E. C. HOLTON.

REINFORCED HANDLE.

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1,132,093. Patented Mar. 16, 1915.

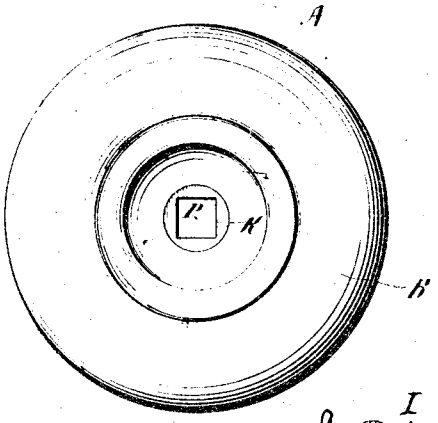


Fig. 1.

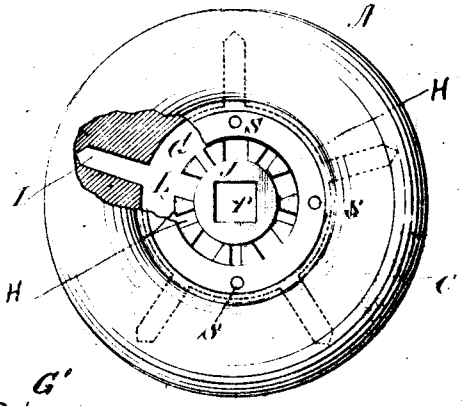


Fig. 2.

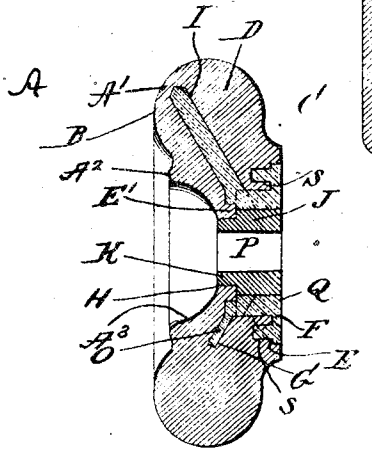


Fig. 3.

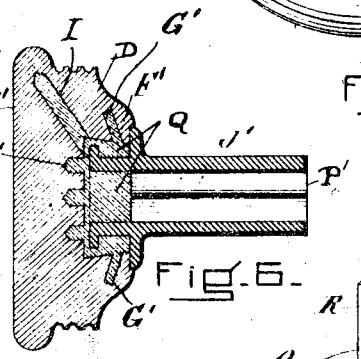


Fig. 6.

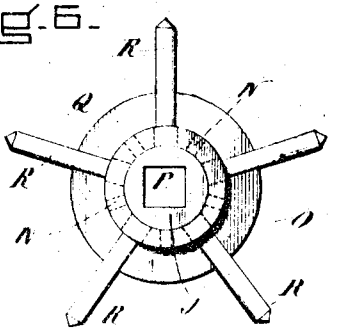


Fig. 4

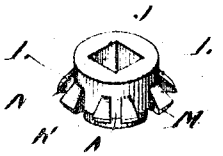


Fig. 5.

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REINFORCED HANDLE.

1,132,093. Specification of Letters Patent. Patented Mar. 16, 1915.

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To all whom it may concern:

Be it known that I, EDWIN C. HOLTON, a citizen of the United States, residing at Somerville, county of Middlesex, and State of Massachusetts, have invented certain new and useful Improvements in Reinforced Handles.

My invention relates to a unitized handle or handle-wheel for valves, brakes, presses, steering gears, doors, door-stops, etc. Handles for these articles are now usually made either entirely of metal and in one piece, or of two or more substances and in two or more parts, one of a non-metallic nature and the others of various metals, and held together by nuts, screws, etc., in a manner that seldom proves satisfactory, rigid or durable,—the non-metallic part annoying the users by its tendency to warp and its frequent liability to split. I produce this unitization by constructing a non-metallic handle internally cored to form a "mold," the parts of which are in such re tions one to another that when all its interstices are flowed with molten metal a cast "spider" handle or hand-wheel is produced, the parts of which, as they rest when cooled within this mold, are so oppositely yet strongly interwoven, intermingled and bound that it becomes a rigid, unbreakable casting unit handle of great strength and durability; possessing advantages in points of economy in cost of manufacture, simplicity of construction, and beauty of design; a handle that will not split, nor twist, nor pull apart, nor be crushed by any reasonable tangential stress, thrust or pressure; nor become loosened by long or excessive service; nor the two substances become loosened by the swelling or shrinking of the covering; also a non-conductor of electricity, or heat, if so desired, as in a handle or handle-wheel for steam valves, etc. (the small ratio of metal to the non-metallic part, reducing to a minimum the degree of heat at the outer circumference of the web or rim).

In the accompanying drawings, Figure 1 illustrates the top side of the article in which my invention is embodied. Fig. 2, a reverse view of the same partly broken away, showing the metal spider casting resting in its mold. Fig. 3 illustrates a section of the handle. Fig. 4 represents the "spider," or metal skeleton of the hand-wheel, as it appears stripped of its mold or covering. Fig. 5 is an enlarged view of the hard metal stopper, plug, hub or shank "J"; Fig. 6 is a cross sectional view of the improvement as applied to a handle or knob for doors, etc.

Similar letters refer to similar parts throughout the several drawings.

A is a general view of the hand grip part and a mold for producing a unitized handle or handle-wheel for valves, etc.; this part is of hard metal, or of a non-metallic substance such as papier mâché, cement, clay, glass, rubber, gutta percha, wood pulp, wood, etc., but preferably of these non-metallic substances some of which are frangible, and hence is referred to hereafter as of a non-metallic substance only, and as of wood only. This non-metallic part in its primary, initial and independent state, is in fact a mold, and in its outer form, "B," of a shape most convenient for the purposes intended (see contour as in Fig. 3); it is made with a thick or heavy rim, "A^1," and with a rounded or bead-like center web, "A^2"; with the center of the top side concave as at "A^3"; this form gives a larger surface for the hand than the old forms, and hence a cooler one, and the concave depression allows of the placing of the nut or screw head at a point so low as to prevent the head of the nut or screw burning the palm of the hand when operating it. In the center of the other or inner side, "C," Fig. 2, is a hole H, common in all forms of these molds or handles. It is either round, square or many sided, but preferably round; it may be of various depths and diameters, and have various curves and angles (according to the measurements demanded by the various sizes, styles and articles it may be applied to), thereby forming the steps, "E," and "E^1," as shown in Fig. 3; with the side or rise of that portion that is the second widest in diameter at right angles to the bottom line of the first or widest tread or step as at "F"; or the side of the recess in the inner side of the handle may be beveled inwardly as at "F^1" in Fig. 6.

In the bottom of the step E (Fig. 3) and the bottom of the recess (Fig. 6) are two or more round holes, "S", and "S^1", respectively, that extend partly through the web of the mold; there are also two or more round or square holes (preferably round) extending laterally and at an angle from the side of the hole or recess in the handle and

nearly through the mold or handle; these I term the lateral holes, "I". A groove, "G", shown in Fig. 3, is made around the entire side or circumference of that portion of the mold or matrix that I term the second step, extending laterally from the side or rise of this second step into the web of the mold or handle; this groove may be placed so as to bisect in its course, so far as it may extend, the two or more lateral holes mentioned above, (this position of the groove produces the flange of the spider in that position that ties and strengthens and binds its spokes together); or this groove may pass around and into the web of the handle or mold at or near the top or bottom of the recess and into the web to various depths and at various angles as at "G¹", Fig. 6. The smaller portion of this common central hole, "H", extends through the web of the handle or hand wheel for valves, etc., in which the hard metal stopper, plug or hub "J", Fig. 5, with its notches "N", and its chamfered side, "L", fits, resting on its seat, "M", thereby stopping the flow of the molten metal "Q", its face "K" forming a seat for a nut, screw or cap. (This form of construction prevents it from turning or moving in the softer metal when strain, stress or force is exerted upon the handle). The wood or non-metallic substance I designate as "D".

The unitization of a valve wheel, etc., is obtained by inserting the small end of the stopper, plug or hub in the central hole in the web, the larger part, or seat, resting on the second step. When thus placed the molten metal is flowed between the side of the wood and the chamfered end and notched side of the stopper, plug or hub filling the small lateral holes and groove aforesaid and the interspace and interstices, thereby forming the cast of the "spider", the latter being seen in Fig. 4, stripped of its mold—de-unitized—with its spokes "R", radiating from the hub into the web and rim of the handle, adding great strength to the wheel and preventing the hub or shank turning in the wood, and binding the parts firmly together. These spokes are strengthened and tied by the flange "O", both transversely attached to the hub or shank "J", and the hole P in this plug hub or shank is adapted to receive a spindle, stem or rod; and that portion of the handle other than the wooden or non-metallic portion is in itself a strong and durable metal handle or handle-wheel; and hence in this improvement I produce a metal handle or handle-wheel rigidly incased within and unitized with a non-metallic handle or hand-wheel in such a manner that each adds greatly to the natural or individual strength of the other—a much needed and desirable result being then achieved.

In Fig. 6 the drawing shows the above principles as applied to a handle or knob for doors, etc. In this form the central hole does not extend through the web, but the lateral holes and grooves are seen in the same relative positions as in Fig. 3. In this form the stopper, plug or hub, with extended shank is applied to the inner side of the mold or handle only, extending nearly to the bottom of the hole "H", with its wider or outer part fitting, filling and resting in the first or widest step. In this form of a mold or handle the process of unitization is accomplished by placing the stopper, plug or hub "J'" in its seat in and over the hole "H" and then pouring the molten metal into the hole "P¹", thereby filling the lateral holes, groove, interspace and interstices, as for a hand-wheel for valves. The outer forms in handles of this class may vary, some being round or circular, others oval, oblong, elliptic or with many sides.

It will readily be seen that the features peculiar to the construction of this common central hole as embodied in my invention, are capable of numerous modifications of the angles, diameters, curves, etc., and of being applied to various articles, and that the general results are virtually the same, regardless of the outer and inner contours and measurements.

Having described my invention and set forth its merits, what I claim is:—

1. A reinforced handle consisting of a body provided with a central aperture and passages extending into close approach to the outer periphery thereof, and a reinforcing metal insert filling said central aperture and passages and serving to bind the parts of the body together.

2. A reinforced handle consisting of a non-metallic body and a metallic binder having divergent connected binding arms embedded in the body to resist splitting thereof and to hold the parts together in case of splitting.

3. A reinforced handle comprising a non-metallic frangible body and a metallic binder having divergent arms and a connecting web embedded in said body, to resist fracture and prevent disintegration thereof.

4. A reinforced handle comprising a non-metallic frangible body and a metallic binder having divergent arms and connecting web embedded in said body, said arms approaching closely the outer surface of the body for the purpose of resisting fracture and separation of parts thereof.

5. A reinforced handle comprising a wooden body having a central aperture and radiating inclined holes approaching closely the outer limits of said body, and a metallic spider having a central portion lining said aperture and arms extending into said holes, thereby serving to bind the parts of the body together and prevent splitting and separation thereof.

6. A reinforced handle comprising a frangible body having a central recess and divergent holes or passages extending from said recess approximately to the outer periphery of the body, and a tough, relatively infrangible internal binder having a hub portion lining said recess and arms extending in said holes or passages for the purpose of uniting the diverse parts of the body and resisting fracture of the same.

7. A reinforced handle comprising a frangible body having a central recess, divergent holes or passages extending from said recess approximately to the outer periphery of the body, and a groove surrounding the aperture and intersecting said holes or passages; and a tough, relatively infrangible internal binder having a hub portion lining said recess, a web or flange embedded in said groove surrounding and united to said hub portion, and arms integrally united to said web or flange, being tied together thereby, and extending into said holes or passages for the purpose of uniting the diverse parts of the body and resisting fracture of the same.

8. A reinforced handle comprising a frangible body having a central recess and divergent holes or passages extending from said recess approximately to the outer periphery of the body, and a tough, relatively infrangible internal binder formed of metal cast in the recess and holes or passages of the body, and being thereby provided with divergent strengthening arms to tie the parts of the body together and prevent splitting thereof.

9. A reinforced handle comprising a frangible body having a central recess, divergent holes or passages extending from said recess approximately to the outer peripliery of the body, and a groove surrounding the recess and intersecting said holes or passages; and a tough, relatively infrangible internal binder having a hub portion lining said recess, a web or flange, contained in said groove surrounding and united to said hub portion, and arms integrally united to said web or flange, being tied together thereby, and extending into said holes or passages for the purpose of uniting the diverse parts of the body and resisting fracture of the same, said binder being formed by flowing molten metal into the internal spaces of the body and allowing the same to harden.

10. A handle having a central recess in one face, holes projecting from the bottom of the recess toward the opposite face, and longer holes or passages extending outward from the recess toward the periphery of the handle and terminating as near as practicable to the outer surface thereof; combined with a quantity of metal lining said recess and extending into said holes and passages to form a reinforcing member for strengthening the handle.

11. A handle or knob having a central recess in one face, holes projecting from the bottom of the recess toward the opposite face, and longer holes or passages extending outward from the recess on a slant as regards the axis of the recess toward the periphery of the knob and terminating as near as practicable to the outer surface thereof; combined with a quantity of metal lining said recess and extending into said holes and passages to form a reinforcing member for strengthening the handle or knob, such metal being cast into the knob and being enabled by the slant of the longer holes or passages to extend continuously into the same without the formation of intermediate air holes or cavities.

12. A handle or the like comprising an outer body having an aperture and passages extending from said aperture toward the periphery thereof, and a metal inset occupying said aperture and passages, the body having a groove extending from the aperture and joining said passages, and the inset having a flange occupying said groove.

13. A reinforced handle comprising a body having an aperture or recess extending inwardly from the central part of one side thereof, and also having passages extending diagonally from the sides of said recess toward the periphery and opposite face of the body, and a metal inset occupying said recess and filling said passages, said passages and the portions of the inset contained therein being of extent sufficient to cause the inset to act as a binder to resist splitting of the body.

14. A reinforced handle comprising a body having an aperture or recess extending inwardly from the central part of one side thereof, and also having passages extending diagonally from the sides of said recess toward the periphery and opposite face of the body, and a metal inset occupying said recess and filling said passages and itself having a recess to receive a shank or spindle.

In testimony whereof I have affixed my signature, in presence of two witnesses.

EDWIN C. HOLTON.

Witnesses:
FRANK G. PARKER,
JOHN BUCKLER.