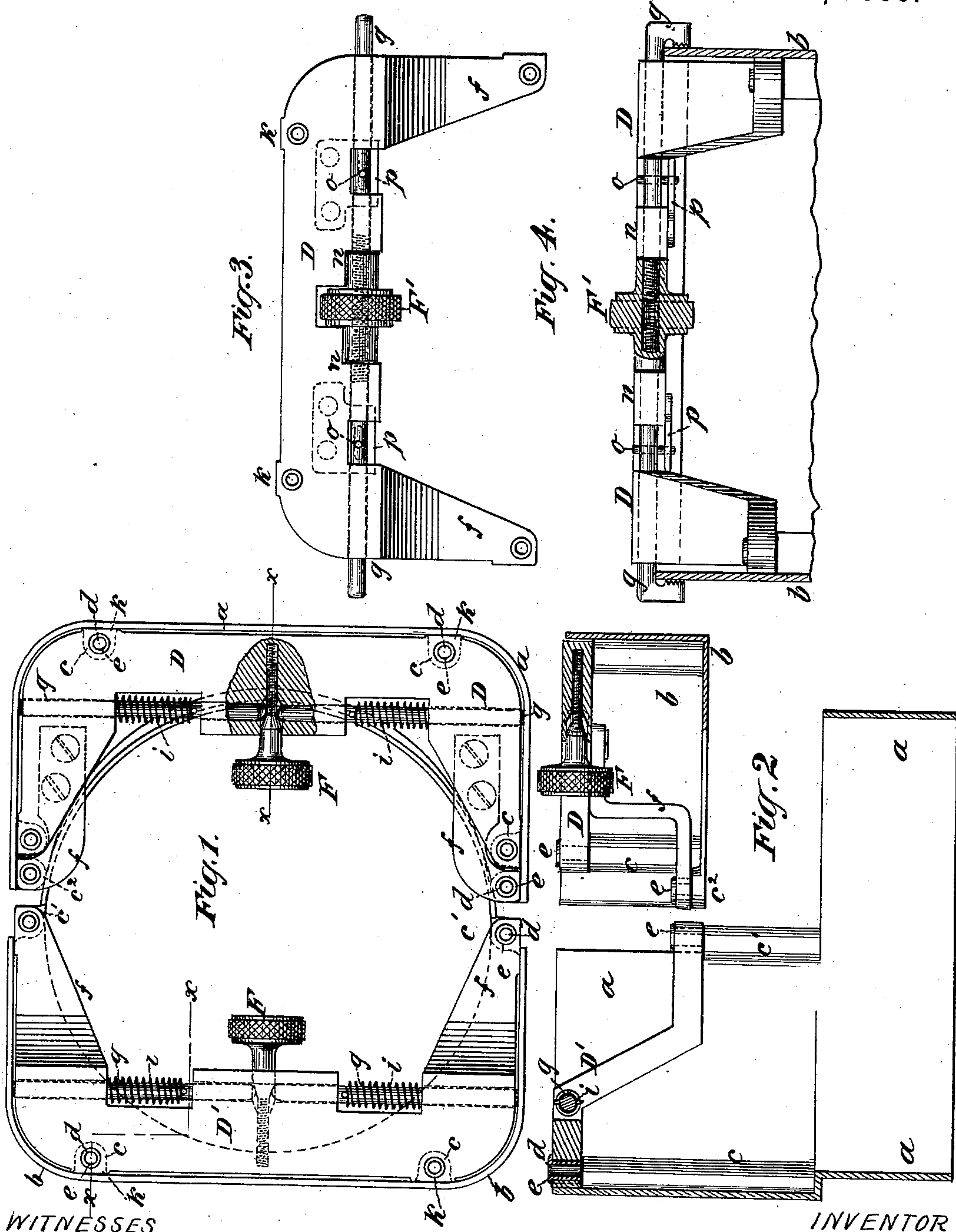


(No Model.)

J. BRADY.
MACHINIST'S JIG.

No. 334,340.

Patented Jan. 12, 1886.



WITNESSES

John Becker.
Geo. E. Gavin

INVENTOR

James Brady.
by Chas. M. Higgins
Attorney.

UNITED STATES PATENT OFFICE.

JAMES BRADY, OF BROOKLYN, NEW YORK.

MACHINIST'S JIG.

SPECIFICATION forming part of Letters Patent No. 334,340, dated January 12, 1886.

Application filed June 15, 1885. Serial No. 168,759. (No model.)

To all whom it may concern:

Be it known that I, JAMES BRADY, of Brooklyn, Kings county, New York, have invented certain new and useful Improvements in Machinists' Jigs, of which the following is a specification.

My improved jig is more especially designed for fitting or finishing hollow or irregular castings of a case-like form, used in the cases or frames of machines or other articles; and its chief object is to enable the screw or other holes to be drilled in the casting in definite and uniform relation with the outline or common center of the castings themselves, so that when two or more sections of the finished casting are put together the holes will not only be in fixed definite relations with each other, but the two sections of the casting so put together will match or junction on their exteriors as closely as practicable, any difference in the size of the castings so put together being equally divided from the common center.

With the jigs generally used it is an easy matter to drill the several screw-holes in fixed definite relations with each other, as these holes are located at fixed distances in the rigid jig-plate, and hence cannot be drilled wrong relatively to each other; but it is not so easy to have these holes always drilled at uniform definite positions relatively to the external or internal walls or common center of the castings, as the jig may be fixed on one casting a little more to one side than on another casting, and hence when the castings are put together they will not junction nicely at their external walls or common centers, but one may overlap the other, producing a bad appearance, unless the trouble is taken to make the parts match by subsequent filing or grinding.

This difficulty my invention is designed to obviate, and it may be briefly stated to consist in an adjustable or centralizing jig formed by the combination, with the jig-plate provided with the drill-holes or other definite marks or points for fitting or boring, of two oppositely-directed bearing or grasping bolts or points adapted to bear upon or grasp the sides of the casting, with an expanding and contracting device for expanding or contracting the bearing-bolts simultaneously in opposite directions, whereby the jig-plate may

always be fastened on the castings in an equalized central position with reference to the sides or common center of the casting, notwithstanding irregularities, so that when holes are drilled and the castings put together the castings will match on their sides or exteriors without other fitting, or their projection on all sides will be equal.

In the drawings annexed, Figure 1 presents a plan view of two of my improved jigs clamped, respectively, to two sections of a case-casting, which are to be finally fitted together; and Fig. 2 shows a sectional elevation of the same on the lines *x x*. Fig. 3 is a plan view of a slightly-modified form of my jig; and Fig. 4, a sectional elevation thereof, shown applied to a casting.

In Figs. 1 and 2, *a b* indicate the two sections of the castings which are to be drilled and fitted together, these castings, as shown, having a hollow case-like form, but which will, of course, constantly vary, being caused by varying shrinkages in the castings. These castings are formed with internal bosses, *c c*, at different points and at different levels, in which screw-holes are to be drilled.

Now, *D D'* indicate the jig-plates, which, as usual, have drill-holes *d* at points corresponding to the position of the bosses *c c*, these drill-holes being formed through hardened-steel bushings *e e*, driven into the jig-plate in the usual manner, as illustrated. The jig-plates shown are formed with bent wings or other members, *f*, to reach and overlap the lower bosses, and the plate will, of course, always be formed to correspond with the position of the holes desired in the rough casting, so that the number of drill-holes in the jig-plate, their relative positions, and the shape of the jig-plate will therefore vary in different cases, and hence the special shape of the jig-plate forms no distinctive part of my invention in itself.

In Figs. 1 and 2 the lower bosses, *c' c'*, in the two castings are designed to be drilled at precisely similar points, so that when the two casting are fitted together the holes should coincide to receive fastening-screws and the exterior of the casting should match on each side as evenly as practicable.

It will now be seen, referring to Figs. 1 and

2, that there is no difficulty in having the several holes $d\ d$ drilled at precisely the same points relatively to each other in all the castings, since these holes are at fixed definite distances in the rigid jig-plate; but it will be observed that without some special provision the jig-plate might be fastened on the castings in indefinite positions relatively to the common center or sides of the castings themselves, so that the holes in one casting would be drilled nearer to one side and the holes in the next casting drilled nearer to the opposite side, so that when the two sections were put together they would not match evenly at their common center or at the exterior, but one would overlap the other and produce a bad and unsightly fit. In order, therefore, to prevent this, I provide the jig-plate with the bearing points or bolts $g\ g$, preferably directed in diametrically-opposite directions. The bolts are arranged to slide freely in sockets in the jig-plate, with their outer ends protruding from the edge of the jig-plate, and toothed or roughened on the end for better adhesion to the surface of the casting, while their inner ends are smoothly rounded and abut against the conical wedging-shank of a binding-screw, F , whose threaded tip screws into the jig-plate at right angles to the bolt, while the milled head of the screw projects free for manipulation, as illustrated. Springs $i\ i$, arranged as shown best in Fig. 1, tend constantly to retract the bolts and press them against the conical shank of the screw, as seen in section in Fig. 1.

Now, referring to Figs. 1 and 2, it will be seen that the jig-plate is formed with two fixed definite abutting points, $k\ k$, adapted to abut against the casting when the plate is applied thereto, and it will therefore be now readily understood that when the jig-plate is placed in or on the casting, as seen in Fig. 1, with the abutting points $k\ k$ pressed up against the side of the casting, the screw F may then be turned inward, which will wedge the bolts $g\ g$ outward equally in opposite directions, thus causing their roughened ends to bear upon the opposite walls of the casting, and thus fix or clamp the jig in a perfectly central definite position on or in the casting, notwithstanding irregularities of individual castings. Hence the holes may now be drilled in the casting in fixed definite positions relatively to the walls or sides of the castings, and when the castings are put together the exterior sides will match as closely as it is possible to have them without subsequent fitting, which has been an important desideratum in jigs of this character, and forms the prime advantage of my invention.

It will be obvious that I do not confine myself to any special form of the bearing-bolts or the expanding and contracting device for operating them, as these may vary considerably without any departure from the principle of my invention.

In Figs. 3 and 4, I show a modification in

which the bolts bear on the exterior of the casting, the outer ends being hooked to overlap the casting, while the inner ends of the bolts are right and left threaded to engage a right-and-left-threaded nut, F' . The nut F' is confined between shoulders n in the jig-plate, but is free to turn, the bolts being prevented from turning by pins o , working in slotted guides $p\ p$. The principle of my invention is, however, not confined to either form illustrated; but any equivalent thereof may be employed.

It will be seen that by means of the devices shown an equal movement of the bearing bolts or clamps in opposite directions is effected, so that the jig will always be set absolutely central in each casting, and the holes will therefore be drilled in each casting in uniform positions relatively to the center and sides of the castings. It is not absolutely necessary, however, that each bolt move exactly equal in opposite directions, as they might move in a slightly differential manner, as would be the case in Figs. 3 and 4 if the screw-thread on one of the bolts were of a different pitch from the other. This would cause the jig to be set slightly eccentric in each casting, instead of exactly central; but as the eccentricity would be relatively the same in each casting the same result would be secured, as already described; but of course the equal movement of the bolts securing the central position of the jig is much preferable, as set forth.

Instead of using two bolts, it is obvious that three or more acting radially may be used, or any other number acting in as many different directions as the shape of the casting may require.

What I claim as my invention is—

1. In a machinist's jig, the combination, with the jig plate or frame, of two or more bearing bolts or clamps projecting from the plate in different directions, and adapted to grasp the sides of the casting or part to be fitted with an expanding and contracting device for operating the said bolts simultaneously, substantially as and for the purpose herein set forth.

2. In a machinist's jig, the combination, with the jig plate or frame, of two or more oppositely or differently directed bearing-bolts projecting from the plate, and adapted to grasp the casting or article to be fitted with an expanding and contracting device for moving the bolts equally in opposite directions, whereby the jig-plate is set central in or on each casting, substantially as herein set forth.

3. The combination, with a jig-plate, such as D , having drill-holes e , of the sliding bolts $g\ g$, protruding from the jig-plate in opposite directions, and a manipulating device for moving the bolts in or out, substantially as herein set forth.

4. A jig-plate provided with two or more bearing-bolts projecting therefrom in different directions, and formed with toothed or roughened ends to bear upon the casting, in

combination with a manipulating device common to both bolts to project or retract the same, substantially as set forth.

5 5. The combination, with a jig-plate, of the bolts *g g* and expanding and contracting screw *F*, arranged and operating substantially as and for the purpose set forth.

6. The combination, with the jig-plate *D*, of

the bolts *g g*, springs *i i*, and screw *F*, arranged and operating substantially as and for the purpose set forth.

JAMES BRADY.

Witnesses:

HARRIS TABER,
JNO. E. GAVIN.