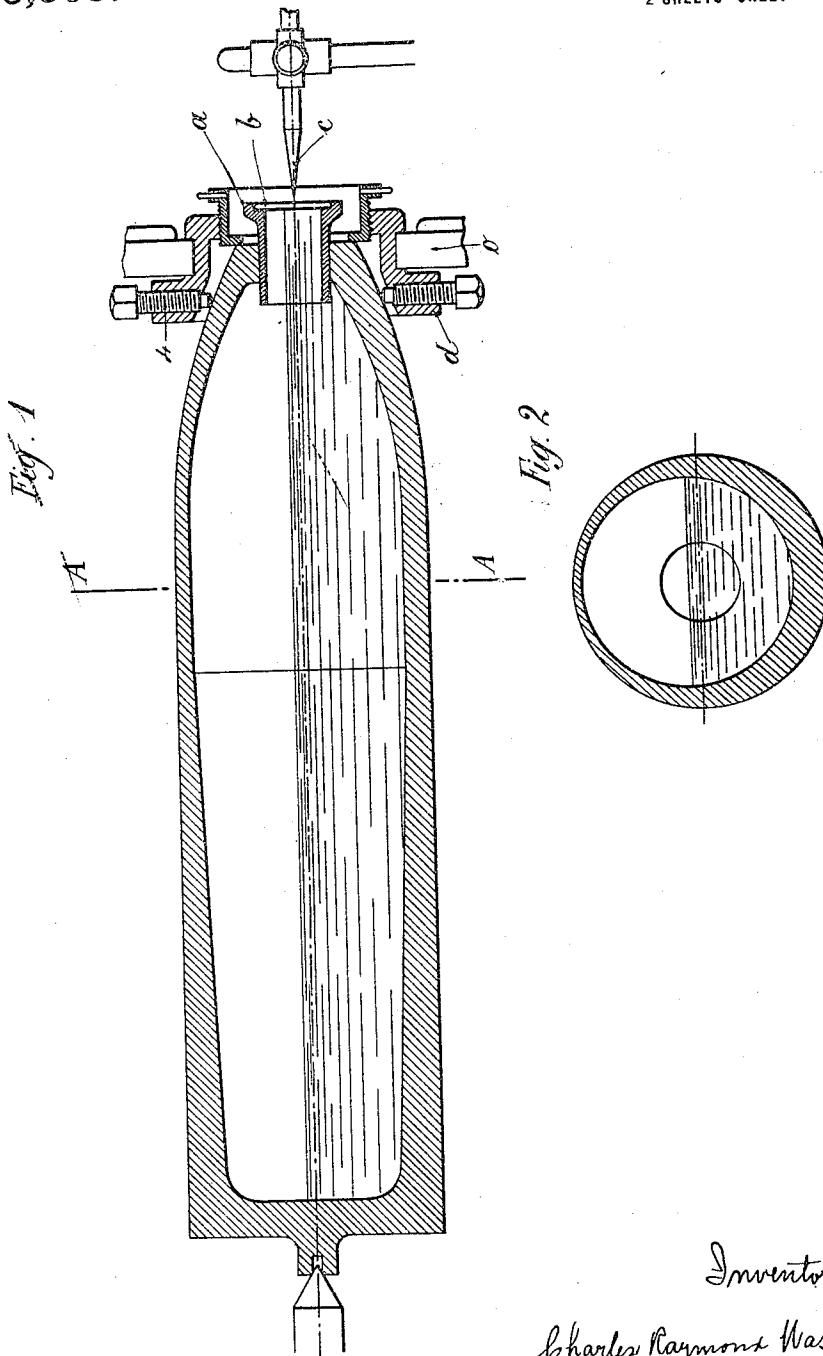


C. R. WASEIGE.
CENTERING METHOD FOR SHELLS.
APPLICATION FILED APR. 24, 1917.

1,285,503.

Patented Nov. 19, 1918.
2 SHEETS—SHEET 1.



Inventor
Charles Raymond Waseige
by *Attorney*
his Attorney

C. R. WASEIGE.
 CENTERING METHOD FOR SHELLS.
 APPLICATION FILED APR. 24, 1917.

1,285,503.

Patented Nov. 19, 1918.
 2 SHEETS—SHEET 2.

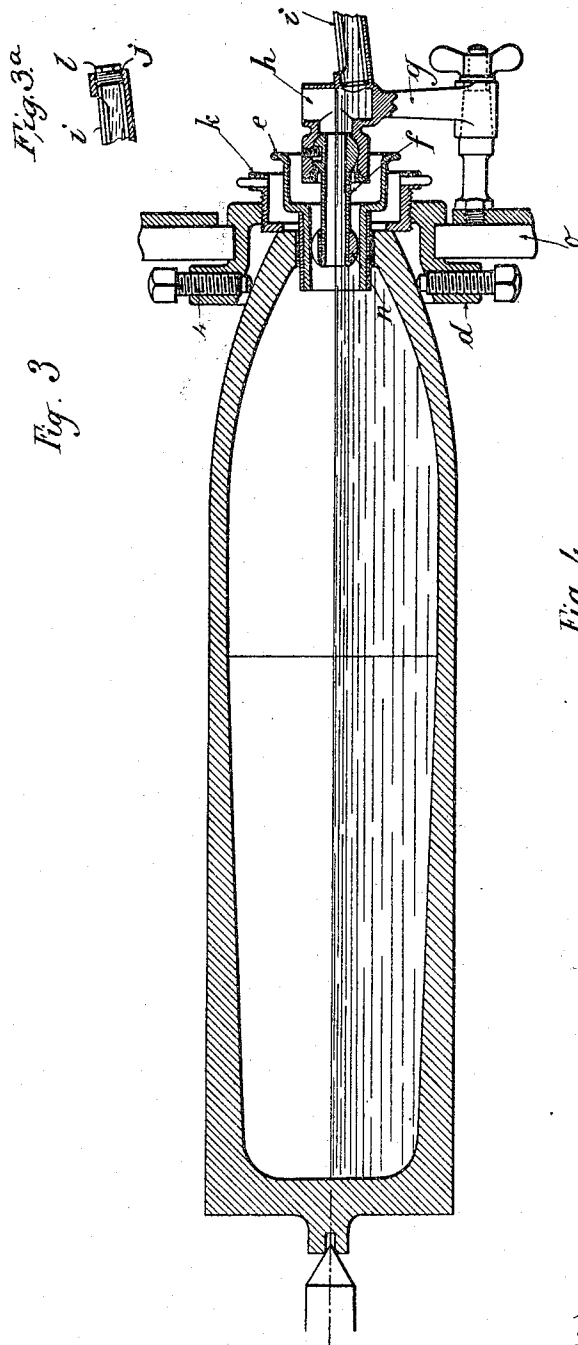
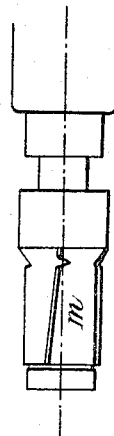


Fig. 4



Inventor
 Charles Raymond Waseige
 by *Attorney*
 his Attorney

UNITED STATES PATENT OFFICE.

CHARLES RAYMOND WASEIGE, OF COURBEVOIE, FRANCE, ASSIGNOR TO SOCIÉTÉ DES AUTOMOBILES ALDA, OF COURBEVOIE, FRANCE.

CENTERING METHOD FOR SHELLS.

1,285,503.

Specification of Letters Patent. Patented Nov. 19, 1918.

Application filed April 24, 1917. Serial No. 164,169.

To all whom it may concern:

Be it known that I, CHARLES RAYMOND WASEIGE, citizen of the Republic of France, residing at 27 Avenue Marceau, Courbevoie, Seine, in the Republic of France, have invented new and useful Improvements in Centering Methods for Shells, of which the following is a specification.

The construction of shells in general and more specially of shells of large caliber with integral bases, is accompanied by great drawbacks as concerns the turning of the outside of the shell so that it will be concentric with the inside. The various mechanical centering methods now in use do not always give sufficiently exact results, and the resulting shells are sometimes found to have an eccentricity between inside and outside which is greater than the standard limits.

The present invention provides a physical method for obtaining a mathematically exact centering of the inside of the shell. This method consists essentially in the use of a shell which is supposed to be in the rough state on the outside, the shell being filled with colored water up to about half its volume, and in the shell orifice there is inserted a hollow stopper ending in a glass plate. The shell is mounted in a lathe, and the boss or nipple of the base is placed upon the headstock point of the lathe, while the pointed end of the shell is held within an adjustable circular holder mounted on the lathe. The variations of the water level in the shell are observed by means of a marking point while the shell is rotated by hand upon the lathe point. The position in which the water level is highest corresponds to a thickened place in the shell, and if the adjustable circular holder is acted upon so as to make the water level remain the same in all positions of the shell, the thickness of the shell will be quite uniform after the shell is turned off on the outside.

In order to operate in the most convenient manner, a device is employed which comprises a hollow stopper which is inserted in the shell orifice, and in this stopper is fitted a tube having a rubber ball on the end next the shell and adapted to slide within the stopper; the other end of the tube opens into the hollowed portion of a suitable support which is mounted on the steady rest or upon the body of the lathe. This tube is fitted

with a steel ball which connects it with the support but forms a joint which allows of a certain amount of movement, this joint being made tight by a stuffing box. The hollow portion of the support has an opening at the top for filling the shell with liquid, and this interior portion is connected with a water-level tube which is inclined at a one-tenth angle and designed to facilitate the observation of the water level within the shell and to amplify the variations of this level which occur in rotating the shell upon the lathe point.

After having centered the shell by the use of the adjustable circular holder, the apparatus is removed from the lathe and the shell orifice is then bored out by means of a milling cutter which is mounted in the usual place of the tail stock point of the lathe. This milling cutter carries a conical portion which serves to produce a bevel in the bored part of the shell, and this bevel is designed to be used for centering the shell in position for all subsequent machine work which is carried out upon it.

In the accompanying drawing, which has a purely demonstrative character,

Figure 1 represents a shell mounted upon a lathe and ready to undergo the operation of centering according to the present invention.

Fig. 2 is a cross section of this shell, according to the line A—A of Fig. 1.

Fig. 3 represents a shell mounted upon a lathe and prepared to undergo the operation of centering, this operation being carried out by the same method but employing a device which permits the water level in the shell to be more easily observed.

Fig. 3^a is a vertical sectional view of a glass tube projecting from the supporting piece *g* shown in Fig. 3.

Fig. 4 shows a milling cutter for making a centering bevel in the shell.

Referring to Figs. 1 and 2, it will be observed that in order to carry out the centering of the shell according to the invention, the shell is filled with colored water up to about half its capacity. A hollow stopper *a* ending in a glass plate *b* is placed in the shell opening. The shell is mounted in a lathe and the boss upon the shell base is centered upon the point of the lathe. The end of the shell point is held in the steady rest *o* of the lathe. Observation is then

made of the variations in the water level while the shell is rotated by hand upon the lathe point, this observation being carried out by the use of the marking point *c* situated in front of the glass plate.

It is evident that the portion of the shell for which the interior volume is the smallest *i. e.* for which the water level is highest, corresponds to a thick place in the shell. In this case the adjustment is carried out by means of the screws 4 of the collar *d* which rotates with the shell within the rest *o*, and the end of the shell is adjusted so that the water level shall remain constant in all positions of the shell. Under these conditions the interior of the shell will be now centered on the lathe, and there will be no thick place after the shell is turned.

The operation can be conveniently carried out by the use of the device represented in Fig. 3, which permits the water level to be easily observed. A shell which is rough on the outside is mounted on the lathe as above indicated, and the device consists essentially of a hollow stopper *e* covered on the outside with rubber, this stopper being fitted into the orifice of the shell. Within the stopper slides a tube *f* provided with a rubber ball *n* in its end lying next the shell, this ball making a tight joint and also allowing the tube to slide according to the different lengths of shell as well as providing for the rotation of the shell and its stopper.

On the outer end of the tube *f* is mounted a steel ball which is maintained in the supporting piece *g* by means of a stuffing-box, and this provides a ball and socket joint for use with the tube in the case of shells which have been previously bored out of center. The supporting piece *g* is mounted upon the circular holder or upon the body of the lathe and can be readily removed. It carries a glass tube *i* which is inclined at an angle of 10 per cent. from the horizontal, this being designed to facilitate the observation of the water level in the shell and to amplify the variations of this level.

The operation for the centering of the shell is as follows: The shell is filled with colored water (for instance the soap water delivered by the lathe pump) through the opening *h* in the supporting piece. The air contained in the interior of the shell can escape through a groove in the top of the rubber ball, while the air in the glass tube can escape through the hole *l* in the stopper *j*.

When the shell is filled up about on a level with its axis, the water level is observed at the top of the glass tube, through an opening provided in the tube carrier. The shell is then rotated by hand upon the lathe center point and about the rubber ball, whereupon the water level is seen to be

displaced along the glass tube, should the interior volume of the shell fail to conform to the horizontal axis. The adjustment is then made so that the water level shall remain at a fixed point in all positions of the shell, this being done as above explained, by adjusting the end of the shell by means of the four screws mounted in the collar *d* which rotates with the shell in the steady rest *o* of the lathe. The shell having been thus centered by the use of the four screws, the support *g* and the stopper *e* are removed and the opening of the shell is bored out by the use of a milling cutter *m* (Fig. 4), mounted in place of the point upon the lathe stock. This milling cutter carries a conical portion for cutting a bevel during the boring, and this bevel is employed for centering the shell in all subsequent operations. In order to keep the shell from slipping off the point of the lathe stock, during the adjustment, it is advisable to use a nut *k* in the collar in order to tighten the shell upon the point. On account of lack of space, or in order to facilitate the observations, it may be found necessary to adjust the level tube at an angle of 90° from the angle shown in the drawing.

It is understood that the above described devices are given only to illustrate the present invention, and that without departing from the essential principles of this invention, it will be possible to modify these devices as to shape, material, dimensions and constructional details.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A shell-centering device containing, in combination, a horizontal supporting point; a fixed circular holder whose axis is horizontal and passes through said supporting point; a collar rotating within said fixed circular holder; centering screws provided in said collar, a shell to be centered, mounted between said supporting point and said collar; a boss cast with the base of said shell and centered exactly with the inside of the shell; a liquid contained within said shell, a hollow stopper placed in the orifice of said shell, and means for observing the variations of level of the liquid during the rotation of the shell, substantially as described and for the purpose set forth.

2. A shell centering device containing, in combination a horizontal supporting point; a fixed circular holder whose axis is horizontal and passes through said supporting point; a collar rotating within said fixed circular holder, centering screws provided in said collar; a shell to be centered, mounted between said supporting point and said collar; a boss cast with the base of said shell and centered exactly with the inside of the

5 shell, a liquid contained within said shell,
a hollow stopper placed in the orifice of said
shell, a rubber ball movable within said
stopper and stopping it completely; a tube
one end of which traverses the ball while
the other end is provided with a ball joint;
a support mounted with the fixed circular
holder and maintaining said ball joint; a
cavity provided in said support communi-
cating with said tube and provided with and
an orifice for filling the shell; an inclined
water-level communicating with said cavity,
substantially as described and for the pur-
pose set forth.

15 3. The herein described method of center-
ing shells, consisting in partially filling the
shell with a mobile indicating medium, ro-
tating the shell in a support whereby ine-
qualities in said shell will be indicated by
20 variations in the level of said indicating

medium, and thereafter adjusting said shell
in its support to accurately center the in-
terior of said shell.

4. The herein described method of cen-
tering shells, consisting in partially filling
the shell with a mobile indicating medium,
rotating the shell about a fixed point adja-
cent one end of the shell whereby inequali-
ties in said shell will be indicated by varia-
tions in the level of said indicating medium,
and thereafter adjusting the opposite end of
the shell to accurately center the interior
thereof.

In testimony whereof I have signed my
name to this specification in the presence of
two subscribing witnesses.

CHARLES RAYMOND WASEIGE.

Witnesses:

LOUIS MOSES,
CHAS. P. PRESSLY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."