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PATENTED APR. 7, 1908.

B. P. FORTIN.  
MACHINIST'S JIG.

APPLICATION FILED JUNE 12, 1905. RENEWED SEPT. 5, 1907.

4 SHEETS—SHEET 2.

FIG. 2.

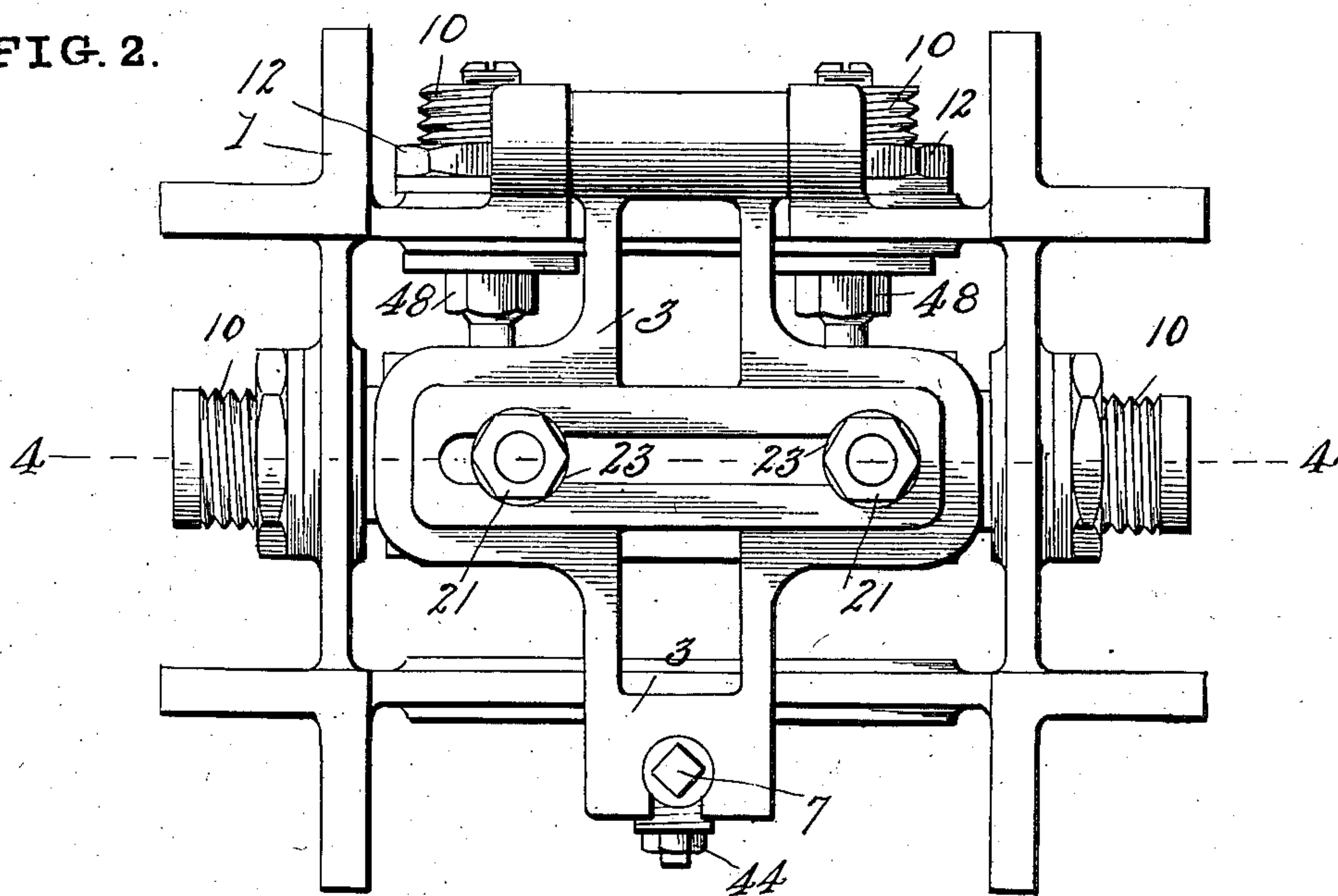
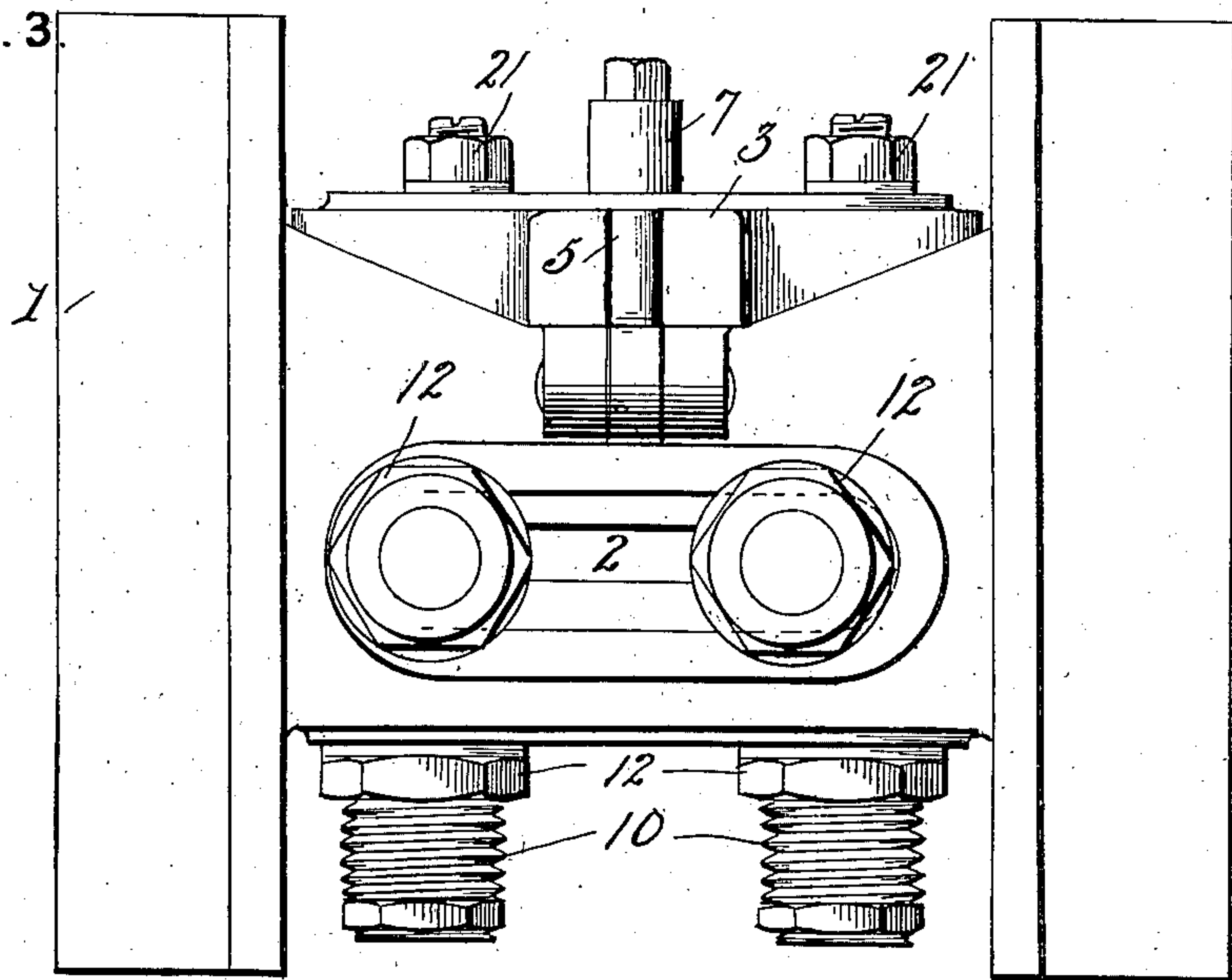


FIG. 3.



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4 SHEETS—SHEET 3.

FIG. 4.

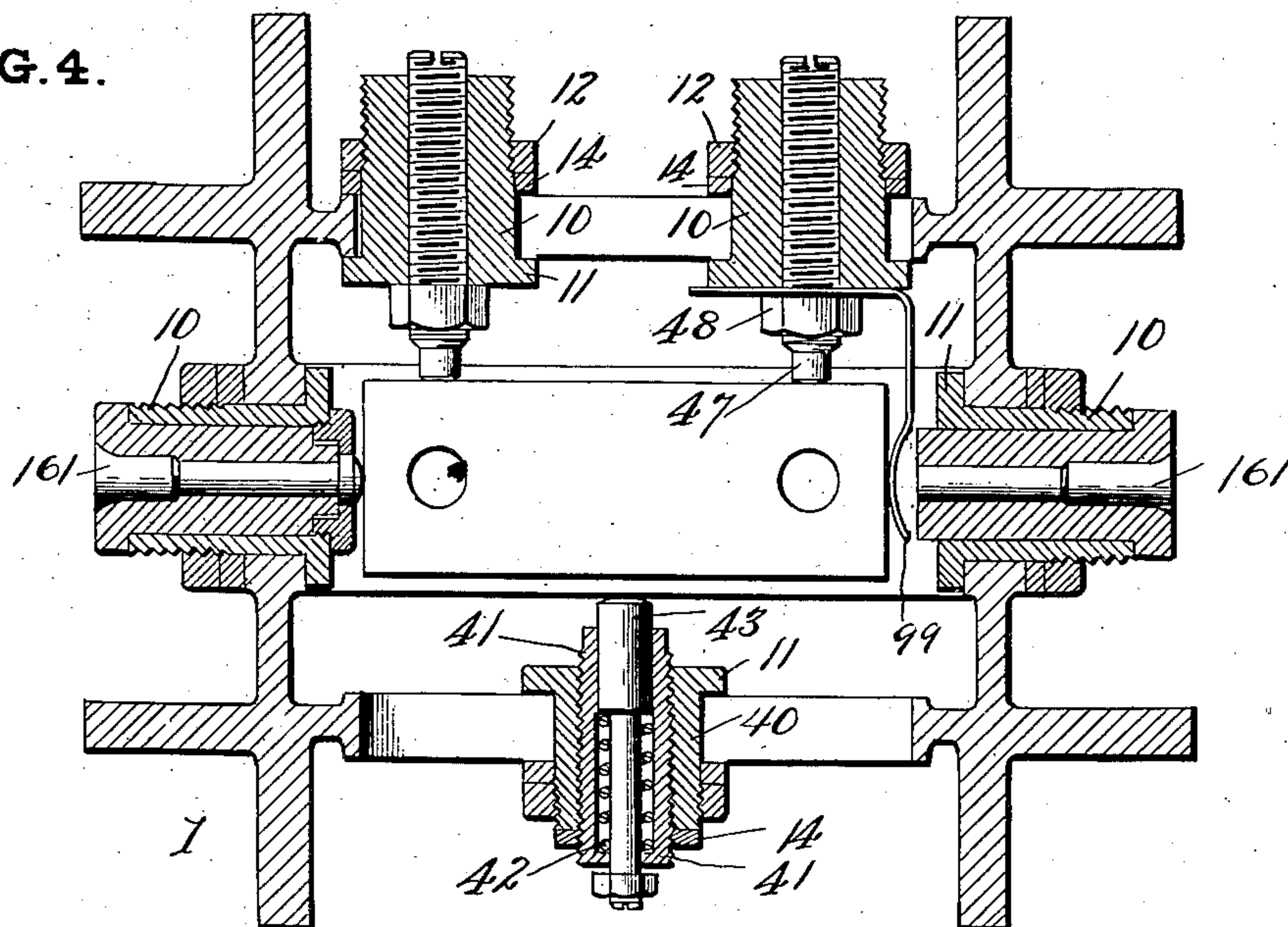
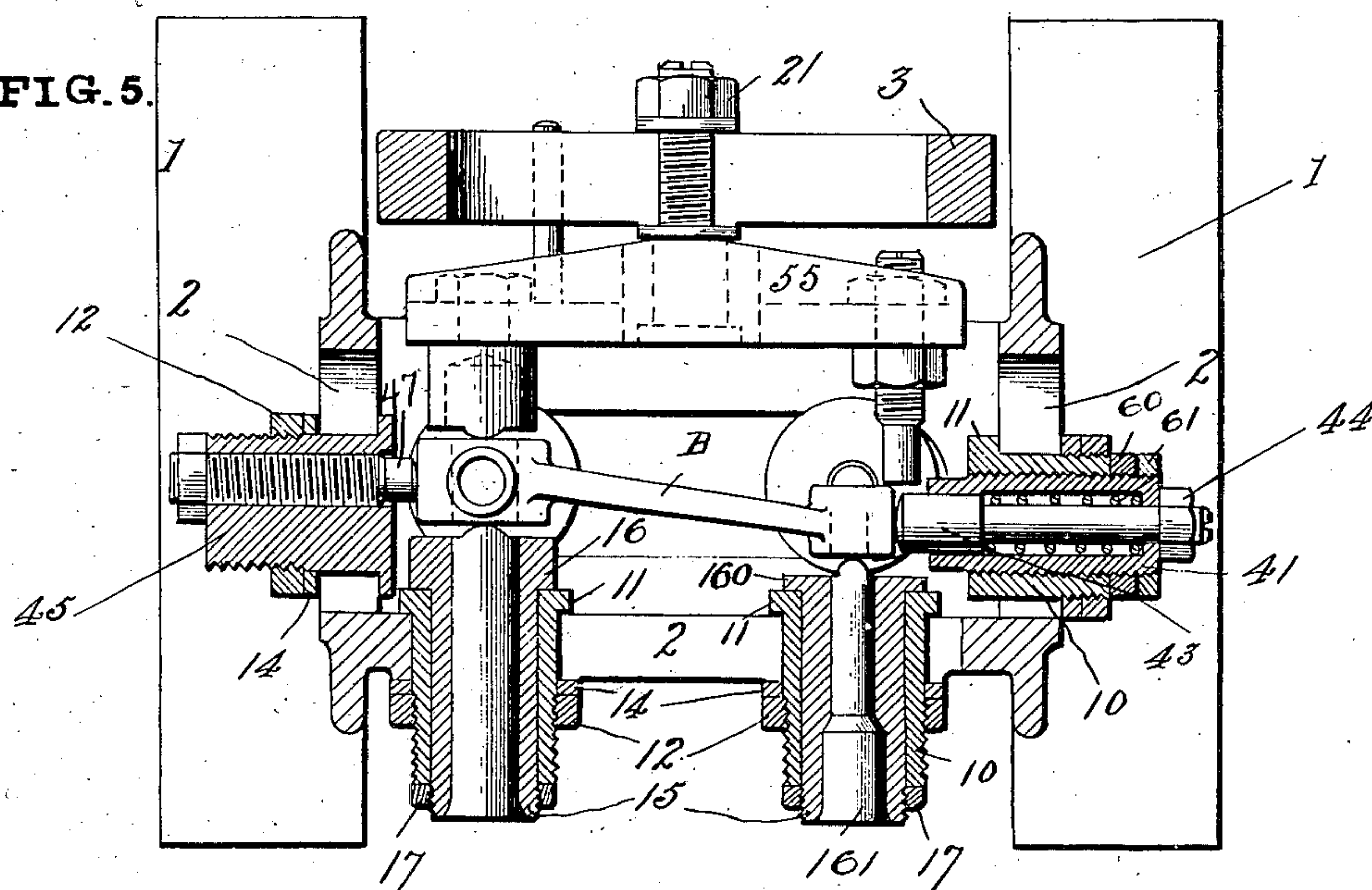


FIG. 5.



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4 SHEETS—SHEET 4.

FIG. 6.

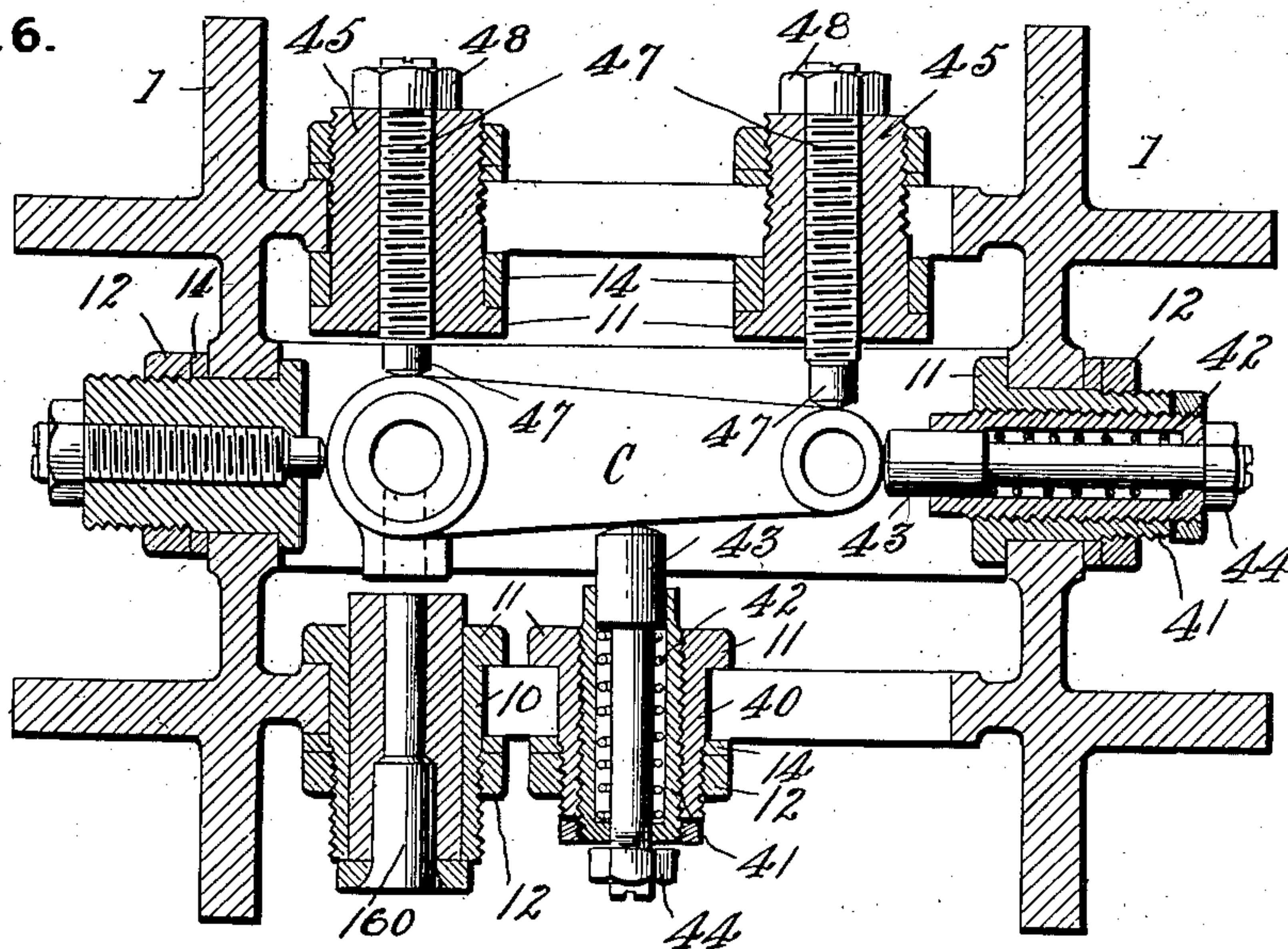
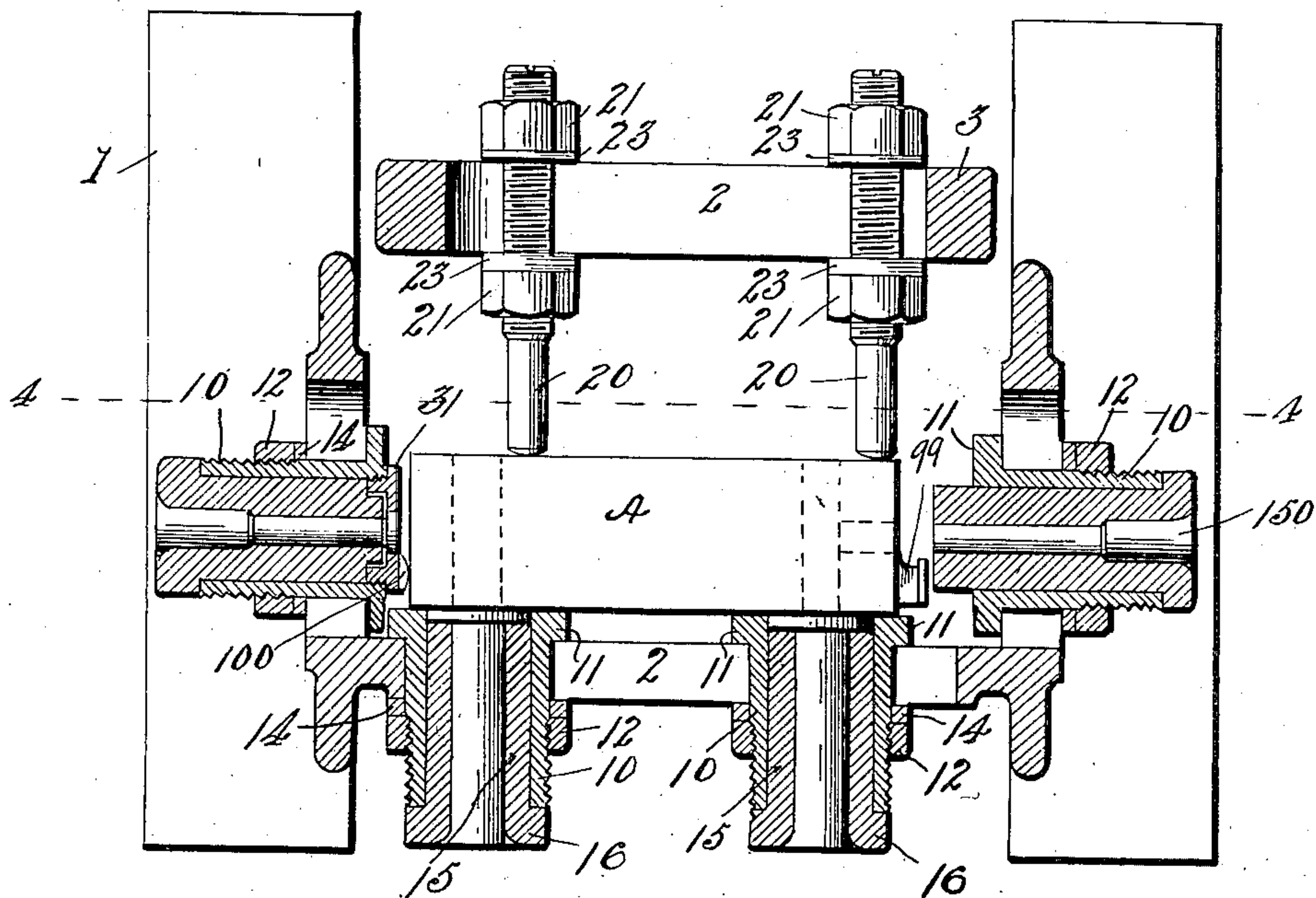


FIG. 7.



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# UNITED STATES PATENT OFFICE.

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## MACHINIST'S JIG.

No. 883,869.

Specification of Letters Patent.

Patented April 7, 1908.

Application filed June 12, 1905, Serial No. 264,800. Renewed September 5, 1907. Serial No. 391,510.

*To all whom it may concern:*

Be it known that I, BENJAMIN P. FORTIN, citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Machinists' Jigs, of which the following is a specification.

This invention relates to jigs or holders in which castings and similar articles are held for boring, reaming, tapping, and like operation.

The object of the invention is to produce a box jig capable of a wide range of use, so that irregular articles of many different shapes may be severally introduced into the jig, and when an article is so introduced it may be firmly held, and still be accessible for the various processes and tools which are subsequently applied to the article. The jig is provided with projections on all sides, which act as legs to support the jig and inclosed article on the drill bed or other machine whichever side of the frame be uppermost.

Figure 1 is a partly broken perspective view of the jig. Fig. 2 is a plan, and Fig. 3 an elevation of the jig. Fig. 4 is a horizontal section of the jig, on line 4-4, Fig. 7, showing a piece of work in place. Fig. 5 is a vertical section, nearly central, showing an irregular piece clamped in the jig. Fig. 6 is a horizontal section, about centrally of the jig, showing clamping means for the piece shown in Fig. 5, and presenting another side of the work. Fig. 7 is a vertical section involving the parts of Fig. 4. Fig. 8 shows face and side views of flat spring.

The jig has a rigid skeleton frame 1, 1, which frame is provided with slots or openings 2, 2, etc., in the top, bottom, sides and ends, such openings being for the entrance of tools to operate on an article within the jig, and for the support of holding pieces between which the work is confined.

The clamping cover 3 of the skeleton frame is hinged thereto at 4, by a suitable hinge joint. The front end of cover 3 is forked, and a bolt 5, pivoted to the frame at 6, may be swung between or away from the arms of the fork. When swung into the fork, a nut 7 on the bolt may be screwed to position to hold the cover securely. The cover can be swung back for the insertion of any article into the skeleton frame, and can be closed and clamped securely by the means

described. When closed the cover becomes practically as rigid as the other sides of the skeleton frame.

In the slot 2 in the side, top or bottom of the skeleton frame, there is a bushing or bushings 10, (Fig. 7), with bodies narrow enough to pass through the slot 2, and heads 11 which cannot so pass through the slot. The edges of these heads rest on the material at the edges of slot 2. The bushing is threaded at its other end, and a nut 12 can be applied to this threaded portion. Washers 14 can be interposed between the nut and frame and either outside or inside the frame. Bushing 10 may itself serve as a guide sleeve for a tool.

Inside the bushing 10 there may be drill or tap guides 15, in the form of sleeves, which neatly fit the bore of the bushings. These guides are preferably formed with heads 16, and may be readily removed from the position shown in Fig. 7, and placed in the position shown in Fig. 5, or otherwise. The work will then rest on the heads 16, and the guides may be held in place by nuts 17 engaging a thread on the outer end of the guide sleeves.

Guide sleeves 15 are prepared especially for the work, in most cases. Consequently the thickness of the head of such guide sleeves may be more or less, and the bore through which the drill or reamer is passed is also made to conform to the work in hand. It is desirable to have all the bushings, washers, guide sleeves, spring pins and gage points interchangeable. (See head 160, and bore 161, Fig. 5, for example.)

Referring again to Fig. 7, it will be seen that clamping pins 20 pass through the slot 2 in the cover 3. These pins 20 have their bodies screw threaded, and nuts 21 permit the pins to be adjusted to any desirable height in the slot. Washers 23 form bearings for nuts 21. Thus if the body to be worked be regular, as at A, Fig. 7, or irregular, (as at B, Fig. 5), the bearing pins may be moved up or down, as well as sidewise in the slots, so as to get the best possible grip on the work in the jig, and a similar adjustment may be made for the supports under the work. Then, drills, reamers, taps, &c., may be passed to the work, either through the guide sleeves, or through the slots between the sleeves and pins.

When the jig is adjusted for a casting or other article of a given size and shape, such



article can be removed and another of like form can be inserted with certainty that the work will be brought to the tool in the same relation in each case, so that duplicates can be produced with exactness. The end support of the article clamped in the jig may be a piece especially adapted to the work. See for example screw collar 31, Fig. 7, provided with an eccentric pin 100. This pin 100 supports the work, while a flat spring 99 (Figs. 4 and 7), bears against the other end thereof. Screw collar 31 may be applied to bushing 10. Spring 99 can be held by one of the gage screws. By having a number of bushings 10 with their adjuncts, all being interchangeable as to position but not uniform as to the matter of projection inside a slot 2, the jig is adapted to the holding of a large variety of articles.

Where the guiding sleeves are not secured to the bushings, they generally fit closely enough to retain their positions. In some instances a bushing, as 40, Fig. 6, is made with an internal screw thread, into which a threaded sleeve 41 fits. This sleeve contains a spring 42, and a spring-pressed pin 43, arranged in a common manner to project the pin against the work. A nut 44 serves to limit the movement of such pin. The bushing 40, Fig. 6, is shown as applied to one of the slots 2 in the side of the jig, but it might be applied in the same manner in other positions. Lock nuts 60 and 61 (Fig. 5) may hold the sleeve 41, if desirable. Bushings 45 are internally screw threaded (see Fig. 6) and gage screws 47 are passed through these bushings. The gage screws can be locked by lock nuts 48.

It is to be understood that in most instances a bushing and attachments may be transferred from one slot to another in the frame 1. Also, as shown in Fig. 5, the bearing pin 45 may have an eccentric relation to the bushing. The slotted cover 3 may carry a yoke 55, which is also preferably slotted, and contains bearing pins 56 and 57, differing in form somewhat from the bearing pins described, but operating in like manner.

From the above it should be understood that my jig, by means of its adjustable bushings, pins, and guide sleeves, is adaptable for use with a large variety of work. That the bushings may generally serve also as guides for drills, reamers, or similar tools, and the work can be so adjusted that any number of fac similes may be operated on with accuracy, yet when desirable to make changes the same can be made within the size limits of the jig, with great facility, as the castings operated on, whether regular or irregular in form, can be so clamped in the jig as to be accessible in nearly all its parts likely, to be operated on, without changing the adjustment. With each jig I generally supply a few extra bushings, guides, and washers, so

that its capacity for adaptation covers a wide field.

Where an eccentric bushing is used, as at 45, Fig. 5, it is obvious that such can be turned on its center to bring the passage through the bushing to various positions, without changing the general position of the bushing, and this whether the bushing is used as a tool guide, or as a support for a clamping pin, screw, or collar.

What I claim is:

1. In a jig, the combination of the slotted frame, a headed bushing having its head within and its body passing through one of the slots and means for adjusting and holding said bushing, and a clamp screw engaging a thread in said bushing.

2. In a clamping jig, the combination of the slotted frame, a headed bushing in a slot in the frame, and a spring-pressed bearing pin projecting from the bushing.

3. In a jig, the combination of the slotted frame, bushings adjustable in the slots in the frame, and a slotted hinged cover to the frame having an adjustable bearing pin in the slot in said cover.

4. In a jig, the combination of a slotted frame, a slotted cover hinged to said frame, means for securing said cover when closed, and means for guiding tools through the slots in the frame, to operate on work clamped in the frame.

5. In a clamping jig, the combination of slotted frame with adjustable bushing, and gage points in the slots for locating work therein.

6. In a jig, the combination of slotted frame, locating points, and spring pins for pressing work against said locating points.

7. In a clamping jig, the combination of a slotted frame, a bushing having eccentric bore and having its body passing through a slot in the frame, and means for locking the bushing in the slot.

8. In a jig, the combination of a frame having a slot therein, a bushing with eccentric bore having its body in said slot, and a clamp piece in said eccentric bore.

9. In a jig, a frame having slots in a plurality of sides, tool guides in said slots and means for holding said guides in adjusted position, a clamping cover connected to said frame, and projections on the frame by which the jig is supported in substantially horizontal position on a horizontal support whichever slot be turned uppermost.

10. The combination of a box jig having slotted sides, bushings passing through the slots and having heads within the jig wider than the slots serving as rigid supports for work and means permitting adjustment of the position of the heads toward and from the center of the jig.

11. The combination of a box jig having slotted sides, a hollow bushing passing



through one of the slots and having a head within the jig wider than the slot serving as a support for work, and means for adjusting the position of the head toward and from the center of the jig to accommodate different shapes and sizes of work consisting of one or more washers inserted between the head and the wall of the jig.

12. In a box jig having slotted sides, means for holding and working upon objects of different sizes and shapes comprising bushings passing through slots in the sides of the jig and having interior heads wider than the slots serving as supports for the work, one of said bushings also having a central bore serving as a guide for a tool to act upon the work, and other bushings passing

through similar slots and adjustable longitudinally, and adjustable pins carried by said bushings for engaging the work and holding it against the heads of the bushings first mentioned.

13. In a jig, the combination of a hollow body, a bushing mounted in a slot therein, and a spring clip adapted to yieldingly engage an object to be worked on mounted on the bushing and adjustable both radially and angularly in relation to the bushing.

In testimony whereof I affix my signature in presence of two witnesses.

BENJAMIN P. FORTIN.

Witnesses:

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