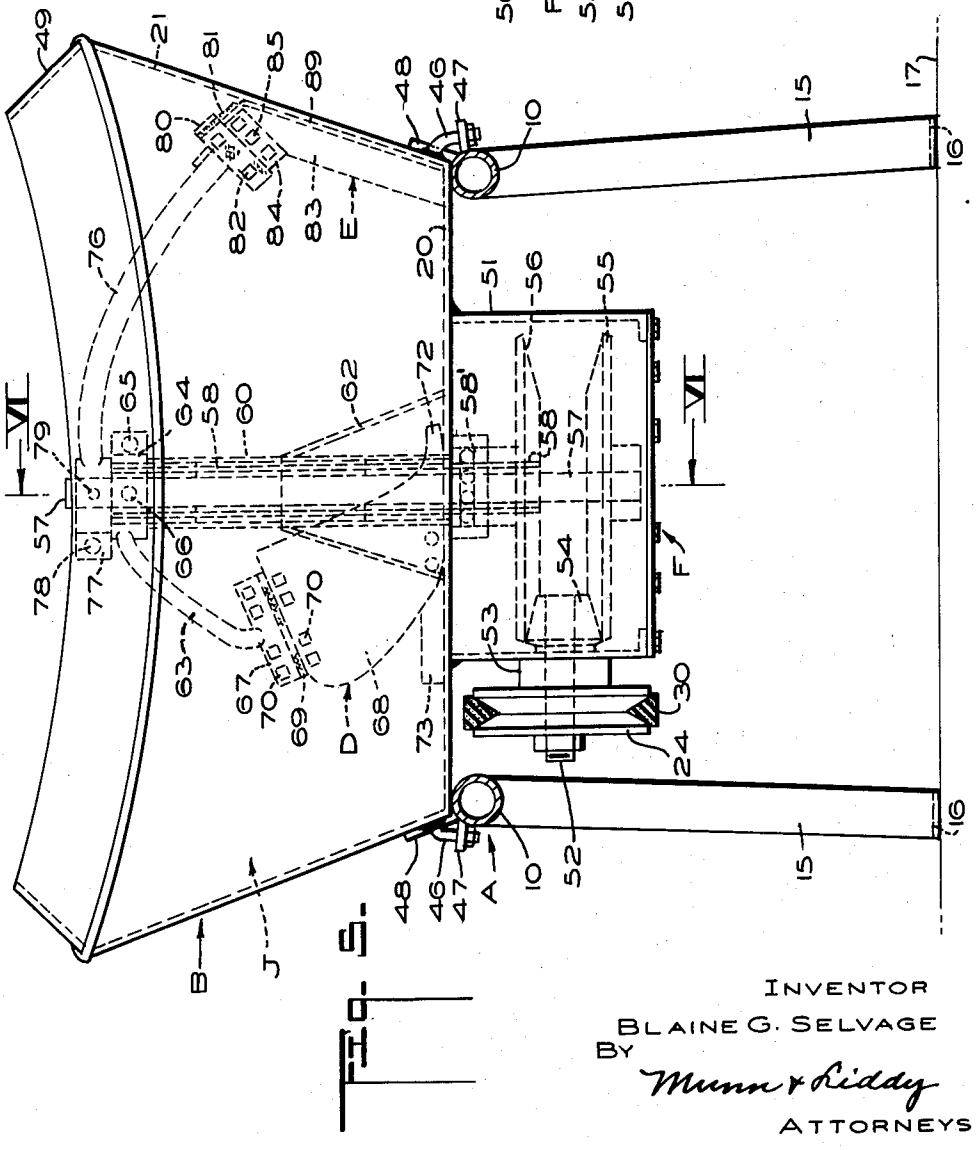


FIG. 5.

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COMBINED WHEELBARROW AND MIXER

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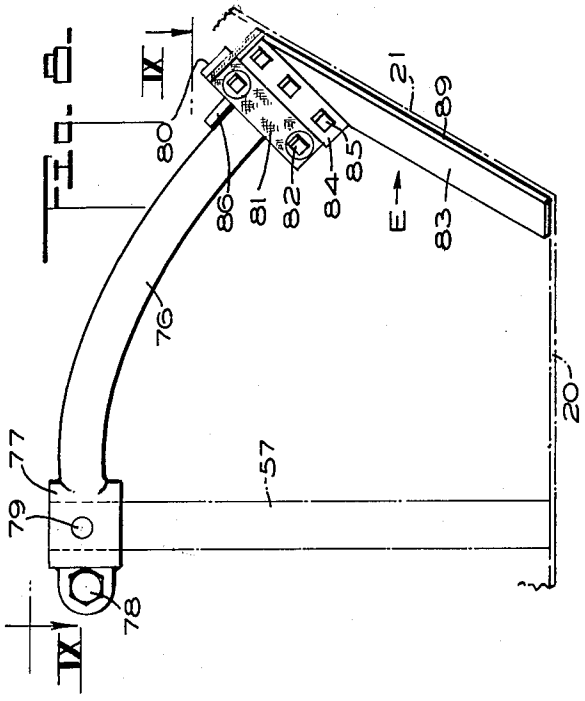


Fig. 6.

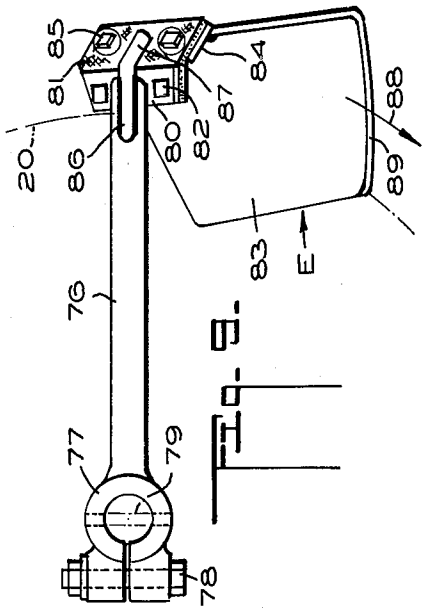


Fig. 8.

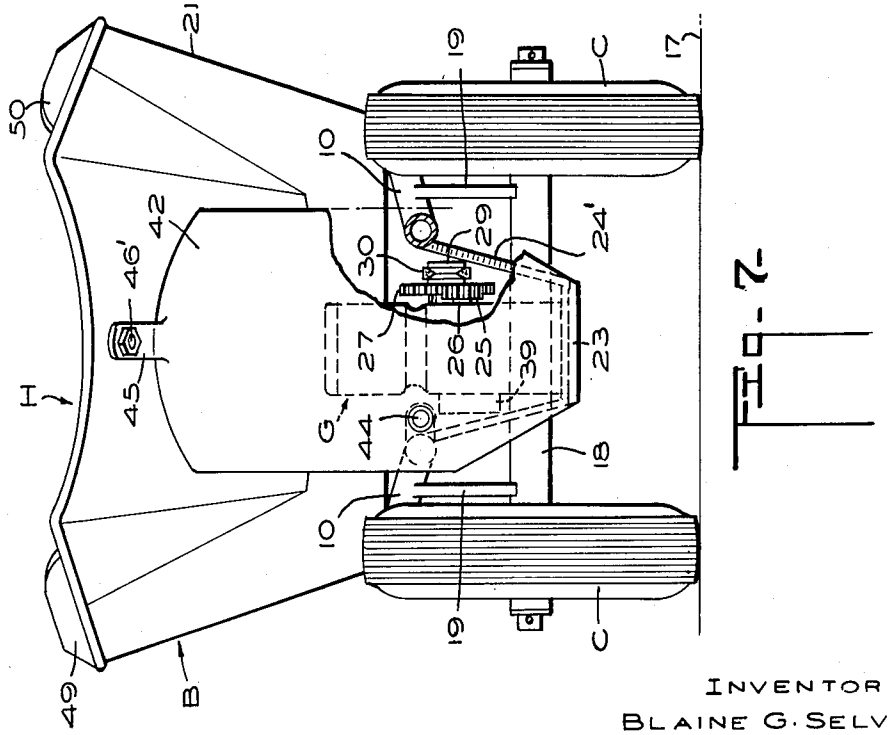


Fig. 7.

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United States Patent Office

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COMBINED WHEELBARROW AND MIXER

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Application November 23, 1953, Serial No. 393,636

6 Claims. (Cl. 259—171)

The present invention relates to a combined wheelbarrow and mixer. It consists of the combinations, constructions, and arrangement of parts, as hereinafter described and claimed.

It is a common practice on larger construction jobs to utilize wheelbarrows for conveying concrete and plaster from a mixer to the place where these materials are to be used. While such a procedure is well adapted for the more extensive projects, it is not suited for smaller undertakings; and, accordingly, these materials generally are mixed in boxes or wheelbarrows by hand, utilizing a shovel or hoe. This is not only laborious and time-consuming, but often a uniform mix is not obtained.

As the cardinal object of this invention, it is proposed to provide a wheelbarrow having a mixer incorporated thereinto, which is designed in such a manner as to thoroughly prepare concrete, plaster and the like. Moreover, it may be utilized for mixing feed for stock, poultry, or used generally as an ordinary wheelbarrow for various purposes.

Broadly speaking, a wheelbarrow is provided with a pair of rotatably-mounted paddles, which may be turned in opposing directions by a drive mechanism carried by the wheelbarrow. These paddles are yieldingly supported so that they may flex when rocks or larger aggregates are caught therebetween during operation. The materials may be thoroughly mixed, and thereafter the contents dumped from the pan of the wheelbarrow through a pouring spout.

Another object is to provide a device of the character described, which is simple in construction, durable and efficient for the purpose intended, and which is well balanced about the supporting wheels of the wheelbarrow.

Other objects and advantages will appear as the specification continues. The novel features will be set forth in the claims hereunto appended.

Drawings

For a better understanding of the invention, reference should be had to the accompanying drawings, forming part of this application in which:

Figure 1 is a top plan view of my combined wheelbarrow and mixer;

Figure 2 is a side elevational view thereof, as seen from the plane II—II of Figure 1;

Figure 3 is an elevational view of the inner paddle, as observed from the plane III—III of Figure 1;

Figure 4 is a vertical sectional view taken along the line IV—IV of Figure 3;

Figure 5 is a sectional view taken along the line V—V of Figure 2, looking at the rear of the wheelbarrow;

Figure 6 is a vertical sectional view taken through the gear box and conical housing of the drive mechanism, as seen from the plane VI—VI of Figure 5;

Figure 7 is a front view of the wheelbarrow, as observed from the plane VII—VII of Figure 2, a portion of the protective shield being broken away;

Figure 8 is an elevational view of the outer paddle, as seen from the plane VIII—VIII of Figure 1; and

Figure 9 is a top plan view of this paddle, as observed from the plane IX—IX of Figure 8.

While I have shown only the preferred form of my invention, it should be understood that various changes, or modifications, may be made within the scope of the annexed claims without departing from the spirit thereof.

Detailed description

In carrying the invention into practice, there is provided a supporting frame indicated generally at A having a tray or hopper B removably mounted thereon. This frame has a pair of ground-engaging wheels C arranged at the forward portion thereof to thereby provide a roll-about structure, which is movable from place to place in the manner of a wheelbarrow. Inner and outer stirring paddles D and E, respectively, are rotatably disposed on the interior of the tray B for mixing material disposed therein. These paddles are turned in opposing directions by a drive mechanism F, which includes a suitable source of power, for instance an engine or motor G. The contents of the tray may be discharged through a pouring spout H provided at the forward end of the tray.

In its structural features, the frame A includes a pair of handle-bars **10—10**, which are interconnected by transverse braces **11** and **12**. Hand grips **14—14** are provided on the rear sections of the handle-bars for grasping by an operator. Legs **15—15** are welded or otherwise secured to the intermediate portion of the bars **10—10** so that their lower ends **16** may contact the ground **17** when the wheelbarrow-like device occupies a position of rest.

As shown in Figures 2 and 7, a transversely-extending axle **18** is disposed beneath the forward part of the bars **10—10**, and is interconnected with the latter by vertical struts **19—19**. The wheels C—C are rotatably mounted on the axle **18** so that one wheel may turn independently of the other. By utilizing two wheels, better balance is obtained for heavier loads.

With respect to the tray B, it includes a mixing chamber J, which defines a circular bottom plate **20** having a conical-shaped wall **21** rising therefrom, with this wall flaring upwardly and outwardly. The spout H is trough-shaped and communicates with the mixing chamber J. As clearly shown in Figure 2, the front **22** of the spout is somewhat higher than the back **23** of the wall **21**. This arrangement has been provided in order to prevent the contents of the wheelbarrow from being discharged accidentally from the spout, when the grips **14** are lifted by an operator and the device is wheeled about.

In Figures 2 and 7, the engine G has been disclosed as being mounted underneath the spout H on a platform **23**, which is suspended from the bars **10—10** by stirrups **24'**. This engine is positioned ahead of the axle **18**, while the mixing chamber J is arranged in back of the axle to thereby produce a load that is at least partially balanced about the wheels C—C. Moreover, the engine is set below the bars **10—10** to lower the center of gravity of the device, and to afford a straight drive to a driven pulley **24** forming part of the drive mechanism F (see Figures 2 and 5). The spout H protects the engine G from above.

It will be appreciated, of course, that an electric motor, or an internal combustion engine, may be used as a suitable source of power. As shown in Figures 2 and 7, the engine G has a pinion **25** secured to its drive shaft **26**. This pinion meshes with a gear **27**, the latter being rotatably supported on a journal shaft **28** extending from the engine housing (see Figure 2). This gear is somewhat larger than the pinion **25** so as to give the proper

speed reduction, and has a drive pulley 29 fixed thereto so that this pulley will turn with the gear 27.

In Figure 2 of the drawings, a belt 30 has been illustrated as encircling the pulleys 24 and 29, whereby the former may be driven by the latter. Normally this belt has sufficient slack therein so that the engine may idle without turning the pulley 24. However, a belt-tightener K has been provided for placing the belt 30 under tension so that the pulley 24 will be turned when the engine is running. Essentially, this tightener includes a link 31, which is swingably mounted on a pin 32 carried by a lug 33 depending from one of the bars 10, the link being provided with an idler pulley 34 bearing against the top reach of the belt.

For the purpose of actuating the link 31 of the belt-tightener, a rod 35 has one end thereof connected to the link, while its opposite end is pivotally attached to a control handle 36. The latter has a sleeve 37' secured thereto, which is rotatably mounted on the transverse brace 11. When the handle 36 is swung into the dot-dash line position shown in Figure 2, the belt-tightener K will hold the belt 30 under tension so that the pulley 24 will be turned by the pulley 29. Of course, when the handle 36 is swung in a counter-clockwise direction in Figure 2, the belt will be released and the engine may be permitted to idle.

In order to start the engine G, a pull rod 37 has been shown in Figure 1 as being provided with a starter handle 38. This rod is connected to a standard motor retrieve 39 on the engine (see Figure 7). Also, a choke rod 40 and a gas control 41 are arranged on the handle-bars within easy reach of the operator.

On the front of the wheelbarrow there is provided a shield 42, which serves to protect the engine G, especially when the spout H is swung in a counter-clockwise direction about the wheels C in Figure 2, as suggested by the arrow 43, while dumping concrete or other contents from the tray B. This shield may be secured to the front ends of the bars 10—10 by studs 44 (see Figures 1, 2 and 7). Also, a perforated ear 45 projects from the top of the shield so that the latter may be anchored to the spout H by a stud 46'.

Moreover, the shield 42 is positioned to serve as a rocker when the wheelbarrow is up-ended for dumping its contents from the mixing chamber J through the discharge spout H. The shield 42 will engage with the ground and support the wheelbarrow in its dumping position. Obviously, the engine is protected by the shield during this dumping operation from striking any object. This shield is disposed ahead of the axle 18 so as to counteract the weight of the handle-bar 10—10. If desired, this shield may be counterweighted in any suitable manner.

As shown in Figures 2 and 5, anchoring studs 46 are provided on the bottom portion of the tray, which may be removably engaged with perforated lugs 47 projecting laterally from the bars 10—10. Also, these bars may have upwardly-extending pins 48 thereon, which engage with the outer lower surfaces of the conical-shaped wall 21 to further retain the tray in place.

Reference is made to Figures 1, 2 and 5, wherein it will be noted that a splash-shield 49 is provided around the sides and back of the marginal rim of the mixing chamber J, with side extensions 50 of the shield being carried partly along the length of the spout H. The purpose of this shield and its extensions is to prevent the contents of the mixing chamber J from splashing out when the paddles D and E are being actuated.

Returning now to the details of the drive mechanism F, and referring to Figures 2, 5 and 6, a gear box 51 has been disclosed as being fixed to the underside of the cylindrical plate 20 centrally thereof. A stub shaft 52 is journalled in hub 53 provided on this box, with the shaft projecting through the wall of the gear box. The driven pulley 24, previously mentioned, is clamped upon the outer end of this shaft, while the inner end of the latter has a bevelled pinion 54 secured thereto.

Lower and upper bevel gears 55 and 56, respectively, mesh with the pinion 54 so as to be rotated by the latter in opposite directions. The lower gear 55 is secured to a vertical shaft 57, while the upper gear 56 is fixed to a sleeve 58. The latter is mounted in a thrust bearing 58'. As shown in Figure 6, the sleeve 58 surrounds the shaft 57, with a pair of inner bushings 59 being disposed therebetween. Centrally disposed of the circular bottom plate 20, and extending thereabove, is a tubular standard 60 through which both the shaft 57 and the sleeve 58 extend. An outer set of bushings 61 are interposed between the sleeve 58 and the standard 60. A cone-shaped housing 62 is mounted around the lower part of the tubular standard 60 and has its base welded or otherwise anchored to bottom plate 20 (see Figure 6).

For the details of the inner paddle D, reference is made to Figures 1, 3, 4, 5 and 6. It includes an inclined supporting arm 63 having a split collar 64 thereon, which is adapted to be clamped to the projecting upper end of the bushing 61 immediately above the top of the tubular standard 60 when a bolt 65 is tightened. Also, set-screws 66 are provided in the collar 64 and extend through openings in the upper bushing 61 so as to secure this collar to the sleeve 58 (see Figure 6).

The arm 63 extends downwardly and outwardly at an angle. It has a bar 67 fixed to its outer end, and a blade 68 of the inside paddle D is yieldingly secured to this bar by a flexible strip 69. This blade is inclined relative to the vertical, as shown in Figure 4 so as to sweep the contents of the mixing chamber J outwardly from the cone-shaped housing 62 when the blade is turned in the direction of the arrow 71 (see Figure 1). A toe 72 on the blade 68 is curved partially around the conical housing 62 to keep the blade from binding into this housing as the inner paddle is rotated. The strip 69 may be fashioned from rubberized belting material, and provides a flexible hinge support for the blade 68 to thus allow limited movement of the blade relative to its arm 63, when aggregate of the concrete tends to jam this blade.

Moreover, the inside blade 68 has a spring strip 73 secured thereto by countersunk bolts or rivets 74. This strip contacts with and is set at right angles to the bottom plate 20, as shown in Figure 4, so that it will follow the surface of this plate when the strip flexes. Lugs 75 are provided on the back of the blade 68 for allowing the strip 73 to be secured in an upright position. The purpose of the strip 73 is to sweep the gap between the inner and outer paddles clear of any mixture that might adhere to the bottom plate 20, and to throw the mixture into the path of the outside blade.

The structural details of the outer paddle E are illustrated in Figures 1, 5, 6, 8 and 9. As shown therein, an inclined supporting arm 76 is provided with a split collar 77 at its upper end, which is adapted to be secured to the upper section of the shaft 57 by tightening a clamping bolt 78. Also, a pin 79 may be inserted through aligned openings in the collar 77 and the shaft 57 to thus anchor them together.

The arm 76 has an inclined bar 80 welded or otherwise secured to the lower end thereof. This bar has a flexible strip of material 81 attached thereto by bolts 82. The outer paddle includes an inclined blade 83 having an extension 84, which is attached to the flexible strip 81 by bolts 85. Thus this strip provides a yielding hinge between the arm 76 and the blade 83 to thus permit limited movement therebetween, when the blade engages aggregate of the concrete. A stop 86 is fixed to the arm 76 and has a finger 87 positioned in back of the extension 84 to limit rearward movement of the blade 83 so that excessive pressure will not be exerted against the inside of the conical-shaped wall 21 by this blade.

During operation of the outer paddle E, the blade 83 is advanced in the direction of the arrow 88 (see Figures

1 and 9), with the leading edge **89** of this blade sliding along the wall **21**. Figures 1, 8 and 9 illustrate the blade **83** as being set at an angle so as to direct the contents of the mixing chamber J towards the central part of the latter.

The arms **63** and **76** are designed to clear one another as they are revolved, with sufficient space being provided therebetween to prevent aggregate from jamming between these arms as they pass each other. In Figure 8, the arm **76** has been curved for the purpose of affording ample clearance between the two arms.

Thus it will be seen that the paddles D and E are designed to produce a uniform mixture in the mixing chamber J, and the blades **68** and **83** of these respective paddles are mounted to release from any jammed position that may occur when larger aggregate is caught therebetween.

Summary of operation

Having thus described the various parts of the combined wheelbarrow and mixer, the use thereof is summarized briefly as follows:

The engine or motor G is started by pulling on the handle **38**, utilizing the choke **40** and gas control **41**, as required. Thereafter the control handle **36** is swung into the dot-dash line position shown in Figure 2, which will actuate the belt-tightener K to place the belt **30** under sufficient tension so as to turn the pulley **24** of the drive mechanism F. This will result in rotating the paddles D and E in the directions of the arrows **71** and **88**, respectively.

Assuming that concrete is to be prepared, the ingredients are placed in the mixing chamber J. As the outer paddle E is rotated, its inclined blade **83** will divert the mix towards the central part of the chamber. At the same time, the inner paddle D is turning in the opposite direction, diverging the mix from the cone-shaped housing **62** towards the conical wall **21** of the mixing chamber J. The spring strip **73**, which scrapes over the bottom wall **20** of the pan B and will sweep the gap between the blades **68** and **83**, throwing the mix thus removed into the path of the outer blade **83**.

In the event that any larger rocks or aggregate should tend to wedge between the blades **68** and **83** as they pass one another, the flexible strips **69** and **81** will allow the blades to yield slightly relative to the arms **63** and **76**, respectively.

The entire apparatus may be rolled to the place where the concrete is to be used, and the paddles may be kept in operation during this period, if desired. By raising on the hand grips **14**, the contents may be discharged through the trough-like spout H. The engine will be protected by the shield **42** during the pouring operation. Moreover, this shield will serve as a rocker when the wheelbarrow is swung in a counter-clockwise direction in Figure 2, about the axle **18**, during the pouring of the concrete.

I claim:

1. In a combined wheelbarrow and mixer: a supporting frame, including an axle; ground-engaging wheels disposed on this axle to provide a roll-about structure; a tray mounted on the frame; the tray defining a mixing chamber having a pouring spout leading therefrom, through which contents of the chamber may be discharged; stirring paddles disposed in the chamber for mixing the contents thereof; and a drive mechanism for actuating the paddles, and including a motor carried by the frame; the motor being disposed ahead of the axle, and the mixing chamber being located in back of the axle, whereby the motor and chamber will at least partially balance one another; the spout extending laterally beyond the motor in all directions and overlying the motor to protect the latter from above.

2. In a combined wheelbarrow and mixer; a supporting frame, including an axle; ground-engaging wheels disposed on this axle to provide a roll-about structure; a tray

mounted on the frame; the tray defining a mixing chamber having a pouring spout leading therefrom, through which contents of the chamber may be discharged; stirring paddles disposed in the chamber for mixing the contents thereof; a drive mechanism for actuating the paddles, and including a motor carried by the frame; the motor being disposed ahead of the axle, and the mixing chamber being located in back of the axle, whereby the motor and chamber will at least partially balance one another; and a protective shield mounted on the frame in front of the motor; this shield being positioned to serve as a rocker for supporting the device by contacting with the ground when the frame is swung about the axle to lower the spout during a pouring operation; the spout overlying the motor to protect it from above; the shield being secured to the frame and to the spout and constituting a bracing support for the latter.

3. In a combined wheelbarrow and mixer: a tray defining a mixing chamber; the latter including a bottom plate having an upwardly-extending surrounding wall rising therefrom; an upright tubular standard disposed in the chamber, and having a cone-shaped housing thereon; the base of this housing being anchored to the bottom plate; a rotatable sleeve mounted in the tubular standard; an arm secured to this sleeve to turn therewith; an inner blade normally arranged in contact with the cone-shaped housing; a flexible hinge connecting this blade with the arm to advance the blade around said housing, when the arm is rotated by the sleeve; the blade being set at an angle to divert contents of the mixing chamber towards said surrounding wall, when the blade is advanced; and means for rotating the shaft to thereby turn the arm and its blade; the blade having a toe at its leading end extending at least partially around the cone-shaped housing and in contact therewith to keep the blade from binding into said housing; the main portion of the blade diverging away from the cone to thereby divert material contained in the chamber from the cone and toward the surrounding wall of the tray, as the blade is advanced.

4. In a combined wheelbarrow and mixer: a tray defining a mixing chamber; the latter including a bottom plate having an upwardly-extending surrounding wall rising therefrom; an upright tubular standard disposed in the chamber, and having a cone-shaped housing thereon; the base of this housing being anchored to the bottom plate; a rotatable sleeve mounted in the tubular standard; an arm secured to this sleeve to turn therewith; an inner blade normally arranged in contact with the cone-shaped housing; a flexible hinge connecting this blade with the arm to advance the blade around said housing, when the arm is rotated by the sleeve; the blade being set at an angle to divert contents of the mixing chamber towards said surrounding wall, when the blade is advanced; means for rotating the shaft to thereby turn the arm and its blade; and a spring strip carried by the blade and positioned to scrape material from the bottom plate of the mixing chamber that lies slightly beyond the reach of the blade as it is advanced over said plate; the strip being disposed substantially at right angles to said plate.

5. In a combined wheelbarrow and mixer: a tray defining a mixing chamber; the latter including a bottom plate having an upwardly-extending surrounding wall rising therefrom; a rotatable shaft disposed centrally of the bottom plate; an arm secured to the shaft to turn therewith; an outer blade having a leading edge normally arranged in contact with the bottom plate from the outer circumference of the plate to a predetermined distance extending inwardly from the circumference; a flexible strip connecting the blade to the arm and constituting a hinge between the blade and arm that will yield slightly in transverse directions as well as pivot to permit the blade to adjust itself as it is moved through the material to be mixed; a rotatable sleeve enclosing a portion of the shaft; a second arm secured to the sleeve to turn therewith; an inner blade having a leading edge normally arranged in

contact with the bottom plate from a point near the center to a point that is spaced inwardly a slight distance from the innermost contact the outer blade makes with the bottom plate; a flexible strip connecting the inner blade to the second arm and constituting a hinge between the two that will yield slightly in transverse directions as well as pivot to permit the inner blade to adjust itself as it is moved through the material to be mixed; a scraper strip carried by the inner blade and designed to contact with that portion of the bottom plate that is not contacted by the blades; said scraper strip moving the material into the path of the outer blade; and means for rotating the shaft and sleeve in opposite directions for moving the blades in opposite directions.

6. The combination as set forth in claim 5 and in

which the center of the mixing chamber has a raised conical portion; and the inner blade has a toe extending at least partially around the conical portion to keep the blade from binding into the conical portion.

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