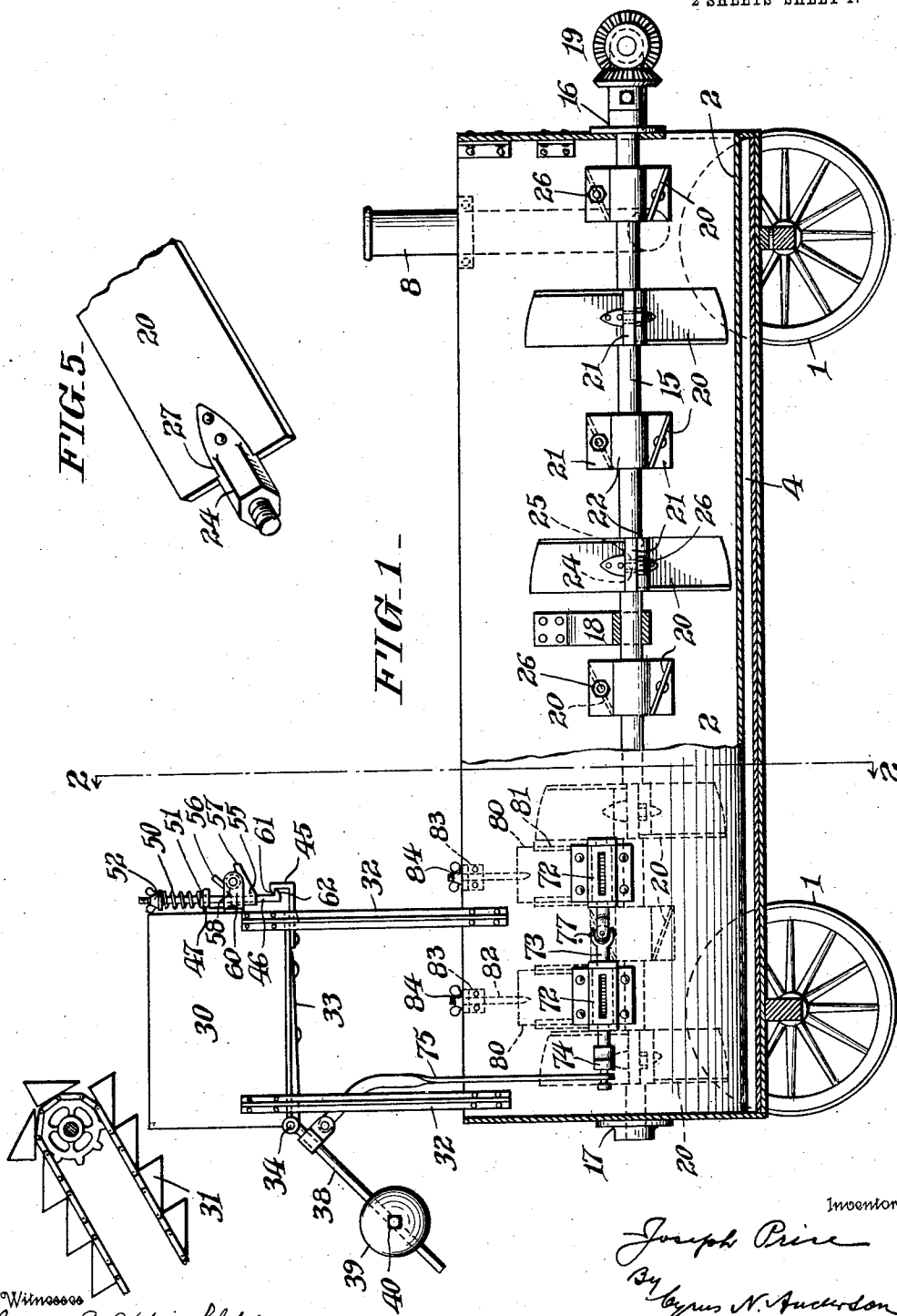


J. PRICE.
CONTINUOUS MIXING MACHINE.
APPLICATION FILED MAY 5, 1910.

1,061,497.

Patented May 13, 1913.

2 SHEETS-SHEET 1.



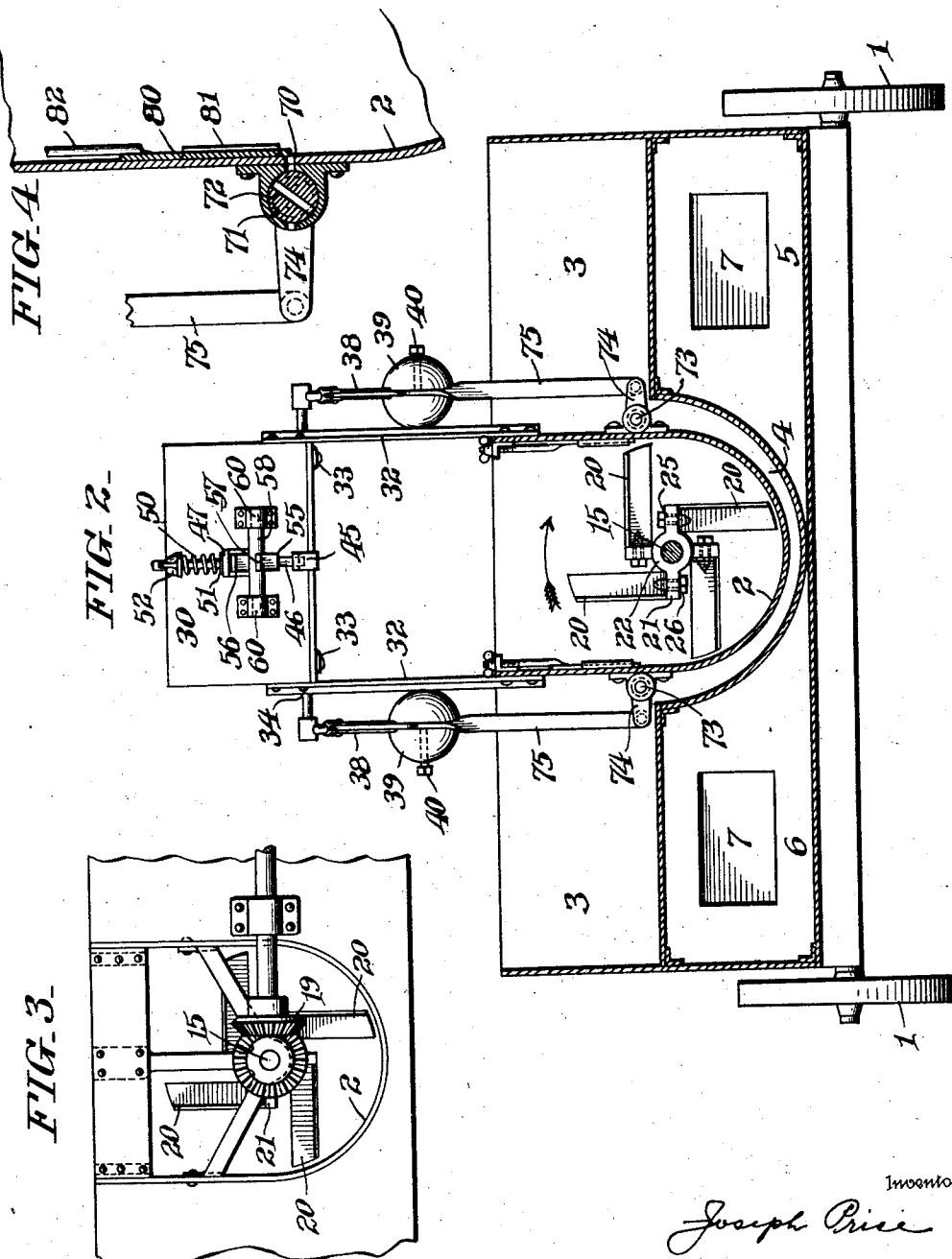
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UNITED STATES PATENT OFFICE.

JOSEPH PRICE, OF PROVIDENCE, RHODE ISLAND.

CONTINUOUS MIXING-MACHINE.

1,061,497.

Specification of Letters Patent.

Patented May 13, 1913.

Application filed May 5, 1910. Serial No. 559,532.

To all whom it may concern:

Be it known that I, JOSEPH PRICE, a citizen of the United States, residing in the city of Providence, State of Rhode Island, have invented a certain new and useful Continuous Mixing-Machine, of which the following is a specification.

My invention has relation to machines for mixing crushed or broken stone such, for instance, as is employed for road or street building, with a suitable binding substance or material such as bitumen, which is mixed with the stone while in the liquid state. The bitumen may be reduced to a liquid state by the application of heat thereto.

One object of my invention is to provide means whereby the stone may be automatically supplied to a mixing chamber at such intervals of time as may be desired.

A further object is to provide means for automatically supplying to the said chamber such quantities of the liquid binding material as may be necessary.

A still further object of my invention is to provide means whereby the stone and the said binding material may be thoroughly and effectively mixed together in the mixing chamber of the machine.

With these and other objects in view which will be set forth hereinafter or which will be obvious, my invention comprehends and resides in the combination and arrangement of parts as hereinafter described and as illustrated in the accompanying drawings forming a part of this specification and in which—

Figure 1 is a view partly in longitudinal section and partly in side elevation; Fig. 2 is a transverse section on the line 2—2 of Fig. 1; Fig. 3 is an end elevation looking toward the left in Fig. 1; Fig. 4 is a transverse section showing a detail of construction; and Fig. 5 is a perspective view of a portion of a mixing blade and its fastening lug.

In the drawings:—1 designates the wheels of a support for the machine by means of which the said machine may be moved from place to place as such movement may become necessary when the machine is in use. The wheels are, of course, arranged in pairs, each pair of which is connected by an axle and upon the said axles the machine is supported.

2 designates a mixing chamber which is located in a depression or trough in the bottom of the receptacle 3 which is adapted to contain the liquid binding material, such as bitumen, which is adapted to enter the said mixing chamber in a manner to be hereinafter described. The lower side of the chamber 2 is located a short distance above the bottom of the said depression or trough. The receptacle 3 extends upon opposite sides of the said mixing chamber 2, the opposite side portions thereof having communication with each other through the opening or space 4 which extends underneath the said mixing chamber 2. The space or opening 4 which extends underneath the mixing chamber 2 extends throughout substantially the length of the said mixing chamber and is in the particular form of construction illustrated substantially semi-circular in cross section. As illustrated, the said space or opening 4 is of greater width at its upper edges than at its bottom portion but it should be understood that my invention is not limited to a construction in which the said opening or space 4 is of such shape or contour in transverse section.

5 and 6 designate portions of a fire box which are located underneath the receptacle 3 and upon opposite sides of the space or opening 4. For the purpose of melting or reducing to a liquid state the bitumen placed in the receptacle 3, a fire is built in the portions 5 and 6 of the fire box, the wood or other material for that purpose being inserted through doors 7 indicated in Fig. 2 of the drawings. If preferred, the doors may be omitted and the end of the fire box left open.

In the construction illustrated, the sides of the fire box 5 and 6 and the receptacle 3 are continuous but, if desired, such sides may be made separately and secured together in any suitable manner.

The smoke and waste gases escape from the sections 5 and 6 of the fire box through chimneys 8, one of which is shown in Fig. 1.

For the purpose of effectively intermingling and mixing together the crushed or broken stone and the binding material, such as melted bitumen, I have provided a shaft 15 located in the mixing chamber 2 and extending longitudinally thereof. The shaft 15 is mounted in bearings 16 and 17 located at

the opposite ends of the mixing chamber and if desired a third supporting bearing 18 may be provided at the central portion of the said mixing chamber. The shaft is revoluble, being driven by and from any suitable source of power. I prefer to employ a gear drive and have shown at 19 a portion of the gear driving mechanism. The shaft, as is shown, extends longitudinally of the mixing chamber and is provided with mixing blades 20 arranged at intervals in couples. The mixing blades are secured to wings or projections 21 extending laterally in opposite directions from sleeves 22 which are secured in any desired manner to the shaft 15. As will be observed, these blades are eccentrically located with respect to the said shaft and extend at right angles thereto. Otherwise stated, the mixing blades are supported upon the shaft in offset relation thereto. The blades are provided at their inner ends with octagonal lugs 24 which are adapted to extend into octagonal openings 25 and to be secured therein by means of nuts 26. The purpose of making the lugs 24 and the openings 25 of octagonal shape in cross section is that the inclination of the blades transversely of the shaft 15 and the mixing chamber may be varied or altered. It will be understood that the cross sectional contour of the lugs may be varied and instead of being eight sided may have any other number of sides as may be desired; or the angular adjustment of the blades may be provided for in any other suitable manner. The lugs 24 are secured to the mixing blades 20 preferably by bifurcating the same as shown at 27 and extending the said blades into the bifurcations or slots and riveting the blades thereto as is indicated in the drawings.

By reason of the fact that the mixing blades 20 are secured to the shaft 15 in offset relation thereto as is illustrated particularly in Fig. 2 of the drawings, they operate to lift a larger proportion of the stone from the bottom of the mixing chamber than would be the case if the said blades extended radially from the said shaft. By this means and by reason of this operation, the stone and the binding material are more thoroughly and effectually intermingled and mixed together.

Having described the mixing chamber, the receptacle for the liquid binding material, the fire box for heating the said material to reduce it to liquid form, and the mechanism for mixing the materials in the said mixing chamber, I shall now proceed to a description of the mechanism for supplying the stone and the binding material to the mixing chamber.

The crushed or broken stone is supplied to a stone receiving box or receptacle 30 in any suitable or convenient manner as by

means of a conveyer of known construction, a portion of which is shown at 31 in Fig. 1 of the drawings. The said conveyer may be supported by any suitable means which, however, is not shown. Preferably the stone receiving box or receptacle is of a size sufficient to hold or contain about two cubic feet of stone and is supported by means of posts or braces 32 secured to the sides of the mixing chambers 2. The bottom of the box or receptacle 30 is secured to hinges 33 hinged or pivoted at 34. Extending rearwardly from the said hinges are arms 38 carrying weights 39 secured by means of binding screws 40. These weights may be adjusted to different positions upon the said arms 38 and held in such position by means of the binding screws 40. The weights 39 tend to hold the bottom of the box or receptacle 30 in closed position, as is indicated in Fig. 1 of the drawings. At the center of one end of the bottom of the box 30 a hook-like member 45 is provided which is adapted to engage the hooked or angular end of a rod or bar 46 which extends through a bracket 47 secured to the side of the box or receptacle 30. The opening through the bracket 47 and through which the said rod or bar 46 extends is elongated in order that the said rod or bar may have a slight rocking motion for the purpose hereinafter set forth. Surrounding the rod or bar 46 is a coiled spring 50 the lower end of which rests upon the bracket 47 or more correctly speaking upon a washer 51 upon the said bracket. The opposite end of the said spring is seated against a wing nut 52. The tension of the spring may be adjusted or varied by turning the said nut 52 so as to move the same inwardly or outwardly upon the rod or bar 46. As the stone is discharged into the box 30 its weight is transmitted through the parts or members 45 and 46 to the spring 50 and by compression of the latter causes downward movement of the said rod or bar 46. Secured to the rod or bar 46 is a positioning member 55 which is bifurcated or slotted forming arms or projections 56 and 57 between which a rod 58 is located. The rod 58 is revolubly supported upon brackets 60 secured to the adjacent wall of the stone receiving box 30. The lower side of the arm or projection 56 constitutes a cam surface which contacting with the rod 58 causes lateral movement of the rod or bar 46 when it is depressed or moved downwardly as by means of the weight of the stone in the box 30. The lateral movement of the said rod or bar 46 is toward the box 30 so as to disengage or disconnect its hooked lower end from the hooked part or member 45. When the hooked part or member 45 is disengaged from the lower hooked end of the bar 46 the spring 50 causes immediate upward movement of the said rod. The arm or projec-

tion 57 is inclined upwardly and its upper surface or edge engages the lower side of the rod 58 and acts as a cam to cause lateral movement of the rod 46 to the right into such position that after the stone is discharged from the box 30 and the bottom of the said box returns to normal closed position under the influence of the weights 39 the hooked parts 45 will engage the lower hooked end of the said rod as illustrated in Fig. 1 of the drawings.

It will be observed that the end of the hooked part 45 is beveled as indicated at 61 while the lower end of the hooked part 46 is beveled as indicated at 62 so that the said parts will readily slide over each other for the purpose of moving into engagement as shown in Fig. 1 of the drawings.

In order that portions of the liquid binder in the receptacle 3 may be admitted into the mixing chamber 2 whenever stone is discharged from the stone receiving box 30, I have provided openings 70 through the sides of the mixing chamber which are closed by valves 71. The valves are mounted in bearings 72 and may be formed integrally with shafts 73 having crank arms 74 which are connected to the weight carrying arms 38 by means of links 75. In the construction shown I have illustrated two openings upon each side of the mixing chamber, although a different number may be employed if desired or necessary. The respective pairs of openings are arranged in substantial alignment on the outside of the wall of the mixing chamber. In order that it may not be necessary to have the bearings for the valves in exact alinement I have provided universal joint connections at 77 as shown in Fig. 1 of the drawings. It will be understood that the size of the openings through the sides of the mixing chamber may be increased or decreased if desired. The opening through the valves 71 corresponds to the openings in the sides of the mixing chamber. Normally, that is to say, when the bottom of the stone receiving box is closed, the valves 71 are closed; that is the openings through the valves are out of alinement with the openings 70 through the sides of the mixing chamber. When the arms 38 are raised at the time the bottom of the stone receiving box drops in order to discharge the stone therefrom, the connecting links 75 are moved upwardly and turn the valves so as to bring the openings therein into alinement with the openings through the sides of the mixing chamber and thus permit the liquid binding material to enter the mixing chamber 2 from the receptacle 3.

It is desirable that means be provided for adjusting the extent of the openings 70 through the sides of the mixing chamber.

For this purpose I have provided adjustable plates 80 which are held in place by guides

81. Rods 82 are connected to the upper edges of the plates 80 and extend through brackets 83 at the upper edges of the mixing chamber. The upper ends of the rods are screw-threaded and are provided with wing nuts 84. By turning these nuts the plates connected to the rods may be adjusted toward and away from the openings 70 in the sides of the mixing chamber. In Fig. 4 of the drawings I have shown an opening 70 having one of the plates 80 extending partially over the same. It will be understood that by adjusting the nut at the upper end of the rod 82 connected to the said plate the latter may be lifted or lowered as desired so as to open or close the opening 70.

In the operation of my machine, the stone is discharged from the conveyer 31 into the stone receiving box 30. The spring 50 and the weights 39 on the arms 38 are so adjusted that when a predetermined amount of stone by weight is received into the said box the lower hooked end of the rod or bar 46 is disengaged from the hooked part or member 45. The weight necessary to cause disengagement of the part 46 from the part 45 may be varied by varying the tension of the spring 50 and by varying the position of the weights 39 on the arms 38. The bottom of the box 30 turns about its pivots 34 to discharge the stone therefrom into one end portion of the mixing chamber 2. As the bottom moves downwardly about its pivot 34 the arms 38 are lifted and cause upward movement of the links 75 connected to the crank arms 74 to thus turn the valves 71 and open the same so as to permit the liquid binding material in the receptacle 3 to enter the openings 70 into the mixing chamber. It is understood, of course, that when bitumen is employed, as it usually is, a fire has been previously built in the fire box 5—6 for the purpose of melting or reducing to a liquid state the said bitumen so that it may readily flow through the openings 70. The rotation of the mixing blades 20 which are supported and carried by the shaft 15 causes a thorough mixing of the stone and the binder as has already been set forth. By reason of the fact that the planes of the blades are inclined at an angle to their axis of rotation they move the stone in the mixing chamber toward the right, having reference to Fig. 1 of the drawings, and cause its discharge at the open end of the said chamber.

One important feature of my invention consists in the provision of the space or opening 4 which extends underneath the mixing chamber 2 and connects the portions of the receptacle upon opposite sides of the said mixing chamber. This space or opening prevents direct contact of the fire in the fire box 5—6 with the bottom of the mixing chamber 2 and thus prevents scorching or burning of the material in the said mixing

chamber. Such scorching or burning is objectionable for the reason that it destroys the binding properties originally possessed by the bituminous binder.

5 Having thus described my invention, I claim:—

1. A weighing machine comprising a stone receiving box having a pivoted bottom, a spring sustained rod in engagement with
10 the said bottom at one edge thereof to support the same while stone is being delivered into the said box, a cam carried by the said rod, and means with which the said cam is in contact to cause lateral movement of the
15 said rod when it is depressed by the weight of the stone in the box to disengage the same from the said bottom to permit pivotal movement thereof to discharge the stone from the said box.
- 20 2. A mixing machine comprising a mixing chamber, a stone receiving receptacle located above said mixing chamber, the said receptacle having a pivoted bottom and the said bottom having a hook-shaped part or
25 member projecting therefrom, movable means for engaging the said hook-shaped member, means for causing lateral movement of the said movable means to disengage it from the said hook-shaped part or
30 member whereby the said bottom is released and the stone discharged from the said receptacle into the said mixing chamber.
3. A mixing machine comprising a mixing chamber, a stone receiving box located
35 above said mixing chamber, the said box having a pivoted bottom and the said bottom having a hook-shaped part or member projecting therefrom, spring-supported means for engaging the said hook-shaped member,
40 means for causing lateral movement of the said spring-supported means to disengage it from the said hooked part or member, whereby the said bottom is released and the stone discharged from the said box into the
45 said mixing chamber.
4. A mixing machine comprising a mixing chamber, a stone receiving box located above said mixing chamber, the said box
50 having a pivoted bottom and the said bottom having a hook-shaped part or member projecting therefrom, spring supported means for engaging the said hook-shaped member, means for causing lateral movement of the said spring-supported means to
55 disengage it from the said hooked part or member, whereby the said bottom is released and the stone discharged from the said box into the said mixing chamber, and means

for returning the bottom of the said box to normal position.

60 5. A mixing machine comprising a mixing chamber, a stone receiving box located above and adapted to supply stone to said mixing chamber, the said box having a pivoted or hinged bottom which bottom is provided with a catch member, a spring supported member adapted to engage the said
65 catch member and support the bottom of the said box, a cam member carried by the said spring-supported member, and a roller or
70 guide with which the said cam member is in engagement to cause movement of the said spring supported member laterally when it is depressed by the weight of the stone in
75 the said box to disengage the said member from the said catch to discharge the stone from the said box into the said mixing chamber.

6. A machine for mixing crushed or broken stone with a binding material comprising a stone receiving receptacle having
80 a hinged or pivoted bottom, a spring-supported catch member having detachable connection with the said bottom, means for varying the tension of the said spring support, arms connected to the said door and
85 extending upon the opposite side of its pivots or hinges from the said catch member, weights adjustably secured to the said arms, and means for disconnecting the said catch
90 member from the said bottom to permit it to move about its hinges or pivots to discharge the stone from the said receptacle, which means is actuated by the weight of the stone
95 in the said receptacle.

7. A weighing machine comprising a stone receiving box having a hinged or pivoted
bottom, a movable catch member for engaging a part on said bottom for supporting it, the said catch member having a beveled surface which engages a beveled surface carried by said bottom when the latter moves
100 from open to closed position whereby the said catch is temporarily displaced from normal position to permit the bottom to
105 close, and means whereby the weight of the stone in said box causes the disengagement of said catch to permit the said bottom to open.

In testimony that I claim the foregoing as my invention, I have hereunto signed my name this 28th day of April, A. D. 1910.

JOSEPH PRICE.

In the presence of—

IRVIN SHUPP, Jr.,

CYRUS N. ANDERSON.