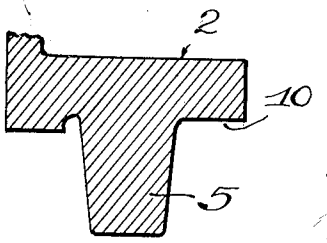
Dec. 22, 1942. T. R. SMITH 2,306,233

MEANS FOR ALIGNMENT OF COVER TO GEAR CASE

Filed April 23, 1940

Fig. 3



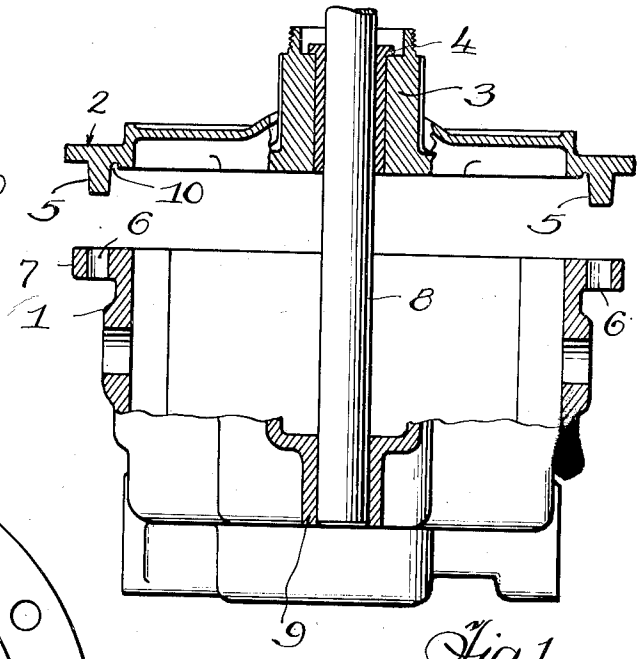




Fig. 1

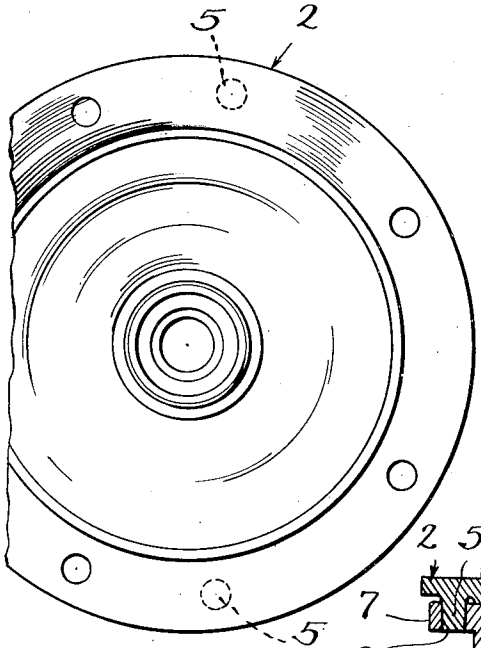



Fig. 4

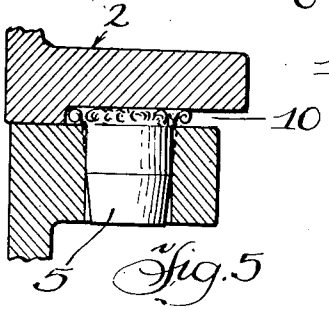



Fig. 5

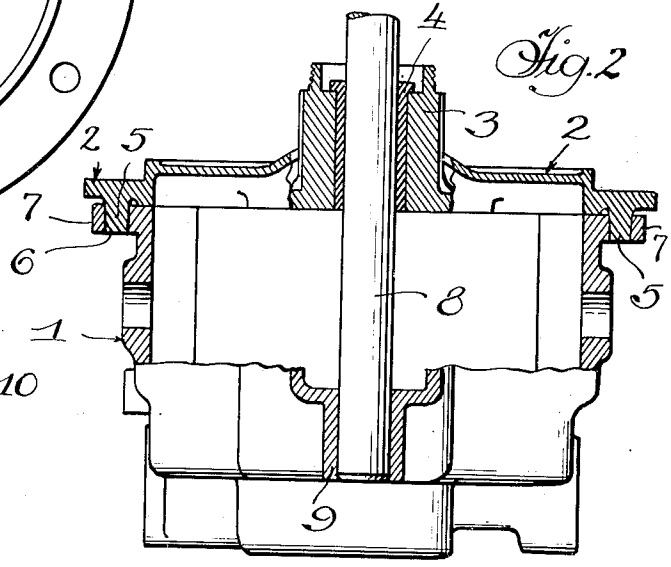



Fig. 2

Witness:
Chas. P. Houser.

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BY Parkinson & Lane
ATTORNEYS.

Patented Dec. 22, 1942

2,306,233

# UNITED STATES PATENT OFFICE

2,306,233

## MEANS FOR ALIGNMENT OF COVER TO GEAR CASE

Thomas R. Smith, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa, a corporation of Delaware

Application April 23, 1940, Serial No. 331,167

3 Claims. (Cl. 74—606)

The present invention relates to a novel means of aligning a gear case cover with respect to its gear case where an accurate alignment of these parts is required or desired. In the novel embodiment, this includes the doweling or pinning into position of the gear case and gear case cover where the gear case is made of any relatively hard material suitable for the purpose such as cast iron, steel, and the like and the cover is made of any relatively softer material such as zinc die casting, aluminum die casting and the like. Both the cover and gear case may be completely and accurately machined before assembly.

In the preferred embodiment, the gear case cover is formed or constructed with suitably spaced locating projections or lugs adapted to fit into locating holes in the flange or periphery of the gear case. These locating lugs are preferably tapered with their ends of a diameter or cross section somewhat less than the locating holes in the gear case but with their diameter or cross section greater at their base or where they are joined to the cover than these locating holes so that as the gear case cover and gear case are pressed together they provide an accurate fit.

In order to hold the necessary holes or openings in the gear case and cover in alignment during the pressing operation, the novel invention comprehends the use of an accurate pilot arbor or shaft. After the gear case cover and gear case are thus pressed together and aligned, the pilot arbor or shaft is removed and the gear case and cover are separated for the purpose of insertion, positioning and assembly of the working parts in the gear case.

Further objects are to provide a construction of maximum simplicity, efficiency, economy and ease of assembly and operation, and such further objects, advantages and capabilities as will later more fully appear and are inherently possessed thereby.

The invention further resides in the construction, combination and arrangement of parts illustrated in the accompanying drawing, and while I have shown therein a preferred embodiment, it is to be understood that the same is susceptible of modification and change, and comprehends other details, arrangements of parts, features and constructions without departing from the spirit of the invention.

In the drawing:

Fig. 1 is a view, part in vertical cross section and part in side elevation, of a disassembled gear case and cover upon an arbor and ready to be pressed together and aligned in accordance with the novel invention.

Fig. 2 is a similar view but of the parts after they have been pressed together.

Fig. 3 is a fragmentary enlarged view in vertical cross section of one of the locating projections or lugs.

Fig. 4 is a fragmentary plan view of the upper side of the cover.

Fig. 5 is a fragmentary view in vertical cross section through the flange of the cover and gear case with these parts pressed together and showing the manner of automatically machining the tapered locating lugs or projections to accurately fit the locating holes.

Referring more particularly to the disclosure in the drawing, the novel invention is shown as embodied in a gear case 1 and gear case cover 2, which in the illustrated emobdiment are adapted for use in housing the power unit or driving mechanism of a washing machine, although it is to be understood that the invention is not limited thereto but may be practiced in the alignment of any type of gear case and cover wherever it is required or desired that there be an accurate alignment between these parts. For a clearer illustration of the invention, the operating mechanism or gearing are not disclosed, it being understood, however, that it may consist of any type of drive unit suitable for the purpose. An upstanding sleeve or collar 3, which may form a part of the cover plate 2 and in which is pressed a bushing or bearing 4, provides a journal in which the operating shaft is adapted to rotate or oscillate. The cover 2 is shown as provided with spaced locating projections or lugs 5 of tapered form with their ends of such diameter or cross section as to be readily received and guided into openings 6 provided in a flange or periphery 7 of the gear case, whereby some slight original misalignment can be tolerated. To properly locate these parts, a pilot arbor 8 is provided and adapted to be journalled in the bushing or bearing 4 and at its lower end in a journal or bearing 9 in the gear case.

As the gear case cover is pressed into the gear case, using the pilot arbor to hold the necessary holes in the gear case and cover in alignment, the locating projections or lugs 5 will be pressed into the locating holes 6 in the gear case until these tapered members come in contact with the edges or periphery of these locating holes. At this point, the pressing together operation auto-

matically machines the tapered lugs or projections 5 to a very accurate fit so that after the gear case and cover are completely pressed together, these parts are accurately aligned and form a tight and accurate fit with the lugs adjacent their base being automatically shaved or machined to the proper position and the pilot arbor or shaft maintaining the openings in the cover and gear case in the necessary alignment. In order to take care of shavings from these lugs as they are turned or curled back, the lower surface of the gear case cover is recessed or undercut at 10. This is clearly shown in Figs. 4 and 5 of the drawing, the latter showing the shavings being curled back into this recess from which they are later removed before final assembly.

In the preferred embodiment, these locating lugs or projections are unsymmetrically spaced whereby the cover can be assembled in but one position and that in the exact relation in which it was originally aligned with the gear case. Also, in the case of a washing machine drive, I have found that instead of using a pilot shaft, the agitator shaft may form its own pilot and thereby eliminate removal of the pilot and complete reassembly of the casing.

Having thus disclosed the invention, I claim:

1. Means for accurately aligning a gear case and gear case cover where the cover is of a material softer than that of the gear case and after alignment, removed for the assembly of the desired gears, comprising unsymmetrically spaced locating holes in the gear case and tapered lugs depending from the cover and spaced similarly to the locating holes in the gear case, the ends of said lugs being of less cross section than the holes but their base being of greater cross section so that when the cover and gear case are tightly pressed together to the position they occupy when assembled, such pressure machines the surface of said lugs to form an accurate fit in the locating holes and an accurate alignment between the cover and gear case.

2. Means for accurately aligning a gear case and gear case cover where the cover is of a material softer than that of the gear case and after alignment, removed for the assembly of the desired gears, comprising spaced locating holes arranged unsymmetrically about the periphery of the gear case and tapered depending lugs projecting from the cover and spaced similarly to the locating holes in the gear case, the ends of said lugs being of less cross section than the holes but their base being of greater cross section so that when the cover and gear case are tightly pressed together to the position they occupy when assembled, such pressure machines the surface of said lugs to form an accurate fit in the locating holes and an accurate alignment between the cover and gear case, and a recess formed in the lower face of the cover adjacent the base of each lug for the reception of the metal machined from the lugs.

3. Means for accurately aligning a gear case and gear case cover where the cover is of a material softer than that of the gear case and in which the gear case and cover are provided with bearing surfaces to be aligned for the reception of a common shaft, comprising means for aligning said bearing surfaces, spaced depending locating lugs provided on the periphery of the cover and similarly spaced holes provided in the periphery of the gear case, the ends of said lugs being of less cross section than the holes but their base being of greater cross section so that when the cover and gear case are tightly pressed together to the position they occupy when assembled, such pressure machines the surface of said lugs to form an accurate fit in the locating holes and an accurate alignment between the cover and gear case.

THOMAS R. SMITH.