In order to mix powdered materials by means of a series of individual containers or bins which serve for the storage of such materials, for instance raw cement meal, cement or similar substances, it has heretofore been the practice to take the material from the several containers or bins by means of suitable discharge devices, conveyor worms, elevators and the like and to thereupon mix the different materials with each other. Plants of this kind are very expensive, require considerable power for operating the same and in addition to this the expenses for maintenance of the plant are relatively very high.

The method of and apparatus for mixing powdered materials according to my invention entirely avoids these disadvantages. Principally my invention consists therein that emptying of the several containers or bins and mixing of the several materials contained therein is accomplished by means of compressed air. More particularly, my invention consists in connecting the several containers or bins operating under pressure by means of pipe systems which serve for conveying the material and for introducing compressed air into said containers. In this manner the contents of a part of the containers may be mixed with the contents of another part of the containers by the aid of proper adjusting means and the material thus mixed may thereupon be properly conveyed as desired.

The accompanying drawing shows a bin comprising a plurality of containers which are operated according to my invention, Fig. 1 being a front view and Fig. 2 a top view of said bin. In the drawing the several containers forming part of the bin are designated by the reference numerals 1, 2, 3, 4, 5, 6, 7 and 8. These containers, which may consist of sheet-metal or re-inforced concrete, are closed up completely air-tight. Through a discharge device 9 provided at the under end each container may be connected to the conveying pipe 11 by opening the valves 10. The discharge devices 9 may be of any desired kind and may for instance consist of double worms, compartment-wheels or plain supply-aprons. By reversing the valves 12 and 13 the conveying conduit 11 may now be connected at will with each of the containers 1, 2, 3, 4, 5, 6, 7 or 8. By means of the connecting pipe 17 with the valve 19 therein every desired container may thus be put under pressure during conveying the material, by utilizing the back pressure which will arise in said conveying conduit. Simultaneously every individual container may be put under pressure by means of the pressure-air conduit 15 with the valves 16 connected thereto.

The mode of operation of a bin constructed according to my invention, for instance, will be as follows: If it is desired to mix the material in the containers 1, 3 and 6 with the material in the containers 4, 5 and 8, the material contained in the containers 1, 3 and 6 is loosened or an emulsion made thereof by means of compressed air or any other known devices. The apparatus used for this purpose is of well-known construction and therefore not indicated in the drawing. After the structure of the material has been loosened as indicated, the said three containers are connected with the pressure-air conduit by opening the valves 16 and are now put under pressure from above. Thereupon the valves 10 are opened, thus establishing a connection between the distributing device 9 and the conveying pipe 11, whereupon after closing the valve 20 and opening the valve 21 the contents of the three containers 1, 3 and 6 are pressed into the containers 4, 5 and 8. The material will now uniformly flow out of the containers 1, 3 and 6 into the containers 4, 5 and 8. After completed mixing of the contents of the containers the respective valves are again closed and the containers 4, 5 and 8 which now contain the completely mixed material are properly connected to the conveying pipe 11 and after closing the valve 21 and opening the valve 20 are conveyed through the conveying conduit 18 towards the place where the material is desired to be used.

I claim:

1. A method of mixing powdered materials stored in separate containers which comprises
applying air under pressure to one of said containers to force a portion of the material therein into a second container to mix the materials, and thereafter opening the second container to permit the air under pressure therein to discharge the mixed materials therefrom.

2. Apparatus for mixing powdered material comprising a plurality of containers in which the material is stored, means for introducing air under pressure to one of said containers, means for establishing connection between said container and a second container to cause the material to be transferred to said second container and be mixed with the material therein, and means for conveying the material thus mixed to some place of use.

3. The method of mixing powdered materials stored in separate containers, which comprises applying air under pressure to a plurality of said containers to force a portion of the material therein into a second group of containers to mix the materials, and thereafter opening the second group of containers to discharge the mixed materials therefrom.

4. Apparatus for mixing powdered material comprising a plurality of containers in which the material is stored, means for introducing air under pressure to one of said containers, means for establishing connection between said container and a second container to cause the material to be transferred to said second container and be mixed with the material therein, a conduit through which air under pressure may be caused to flow operatively associated with said second container and withdrawing the mixed material therefrom and conveying the same to some place of use, and means for equalizing the pressure of the air within said conduit and within said second container.

In testimony whereof I affix my signature.

PAUL GOEBELS.