June 29 , 1926. 1,590,542

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TAMPING MECHANISM FOR CONCRETE BLOCK MACHINES

Filed Oct. 24, 1924 2 Sheets-Sheet 1

FIG. 1

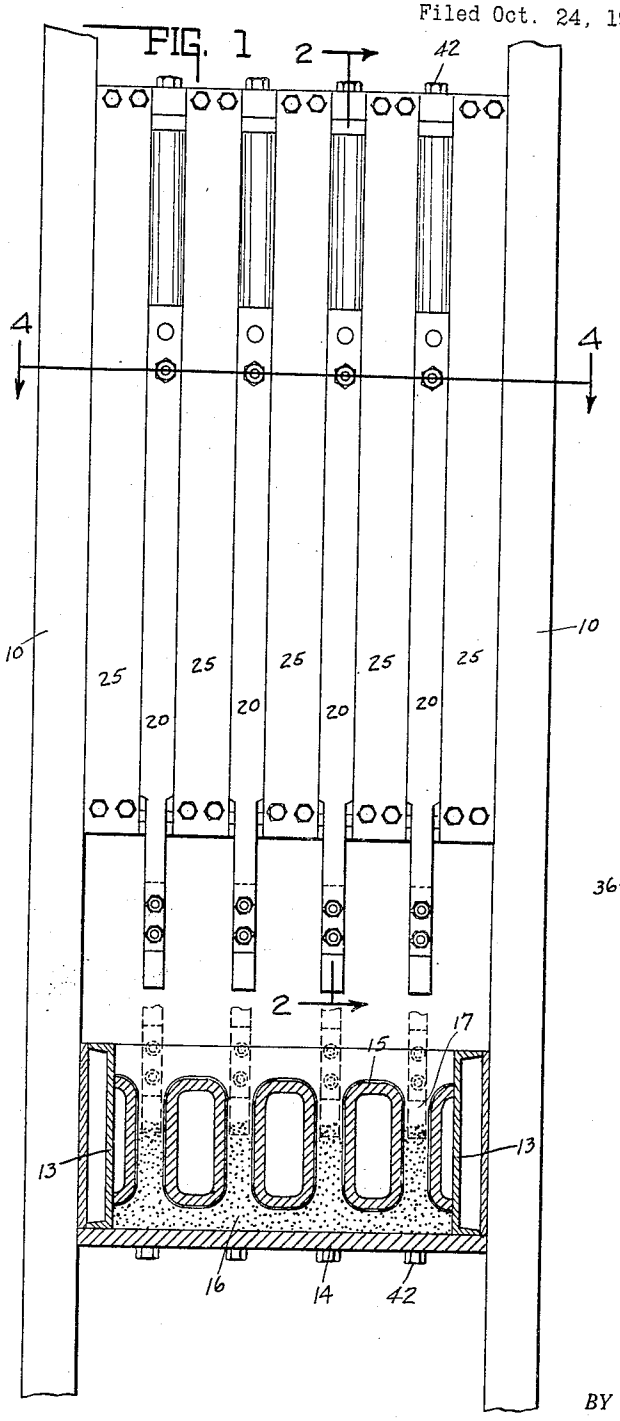
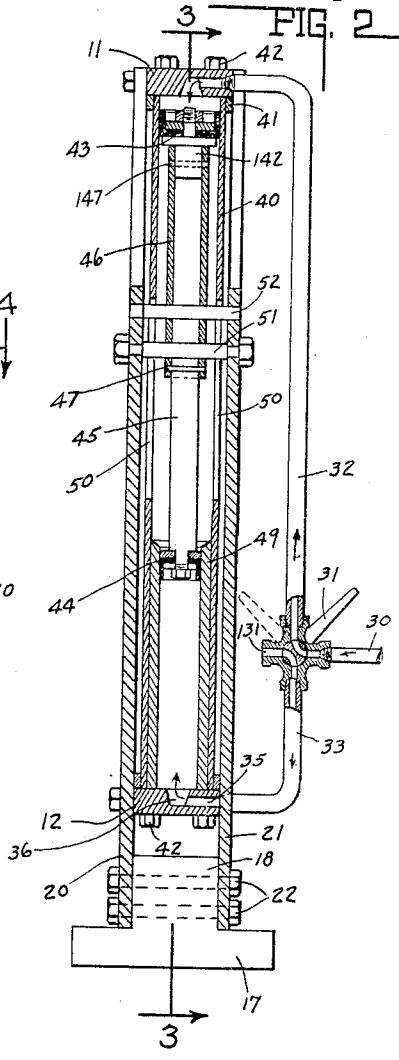


FIG. 2



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Filed Oct. 24, 1924 2 Sheets-Sheet 2

FIG. 3

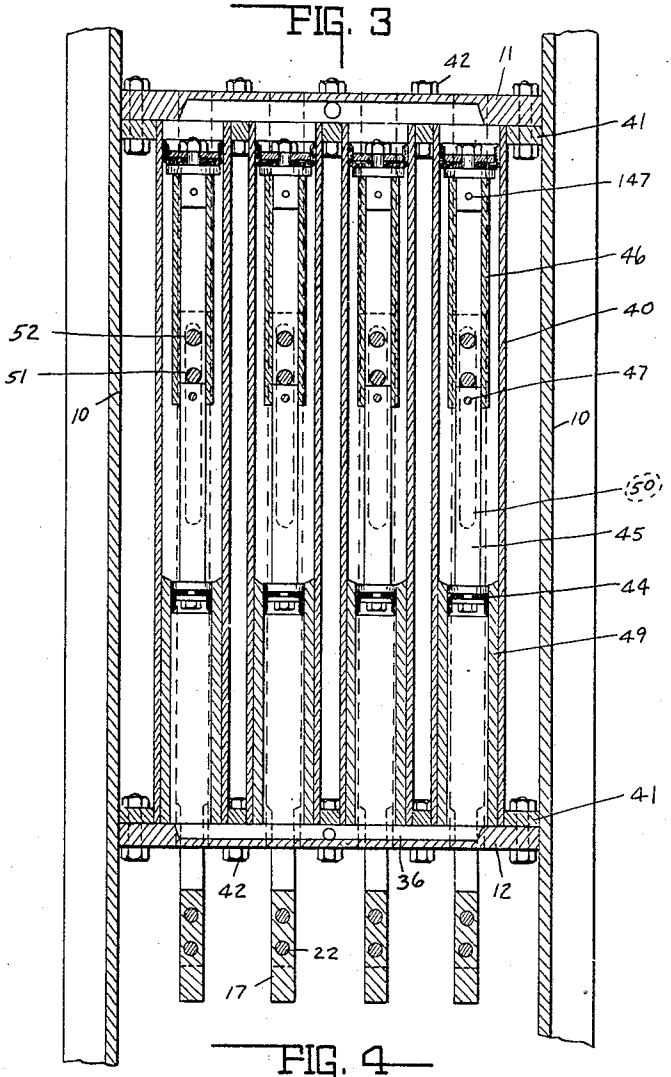
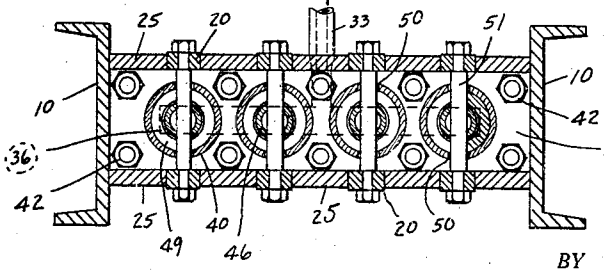


FIG. 4



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UNITED STATES PATENT OFFICE.

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TAMPING MECHANISM FOR CONCRETE-BLOCK MACHINES.

Application filed October 24, 1924. Serial No. 745,709.

This invention is an improvement in tamping mechanism for machines for making concrete blocks and the like, which enables such concrete products to be made very cheaply and so as to increase the binding effect of the cement and thus improve the quality of the product, at least in proportion to the cement used.

To the above end, fluid under pressure is employed for operating the tampers, both actuating them and lifting them, and thus not only rapid operation of the machine is enabled, but the speed can be controlled and the tamping be made very effective.

One feature of the invention consists in providing a double cylinder construction with two pistons on one piston rod construction, and having tamping bars parallel with the piston rod construction and connected therewith between the pistons. An additional feature of the invention consists in providing two tamper bars on opposite sides of the cylinder and piston construction and operatively connecting them with the piston construction by a pin or bolt extending through them. Along with this feature is the further feature of making the two cylinders of one tube and having the same longitudinally slotted on opposite sides thereof intermediate the ends of the tube or the two cylinders through which said pin or bolt extends and whereby it is guided.

Another feature of the invention consists in having one of the cylinders larger than the other, for actuating or giving the driving stroke to the tamper, the reduced cylinder being employed to lift the tamper and do the lesser work. Along with this feature is the further feature of making the two cylinders in one tube and placing a lining cylinder within one end of the tube for forming the reduced cylinder for lifting the tamper.

Another feature of the invention consists in the means for guiding the tampers, which is an important feature, because of the accurate stroke required of the tampers in passing between the cores. To this end the tampers have a pair of tamping bars, one on each side of the cylinder and piston construction, and they are guided by slots in the cylinder construction through which the connecting pins operate and are also guided by parallel plates located between the tamper bars and fitting snugly against them. This gives a long guiding or bearing means for the tamper bars and enables them to be guided at their upper ends as well as at their lower ends and for practically their entire length.

By reason of the construction of the cylinder apparatus herein the usual requirement of glands becomes unnecessary and is avoided. The fact that the two cylinders are in one tube and said tube at each end is secured to a manifold with which it is air tight and the other end of the cylinder is closed by the piston, makes glands unnecessary and simplifies the construction.

The full nature of the invention will be understood from the accompanying drawings and the following description and claims:

In the drawings, Figure 1 is a front elevation of the tamping portion of a concrete block machine, and a vertical transverse section through the mold box and cores. Fig. 2 is a vertical section on the line 2—2 of Fig. 1. Fig. 3 is a vertical section through the machine on the lines 3—3 of Fig. 2. Fig. 4 is a transverse section through the machine on the line 4—4 of Fig. 1.

In this machine there is a frame having the uprights 10 at each side, as shown. Between said lateral uprights there are manifolds 11 and 12 extending transversely of the machine and secured to said uprights. Also the mold is mounted between and operatively mounted in said frame, as shown in Fig. 1, and having end members 13 and a bottom plate 14. Cores 15 project from the rear horizontally into the mold box and are hollow and oval in cross section as shown. In the mold box there is concrete material 16 to be tamped, it being below and between and at times above the cores.

The tamping mechanism provides individual independently operating tampers with tamping heads 17 at the lower end, narrow enough to pass into the space between the cores, as shown by dotted lines in the lower end of Fig. 1. The tamper head is T-shape and the shank 18 thereof is secured between and to the lower ends of front and rear tamper bars 20 and 21 by bolts 22, as shown in Fig. 2. The lower ends of the tamper bars are reduced in width, as shown in Fig. 1, so as not to exceed the width of the tamper head 17 or the space between the cores. But the major

portion of the tamper bar is wider, as seen in Fig. 1, and both the front and rear tamper bars operate between and are guided by vertical guide bars 25. These guide bars fit snugly against the tamper bars so as to guide them in their vertical movement with great accuracy. This results largely from the great length of the tamper bars and the guide bars.

In the machine herein shown the tamper bars are operated by compressed air or other fluid under pressure coming in through pipe 30 to the four-way valve 31 from which a pipe 32 leads to the top manifold 11 and a pipe 33 leads to the lower manifold 12. The manifolds herein shown are thick plates with an inlet 35 leading to a chamber 36 extending transversely of the machine.

Between the manifolds there is a series of cylinder tubes 40. Said cylinder tubes are secured to a cross plate 41 and also they are secured to the manifolds by the bolts 42 and the parts welded so as to make tight joints between the cylinder tubes and manifolds. In each cylinder tube there is an upper or driving piston 43, and a lower or lifting piston 44. These pistons are connected by a piston rod construction consisting of a rod 45 carrying the lower piston 44 and extending into a tube 46 which carries the upper piston. Said two piston members are secured together by pins 47. The piston rod construction is of such length as to permit the piston to reciprocate in the cylinder tube for about a third of the length of said cylinder tube in each direction, so that the upper third of said cylinder tube constitutes a cylinder for the upper piston 43 and the lower third contains an internal cylinder lining 49 which forms a cylinder for the lower piston 44.

The cylinder tube 40 between the limits of stroke of the two pistons 43 and 44 has in opposite sides vertical guide slots 50 through which a bolt 51 and a pin 52 extend from the tamper bars 20 and 21, as shown in Fig. 2. Said bolt and pin extend diametrically through the piston tube 46 and furnish connections between the piston construction and the tamper bars, whereby the former actuates and moves the latter. The slots 50 are just wide enough to permit the extension through them of the bolt 51 and pin 52 so as to serve as guides for the vertical movements of said pins or bolts and cooperate with the guide plates 25 in the fine and accurate guiding of the tamper bars and tampers in their vertical movement, whereby the tampers will always be truly centered between the cores and will transversely fill the space between the cores, as seen in Fig. 1, and will not hit or interfere with the cores. This feature of the construction is a very important one. When the core is actuated downwardly, as shown by dotted lines in Fig. 1, it acts powerfully as a tamper because its width is substantially the same as the space between the cores.

The full lines in Figs. 1 and 2 show the tampers all in elevated position. As soon as the four-way valve 31 has been moved to its present position, shown by full lines in Fig. 2, fluid under pressure comes through pipes 30 and 32 into the top manifold and the upper cylinder portions of the cylinder tubes and actuates and drives the pistons 43 downward, which force the tampers down to the dotted line position shown in Fig. 1. However, each tamper is individual and independent from the others and each will go as far as the material beneath it will permit and they will go with great force if the fluid pressure is sufficient. The upper cylinder sections are relatively large in diameter and, therefore, have relatively great power. When the four-way valve 31 is moved to the dotted line position shown in Fig. 2, the pipe 32 will cease to be in communication with the pipe 30 and the latter will be then in communication with the pipe 33 through which fluid under pressure will go to the manifold 19 and supply fluid under pressure to the lower cylinder sections of the cylinder tubes and force the pistons 44 upward and thereby lift the tampers from the tamping position shown by dotted lines in Fig. 1 to the full line position shown in Figs. 1 and 2.

The foregoing operation is repeated as desired for effecting the tamping, but the tamping efficiency is so great that usually about two strokes of the tampers in each tamping operation will be sufficient; that is, two strokes when the mold is half full, two when it is full and two after the finish plate, not here shown, has been placed upon the mold, as is well known in the art.

The piston 43 is held in place on the piston tube 46 by a shank 143 and a pin 147. In the four-way valve there is an exhaust port 131 to permit the reciprocation of the pistons, as it is alternately in communication with pipes 32 and 33.

The invention claimed is:

1. Tamping mechanism including two cylinder construction adapted to be actuated by fluid under pressure, a piston rod construction, a tamper head, tamper bars extending from said tamper head to opposite sides of the piston rod construction, and means for securing the tamper bars and piston rod construction together.

2. Tamping mechanism including two cylinders for fluid under pressure, one for actuating the tamper and one for lifting the same, a single piston rod construction for the two cylinders, a piston on each end of said rod in the two cylinders respectively, a tamper, tamper bars extending from said tamper along opposite sides of said cylin-

ders, and means for connecting said bars to the piston rod construction about midway between the pistons.

3. Tamping mechanism including a tamper, and means for operating the same consisting of a cylinder tube longitudinally slotted between its ends on opposite sides thereof, a piston in each end of said tube, a piston rod construction connecting the pistons and short enough to permit a reciprocation thereof, means for applying fluid under pressure to the ends of the cylinder tube for alternately operating the pistons, a pair of tamper bars connected with the tamper and extending on opposite sides of said tube, and means extending through said slots for connecting the tamper bars with the piston rod construction about midway between the pistons.

4. Tamping mechanism including a series of tampers, a series of cylinder tubes longitudinally slotted between their ends, there being one tube for each tamper, a manifold at each end of the series of cylinder tubes, a piston in each end of each cylinder tube, a piston rod construction connecting the pistons in each cylinder tube and short enough to permit reciprocation thereof, means for alternately introducing fluid under pressure in the manifolds, and means extending up from each tamper beside said tube and connected with the piston construction about midway between the pistons.

5. Tamping mechanism including a series of tampers, and means for operating the tampers consisting of a cylinder tube for each tamper which is longitudinally slotted between its ends on opposite sides of the tube, a manifold secured to each end of the series of cylinder tubes, a piston in each end of each cylinder tube, a piston construction connecting the pistons in each cylinder tube and which is short enough to permit reciprocation thereof, means for alternately introducing fluid under pressure into the manifolds, a pair of bars extending from each tamper along opposite sides of each cylinder tube, and means extending through said slots for connecting said tamper bars with the piston rod construction about midway between the pistons.

6. Tamping mechanism including tampers, and means for operating the tampers consisting of a frame having longitudinal side bars, a manifold secured to each end of said side bars, a series of cylinder tubes in said frame with their ends secured to said manifolds and longitudinally slotted intermediate their ends, a piston in each end of each cylinder tube, a piston rod construction connecting said pistons and short enough to permit reciprocation thereof in said tube, means for introducing fluid under pressure alternately into the manifolds, bars extending from the tamper along side the cylinder tubes and between said side bars, and means extending through said slot for connecting the tamper bars with the piston rod construction about midway between the pistons.

7. Tamping mechanism including a tamper, and means for operating the tamper consisting of a cylinder tube longitudinally slotted between its ends, a restricting tube in one end portion of said cylinder tube for reducing the cylinder at such end, a relatively small piston in the reduced end of said cylinder tube and a correspondingly large piston in the other end thereof, a piston rod construction connecting the two pistons, means for introducing fluid under pressure alternately into the ends of the cylinder tube for reciprocating said pistons, and means for connecting the tamper to the piston rod construction about midway between said pistons.

8. Tamping mechanism including a tamper, and means for operating the tamper consisting of two cylinders in alignment, one of greater bore than the other, a piston in each cylinder suitable for the bore thereof, a piston rod construction connecting the two cylinders including a tube connected to the piston in the larger cylinder, a rod connected with the piston in the smaller cylinder and extending into said tube and secured thereto, means for introducing fluid under pressure alternately into said cylinders, and means for connecting the tamper to the piston rod construction about midway between the pistons.

9. Tamping mechanism including a tamper, and means for operating the tamper consisting of two cylinders in alignment, one of greater bore than the other, a piston in each cylinder suitable for the bore thereof, a piston construction connecting the two cylinders including a tube connected to the piston in the larger cylinder, a rod connected with the piston in the smaller cylinder and extending into said tube and secured thereto, means for introducing fluid under pressure alternately into said cylinders, a pair of tamper bars connected with the tamper and extending up on opposite sides of a cylinder, and means extending through the tamper bars and said tubular portion of the piston rod construction and about midway of the two pistons.

10. Tamping mechanism including a tamper, and means for operating the tamper consisting of a cylinder tube longitudinally slotted between its ends on opposite sides thereof, a piston in each end of the cylinder tube, a piston rod construction connecting said pistons which is short enough to permit the reciprocation, means for supplying fluid under pressure alternately to the ends of said cylinder tube, a pair of bars extending with the tamper and extending along side the cylinder tube, and bolts ex-

tending through said tamper bars and the slots in the cylinder tube and connected with said piston construction about midway between the pistons, said bolts being substantially as wide as said slots, whereby the tamper will be actuated in its movements.

11. Tamping mechanism including a tamper, and means for operating the tamper consisting of a cylinder tube longitudinally slotted between its ends on opposite sides thereof, a piston in each end of the cylinder tube, a piston rod construction connecting said pistons which is short enough to permit the reciprocation, means for supplying fluid under pressure alternately to the ends of said cylinder tube, a pair of bars extending with the tamper and extending along side the cylinder tube, two bolts extending through said tamper bars and the slots in the cylinder tube and connected with said piston construction about midway between the pistons, said bolts being substantially as wide as said slots, and rigid guide plates on each side of each tamper bar and in contact therewith, whereby the tamper will be accurately guided.

12. Tamping mechanism including a plurality of tampers, and means for operating and controlling the operation of the same including a cylinder for operating each tamper by the use of fluid under pressure, a tamper bar extending up from each tamper beside said cylinder, a piston in said cylinder, a piston rod construction connected with said tamper, and guide plates on each side of each tamper bar and engaging the same for accurately guiding the vertical movement thereof.

13. Tamping mechanism including a frame consisting of upper and lower manifolds, parallel plates spaced apart and secured on each side of said manifolds, a cylinder mounted on said frame for each tamper, a piston therein, a piston rod, means for introducing fluid under pressure alternately into the manifolds, a tamper under each cylinder, a pair of tamper bars extending upwardly therefrom on opposite sides of the cylinder and between said frame plates, and means for connecting the tamping bars to the piston rod, said frame plates engaging both lateral edges of each tamper bar in order to vertically guide the same accurately.

14. Tamping mechanism including a series of tampers, a cylinder tube for each tamper slotted on the opposite sides between its ends, cross heads for the upper and lower ends of the cylinder tubes, plates secured to said cross heads on opposite sides thereof and spaced apart so as to leave guideways between each pair of plates, pistons in each end of said cylinder tube, a piston rod construction connecting said pistons and short enough to permit of reciprocation thereof, means for admitting fluid under pressure alternately into said manifolds, a pair of tamper bars extending up from each tamper on opposite sides of each cylinder tube and fitting snugly in the space between said guide plates, bolts extending through said tamping bars, and slots in said cylinder tube and connected with the piston rod construction and being as wide as said slots, whereby said cylinder tubes and bolts will cooperate with said guide plates in the accurate guiding of the tamper.

In witness whereof, I have hereunto affixed my signature.

LAYTON M. PARKHURST.