Nov. 21, 1933. H. I. DYER 1,936,158

PISTON PIN

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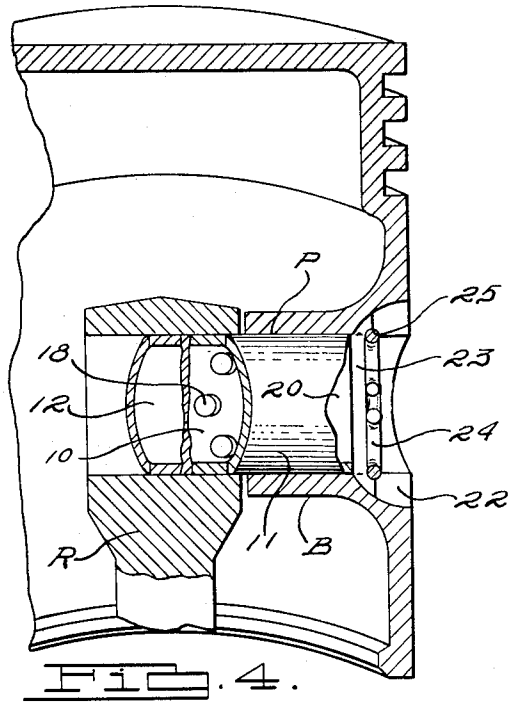


Fig. 4.

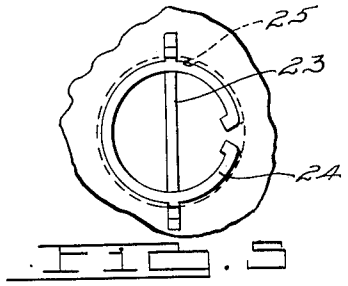


Fig. 5

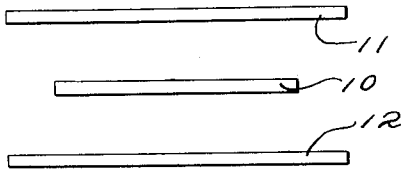


Fig. 6.

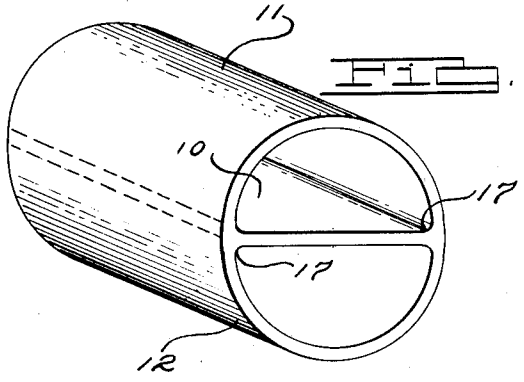


Fig. 1.

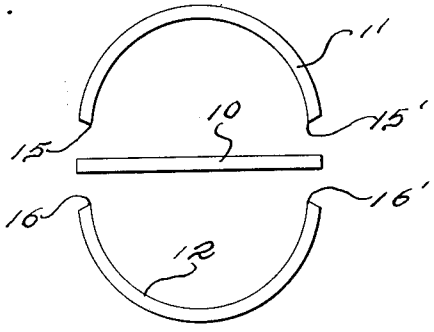


Fig. 2.

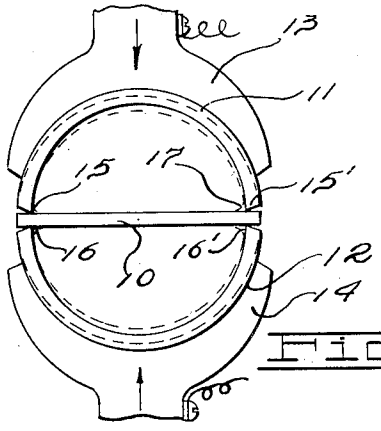


Fig. 3.

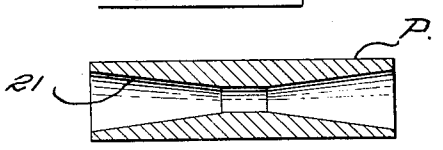


Fig. 7.

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PISTON PIN

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4 Claims. (Cl. 219—10)

Although referred to simply as a piston pin, the present invention should be understood to include a novel method of forming piston pins, or like articles, from three pieces of sheet metal,—two of said pieces being oppositely concave and ordinarily semi-cylindrical in form, and a third piece (flat and having a lesser diameter) being employed as a reinforcing partition extending longitudinally of the completed pin.

"Wrist" pins for pistons having heretofore commonly been formed from expensive bar stocks and reduced in weight by boring and reaming operations which are wasteful of metal as well as of power and time and attention, it is an object of the present invention to provide light but strong piston pins from a suitable sheet metal.

It is a special object of the present invention economically to provide a piston pin with an internal reinforcing web extending longitudinally thereof and adapted to be disposed in the plane of the maximum pressure to which said pin is subjected, said webs or partitions or other parts of the novel pins may be terminally so shaped as to cooperate with usual or special pin-retaining devices, of any appropriate character, in substantially preventing longitudinal or rotative movement of said pins within pistons; and said partitioning webs may, to facilitate such cooperation and/or a welding in a preferred manner hereinafter described, initially have a dimension or dimensions slightly greater than the corresponding dimension or dimensions of the wall members of the finished pin.

Other objects of the present invention may be best appreciated from the following description of an illustrative embodiment thereof, taken in connection with the appended claims and the accompanying drawing.

Fig. 1 is a perspective view of one type of pin illustrative of the present invention.

Fig. 2 is an end elevational view showing diagrammatically the assembly of two oppositely concave and substantially semi-cylindrical members and an intermediate partitioning member,—these being all formed from sheet stock.

Fig. 3 is a diagrammatic view taken similarly to Fig. 2 but illustrative of a preferred technique of uniting the mentioned members.

Fig. 4 is a perspective longitudinal sectional view through a piston in which a pin illustrative of the present invention is so secured as to dispose the mentioned reinforcing partition in a plane of maximum compressive effect during use thereof.

Fig. 5 is a detail view pertinent to a use rather than to the structure of the novel pin and taken as indicated by the arrow 5 of Fig. 4,—merely to show one type of clip available to secure a piston pin illustrative of the present invention in suitable bearing bosses provided in pistons.

Fig. 6 is a view similar to Fig. 2, but showing flat blanks, assumed to be substantially rectangular in outline and to be properly proportioned but to have received no curvature.

Fig. 7 is a view introduced for purposes of comparison, showing in longitudinal section a prior art pin.

Referring first to the more general features shown in Fig. 4, a pin P is shown as extending through bosses B of a piston and also through a bearing in a connecting rod R; but the specific character of said piston and said rod, as also the specific character of any keeper organization, employed to limit or prevent longitudinal or rotative movement of pins P within the bearings B, may be regarded as comparatively immaterial to the present invention in pin construction.

Although Fig. 6 shows a presumably rectangular or slightly trapezoidal blank 10, adapted to be employed as a partitioning or reinforcing element, as disposed between wider blanks 11 and 12, adapted to serve as wall blanks when suitably curved and placed, it will be obvious that configurations such as are indicated in Fig. 2 may be imparted to said blank either simultaneously with or subsequently to an initial blanking operation. As suggested in Fig. 3, either or both of the semi-cylindrical members 11, 12 may then be disposed in edge to edge relationship with the partitioning member 10; and, although union might be effected by alternative means, the illustration suggests union of the mentioned edges by the passing of an electric current therethrough while effecting a movement of approach between said partitioning element, which may serve as an intermediate electrode, and one or both of a pair of relatively movable pressure-applying electrodes 13, 14. In favor of this method, it may be noted that the external periphery of the members 11 and 12 after a semi-cylindrical form has been imparted thereto, and the provision of comparatively sharp edges at 15, 15' and 16, 16', may be favorable not only to the development of a high temperature, due to the limited contact and consequent high resistance along said edges, but to the single-operation formation of substantially cylindrical or slightly oversize pins upon the advance of the members 11 and 12 from such positions as those in which said members are shown in full lines in Fig. 3 to such positions as are

indicated in dotted lines; and the flow of metal at said edges may be such as to produce not only the mentioned external form but an inward flow of metal, adjacent said edges, substantially as indicated at 17 in Figs. 1 and 3.

It will be obvious not only that any desired grinding finishing, plating and/or other perfecting steps may be applied to pins produced from three pieces of sheet metal in substantially the described manner, and it will be understood that the new pin P may be used in substantially the same manner as a pin P' of the general character illustrated in Fig. 7; but that the formation of a tapered or cylindrical bore 21 in pins of the latter character is an expensive and wasteful operation; and that, because pins of the type last referred to are unprovided with means to prevent rotation thereof, the disposition and quantity of metal therein must provide for a safety factor not required in novel pins P, provided the latter be used in conjunction with some means, such as shown in Figs. 4 and 5, serving to hold the reinforcing partitions 10 in a longitudinal diametrical plane common to the pin P and the piston receiving the same. In this connection, and merely for the sake of completeness, a transverse slot or groove 22 is shown as receiving a key 23, adapted to enter slots left at one end of a short portion member 10; and a split ring 24 is shown as so entering a peripheral slot 25 as to retain said key,—but these features will be understood to be of subordinate interest herein, being elsewhere described and claimed.

Although the foregoing description has included complete details of but one embodiment of the present invention, it should be understood not only that various features thereof might be independently employed but also that numerous modifications, additional to any suggested herein, might easily be devised by skilled workers, if informed of the foregoing,—all without departure from the scope of the present invention, as the latter is indicated above and in the following claims.

I claim:

1. A method of producing reinforced cylindrical articles from separate pieces of sheet metal which comprises, disposing curved outside pieces in edge to edge alignment against a partition, providing inwardly sloping edges on said outside pieces, and welding said pieces by melting said sloping edges which forms a shoulder with the partition inwardly of the outer surface of the finished article.

2. A method of producing reinforced articles of piston pin type from separate pieces of sheet metal which comprises, disposing curved outside pieces in edge to edge alignment against a partition, providing inwardly sloping edges on said outside pieces, and uniting said pieces when so aligned by passing a current through mutually contacting edges thereof.

3. A method of producing reinforced articles of piston pin type from separate pieces of sheet metal which comprises, disposing curved outside pieces in edge to edge alignment against an inner partition, providing inwardly sloping edges on said outside pieces, and uniting said pieces when so aligned by passing a current through mutually contacting edges thereof while effecting a movement of approach between said pieces.

4. A method of producing reinforced cylindrical articles from separate pieces of metal which comprises, disposing oppositely curved outside pieces in edge to edge alignment against a partition piece, providing inwardly sloping edges to said outside pieces and simultaneously uniting such curved pieces to said partition when so aligned by passing a current through mutually contacting edges thereof while oppositely advancing said outside pieces in relation to said partition to form shoulders with the partition inwardly of the outer surface of the finished article.

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