Oct. 26, 1943. R. W. BAILY 2,332,688

APPARATUS FOR MAKING CONCRETE ROADWAYS

Original Filed Sept. 18, 1939

Fig. 1.

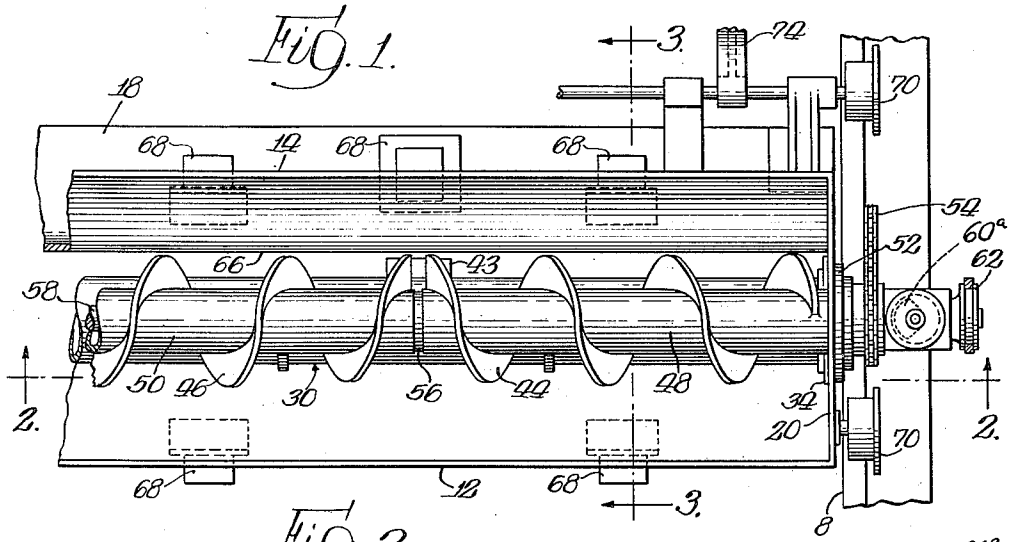


Fig. 2.

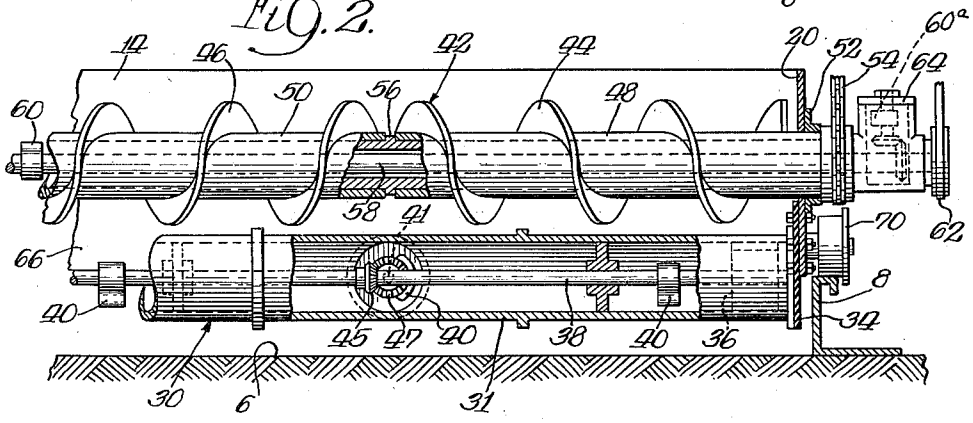
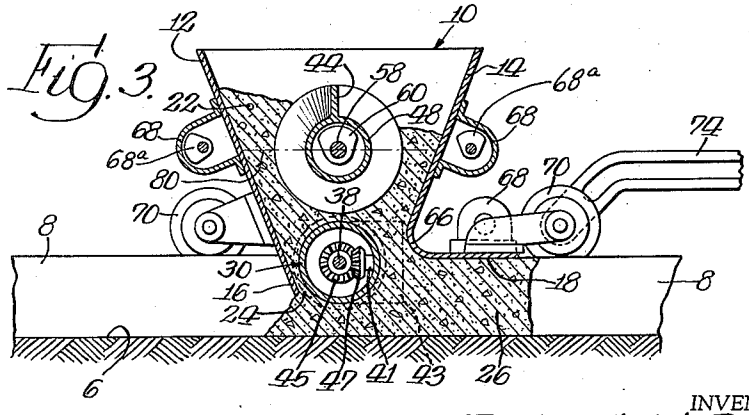


Fig. 3.



INVENTOR.
Robert W. Baily.
BY Bair & Freeman
Atty's.

Patented Oct. 26, 1943

2,332,688

UNITED STATES PATENT OFFICE

2,332,688

APPARATUS FOR MAKING CONCRETE ROADWAYS

Robert W. Baily, Narberth, Pa.

Original application September 18, 1939, Serial No. 295,530. Divided and this application August 11, 1941, Serial No. 406,364

3 Claims. (Cl. 94—46)

My invention relates to an apparatus for striking off or leveling the surface of a concrete or similar types of roadways and vibrating the latter to cause the concrete to become exceedingly dense and homogeneous and rid it of entrapped air and water.

It is one object of this invention to provide a new and improved apparatus for striking off the surface of a concrete roadway through the use of a strike-off board or screed and intensively vibrating the concrete by mechanism carried by the screed so that the concrete becomes a dense practically fluid mass readily flowing to places of least resistance and causing the elimination of air and water entrapped in the concrete.

A further object of my invention is to provide means in the bins or hoppers for conveying the material longitudinally in the bins, from the ends toward the intermediate zone, from one end toward the opposite end, or from the intermediate zone toward either end, so that the material as received in the bins may be kept uniformly disposed over the whole length of the bins, or concentrated at any locality or localities in the bins at the will of the operator.

Another object of my invention is to provide means to prevent the segregation or separation of the material before and during treatment.

This application is a division of my copending application, Serial No. 295,530, filed September 18, 1939, which issued November 4, 1941, as Patent No. 2,261,491.

Referring to the accompanying drawing:

Figure 1 is a top plan view of a preferred form of my apparatus.

Figure 2 is a vertical cross sectional view taken on the line 2–2 of Figure 1.

Figure 3 is a vertical cross sectional view taken on the line 3-3 of Figure 1.

In the embodiment chosen to illustrate my invention, there is shown a subgrade 6 which has been prepared to receive a material such as concrete. On the subgrade are positioned forms 8 of the usual kind secured to the subgrade by conventional means in order to confine the material to a selected portion of the subgrade such, for example, as a roadway.

For depositing the material I provide a bin or hopper 10 provided with a front wall 12 and a rear wall 14. It will be noted that the front wall has a lower portion 16 extending below the top of the form 8 which is below the top of the finished level of the material to be placed. The rear wall 14 is bent around so that a screedlike portion 18 trails behind the bin. The screed as here shown is level with the top of the forms which, at the same time, determines the finished level of the material being placed. The bin also is provided with ends 20, only one end of which is shown in Figures 1 and 2. The other end, of course, is the same in construction except that the parts are reversed.

The material 22 which is to be placed on the subgrade is deposited into the top of the bin 10 which carries along a substantial quantity of it so that the bin will always be partly full. The material passes down through the bin and out through an orifice 24 at the bottom of the bin from whence it spreads to the subgrade. As the bin passes along, a portion 26 of the material under the screed will completely fill the space on top of the subgrade and the under side of the screed.

To assist in placing the material on the subgrade as it emerges from the orifice 24, there is provided a vibrator generally designated by the character 30 contained within a housing 31. The housing may be located anywhere with relation to the bin 10 but for convenience, as shown in Figure 3, the housing has been located adjacent the lower orifice 24 of the bin 10 and is sustained by end 20 of bin 10 by means of elastic connections 34 which serve to dampen the transmission of vibrations from housing 31 to bin 10 or other parts of the mechanism or to the forms or other structures associated with the material, and to allow free vibration of vibrator 30. The housing 31 is associated with rotative means 36 and a rotating shaft 38 which carries out-of-balance weights 40. A stub shaft 41 suitably journaled in a casing 43 is driven by bevel gears 45 and 47 and rotates a similar weight 40.

Above housing 31 or elsewhere as convenient, I provide a conveying mechanism 42 which for convenience I have shown as twin screws 44 and 46, arranged on their hollow shafts 48 and 50. Shaft 48 extends through bin end 20 running in gland 52 and is revolved in either direction by a power mechanism 54. Gland 52 may be of rubber and thus be resilient to afford vibration damping means for damping the transfer of vibrations to carriage parts, forms, or other structures associated with the material. Hollow shaft 50 is rotatably associated with shaft 48 at 56 and is rotated by means not shown, in a manner similar to power means 54. Shafts 48 and 50 may be provided with shafts 58 carrying out-of-balance weights 60 rotated by rotative means 62. Shafts 48 and 50 may be provided with vibrating mechanisms 64 and weights 60a. A rear wall 14,

through a rounded portion 66, is associated with the screed 18. Walls 12 and 14 and ends 20 of bin 10 and the screed 18 may be associated with vibration mechanisms 68 and weights 68a, connected in turn with a suitable power means not shown. Wheels 70 may be provided for engagement with the forms 8 for affording a carriage for bin 10 and its associated apparatus. A drive bracket 74 may be propelled by a suitable motive power, not shown herein. Elastic means, likewise not shown, may be interposed between the bin 10, the screed 18, and the form 8 for damping the transmission of vibrations from the bin 10 or the screed 18 or associated devices, to carriage 70 or form 8. In lieu of carriage 70 as shown, other carriage or propulsion means not shown may be provided. Screed 18 may be arranged not to make contact with the form.

In the operation of the apparatus described, I show in Figure 3 the material 22 to be treated deposited in the bin 10 with its upper level preferably maintained at an elevation above a portion 80 of screws 44 and 46. Should the material be not satisfactorily disposed through the length of bin 10, it may be conveyed longitudinally of the bin in either direction or in both directions by proper manipulation of screws 44 and 46. If desirable, the screws 44 and 46 may impart vibrations to the material to render it plastic, or to prevent segregation, or to expel entrapped air and surplus water, to condense and improve the material, or to cause particles of the material to move relatively to each other. These objects may be supplemented or assisted or otherwise attained by imparting to the material, vibrations from the walls of the bin 10 or from the screed 18 or from the vibrator 30 in the lower orifice 24 of the bin or by any combination of manipulation of the parts.

The vibrator 30 may be located below and before the orifice 24 of bin 10, or before, below or behind screed 18.

In the arrangement shown, the material 22 will, by force of gravity assisted by vibrations, pass downwardly through bin 10, past screws 44 and 46, thence past vibrator 30 and be deposited on supporting medium or subgrade 6. The material 22 shown at location 26 will then be acted upon by the screed 18 either to vibrate the material or to strike it off to approximately the desired surface elevation, or both.

While I have indicated the apparatus as a unitary structure, I may divide it into a plurality of parts, whereby the bin or its associated devices may be operated separately from the other parts of the apparatus, or in conjunction with other equipment. Likewise any part of the apparatus may be arranged for adjustment in any direction, whereby the distance between the forms 8 may be varied or the finished surface of the material may be left at any elevation or having any desired contour or crown, and whereby the material may be constructed in a plurality of strata or whereby a variety of materials may be deposited simultaneously or in any sequence.

It will be understood that the vibrating mechanism herein described may be supported on a carriage such as here shown or on pavement or other machines, by vibration damping means such as are illustrated in my Patents No. 2,018,294, No. 2,094,910 and No. 2,110,413.

I claim as my invention:

1. A vibrating apparatus for placing composite material and striking off said material to a finished grade level comprising an elongated bin having sides and end walls for holding and delivering the material, said bin having a discharge opening at the lower side extending over the surface on which the material is to be placed, supporting means for supporting and advancing the bin laterally relative to its long dimension across said surface, a conveyor in the bin comprising a helical rotating member extending from end to end thereof for passing material endwise within the bin, said rotating member being hollow and having a rotating shaft journaled therein carrying off-center weights comprising a vibrating member adapted to vibrate said conveyor, and power means connected to said vibrating member actuating said member during the placing of said material.

2. In an apparatus for making concrete roadways and the like, an elongated hopper having an elongated bottom orifice extending lengthwise of the hopper, a conveyor in the upper part of the hopper for moving material lengthwise of the hopper, an elongated vibrator arranged in the path of material passing through the orifice, means for vibrating the conveyor, and means for vibrating the hopper walls.

3. In an apparatus of the kind described, an elongated hopper having an elongated bottom orifice, conveyor means in the upper part of the hopper for moving material lengthwise of the hopper, means for vibrating the conveyor so that material packed into the hopper may be simultaneously distributed lengthwise of the hopper and internally vibrated.

ROBERT W. BAILY.