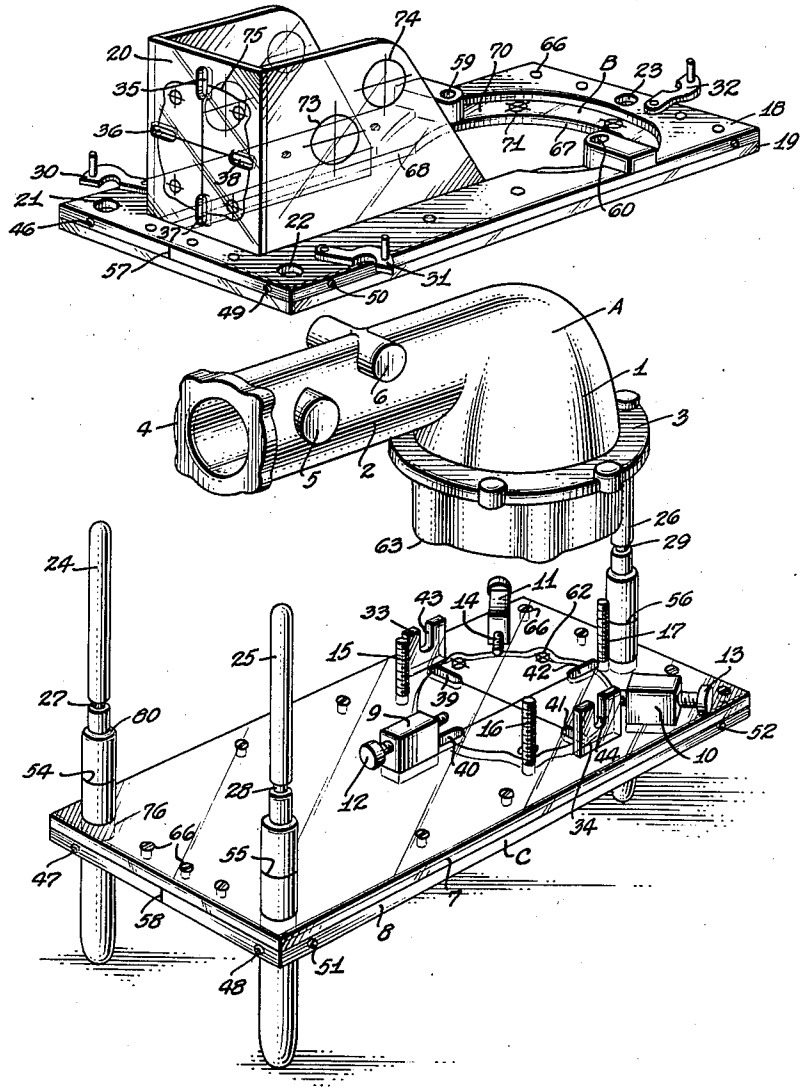
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Fig. 1.



Inventors:

WERNER BAESGEN +
OTTO PÄTZOLD

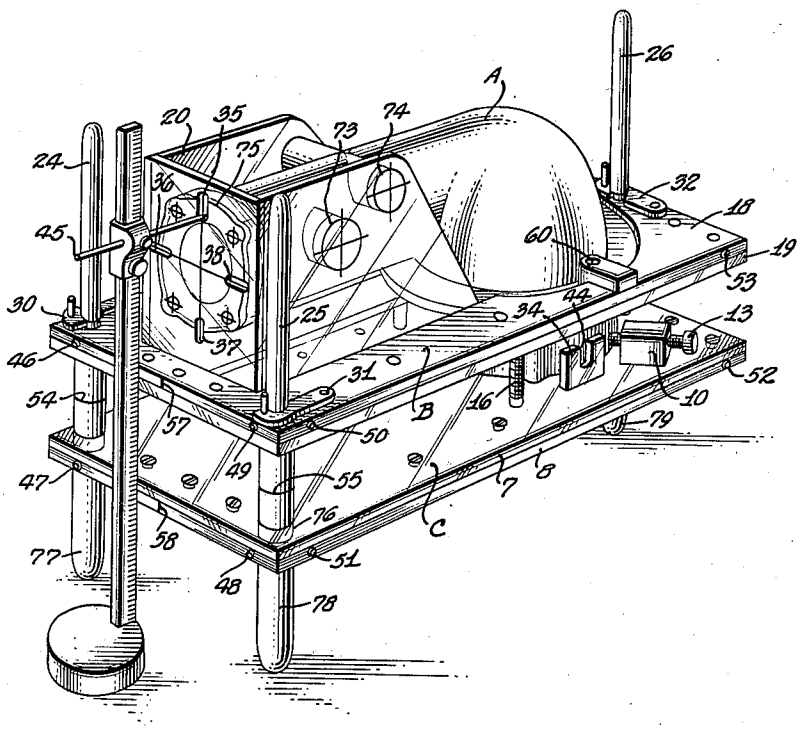
By John A. Tehlmuka
Attorney

Jan. 13, 1942. W. BAESGEN ET AL 2,270,158

TEMPLET

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Fig. 2.



Inventors:
WERNER BAESGEN +
OTTO PÄTZOLD

By John A. Schenck
Attorney

Jan. 13, 1942. W. BAESGEN ET AL 2,270,158

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Fig. 3.

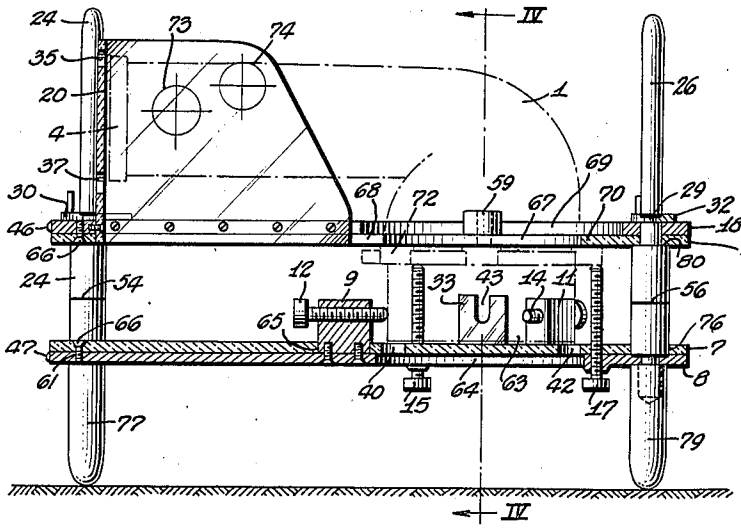
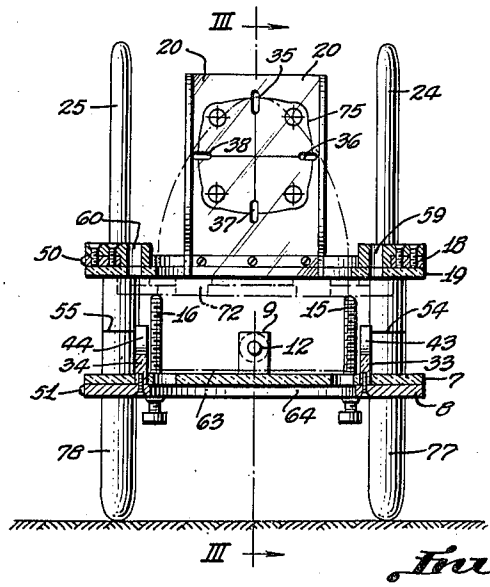


Fig. 4.



Inventors:

WERNER BAESGEN +
OTTO PÄTZOLD

By John A. Kehlenbeck
Attorney

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UNITED STATES PATENT OFFICE

2,270,158

TEMPLET

Werner Baesgen and Otto Pätzold, Dessau, Germany, assignors to Junkers Flugzeug-und-Motorenwerke A. G., Dessau, Germany, a corporation of Germany

Application April 2, 1940, Serial No. 327,385
In Germany February 9, 1939

12 Claims. (Cl. 33—174)

The invention relates to a templet or device for testing the dimensions of partly finished products, as, for instance, castings, forgings and pressed parts which are to be finished by boring, milling, turning or the like. The invention relates more particularly to a templet in which wall portions are provided with tracings of the finished article according to the actual position and dimensions of the latter so as to enable the user of the device to ascertain any aberration of the shape and dimensions of the test piece relatively to the finished article.

Devices of this kind, hitherto in use, are serviceable only for testing the accuracy of the dimensions of the test piece, whereas the marking with the aid of a needle or bore had to be accomplished in separate operations independent of the testing and of each other, and which, consequently, are circumstantial and time consuming, particularly in the mass production. The invention contemplates to improve the templets of the above-mentioned type and to increase their applicability by the provision of means whereby, in addition to the testing as to the accuracy of the shape of the test piece, the marking with the needle and the boring of holes as, e. g. required for securing the test piece to the finishing machine in a desired position may be accomplished in the templete proper, that is to say in one step of operation. For this purpose, the walls of the templet are made, at least partly, of a transparent material, preferably of shatter-proof glass, as first described in our copending application for U. S. patent, Serial No. 202,984. According to the invention, these walls are suitably reinforced and recessed, and with a view to increasing the stability and to decrease the sensitivity to external influences the reinforcing elements, frames, plates, masks or the like, are made of a resistant material, preferably of a metal like duralumin. Such reinforcing elements are so arranged and constructed as to hold and to connect to each other the transparent templet parts which, serving to receive the test piece, are provided with the contours and marking lines of the finished article. Also in accordance with the invention, the reinforcing elements may be provided with means for additionally working the test piece in the templet, particularly with supports in various planes for marking the test piece, and with guides or tracks for boring tools and the like.

Other objects and details of the invention will be apparent from the description hereinafter and the accompanying drawings illustrating an embodiment thereof by way of example.

In the drawings,

Fig. 1 is a perspective view of a testpiece between the two main parts of a templet according to the invention, the parts being shown separate from each other,

Fig. 2 is a perspective view of the same templet parts with the test piece secured thereto, Fig. 3 is a longitudinal section on the line 3—3 of Fig. 4, and Fig. 4 is a transverse section on the line 4—4 of Fig. 3.

Referring now to the drawings, A is a piece to be tested as to the accuracy of shape and to be prepared and marked for further operation. In the illustrated example, the test piece is a rectangular elbow casting with a shorter pipe portion 1 of a larger diameter, and with a longer pipe portion 2 of a smaller diameter. Both said portions are provided with flanges 3 and 4 respectively. Furthermore, the narrow portion 2 is provided with lateral projections 5 and 6 serving the purpose for which the finished article is destined.

The templet, in its illustrated form, consists of a top part B and a bottom part C. Each of the parts comprises one or several transparent wall portions with tracings thereon and elements reinforcing such wall portions. The bottom part C has a transparent plate 7, preferably of shatter-proof glass and a reinforcing element in the shape of a metal plate 8, preferably of duralumin, covering the outside, i. e. the lower side of the transparent plate 7. Both plates are provided with registering holes as indicated at 61 through which screws may be passed in order to secure the plates to each other. A tracing 62 is applied to the transparent plate according to the shape and size of the lower face of the finished article and corresponding to the bottom face 63 of the test piece A. A recess 64 somewhat larger than the periphery of the tracing 62 is provided in the metal plate 8, and so arranged that the tracing and the test piece face 63 may be inspected through said recess when the test piece is secured to the templet in operative position by suitable means to be hereinafter described. Passing through suitable recesses such as 65 of the plate 7, interiorly threaded members or blocks 9, 10, 11 are secured to the top face of the metal plate 8 by suitable means as by welding, soldering, casting, screwing, or riveting. Set screws 12, 13 and 14 are passed through the threading of the blocks 9, 10, 11 respectively, and the arrangement is such that the test piece A may be secured to the

bottom piece C by means of said set screws 12, 13, 14 and adjusted thereby as to its position opposite the tracing 62. For this reason, the blocks with their respective screws are spaced approximately 120° from each other in the illustrated example. Intermediate each two neighborhood blocks, a screw stud is attached to plate 8 so as to project upward through a suitable hole in plate 7. These studs denoted with 15, 16, 17 respectively are so arranged that they may be screwed in or out in order to adjust their lengths projecting upwards of plate 7. They serve as supports for a suitable face of the test piece, e. g. in the case of the illustrated test piece, for the lower face of flange 3 of the elbow A. When the templet is used the screws 15, 16, 17 will be so adjusted that the bottom face 62 is held very close to but out of engagement with plate 7. Thus, the latter is protected against external influences, by the reinforcing structure of a resistant and durable material which is not subject to variations of temperature within practical limits.

The top part B of the templet comprises also a transparent plate 19 with a reinforcing plate 18 on top thereof and secured thereto by suitable means such as screws 66. Plate 19 is provided with a circular recess 67 communicating with a rectangular recess 68. Plate 18 is similarly recessed; however, its circular recess 69 is wider than the recess 67 so that the upper face of the flange 3 of test piece A may be inspected through the rim portion 70 of plate 19 which projects interiorly of the recess 69. A transparent structure 20 is erected on top of the plates 18 and 19 so as to encompass the straight line borders of the recess 68. This structure is in accordance with the body form of the elbow portion 2 and flange 4, as will be apparent from Fig. 2. However, structure 20 should be sufficiently wide to insure that the corresponding portions of the test piece are close to the structure walls but do not contact the latter when the test piece is assembled with the templet as will be described hereinafter. Tracings are provided on the transparent material of plate 19 and the structure 20 for comparison with corresponding contours of the test piece. Such tracings or marks are indicated in the drawings, e. g. at 71 for the round 72, at 73 and 74 for the projections 5 and 6 respectively, and at 75 for the face of flange 4.

Means are provided for securing templet part B to C and for preventing plate 19 and structure 20 from directly contacting the test piece A when the latter is fastened to the part C. In the illustrated form, such means consist of guides or tracks in the shape of stay bolts 24, 25, 26 which are secured by suitable means to plate 8 of the templet part C and project therefrom upward through holes in the transparent plate 7 as indicated at 76. The bolts may have lower projections 77, 78 and 79 respectively, so as to form legs of the templet structure. At an adequate distance from plate 7, the bolts have shoulders, as indicated at 80, to support the upper templet part B. The upper ends of the studs or bolts 24, 25, 26 are sufficiently long to prevent the test piece A secured to part C from contacting plate 19 and structure 20 when part B with guide holes 21, 22, 23 is moved downward on the track constituted by said bolts. Thus, injuries to the transparent parts are avoided. The bolts 24, 25, 26 may be further provided with notches 27, 23, 29 respectively to be engaged by latches 30, 31, and 32 pivoted on the top surfaces of plate 18. When the latches are in locking position, the templet parts B and C are secured to each other.

In using the device, the test piece is placed on the ends of the screws 15, 16, 17 and between the ends of the set screws 12, 13, 14. By manipulating the screws the test piece is adjusted and coincidentally secured to the lower templet part C owing to the clamping action of the set screws in such a position that the test piece is in registry with the tracing and test marks provided on the transparent plate 7 according to the contours of the finished article, whereby those portions of the test piece which will be removed in machining the piece will project beyond the tracings. Thereafter, the top part B will be slipped over the bolts 24, 25, 26 and locked in position with the aid of the latches 30, 31, 32 whereupon the tracings and marks on the transparent plate 19 and structure 20 will be also in registry with the corresponding parts of the test piece. Thus, the piece A may be tested as to the accuracy of the dimensions through the recesses of the reinforcing elements which coincidentally protect the transparent plates 7 and 19 against injury owing to external influences.

Various means are provided in connection with the reinforced templet for making possible or at least for facilitating the marking of the test piece while it is held in the templet. For this purpose, the transparent walls may be recessed as clearly shown at 35, 36, 37, and 38 in the wall of the structure 20 and at 39, 40, 41, and 42 in the plate 7. Furthermore, brackets may be secured to the reinforcing elements so as to pass through the transparent walls as shown at 33 and 34. These brackets are arranged close to the surface of the pertaining portion of the test piece and are provided with recesses 43 and 44 through which the marking needle 45 may be applied. In a similar manner, bore bushings such as 59, 60 may be provided which are secured to the reinforcing elements in registry with holes in the respective transparent plate. Such bushings serve to guide a boring tool in providing the test piece with holes required for securing the piece to a machine for the subsequent finishing operations.

In order to facilitate the marking of the test piece in different planes, the reinforcing elements may be equipped with supports, e. g. in the shape of hardened steel studs, as indicated at 46, 49, 50 and 53 in connection with plate 18 and 47, 48, 51, and 52 in connection with plate 8. Now, it will be apparent from Fig. 2 that the supports 46 to 49 and 50 to 53 and the ends of the stay bolts 24, 25, 26 define three planes at right angles with respect to each other in which the marking may be accomplished. It is advisable to use for this purpose several marking needles fixedly set to different measures, and to place the templet with the inserted test piece successively in various positions upon the supports which are arranged in different planes perpendicular to each other. Additional marks 54, 55, 56 may be applied to the bolts 24, 25, and 26 respectively, and other marks such as 57 and 58 to the plates 8 and 18 in order to facilitate the marking of the test piece.

The invention hereinabove described makes it possible in a simple manner, in a short time and in a single step of operation, to test the partly finished product, to mark it and to prepare it for the subsequent working with the aid of other devices, so that it constitutes an appreciable improvement of the templets, particularly of the

transparent templet hitherto used. Modifications and changes in the structure, proportion and arrangement of the parts may be made by those skilled in the art without departing from the nature and scope of the invention as defined in the appended claims.

We claim:

1. In a templet of the type described the combination of transparent walls, spaces to hold said walls releasably at a predetermined distance from each other so as to receive therebetween a partly finished article in a predetermined position relatively to said walls, a marking traced on portions of said walls according to the desired shape of the finished article portion in registry with said marking when the article is in said predetermined position, and rigid elements of resistant material attached to said walls so as to reinforce the latter, said elements being provided on such portions of the walls which are exteriorly of the space occupied by said marking so as to permit inspection of said partly finished product through the marking-provided portions of the transparent walls.

2. In a templet for testing the shape of a partly finished product in comparison with tracings applied to portions of said templet according to the desired shape of the finished article that improvement which consists of a templet wall composed of a transparent plate with tracings thereon and of a metal plate being attached to and covering the outside surface of said transparent plate and being recessed in the range of the tracing thereon so as to leave the tracing-provided portion of the transparent plate uncovered.

3. In a templet of the type described the combination of tracing-provided transparent walls with a reinforcing frame structure, said structure including metal cover plates of said walls, said plates being attached to the outside surfaces of said walls and recessed in the range of said tracing, and connecting members adapted to hold said plates in spaced relation according to the shape of a partly finished product whose outline is intended to be tested in relation to said tracing.

4. A device as claimed in claim 3, in which supporting elements are provided on said frame structure, said supporting elements being arranged in different planes whereby said templet may be supported when placed on a base plate in any one of a plurality of predetermined positions.

5. A device as claimed in claim 3 in which hardened steel studs are provided on said frame structure, said studs being arranged in different planes at right angles in relation to each other so as to serve as supports permitting marking and boring of the partly finished product in the same device without readjustment of the product therein.

6. A device as claimed in claim 3 in which said transparent walls are provided with recesses in places where it is intended to mark the partly finished product with a marking tool.

7. A device as claimed in claim 3 in which said frame structure comprises bore bushings in registry with holes in the transparent wall, said bushings being arranged in places where it is intended to provide the partly finished product with bore holes.

8. In a templet of the type described the combination of tracing-provided transparent walls with a reinforcing frame structure of a material durable and resistant to external influences and to variations of temperature within practical limits such as duralumin, said frame structure including means for releasably attaching said walls thereto, and spacers for said walls, whereby the position of said walls relatively to each other is ensured so as to receive therebetween a partly finished article in registry with said tracing.

9. In a templet of the type described the combination of tracing provided transparent walls with a reinforcing frame structure to which said walls are attached, said structure including means for securing a partly finished product to said structure and to adjust it in relation to the tracings on said transparent walls.

10. In a templet of the type described the combination of tracing provided transparent walls with a reinforcing structure to which said walls are attached, said structure including supports to hold a partly finished product to be tested in the templet, opposite the tracing close to the transparent walls but out of contact therewith, and means for securing said product to said structure.

11. A device as claimed in claim 10 wherein said securing means include adjustable clamping screws whereby the position of said product relatively to said tracing may be adjusted said screws having axes arranged substantially parallel to the plane of said tracing.

12. A device as claimed in claim 1 in which testing marks are provided on said reinforcing elements.

WERNER BAESGEN.
OTTO PÄTZOLD.