Feb. 8, 1927. 1,616,816

G. C. MARTIN

PACKER HEAD FOR PIPE MOLDING MACHINES

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Fig. 1.

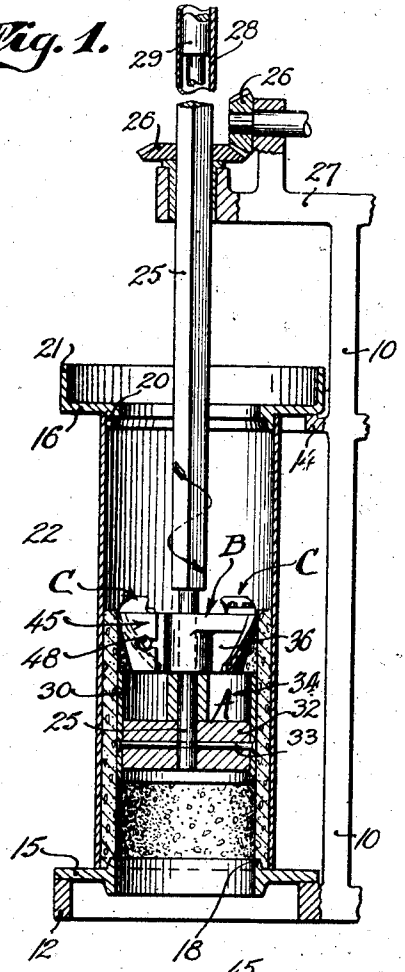
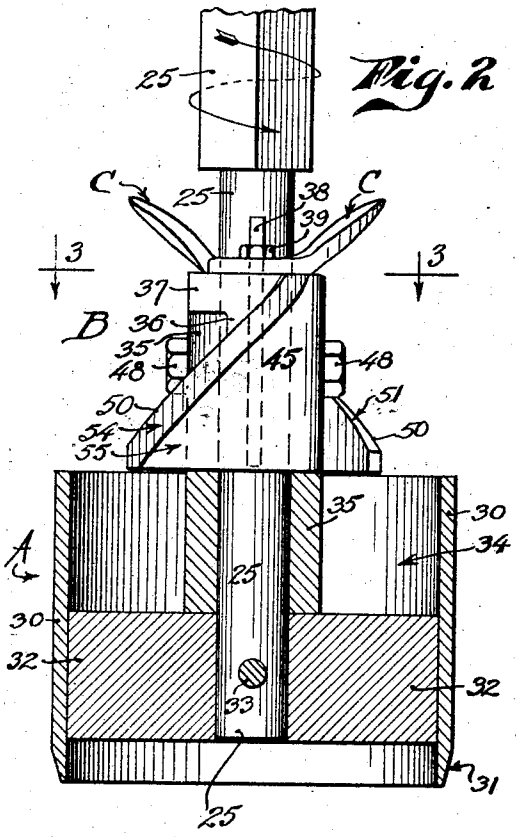


Fig. 2.



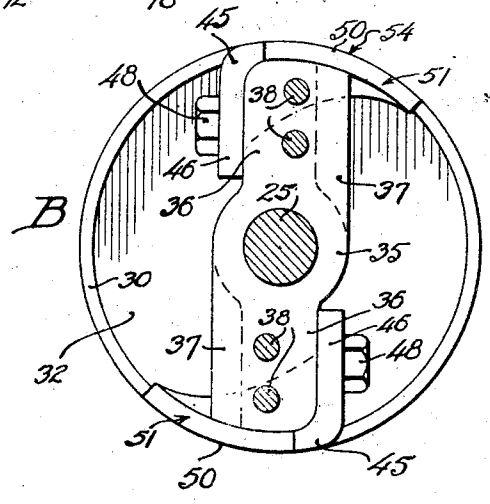


Fig. 3.

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Fig. 4.

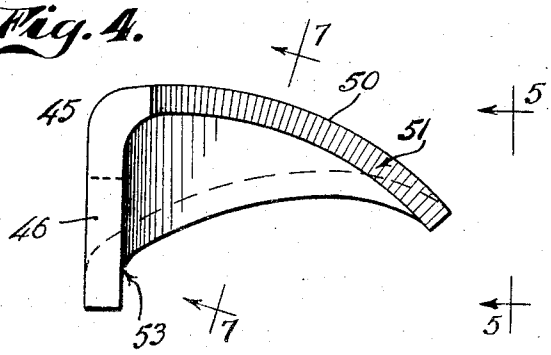


Fig. 6.

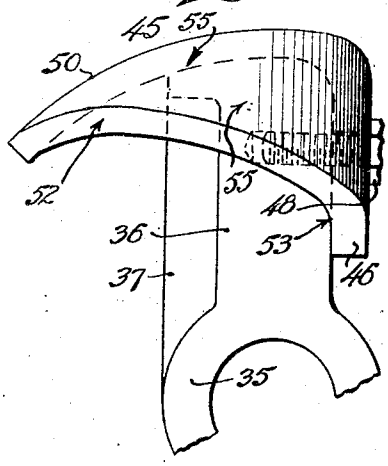


Fig. 5.

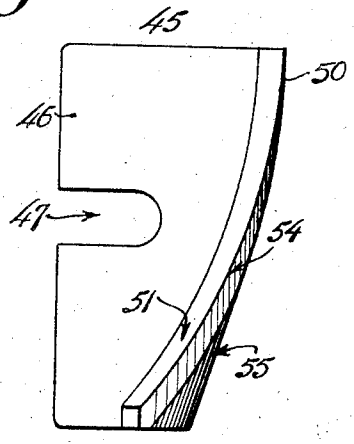


Fig. 7.

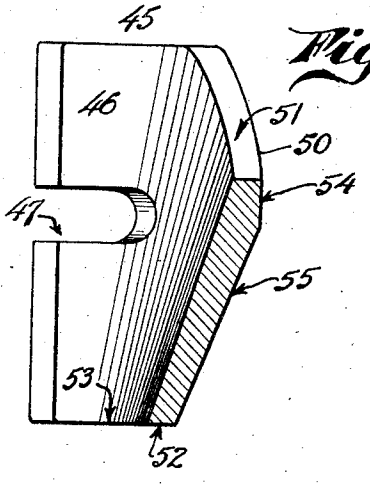
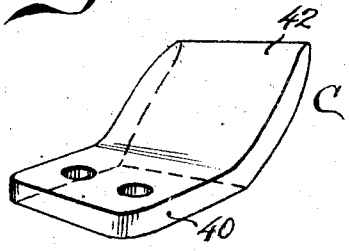


Fig. 8.



INVENTOR,
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Patented Feb. 8, 1927. 1,616,816

UNITED STATES PATENT OFFICE.

GEORGE C. MARTIN, OF LOS ANGELES, CALIFORNIA.

PACKER HEAD FOR PIPE-MOLDING MACHINES.

Application filed April 20, 1925. Serial No. 24,397.

This invention relates to means and method for forming pipe, and more particularly to making concrete or cement pipe or other similar pipe where molds are employed.

The chief object of the invention is to provide a packer head which will produce pipe which is compact and solid, is free from voids and weakened zones, and has uniform maximum strength throughout particularly in the bell of the bell-ended pipe.

A further object of the invention is to forcibly feed the material to insure proper packing in the bell, to trowel the material to provide a uniform surface, and to smooth the troweled surface.

With these objects in view and others which will be apparent, the invention comprises the novel and useful combination and arrangement of parts and the features of construction illustrated in certain forms in the drawings, described generally hereinafter, and finally pointed out in the claims, it being understood that the invention is limited only as defined in the claims.

As practiced, the packer head comprises a propelling member for forcibly feeding the material supplied, a packer element comprising one or more packing shoes of special design to trowel the surface and carry off excess material as well as force the material downwardly, and a smoothing head having a continuous smoothing surface for smoothing the pipe surfaces after formation by the packer shoes.

In the accompanying drawings wherein certain embodiments of the invention are disclosed by way of illustration,

Figure 1 is largely a vertical section through pipe-forming apparatus with the present packer head in operative position;

Figure 2 is a view of the packer head partly in vertical section and partly in elevation taken at right angles to the showing of Fig. 1;

Figure 3 is chiefly a plan view of the packer head taken from the line 3—3 of Fig. 2;

Figure 4 is a plan view of one of the packer shoes of the packing element;

Figure 5 is an elevation thereof as taken from the line 5—5 of Fig. 4;

Figure 6 is a fragmentary view from the under side of the packer head and is the reverse of the view shown in Figure 3;

Figure 7 is a sectional detail taken on the line 7—7 of Fig. 4; and

Figure 8 is a perspective view of one of the propeller wings.

Corresponding parts in all the figures are designated by the same reference characters.

The packer head comprises primarily three elements, namely, a smoothing head A, the packer element B, and the propelling member C. This head operates in a mold carried upon a frame 10 having upper and lower brackets 12 and 14 which respectively support upper and lower pipe-forming rings 15 and 16. The lower ring 16 is provided with an inner annular forming flange 18, while the upper ring 16 is provided with an inner annular forming flange 20 and an outer upper flange 21 serving to form a hopper for the pipe-forming material being introduced. Interposed between the two rings 15 and 16 is the pipe mold 22 in which the pipe is formed and within which the packer head is suspended and operates through the medium of a squared vertical drive shaft 25 driven by gears 26 carried by a bracket 27 on the frame 10. The squared shaft 25 is adapted to be raised as through the medium of a lifting cylinder 28 and a fluid actuated piston 29, for the purpose of elevating the packer head gradually during the pipe-forming operation.

The smoothing head A of the packer head assembly comprises a cylindrical smooth-faced smoothing head 30 whose outer lower portion 31 may be beveled as shown, said head being provided with a carrier head in the form of a circular block 32 which is secured to the lower end of the shaft 25 and to the smoothing head 30 by means of a riveted cross pin 33 or the like. Thus the shaft 25 is made to drive the smoothing cylinder or head 30, and the carrier 32 serves to provide a bottom for said cylinder 30 forming a hopper or receptacle 34 for pipe-forming material or the carrier may be arranged higher in the head 30 so that its upper surface is on a level with the upper edge of the said head. Also secured upon the shaft 25, as by welding or otherwise, is the hub 35

of the packer element B, this hub being provided above the horizontal plane of the top of the smoothing head with radially extending wings 36 which may have overhanging reinforcing flanges 37.

Upon the upper faces of the wings 36 there are mounted the blades of the propeller member C by means of screw-threaded pins 38 mounted in said wings 36 having nuts 39 thereupon, the pins 38 passing through apertures in the bases 40 of said blades C. The blade portions proper 42 (Fig. 8) slope upward for the purpose of positively forcing the pipe-forming material downward during rotation to get material where the wings 45 may work it down to thereby assist the packing and insure a compact and uniform pipe structure.

The packer element B consists essentially in packing shoes 45 secured to the wings 36. Each shoe 45 has a flat foot 46 slotted at 47 to engage a side of the respective wing 36, the shoe being held in position on said wing by means of a screw 48. From the foot of each shoe 45 a spreading or packing blade 50 which in combination with the receding surface of the packing shoe 45 packs cement into the mold, extends rearward, the edge 54 acts to shear the surplus cement rather than let it ball up and work hard. The lower edge 52 of said blade 50 lies in a horizontal plane and extends from a point in vertical alinement with the lower or rear end of the upper edge 51 inward toward the axis of the hub 35 and shaft 25 and joins the lower edge of the foot 46 at the point 53. Adjoining the upper sloping edge 51 and forming a part of the side wall of the blade 50 there is a comparatively narrow helically disposed troweling portion 54 in vertical alinement with the outer smoothing wall of the smoothing head cylinder 30. Thus the side wall 55 of blade 50 lying between the lower edge 52 and said troweling portion 54 gradually recedes from the cylindrical form determined by the smoothing cylinder 30 and the inclined edge 54, squeezing the pipe forming material downwardly between the cylinder 30 and the pipe mold 22.

During operation of the apparatus, the cement or other pipe forming material is poured into the mold through the upper forming ring 16 while the entire packer head A, B, C is being rotated by shaft 25, the operation being started with the packer head at the bottom of the mold. The rotary movement of the propeller blades forces the fed material downward and the wiping edges 54 in combination with the receding walls 55 force the cement downwardly and outwardly to make the pipe. This action in conjunction with the action of the packer shoes thoroughly compresses and packs the cement against the mold and into the space between the mold 22 and the smoothing head A. As the packer shoes 45 rotate they tend to compress the material both downwardly and outwardly, the lateral troweling portion 54 has a point of contact with the finished pipe angularly disposed to the axis of revolution which smooths out and trowels the inner surface of the pipe being formed.

As the pipe-forming material is packed against the mold 22 the shaft 25 and packer head are gradually elevated by the lifting piston 29 enabling the rotating cylinder 30 of the smoothing head A to form a perfectly smooth inner pipe surface.

Therefore it will be seen that the present invention produces pipe from cement, concrete and like plastic materials which is free from voids and weakened zones and is thoroughly solid and compact. As a result the pipe has much greater strength per unit of thickness than heretofore. Also thicker pipe may be produced with the present apparatus than heretofore since perfect packing and compressing are obtained.

Having thus disclosed my invention, I claim and desire to secure by Letters Patent:

1. A device for forming cylindrical pipe from plastic material which subsequently hardens, including a member having a helically formed contact surface working against the inner wall of such pipe during its formation, and a receding wall leading from said contact surface to carry away excess plastic material without crowding.

2. A device for forming cylindrical pipe from plastic material which subsequently hardens, including a member having a helically formed relatively narrow contact surface working against the inner wall of such pipe during its formation, and a receding wall leading from said contact surface to carry away excess plastic material without crowding.

3. A device for forming cylindrical pipe from plastic material which subsequently hardens, including a member having: a contact surface adapted to work against the inner wall of such pipe during its formation; said contact surface being relatively narrow and diagonal to the elements of the pipe; and a surface having a constantly changing radius.

4. A device for forming cylindrical pipe from plastic material which subsequently hardens, including a member having a contact surface working against the inner wall of such pipe during its formation and which is at an angle to the axis of rotation of the pipe, and a wall portion leading from said contact surface which has a constantly changing radius.

5. A device for forming cylindrical pipe from plastic material which subsequently hardens, including a member having a relatively narrow helically formed contact surface working against the inner wall of such

pipe during its formation, and a wall leading from said contact surface at an angle to the inner surface of the pipe being formed.

6. A device for forming cylindrical pipe from plastic material having a leading edge portion and a trailing edge portions working against the inner wall of such pipe during its formation, said contact surface being at an angle to the axis of rotation of the pipe; said member likewise being formed with a wall having a constantly changing radius from the leading edge portion to the trailing edge portion, the portion of least radius being at the leading edge portion.

In testimony whereof, I have signed my name to this specification.

GEORGE C. MARTIN.