Jan. 10, 1950

B. ESSICK

2,494,119

PORTABLE POWER-DRIVEN MIXER

Filed March 17, 1947

2 Sheets-Sheet 1

Fig. 1.

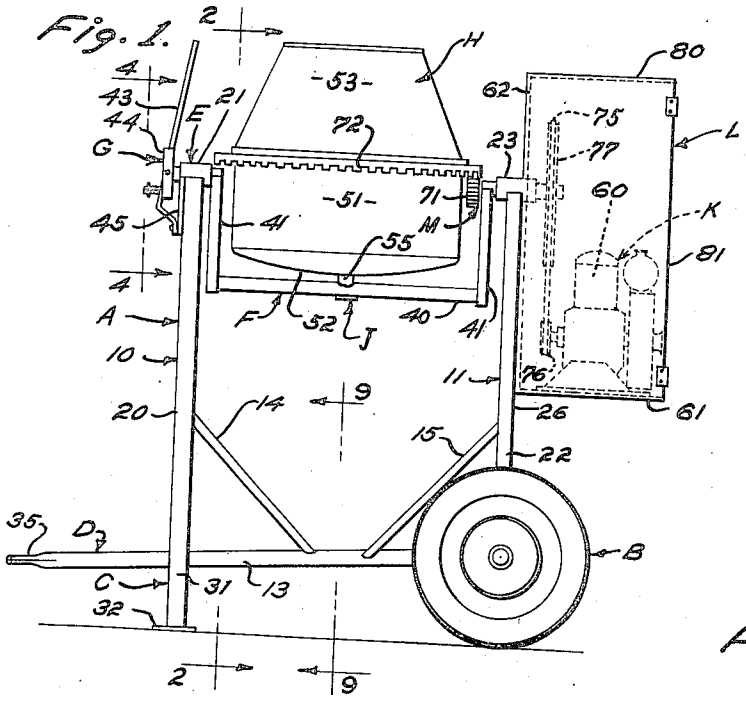



Fig. 2.

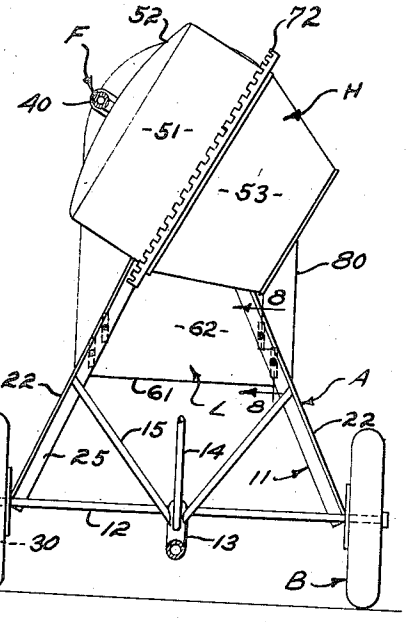
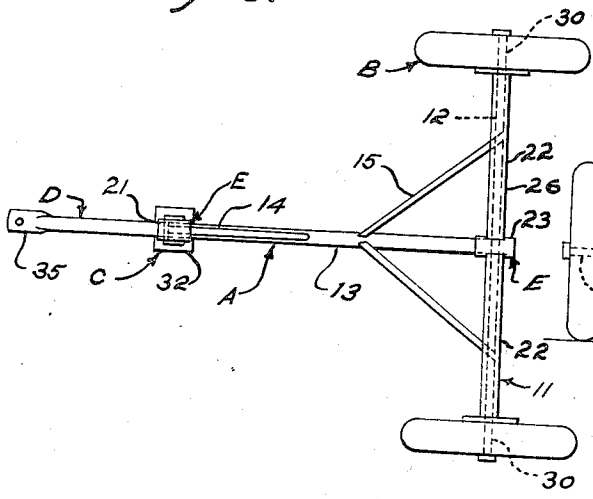



Fig. 3.




Inventor
Bryant Essick
By W. Mayfield
Attorney

Jan. 10, 1950 B. ESSICK 2,494,119

PORTABLE POWER-DRIVEN MIXER

Filed March 17, 1947

2 Sheets-Sheet 2

Fig. 4.

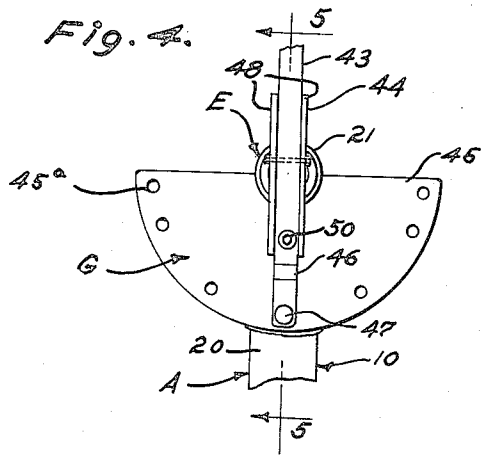



Fig. 5.

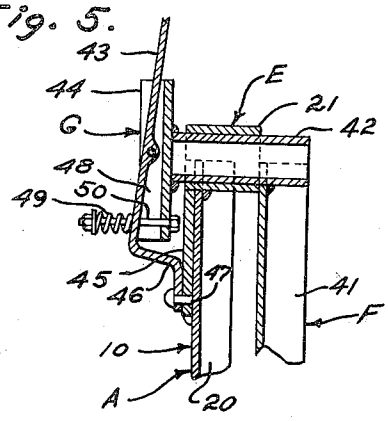



Fig. 6.

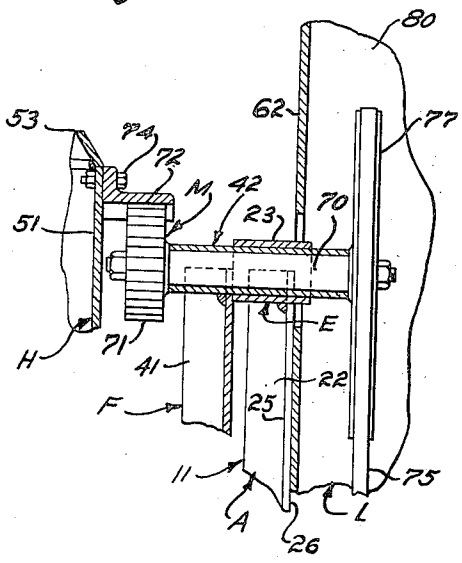



Fig. 8.

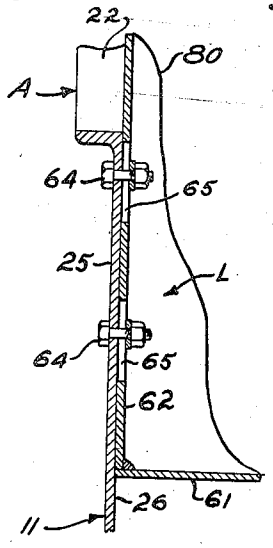



Fig. 9.

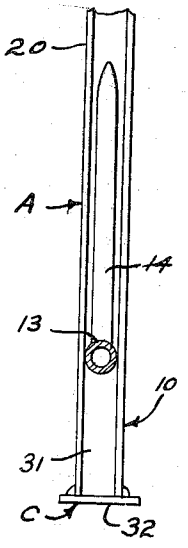
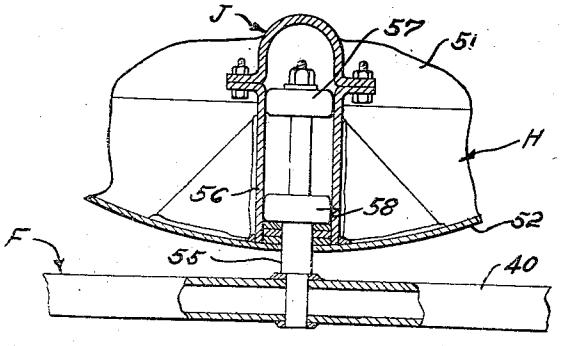



Fig. 7.




Inventor
Bryant Essick
By
Attorney

Patented Jan. 10, 1950

2,494,119

# UNITED STATES PATENT OFFICE

2,494,119

## PORTABLE POWER-DRIVEN MIXER

Bryant Essick, Los Angeles, Calif., assignor to Essick Manufacturing Company, Los Angeles, Calif., a corporation of California

Application March 17, 1947, Serial No. 735,118

1 Claim. (Cl. 259—177)

1

This invention relates to a portable power driven mixer and it is a general object of the invention to provide a simple practical and improved mixer suitable for handling materials such as plaster, cement, or the like.

There are many situations in which a portable power driven mixer of the general character above referred to may be used to advantage. The use of such machines is increasing. However, their use has heretofore been limited due to the fact that they are generally difficult or cumbersome to handle and to be dependable and rugged they have required expensive, heavy construction.

It is a general object of my present invention to provide a mixer of the general character referred to which is of very simple, inexpensive construction, making the machine practical for general use.

Another object of the present invention is to provide a mixer of the character referred to which is durable and dependable. The mixer that I have provided involves few simple reliable wearing parts and it is free or parts or mechanisms subject to failure or mechanical trouble.

Another object of the invention is to provide a mixer of the character referred to which is flexible and convenient to use. The machine that I have provided is such that it can be easily transported and maneuvered and it is exceptionally convenient to load and unload when in operation.

Another important feature of the present invention is to provide a frame for a machine of the general character referred to which frame is particularly simple in form and construction. The frame that I have provided involves a minimum number of simple, inexpensive parts related to form a strong rigid structure that is durable and effective in operation.

It is another object of the invention to provide a simple practical improved yoke for a mixer of the character referred to. The yoke that I have provided is a fabricated element formed of simple, inexpensive parts and is such that it can be inexpensively manufactured so that it is strong and durable and free of defects.

Another object of my invention is to provide a power driven mixer of the type referred to including a simple practical improved arrangement and mounting of the power unit or engine. Through the construction that I have provided the engine is located so that it contributes to proper balance of the machine and it is mounted or carried by frame elements supporting other

2

parts of the machine so that it requires no special frame construction.

It is a further object of my present invention to provide a portable power driven mixer of the character referred to including a rotatable mixing bowl carried in a yoke which is rotatable, the structure being such that the bowl can be rotated between a full upright position and a fully inverted position.

It is another object of the present invention to provide a power driven mixer of the general character referred to wherein the drive between the engine employed for power and the bowl of the mixer involves a belt adjustable through shifting of the engine mounting on the frame which supports the mixing bowl.

The various objects and features of my invention will be fully understood from the following detailed description of a typical preferred form and application of the invention, throughout which description reference is made to the accompanying drawings, in which:

Fig. 1 is a side elevation of a typical power driven mixer involving the structure of my present invention. Fig. 2 is a sectional view of the structure taken substantially as indicated by line 2—2 on Fig. 1. Fig. 3 is a plan view of the mixer shown in Fig. 1 being a view of the frame alone with the other elements of the device removed therefrom. Fig. 4 is an enlarged view taken as indicated by line 4—4 on Fig. 1. Fig. 5 is an enlarged sectional view taken as indicated by line 5—5 on Fig. 4. Fig. 6 is an enlarged sectional view showing a part of the drive provided by the engine and mixing bowl. Fig. 7 is an enlarged detailed sectional view showing the mounting of the mixing bowl in the yoke. Fig. 8 is an enlarged detailed sectional view taken substantially as indicated by line 8—8 on Fig. 2, and Fig. 9 is an enlarged sectional view taken substantially as indicated by line 9—9 on Fig. 1.

The machine of the present invention involves, generally, a frame A, wheels B supporting the rear end portion of the frame, a single foot C supporting the forward end of the frame, a draft tongue D projecting forward from the frame, aligned bearings E carried by the frame, a yoke F rotatably supported by the bearings, retaining means G releasably retaining the yoke in a predetermined rotative position, a mixing bowl H, mounting means J rotatably supporting the mixing bowl in the yoke, power means K, mounting means L for the power means K whereby it is supported on the frame A, and drive means M between the power means K and the bowl H.

The frame A is a highly important element of the structure or machine and in its preferred form it involves two bearing supports, one a front bearing support 10, the other a rear bearing support 11. The frame also includes a lateral spreader 12 at the rear of the machine stabilizing the rear support 11, a longitudinal spreader 13 extending between the front and rear supports spacing and coupling them together, and braces 14 and 15 for the front and rear bearing supports, respectively.

The front bearing support is preferably a simple, straight, vertical or upright leg 20, the upper end of which carries the forward bearing 21 while the lower end is rigidly joined to the forward end of the longitudinal spreader 13. To gain a simple sturdy inexpensive construction I form the forward support 10 of a single integral leg member and I have found it advantageous to employ a channel iron in the formation of this element of the frame. The front or forward bearing 21 may be mounted on or attached to the upper end of the front leg 20 in any suitable manner, for instance, it may be permanently welded thereto so that it is, in effect, a permanent rigid portion of the front leg.

The back or rear bearing support 11 is a divided structure involving two rear legs 22 preferably joined together at their upper ends where they support a back or rear bearing 23. The rear legs 22 are preferably straight members which are oppositely inclined so that they extend downwardly and laterally in opposite directions from the point where they support the bearing 23. The pitch or inclination of the rear legs 22 is such that their lower ends are spaced a substantial distance apart, as shown in Fig. 2 of the drawings. The lower ends of the rear legs 22 are made secure or are fixed to the ends of the lateral spreader 12. In practice I may employ welded connections between the legs 22 and the spreader 12. The legs 22 may vary widely in form and construction. However, in practice I prefer to employ simple angle irons for the legs and I arrange the angle irons so that they have flanges 25 with rearwardly facing sides or faces 26 at the rear of the machine to accommodate the mounting means L hereinafter described.

The lateral spreader 12 may be a simple straight horizontally disposed member which extends between and connects to the lower ends of the rear legs 22 to tie them together and to brace them in the desired spaced relation. In practice the lateral spreader 12 may be a simple bar or tube such as is shown throughout the drawings.

The longitudinal spreader is the sole element of the frame extending between the front and rear bearing supports and is located at the bottom of the frame where it extends between the lower end of the front leg 20 and the lateral spreader 12 which in turn extends between the lower ends of the rear legs 22. The longitudinal spreader may be a simple straight member which is substantially horizontal when the machine is in operating position as shown in Fig. 1. To gain the desired strength and rigidity I prefer to form the longitudinal spreader of a tube of substantial diameter and I securely or rigidly fix it to the lateral spreader 12 and the leg 20, preferably by welding.

The braces 14 and 15 couple the legs of the frame with the longitudinal spreader and they serve primarily to stiffen the frame lengthwise of the machine, although the braces 15 for the rear legs 22 are also effective in bracing the frame laterally. The brace 14 is a single, simple part extending diagonally between the front leg 20 and the longitudinal spreader 13. The braces 15 for the rear legs 22 extend diagonally from the spreader 13 to the legs 22 and these braces extend diagonally in two directions, that is, longitudinally of the machine and also laterally. The lower ends of the braces 14 and 15 are joined to or connect with the longitudinal spreader 13 intermediate its ends and they preferably connect to the spreader 13 at points spaced a substantial distance apart so that the frame at the middle portion is wholly unobstructed above the longitudinal spreader 13 as will be seen from an examination of Fig. 1 of the drawings. In practice the braces 14 and 15 are of such size and length as to effectively brace the legs of the frame and I may form the braces of tubular stock so that they are light and rigid. The braces may be joined to the other frame parts in any suitable manner, as for instance by welding.



The wheels B provided to support the rear end portion of the machine are preferably located on an axis transverse of the machine and in accordance with my invention they are mounted on extension 30 of the spreader 12 immediately outside of the frame as shown in Fig. 2 of the drawings. It will be apparent that the wheel supporting extensions 30 may be integral continuations of the spreader 12 in which case the spreader becomes, in effect, an axle for carrying the wheels as well as an active part of the frame A.

The foot C provided to support the forward end of the frame includes a part 31 extending downwardly from the forward lower corner of the frame where the front leg 20 joins the longitudinal spreader 13, and a bearing plate 32 on the lower end of the depending part 31. In practice the foot part 31 is formed as an integral extension or continuation of the channel member which forms the front leg 20 and the bearing plate 32 is a simple flat plate secured to the lower end of the beam as for instance by welding.

The tongue D projects forward from the lower forward corner of the frame and is provided at its outer end with an eye portion 35 or other suitable coupling part by which the tongue may be coupled to a hitch such as may be employed on a suitable draft vehicle. The tongue D is preferably a straight rigid tubular part and in accordance with my construction it is an integral continuation of the longitudinal spreader 13. When the foot part 31 is integral with the channel forming the leg 20 and the tongue is an integral continuation of the longitudinal spreader 13, the channel and the tube forming the spreader and tongue may be related by passing the tube through an opening in the web of the channel and welding the tube and channel together in the desired crossed relation.

The yoke F of the machine is an important element since with my construction it not only serves to carry the mixing bowl but I also preferably employ it as a structural element between the upper end portion of the front and rear bearing supports, stiffening and stabilizing the entire machine. In accordance with my preferred construction the yoke has a main section or body 40, arms 41 projecting laterally from the ends of the body and trunnions 42 projecting from the arms to be carried in the bearings 21 and 23.

In accordance with my invention the body of the yoke is a simple, straight tubular part and the arms 41 are plates fixed or joined to the ends of the tube, as by welding or the like. By em-

ploying a tube in the formation of the body 40 of the yoke I obtain a light construction which is strong and rigid. The plates forming the arms 41 are sufficiently heavy to rigidly connect or couple the trunnions 42 with the body 40. I prefer to form the trunnions so that they are tubular and I thereby am able to rigidly and dependably join the trunnions to the arms as by welding, and the trunnions have large bearing surfaces providing effective rigid bearing engagement of the trunnions in the bearings bracing the upper end portion of the structure against racking. It is to be understood of course that the trunnions are rotatably supported in the bearings 21 and 23 so that the yoke which extends between and couples the upper end portions of the supports of the frame is rotatable about a horizontal axis extending lengthwise of the machine.

The means G provided for retaining the yoke in the desired rotative position may vary widely in form and construction. The means G is preferably located at the forward end of the machine and in accordance with my invention it involves a finger lever by which the means G may be operated and which serves as a lever or handle for rotating the yoke when the means G is released. In the construction illustrated the means G includes, generally, a working part or lever 43, a bracket 44 by which the lever 43 is coupled to the trunnion carried in the forward bearing 21 and a latch plate 45 fixed to the front leg 20 adjacent the bearing 21.

The lever 43 may be a simple, longitudinal strap or the like having a projecting end forming a handle and having an inturned end 46 carrying a latch pin 47 which cooperates with the latch plate 45. The bracket 44 by which the lever 43 is supported may be a longitudinal channel member fixed to the end of the trunnion carried in the bearing 21 to extend transversely of the axis of the trunnion. The sides or flanges 48 of the bracket confine the lever between them and a spring 49 carried on a stem 50 projecting from the bracket normally yieldingly urges the lever inwardly or into position to be confined between the flanges of the bracket.

The latch plate 45 may be segmental shaped part suitably fixed to the frame A and, as shown in the drawings, it is provided with a suitable series of apertures 45a to receive the latch pin 47. The series of apertures is concentric with the axis of the yoke and the pin 47 is such as to selectively enter the apertures 45a when moved into register therewith. The spring 49 normally yieldingly holds the lever 43 in position where the latch pin 47 enters and is maintained in seated engagement in one of the apertures of the latch plate. To release the latch pin from the latch plate the handle portion of the lever 43 is swung in the direction indicated by the arrow in Fig. 5 and when the latch pin is released from the latch plate the lever may be used as a means for conveniently swinging or turning the yoke on its axis. In practice I may provide any desired number of apertures 45a in the latch plate and I may locate the apertures so that the yoke can be set to hold the mixing bowl in the desired operating positions.

The mixing bowl H may be of the type generally employed in devices of this general character and it is suitably mounted in the yoke by the means J. The particular mixing bowl illustrated in the drawings includes a cylindrical body 51 closed at its lower end by a bottom 52 and an extension 53 of the body which is tapered or in the nature of



a truncated cone the large end of which joins the body 51 while the small end is open providing an access opening for the bowl. The mounting means J rotatably supporting the bowl in the yoke on an axis transverse of that of the yoke preferably involves a fixed pin 55 projecting from the body 40 of the yoke at a point midway between the arms 41 and in the same direction as the arms 41 so that its axis intersects that of the yoke. A bearing cage 56 is carried by the bowl, preferably by the bottom 52 of the bowl, so that it is located within the bowl, and suitable anti-friction bearings 57 and 58 act between the pin 55 and the cage 56. The cage is preferably closed keeping foreign matter from the bearings 57 and 58, and it will be understood that in practice I may use any suitable anti-friction bearings, it being preferred to use bearings which are combined radial and thrust bearings in order that the bowl may be effectively and dependably supported from the yoke.

The power means K provided for driving the bowl H may be any suitable prime mover, for example, it may be a suitable electric motor or a small internal combustion engine 60, such as I have indicated in the drawings.

The mounting means L that I provide for mounting the engine 60 is located at the rear end portion of the frame A and in the particular case illustrated it involves an L-shaped bracket having a horizontal flange 61 on which the engine is mounted, and a vertical flange 62 that bears on the faces 26 of the rear legs 22. The vertical flange 62 is joined or coupled to the legs 22 so that the mounting L may be shifted bodily relative to the frame, preferably vertically relative to the frame. In the case illustrated bolts 64 are carried by the rear legs 22 of the frame and extend through vertical slots 65 provided in the vertical flange 62. When the bolts 64 are tight the flange 62 is rigidly held in position at the rear of the frame, whereas when the bolts 64 are loosened the mounting L is free to be shifted or adjusted vertically at the rear of the frame.

The drive M provided between the power means K and the bowl H involves a drive shaft 70 rotatably supported in the tubular trunnion of the yoke which is, in turn, rotatably carried in the rear bearing 23. The shaft 70 carries a pinion 71 having meshing engagement with a ring gear 72 surrounding the bowl preferably at the end portion of the body of the bowl to which the extension 53 is joined. In the particular case illustrated the ring gear 72 is a part formed separately from the bowl and is secured thereto by suitable fastening means 74.

The drive provided between the engine 60 and the shaft 70 may be a simple drive and in practice I prefer to employ a belt drive, in which case a belt 75 operates over a drive pulley 76 on the engine shaft and over a driven pulley 77 on the shaft 70. In practice it is desirable to employ a small high speed engine 60, in which case the drive pulley 76 may be small relative to the driven pulley 77. The adjustable mounting means L hereinabove described effectively cooperates with the drive above described, since by shifting the mounting vertically I am able to effect the desired adjustment of the belt drive. When it is desired to tighten the belt it is a very simple matter to loosen the bolts 64 and to allow the weight of the means K and L to tighten the belt by means of gravity, after which action the bolts may be re-tightened.

In practice it is desirable to house or guard

the working parts subject to being adversely affected by foreign matter. As shown in the drawings I prefer to provide a housing 80 to encase the engine and the shaft 70. The housing 80 may be a suitable sheet metal structure provided at its rear end with a hinged closure 81 or the like by which the interior of the housing is made accessible. It is preferred, in practice, to mount the housing on the bracket of the means L. However, it will be apparent that the housing may, if desired, be secured to the frame A so that it is permanently fixed relative to the frame, in which case the mounting bracket of means L will shift within the housing.

From the foregoing description it will be observed that I have provided a machine which may be constructed so that it is light, compact, and convenient to operate, at the same time being sturdy and durable and unusually inexpensive of construction. In handling the machine it may be moved from place to place with little effort by lifting the forward end through the tongue D. When the tongue is lifted the frame swings about the axis of the wheels B and the center of gravity of the machine shifts rearwardly making it very easy to handle. When it is desired to move the machine by means of a shaft vehicle the tongue is lifted and coupled to the vehicle and when so coupled the greater part of the weight of the machine is borne by the wheels B and the draft vehicle is not burdened or overloaded but functions mainly to merely roll the machine on the wheels B.

When the machine is being used to mix materials it operates in the general manner common to mixers of this type, that is, the bowl is driven and tilted as required, it being understood that the bowl may be equipped with baffles or fins as circumstances require in order that it act to most effectively mix the materials being handled.

The retaining means G that I have provided is an exceedingly simple, inexpensive mechanism conveniently located and easily operated. In handling or operating the machine the frame being simple and compact does not interfere with convenient location of auxiliary equipment such as wheelbarrows, or the like adjacent the machine to receive material from the mixing bowl. Furthermore it will be apparent that I may, whenever desired, reverse the bowl by swinging the yoke F 180° from the position shown in Fig. 1, in which case the yoke will be up and the mouth of the bowl face down. It may be desirable to position the bowl in this manner when it is being moved from one location to another. As the machine operates the frame A in and of itself serves as an effective support for the front and rear bearings 21 and 23, while the trunnions of the yoke being carried in the bearings couples the rigid yoke F with the upper end portions of the uprights of the frame to effectively brace and stabilize the entire frame structure. It is also important to note that by having provided a machine of the character described with but few simple exposed parts, the machine is easily maintained in proper clean operating condition as there are few points at which material can accumulate or be deposited in the normal course of operation.

Having described only a typical preferred form and application of my invention, I do not wish to be limited or restricted to the specific details



herein set forth, but wish to reserve to myself any variations or modifications that may appear to those skilled in the art and fall within the scope of the following claim.

Having described my invention, I claim:

A machine of the character described including, a horizontal transverse spreader, ground engaging wheels on the ends of the spreader, a single straight vertical member located centrally of the machine forward of the transverse spreader and having a ground engaging base on its lower end and an opening through it above its lower end, a tubular longitudinal spreader having its rear end attached to the first mentioned spreader at the middle thereof and extending forward therefrom and through said opening, said longitudinal spreader being fixed to the said vertical member and having a tongue portion projecting forward therefrom a diagonal brace fixed to said member at a point spaced above the said opening and to the longitudinal spreader at a point spaced rearward from said member, legs extending upwardly and inwardly from the transverse spreader immediately inside the wheels and in a vertical plane transverse of the machine, the upper ends of the legs being joined together at the center of the machine, aligned bearings carried by the upper ends of the legs and the upper end of said member on an axis directly above and substantially parallel with the longitudinal spreader, braces fixed to the legs at points above the transverse spreader and extending forward, inward, and downward therefrom and fixed to the longitudinal spreader forward of the transverse spreader, a yoke with trunnions rotatable in said bearings, a mixing drum rotatably carried by the yoke on an axis normal to that of the bearings, latch means on the foremost trunnion of the yoke releasably holding the yoke against turning, a bracket engaging the legs at the upper portions thereof, means coupling said bracket to the legs for vertical adjustment relative to the legs, a box-like housing at the bracket and projecting rearwardly from the legs at the upper portions thereof, a prime mover fixed on the bracket and located in the housing, and a drive from the prime mover to the drum including, a shaft rotatably carried in the rearmost trunnion of the yoke, a drive pulley operated by the prime mover, a driven pulley on the rearmost trunnion, a belt operating over and between said pulleys, and a gear drive from said rearmost trunnion to the drum.

BRYANT ESSICK.


## REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

| Number | Name | Date |
|---|---|---|
| 1,453,323 | Palmeter | May 1, 1923 |
| 1,475,904 | Vandenplas | Nov. 27, 1923 |
| 1,760,906 | Johnson | June 3 1930 |
| 2,207,011 | Hopkins | July 9, 1940 |
| 2,299,888 | Fesenmaier | Oct. 17, 1942 |

FOREIGN PATENTS

| Number | Country | Date |
|---|---|---|
| 1,198 | Australia | Mar. 16, 1931 |
| 355,850 | Great Britain | Sept. 3, 1941 |
| 680,531 | France | May 1 1930 |