March 16, 1943. J. KARDOS ET AL 2,313,825

TAMPING MACHINE

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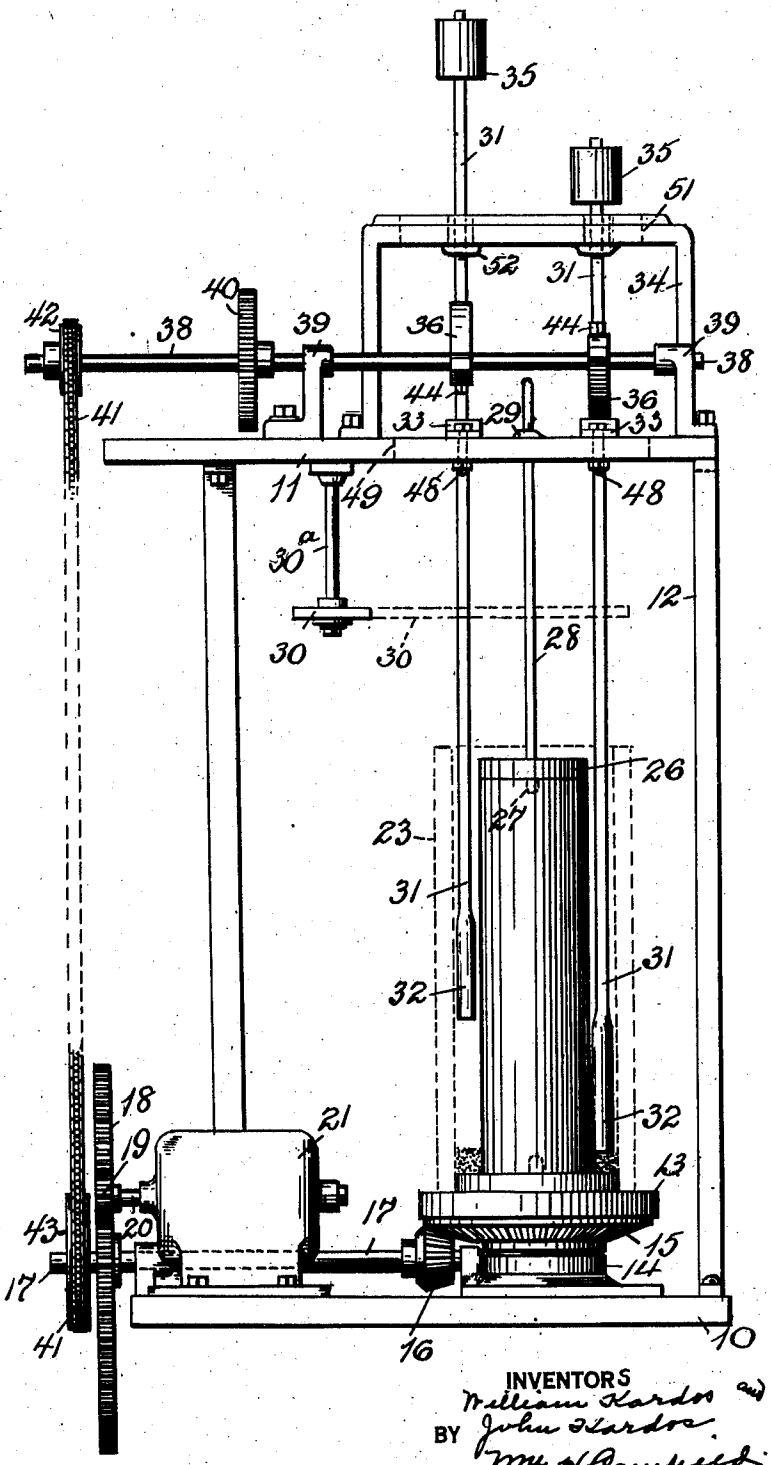


Fig. 1

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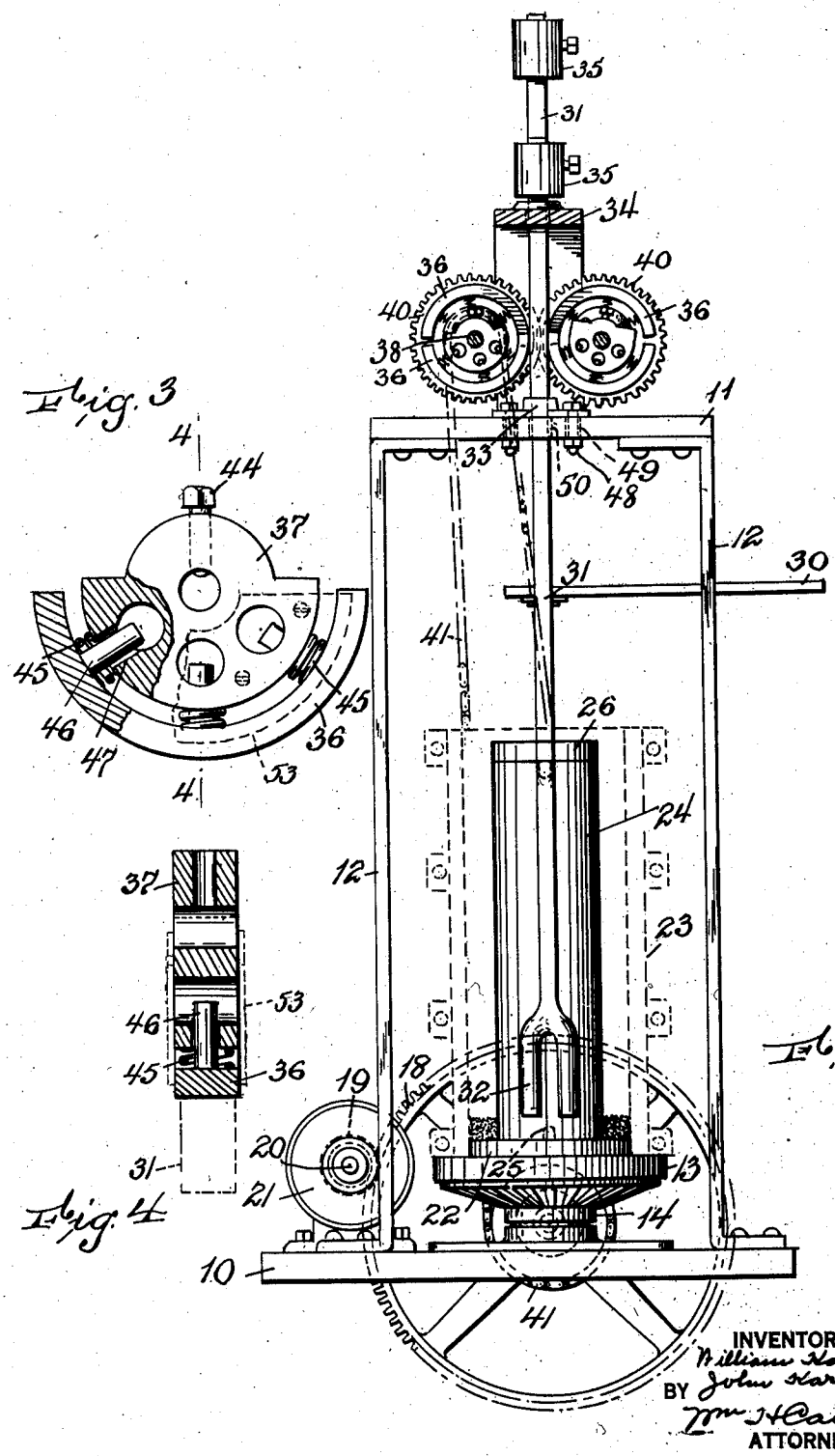


Fig. 2

Fig. 3

Fig. 4

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TAMPING MACHINE

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3 Claims. (Cl. 25—41)

This invention relates to an improved tamping machine for compressing materials inside suitable molds. The machine is of the type that raises tamping rods by mechanical means and releases the rods in order that they may fall on the material. Suitable weights can be placed on the rods for regulating the blow on the material.

The machine is particularly adapted for tamping with an even pressure or blow, that is, that the increase in height or thickness of the material in the mold does not cause any variation in the strength of the tamping pressure. The material is fed to the mold and as it is tamped the height of the tamped material rises. The present machine delivers the same pressure or blow without regard to the point of rest or starting.

This feature of the machine is important in some industries. The even and consistent tamping blows are necessary in order to produce a satisfactory product. For instance, in the manufacture of some carborundum articles, the carborundum is mixed with a suitable vehicle or binder and then compressed by tamping into tubes, tiles and other articles. The use of some of these articles is in locations where they are subjected to extremely high temperatures. These articles have heretofore been tamped by manual operation, the workman tamping by a tool held in the hands and patted or pressed on the "mix."

In the present production of these articles various factors cause an uneven tamping. Sometimes it is due to the tiring of the worker and sometimes to the consistency of the "mix."

A percentage of the articles are not satisfactory.

If tamped too lightly, a tube will have pitted or granular spots on the surface and also inside and therefore unsatisfactory for use. If tamped too heavily the mix will "jell" and be unsatisfactory when taken from the molds. It will be seen therefore that time and care are necessary for the successful manual tamping of these articles.

The present machine is designed for use on such articles. The mechanism can be adjusted to deliver the proper tamping blow for the material for a certain purpose. This tamping blow or pressure is uniform when the machine is in operation and is the same, from the bottom to the top of the mold, on the growing mass of "mix" being fed into the mold.

The invention is illustrated in the accompanying drawings in which Figure 1 is a side view of a machine embodying the invention. Figure 2 is an end view of the machine shown in Figure 1 with the top bracket in section to show the mechanism for operating the tamping rods. Figure 3 is a detail side view of a segmental rocker for raising a tamping rod, the rocker being broken away in part. Figure 4 is a section on line 4—4 in Figure 3.

The machine comprises a mold support and tamping rods which operate vertically to compress the material in the mold to the proper degree. The machine may be designed for various types of mold either movable or stationary. The drawing illustrates a machine including a rotatable mold support for the manufacture of cylindrical solid rods or hollow tubes.

The machine is provided with a suitable base 10 and a raised platform 11 supported on braces 12. The base is provided with a mold support. In the form shown the mold support is a rotatable table 13 mounted on bearings 14, usually anti-friction bearings. The table is rotated by a bevel gear 15 secured to the table 13 and a bevel gear 16 on a shaft 17. The shaft 17 is provided with a gear 18 which in turn is driven by a pinion 19 on the shaft 20 of an electric motor 21. The motor is preferably seated on the base 10. The gear mechanism may be operated by a hand crank if desired.

The table 13 is constructed to receive a suitable mold. The form illustrated comprises a flange 22 around which fits a mold 23. The mold 23 is made of separable halves and is of the usual commercial type. In the case of a tubular article that is to be tamped the core 24 is centered on the mold support and after use is adapted for removal with the article. The removable core is seated on a pin 25 and is held from wobbling by a disc 26 having a pin 27 fitting in the top of the core. The disc 26 is rotatable with the core and is centered by a rod 28 rotatable and slidable in a bearing 29 on the platform 11. The rod 28 is used for steadying the disc 26 and for lifting the disc to release the core 24 when an article is to be removed from the machine. The rod 28, the disc and the tamping rods to be hereinafter described are supported above their operative positions when a mold is to be installed or removed. This support may be in the form of an arm 30 pivoted on a post 30a and movable from the position shown in full lines in Figures 1 and 2, which is its inoperative position to the position shown in dotted lines in Figure 1. In the latter position it holds the disc 26 and the tamping rods 31 out of the way.

The tamping rod or rods are located to operate

vertically between the walls of the mold. In a circular mold the rods are placed on opposite sides of the core although only one rod may be used if desired.

The tamping rods are shown at 31 and are provided on the bottom with tamping feet 32 and of a construction to allow the mix to be distributed evenly inside the mold. The tamping feet are sometimes made removable in hand tamping tools in order to allow the replacement of feet or to install different sizes or forms of feet. The same construction can be employed in this machine.

The mix is usually fed steadily in desired quantities by hand or by a mechanical feed which feeding device is not shown in the drawings.

The tamping rods 31 extend up through the platform 11, sliding freely through bearings 33. A bracket 34 may be installed on the platform 11 for additional support for the tamping rods. Weights 35 are placed on the tamping rods 31 and are changeable to various sizes according to the nature of the "mix." The tamping rods are raised mechanically and allowed to drop freely on the "mix" in the mold. The distance of fall or drop is the same without regard to the point of rest before the rod is raised. In other words, every blow in the tamping is of the same strength.

The mechanism for raising the rods comprises a segmental rocker or rockers. The drawings show a rocker on opposite sides of each tamping rod. The rockers are shown in detail in Figures 3 and 4. Each rocker or grip 36 is mounted on a backing 37 which is mounted on a shaft 38. The machine in the drawings is provided with two shafts 38, mounted in bearings 39 and rotated in unison and in opposite directions by the gears 40.

One of the shafts is driven by a chain 41 passing over a sprocket 42 on one of the shafts 38 and over a sprocket 43 on the shaft 17. The gearing and connections are proportioned to operate the tamping rods in proper timing with the rotation of the mold.

The elevating devices for the tamping rods are arranged to raise the rods alternately and thus allow each to drop on the material. Each rocker or grip, consisting of the abutment 37 and the friction strip 36, is secured on a shaft 38. The bolt 44 shows one form of such securing means. A square shaft and hole may be used if desired. The friction strip, usually of metal, is in the form of a semi-circular piece and is spaced from the backing 37 by springs 45. Other yielding spacing means may be employed. The spring shown are suspension springs placed around studs 46 which fit loosely in the holes 47 in the base or backing 37. It will be evident that when a rocker engages a tamping rod the springs or other resilient backing insure the frictional engagement to raise the rod. This engagement continues for half the rotation of the rocker and then the rocker clears the rod and allows it to fall. As one rod falls the other begins to ascend, as the rockers are arranged to operate the rods alternately.

It will be evident that with this construction and operation a tamping rod is raised the same distance for each tamping blow and uniform tamping pressure is exerted on the mix from the beginning to the end of the tamping process. A tamping rod rises the distance each time it ascends, which distance is the length of the outer curved face of the friction strip 36.

In the event that a smaller or larger core 24 is to be used on a smaller or larger mold is to be used, the tamping rods must be either moved close together or farther apart. For this reason the bearings 33 are held by bolts 48 which are arranged in slots 49. The slot 50 permits movement of the tamping rods. The slot 51 in the bracket 34 is for the purpose of allowing the rods 31 and the bearings 52 to be moved. The rockers or grips 39 are also shifted after releasing the bolts 44 and then secured in place in a new position by again fastening the bolts 44.

It will be evident that the tamping mechanism can be used in conjunction with a fixed mold or a reciprocating mold.

Various changes can be made in the form and proportions of parts without departing from the scope of the invention.

The segmental curved strip 36 with its supporting elements provides a friction device with a limited yielding attachment due to the springs 45 or other resilient means. The limited flexibility not only provides a contact with the tamping rod without shock but also insures a firm frictional engagement. This eliminates lost motion and provides a positive smooth engagement for raising the tamping rod. Side plates 33 may be secured on an abutment 37 and extended to steady the curved strip 36 against excess side movement of the strip and insure more positive contact with the tamping rods.

We claim:

1. A tamping machine comprising a mold support, a vertically movable tamping rod above the mold support, a rotatable curved segmental strip for intermittently engaging the side of the rod to lift the rod, a support for the strip comprising an abutment and a rotating shaft on which the abutment is secured, the strip being spaced from the abutment and resilient means in the space for yieldingly holding the strip in contact with the rod.

2. In a tamping machine, a tamping rod, a mechanism for raising and then releasing the tamping rod, said mechanism comprising a shaft, an abutment secured on the shaft and having a curved outer face, the face having radially arranged openings, a curved strip spaced from the face of the abutment, fingers on the inner face of the strip and extending loosely into the openings, and springs between the strip and the abutment whereby the rotation of the shaft causes an intermittent engagement of the strip with the tamping rod.

3. In a tamping machine, means for operating a tamping rod, said means comprising a rotary shaft, an abutment on the shaft, the abutment having a curved face and recesses in the curved face thereof, a curved segmental strip spaced from the curved face of the abutment and having fingers projecting inwardly into the recesses of the abutment, springs surrounding the fingers and yieldingly holding the strip in place whereby the strip has a limited rocking motion on the abutment and intermittently engages the tamping rod when the shaft is rotated.

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