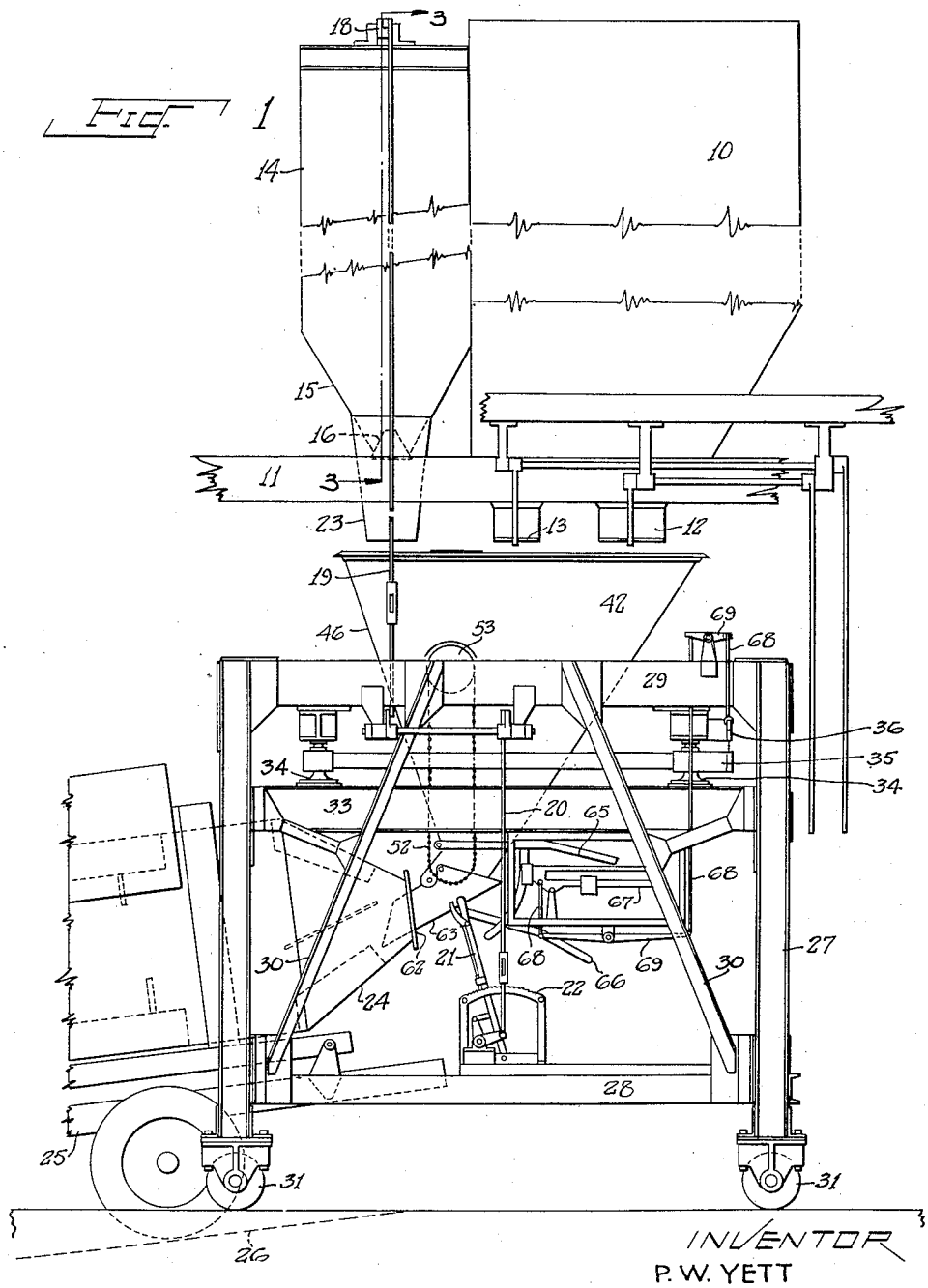
Sept. 16, 1930. P. W. YETT 1,775,746

PORTABLE PROPORTIONING MACHINE

Filed May 20, 1929 4 Sheets-Sheet 1

Fig. 1



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PORTABLE PROPORTIONING MACHINE

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FIG. 2

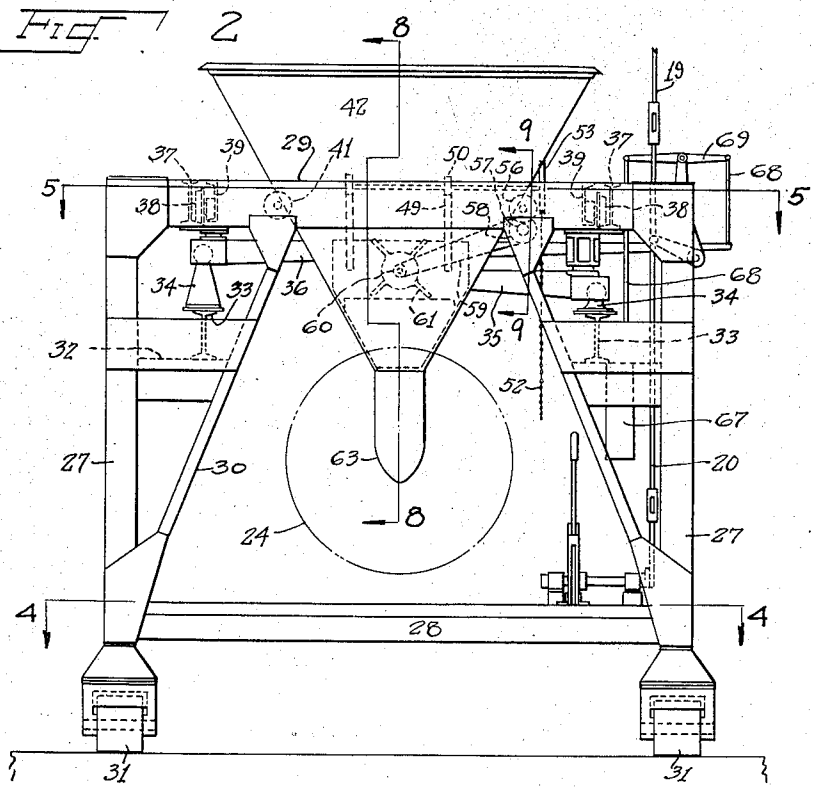


FIG. 3

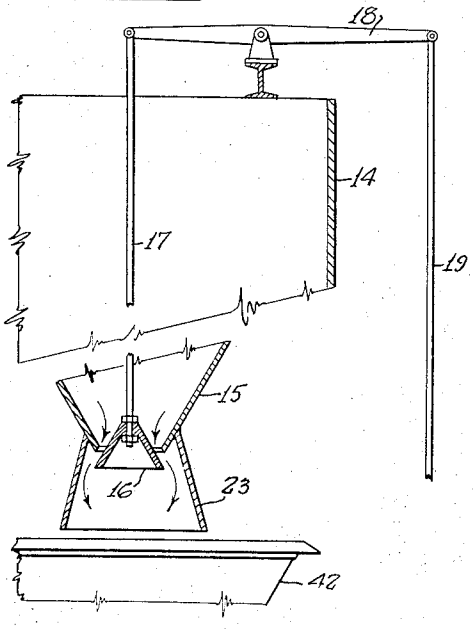
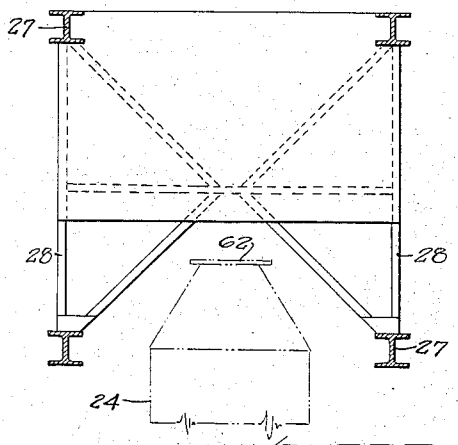


FIG. 4



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PORTABLE PROPORTIONING MACHINE

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FIG. 5

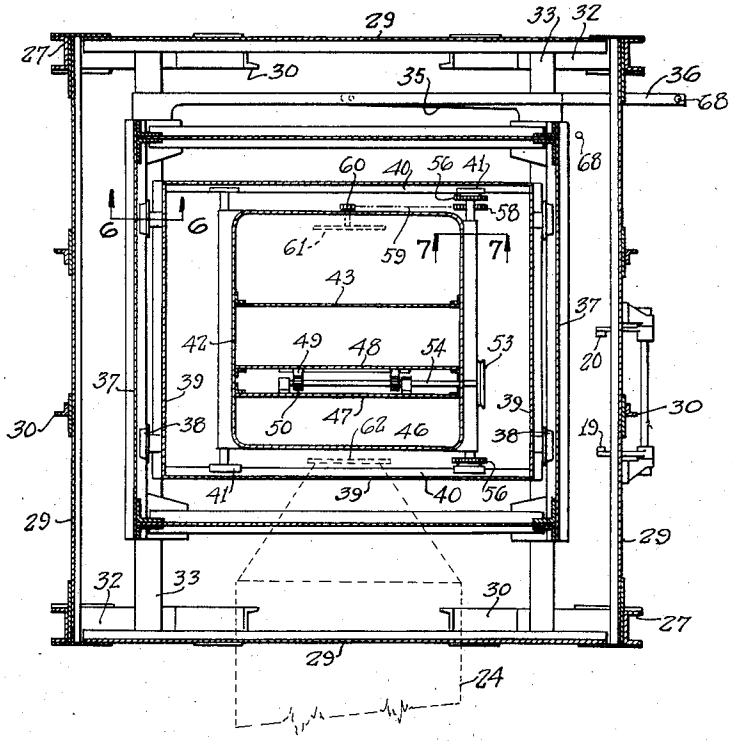


FIG. 6

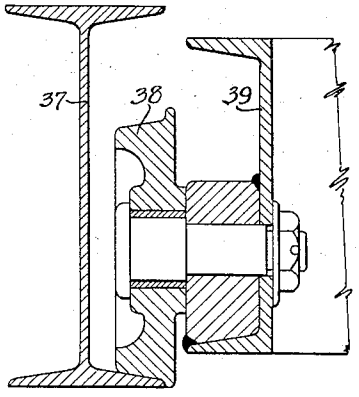
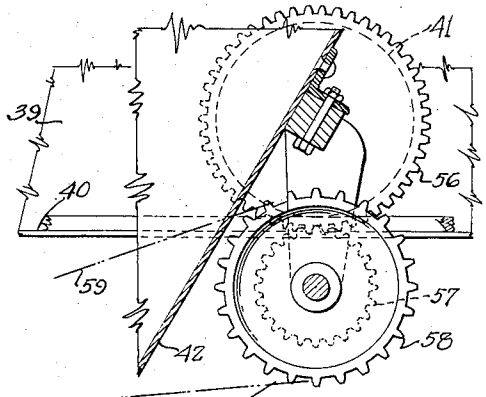


FIG. 7



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PORTABLE PROPORTIONING MACHINE

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FIG. 8

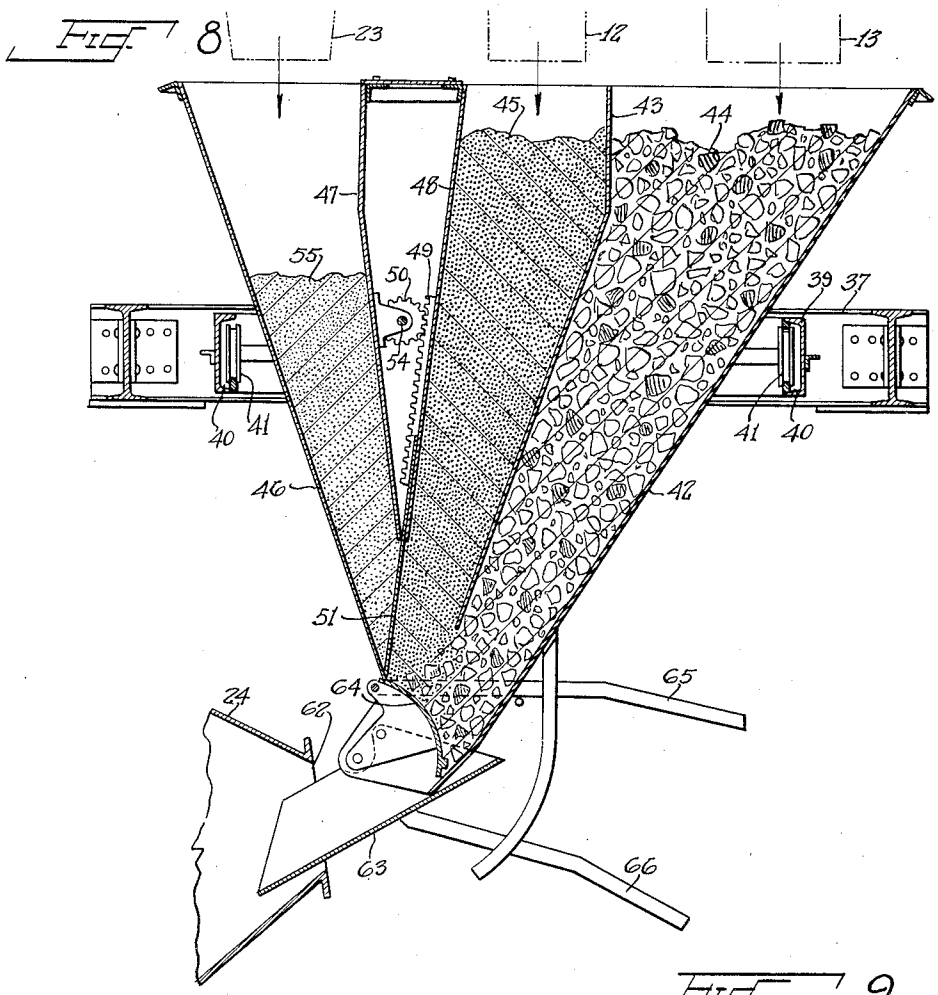
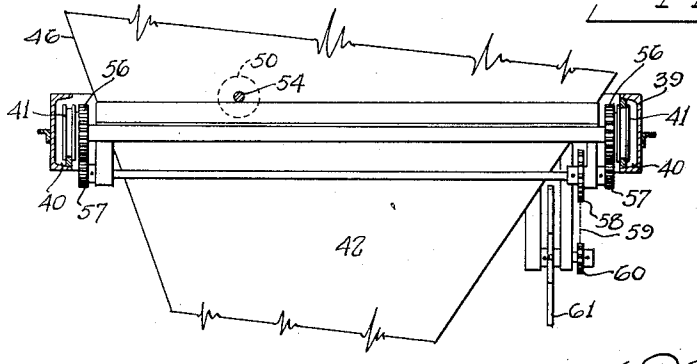


FIG. 9



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Patented Sept. 16, 1930 1,775,746

UNITED STATES PATENT OFFICE

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PORTABLE PROPORTIONING MACHINE

Application filed May 20, 1929. Serial No. 364,654.

This invention relates generally to the use of concrete, and particularly to portable proportioning machines.

The main object of this invention is to provide a portable charger for concrete mixers.

The second object is to provide a proportioning charging unit which can be satisfactorily operated by one man.

The third object is to provide a combined charging and proportioning unit which can be used in conjunction with the ordinary type of bunkers without necessitating expensive alterations thereto.

The fourth object is to construct a charging unit adaptable for smaller operations.

These and other objects, will become more apparent from the specification following as illustrated in the accompanying drawings, in which:

Figure 1 is a side elevation of the apparatus showing its relation to storage bins and mixing machines.

Figure 2 is a front end elevation.

Figure 3 is a section taken along the line 3—3 in Figure 1.

Figure 4 is a horizontal section taken along the line 4—4 in Figure 2.

Figure 5 is a horizontal section taken along the line 5—5 in Figure 2.

Figure 6 is a vertical section taken along the line 6—6 in Figure 5.

Figure 7 is a vertical section along the line 7—7 in Figure 5.

Figure 8 is a vertical section through the proportioning hopper.

Figure 9 is a section along the line 9—9 in Figure 2.

Similar numbers of reference refer to similar parts throughout the several views.

Before entering into a description of the drawings it will be understood that there are two commonly used methods of assembling aggregates for the purpose of forming concrete. First, in which various grades and kinds of material are disposed in scattered piles over a large area on the ground from which the desired kinds and amounts of material are selected and collected for delivery to the mixing machine.

The second method, usually employed where storage space is at a premium, is to place the material in elevated bins from which it is drawn by gravity as required, usually drawn from the bins into trucks by means of which it is hauled to the job and deposited on the ground, after which it is again picked up and placed in a mixing machine, which, aside from the unnecessary handling involved, requires the maintenance of a storage of the different kinds of material at the job to prevent a shortage occurring in any one kind of ingredient. This storage, of course, is maintained at a considerable expense, which must ultimately be borne by the consumer.

In recent years this wasteful method has been largely replaced by machines consisting of trucks which not only transport the aggregates from the storage bins to the forms, but mixes the aggregates in transit and continues this mixing operation until the material is completely discharged from the machine, thereby not only maintaining complete uniformity of the mix, but also making it possible to secure a satisfactory flow thereof without accompanying same with an objectionable amount of water. Of still greater importance is the fact that the mix is never permitted to set before it is finally deposited in the forms, thereby providing an ideal combination of conditions which are so obviously desirable, namely an efficient assembly of the materials, a rapid transit thereof to the job and a perfect mixing of the materials in transit, which persists until the time the mix is deposited in the forms.

The storage bins having been in existence and the combined mixing and transporting machines having appeared upon the scene, I have now provided a connecting link between the storage bins and the mixing machine by means of which materials may be selectively gathered from the bins and assembled in accord with the most stringent regulations as to proportioning and then discharged in uniform proportions into the mixing machine. By this is meant that gravel will not enter at one time, sand at another and cement at another time, but all of the ingredients will begin to flow at the same time and all will cease to flow at the same time.

In other words, their rate of flow into the mixing machine is proportional to their respective amounts throughout the entire period of charging.

For the purpose of adapting this device to use with existing bunkers it is made portable and of a size which will permit it to be moved from place to place with very little effort. The use of this unit will make it possible to operate from a group of elevated storage bins almost as efficiently as though each of the bins were equipped with its own charging apparatus.

Referring in detail to the drawings, there is shown an old style of storage bin 10 mounted on an elevated support 11. The storage bin 10 ordinarily contains sand and gravel or crushed rock, whose flow therefrom is controlled by the gates 12 and 13. To the bin 10 is added a cement bin 14 from whose funnel-shaped bottom 15 cement can flow, under the control of the conical valve 16 suspended from the rod 17 and operated through the rocker arm 18, and the rods 19 and 20 which, in turn, are operated by the hand lever 21 associated with the quadrant 22 for holding the valve 16 at any desired setting. A nozzle 23 is placed around the bottom 15 of the bin 14 to prevent unnecessary waste of the falling cement.

Turning now to the mixing apparatus it will be seen to consist of a rotatable cylinder 24 mounted on the truck 25 which is backed under the hopper 10 on an inclined runway 26.

Referring directly to my invention it consists of a portable frame comprising four upright legs 27 which are held in spaced relation by the cross ties 28 and 29 and stiffened by the braces 30. The legs 27 are, in this instance, mounted on wheels 31 which obviously may be flanged to operate on rails or rubber tired if used as a trackless vehicle. Also it may be propelled by man power, drawn by a tractor or actually provided with its own motive power as seems most desirable for the particular purpose intended, without departing from the spirit of my invention.

Across the legs 27 are secured the scale platform girders 32 which support the transverse girders 33 upon which rest the parts 34, 35 and 36. Upon the scale, which may be of any desired type suitable for the purpose, is mounted a scale track 37 upon which rest the flanged wheels 38 of the scale frame 39 whose sides 40 form tracks for the wheels 41 which support the weighing hopper 42.

The weighing hopper itself is provided with a dividing wall 43 separating the compartment for the gravel 44 from the compartment for the sand 45. The cement hopper 46 is auxiliary to the hopper 42 and its wall 47 is spaced from the wall 48 of the hopper 42 to provide room for the operating rack 49 and pinion 50, by means of which a vertical slidable gate 51 is operated by means of the chain 52 which passes around the sprocket 53 on the shaft 54. The gate 51 provides an effectual means for preventing the cement 55 from flowing into the sand compartment, and also prevents the sand from flowing into the cement compartment, should either of these materials be inserted in advance of each other.

One pair of wheels 41 serves as drivers and motion is supplied thereto through the gears 56 and 57, which, in turn, are driven from the sprocket 58 whose chain 59 passes around the sprocket 60 on the hand wheel 61, whose function it is to provide a control for the lateral positioning of the hopper with relation to the mouth 62 of the mixing cylinder 24.

It will be noted that in a transverse direction, that is longitudinal with the cylinder 24, the weighing hopper 42 is free to roll on its wheels 38 for the purpose of permitting the operator to slide the charging spout 63 into the opening 62, and also to prevent injury to the apparatus in case the truck should be backed too far into same.

It is desirable to provide a curved gate 64 for the hopper 42, past which also flows the cement from the cement hopper 46. The gate 64 is operated by the hand lever 65; whereas the charging spout 63 is held in the desired position by the hand lever 66. A scale beam 67 is connected to the weighing platform by means of the rods 68 and rock levers 69.

The operation of the device is as follows: Assuming that the unit is to be used in conjunction with a bunker system the portable vehicle above described is moved under the respective bin where the various materials are permitted to enter the weighing hopper. When a given weight of one material is received the vehicle is moved to the next hopper where another ingredient of the mix is added and weighed, and so on until the correct proportions have been assembled and confined within the hopper, as shown in Figure 8. At this point the truck with its mixing cylinder is backed into position and the operator by manipulating the hand wheel 61 aligns the spout 63 with the opening 62. If the truck when stopped is not sufficiently close to the hopper he merely pushes the weighing hopper toward the truck until the charging spout 63 enters the opening 62. If the truck, however, is backed too far, instead of injuring the apparatus by so doing, it merely carries the hopper with it without doing any damage.

The operator then opens the gate 64 by means of the lever 65 and, having previously opened the cement gate 51 by means of the chain 52, allows the aggregates to emerge from the weighing hopper 42 in a stratified manner, and as they emerge to gradually mix so that by the time they enter the cylinder 24

they are thoroughly assembled in their proper proportions, and it then remains for the mixing cylinder 24 to merely complete the dry mixing and finally the wet mixing, and to maintain this mixing action until the concrete has been transported to and deposited within the forms.

It must be borne in mind that one reason which makes necessary the more careful assembling of the aggregates before the insertion of same into the mixer is the fact that these materials are mixed in transit in cylinders whose length is proportionately great when compared with the diameter; whereas in the old type of mixing cylinder the diameter was great and the length relatively small, making it a matter of little moment just how the materials entered the cylinder providing they actually did enter it.

Since the mix in transit system is so far superior to the old methods employed, and since many plants are equipped with the old style of storage bins and other apparatus, I have provided this device to accommodate old facilities to this new method of handling and mixing concrete without an undue expenditure for alterations or scrapping of existing equipment.

It can also be seen that by this method the man power required is reduced to a minimum, one man being sufficient to operate the entire charging unit, and the apparatus above described will enable him to not only take care of this work himself, but to do so in a highly efficient manner as far as accuracy and all around dependability is concerned.

I claim:

1. A portable proportioning machine having in combination a portable supporting frame, a weighing mechanism mounted on said frame, and means for adjusting the relation between the position of said weighing mechanism and support in two horizontal directions normal to each other.

2. In a portable proportioning machine the combination of a portable support, a weighing mechanism mounted on said support, an aggregate assembling hopper mounted on said weighing mechanism, means for providing horizontal movement to said assembling hopper, and a discharge spout under said assembling hopper whereby materials from said hopper may be received in stratified form and discharged in a semi-mixed form into a mixing machine.

3. In a portable proportioning machine the combination of a vehicle, a weighing hopper mounted on said vehicle having track means whereby said weighing hopper is capable of lateral movement in a horizontal plane in perpendicular directions, a discharge gate for said weighing hopper, dividing walls in said weighing hopper whereby various materials may be independently measured and collectively gathered in stratified order, and a discharge spout under said hopper including a gate whereby said stratified aggregates may be delivered to a mixing machine.

4. In a portable proportioning machine the combination of a vehicle, a measuring hopper mounted on said vehicle having a discharge nozzle at the lower end thereof, a plurality of compartments formed within said hopper for the reception of various kinds of aggregate, carriage means between said hopper and vehicle permitting a relatively horizontal movement of said hopper with regard to the vehicle, means for preventing the mixture of the cement with the sand and gravel during assembly, and gate means at the bottom of said hopper whereby there may be a uniform proportional rate of flow of materials from said hopper out of said discharge nozzle.

5. In a portable proportioning machine the combination of a vehicle adapted to occupy a position under an elevated storage bin, a weighing scale mounted on said vehicle, a pair of tracks mounted on said scale, a wheeled frame mounted on said tracks, a second pair of tracks mounted on said wheeled frame normal to said first mentioned tracks, a wheeled weighing hopper mounted on said last mentioned tracks having means for propelling same connected with its supporting wheels, a plurality of divisions for said weighing hopper arranged and adapted to hold various kinds of aggregate in a superimposed relation with the coarsest aggregate lowermost and the cement uppermost and to discharge same in a manner to employ the coarser aggregates as a vehicle for the finer aggregates, and means for regulating the rate of flow of said materials from said hopper.

6. In a portable proportioning machine the combination of a weighing hopper provided with a subdividing partition in which hopper gravel is stored on one side of the partition and sand is stored on the other side thereof, a discharge nozzle for said hopper including a gate for controlling the flow of materials from the hopper, an auxiliary cement hopper mounted alongside of said sand and gravel hopper having a gated outlet opening into the sand compartment, a wheeled support for said hopper permitting its movement in one lateral direction, and a second wheeled support for said first mentioned wheeled support adapted to permit a horizontal movement of said hopper in a direction perpendicular to its first mentioned direction of movement.

7. In a portable proportioning machine the combination of a weighing hopper provided with a subdividing partition in which hopper gravel is stored on one side of the partition and sand is stored on the other side there-

of, a discharge nozzle for said hopper including a gate for controlling the flow of materials from the hopper, an auxiliary cement hopper mounted alongside of said sand and gravel hopper having a gated outlet opening into the sand compartment, a wheeled support for said hopper permitting said movement in one lateral direction, a second wheeled support for said first mentioned wheeled support adapted to permit a horizontal movement of said hopper in a direction perpendicular to its first mentioned direction of movement, and a portable weighing scale upon which said second wheeled support is mounted.

8. In a charging apparatus the combination of a plurality of elevated storage bins with a portable aggregate assembling unit adapted to be moved under said elevated bins and receive materials therefrom, a portable mixing machine adapted to be positioned below said portable unit, and means whereby the discharge from said hopper may be adjusted laterally to secure an axial alignment with relation to said mixer and to provide a longitudinal movement with relation to said mixer.

9. In a portable proportioning machine the combination of a proportioning hopper with a portable support for said hopper, and means for permitting adjustment of the position of said hopper laterally and longitudinally with relation to its outlet side.

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