June 21, 1932. M. GUYOT 1,864,242

PERMANENT MOLD

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Fig. 1

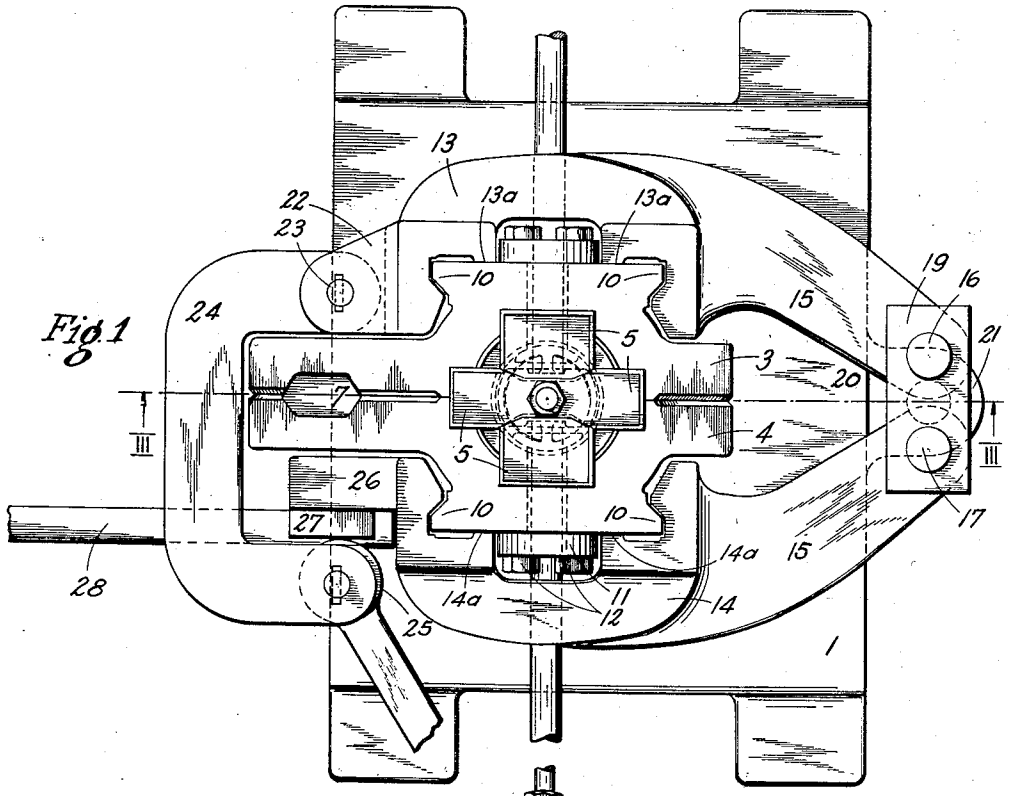
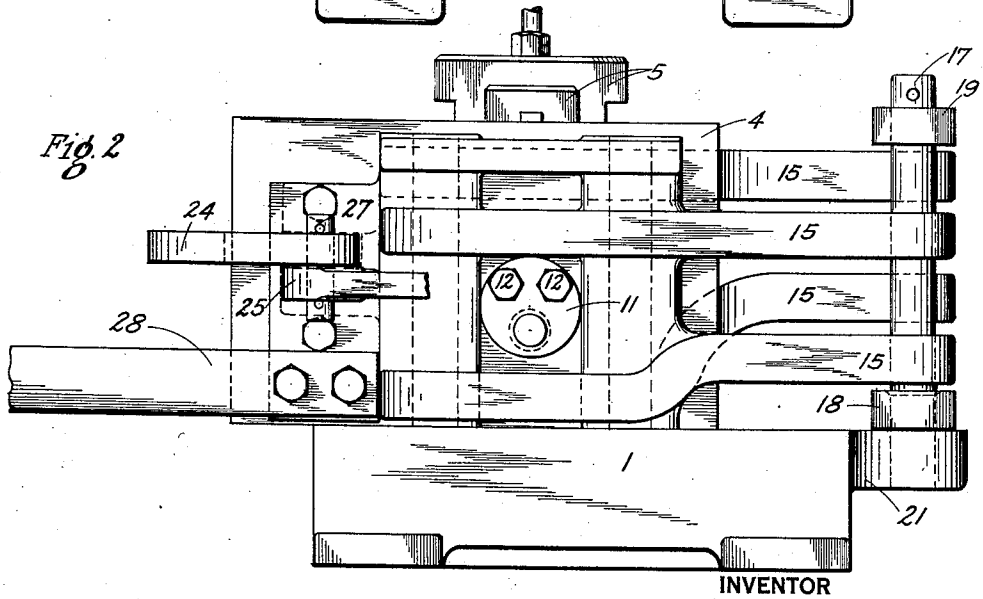


Fig. 2



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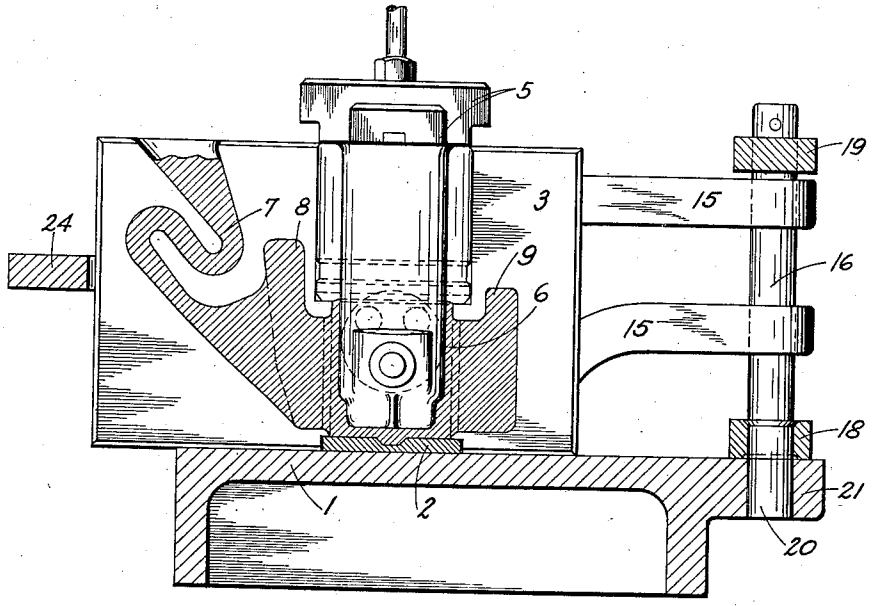


Fig. 3

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Patented June 21, 1932 1,864,242

UNITED STATES PATENT OFFICE

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PERMANENT MOLD

Application filed July 12, 1928. Serial No. 292,120.

This invention relates to permanent molds such as are used in the molding of pistons and the like.

Heretofore permanent molds have been constructed consisting of side sections which are pivoted together or to a supporting base at one end and clamped together at the other. While molds using such sections have produced satisfactory castings, the sections themselves were bulky and heavy, expensive to manufacture, and required a large amount of storage space when not in use. As a separate set of side sections had to be used for every different size and type of piston made, the investment in material, work, and storage space required to supply all the various sizes and types of motors on the market was very great.

It is an object of the present invention to reduce the necessary investment incident to the use of such mold sections by providing a mold in which only the parts immediately surrounding the casting cavity need be interchanged when it is desired to cast a different size or type of piston.

Other objects will hereinafter appear.

The invention will be better understood from the description of one practical embodiment thereof illustrated in the accompanying drawings in which

Fig. 1 is a plan view of a piston mold embodying the said invention,

Fig. 2 is a side elevation of the apparatus of Fig. 1, and

Fig. 3 is a central longitudinal section thereof taken on the line III—III of Fig. 1.

The mold comprises a supporting base 1 having a flat horizontal upper surface upon which the mold cavity forming parts are supported. These comprise a pilot 2 forming the bottom of the molding cavity, two complementary side sections 3 and 4 and a core 5. The pilot and core are substantially the same as have heretofore been used in molds for casting similar objects, while the side sections are modified and reduced in size, effecting a great saving of material, storage space required, and exterior machining.

The side sections are provided internally with object-forming recesses 6 and gate and rise forming recesses 7, 8, and 9 and the exteriors of the side sections are provided with dove-tailed shape portions 10. Each side section may be provided with a core-pin bushing 11 having its flange secured thereto by screws 12. Two carrier sections 13 and 14 engage the side mold sections, these carriers being provided with dove-tailed grooves in which the dove-tails of the side sections loosely fit, sufficient clearance being allowed to permit slight movement of these sections and allow them to adjust themselves when being moved together to align the recesses properly, these side sections being guided to properly aligned position by the pilot fitting within the lower end of the recesses. Arms 15 extend rearwardly from the side section-engaging parts of the carriers and are pivoted upon two pins 16 and 17, the upper and lower ends of which are supported in yokes 18 and 19, the lower of which has, intermediate the pivot pins, a depending pivot 20 engaging a hole formed within a projecting lug 21 upon the mold base. The other ends of the carrier 13 terminates in lugs 22, supporting pivot pin 23 on which is a clamping member 24, provided at its end with a pivoted eccentric lock 25, while the corresponding end of carrier 14 has projecting lugs 26 carrying an abutment 27 adapted to be engaged by the lock. A handle 28 is secured to carrier 14 to facilitate the opening and closing of the mold.

The carrier sections bear upon the exterior of the side mold sections closely adjacent the core pin bushings at points 13A and 14A, and press these side sections together so that the greatest pressure between them is exerted at the sides of the molding cavity. This is important as when two mold halves are in operation, the contacting surfaces, being heated more readily than the exterior surfaces thereof, tend to expand at a greater rate than the exterior, causing the side sections to warp away from each other in such a manner as to present convex surfaces of contact. When the mold halves are hinged at one end and clamped at the other, as has heretofore been the common practice, the

mold halves are likely to be tight near the hinge and to curve away from each other until they are quite open near the ends which are to be clamped. If the mold halves are closed by pressure near the center as is done in the present invention, they will be in tight contact in the center and such curving as does occur will cause very little separation between their ends because of the relatively short distance from the portions of the mold halves which are tightly pressed together, this distance being much less than the overall length of the mold halves.

From the above it will be seen that the only parts which need be interchanged in casting different sizes or types of articles are the pilot, core, and side mold sections, the side mold sections being much smaller than those heretofore used, and not having integrally joined therewith the parts which are now embodied in the carrier members and locking means, all of which are used irrespective which mold sections are in use and, therefore, the machining required on these parts is not duplicated for every set of mold sections, saving the cost of labor and material, and of storage space.

The operation of the mold is substantially the same as if the side sections and carriers were integral, each side section pivoting about its pin, and the pins due to their support upon the pivoted yoke, permitting movement of the side sections and carrier longitudinally of the bed or base to accommodate themselves to the pilot and align their interior recesses.

While I have described the illustrated embodiment of my invention in some particularity, obviously many modifications and variations thereof will readily occur to those skilled in the art to which this appertains, and I do not, therefore, limit myself to the precise details shown and described, but claim as my invention all embodiments coming within the scope of the appended claims.

I claim:

1. A mold comprising side sections provided on their inner surfaces with complementary recesses forming casting, riser, and gate cavities, a pilot forming the bottom of the casting cavity, a core insertable within the side sections, the side sections being provided on their outer surface with outwardly extending flanges, carriers loosely engaging said flanges, and a mold base supporting the pilot, side mold sections, and carriers.

2. A molding apparatus comprising a base, a yoke pivotally supported thereby, pivot pins carried by said yoke, carriers pivoted on said pivot pins, clamping means pressing the free ends of said carriers toward each other, mold side sections having complementary internal recesses and outwardly extending dove-tailed shape projections, the projections being received within dove-tailed recesses in the carriers, and means for aligning the recesses within the mold side sections.

3. A molding apparatus comprising a base, a yoke pivotally supported thereby, pivot pins carried by said yoke, carriers pivoted on said pivot pins, clamping means pressing the free ends of said carriers toward each other, mold side sections having complementary internal recesses and outwardly extending dove-tailed shape projections, the projections being loosely received within dove-tailed recesses in the carriers, and means for aligning the recesses within the mold side sections.

4. Molding apparatus comprising a base having a substantially horizontal flat top, a pilot carried thereby adapted to form the bottom of a molding cavity, two pivot pins supported on a yoke pivoted intermediate their axis to the base, carrier sections having one end pivoted to the pivot pins, clamping means engaging the free ends of said carriers, dove-tailed shaped grooves on the inner faces of said carriers, two side wall sections having dove-tailed shaped projections loosely engaging said grooves, the inner surfaces of said sections having complementary recesses to form molding, gate, and riser cavities, the cavities being aligned by engaging the pilot, and a core inserted within the side sections and supported thereby.

5. Molding apparatus comprising a base having a substantially horizontal flat top, a pilot carried thereby adapted to form the bottom of a molding cavity, two pivot pins supported on a yoke pivoted intermediate their axis to the base, carrier sections having one end pivoted to the pivot pins, clamping means engaging the free ends of said carriers, handles carried by carriers, dove-tailed shaped grooves on the inner faces of said carriers, two side wall sections having dove-tailed shaped projections loosely engaging said grooves, the inner surfaces of said sections having complementary recesses to form molding, gate, and riser cavities, the cavities being aligned by engaging the pilot, and a core inserted within the side sections and supported thereby.

6. A molding apparatus comprising a base, a yoke pivotally supported thereby, pivot pins carried by the yoke carriers pivoted on said pivot pins, and having free ends to swing apart and around the pivot pin as a center, side mold sections having complementary internal recesses carried by the carrier, means for aligning the recesses within the side mold sections, and a clamping device for applying inwardly directed pressure intermediate the free and pivoted ends of said carriers and in the direction of the complementary recesses in the side mold sections.

7. A molding apparatus comprising a pair of separate mold halves having casting cavity forming recesses intermediate their ends, a pair of members loosely embracing

said mold halves, means pivotally connecting said members at one end, and means for clamping said members together at the other end, the intermediate portions of said members abutting said mold halves intermediate the ends thereof in such a manner that the entire force of said clamping means is exerted on said mold halves opposite the recesses therein.

8. A molding apparatus comprising a base, a pair of carriers pivotally mounted on said base, the inner face of each of said carriers being formed with spaced recesses, a mold section associated with each of said carriers and having on its outer face a dove-tail projection slidably engaged in the recesses of the respective carrier, said projection being somewhat smaller in dimension than said recesses whereby the inner face of said carriers may abut the outer ends of the dove-tail projections on said mold sections and press the same together.

9. A molding apparatus comprising a base, a pair of carriers pivotally mounted on said base, means for clamping the free end of said carriers together and a pair of side mold sections disposed between said carriers, each of said side mold sections having a projection extending from its outer face loosely embraced by one of said carriers whereby said carriers may abut said mold sections and press the same together while leaving the mold sections free for movement relative to the carriers and unconfined thereby so that stresses in said mold sections resulting from warpage and temperature variations are not transmitted to said carriers.

In testimony whereof I hereunto affix my signature this 6th day of July, 1928.

MARIUS GUYOT.