Oct. 7, 1930. F. C. JONES ET AL 1,777,567

FIXTURE FOR FORMING BEARINGS

Filed Dec. 28, 1925 3 Sheets-Sheet 1

Fig. 1.

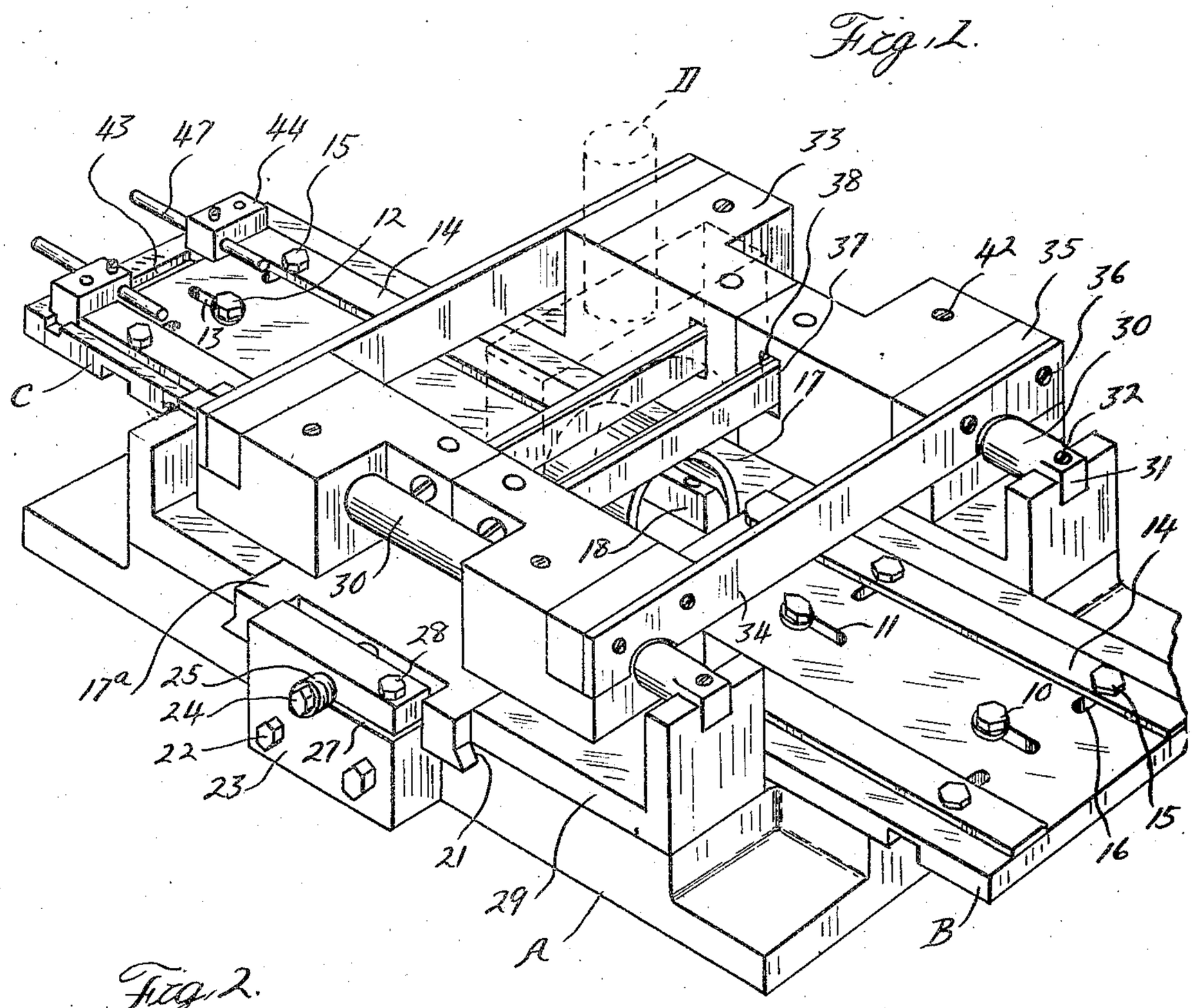
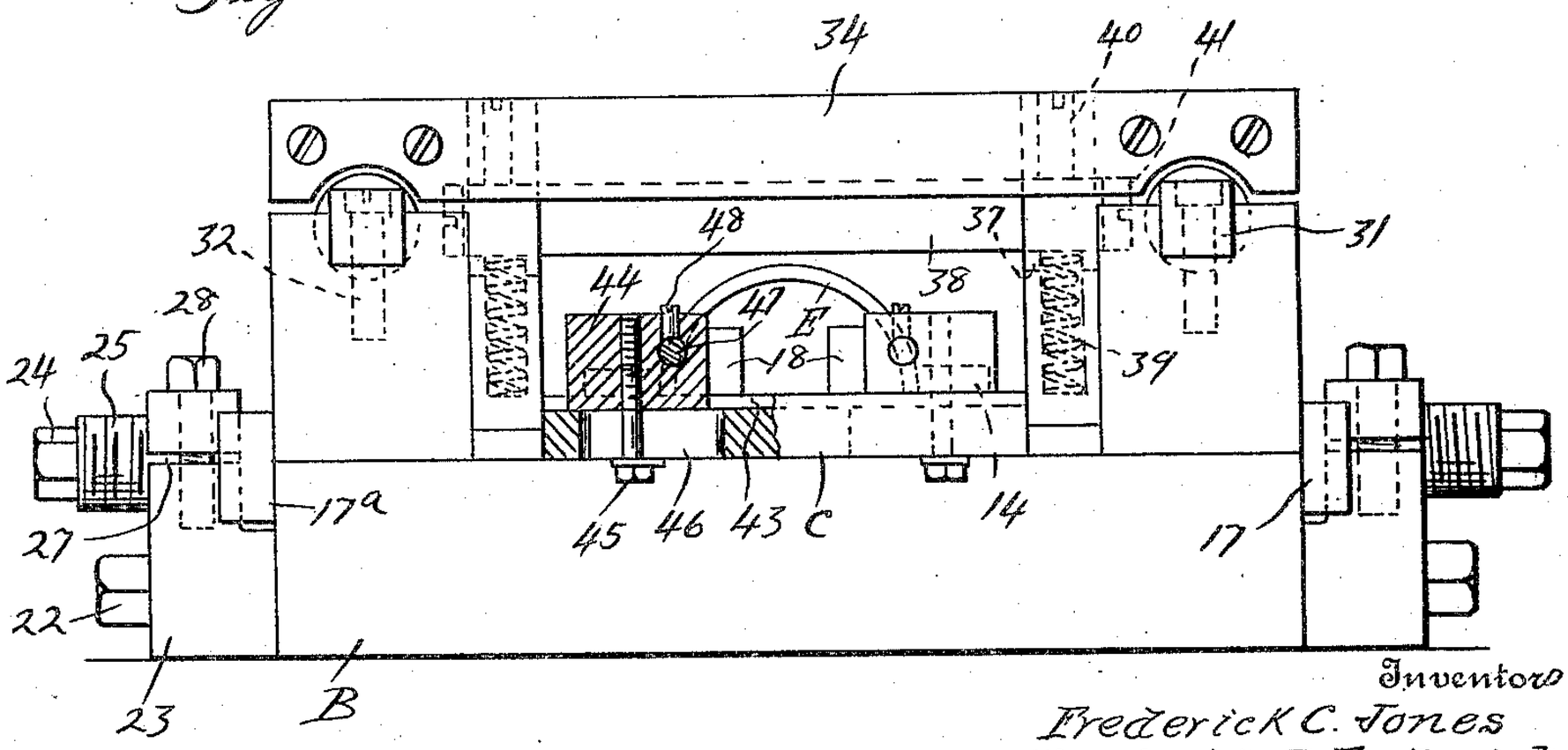


Fig. 2.



Inventors
Frederick C. Jones
Winfield S. Enderich

By Whittemore Hulbert Whittemore
& Belknap Attorneys

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FIXTURE FOR FORMING BEARINGS

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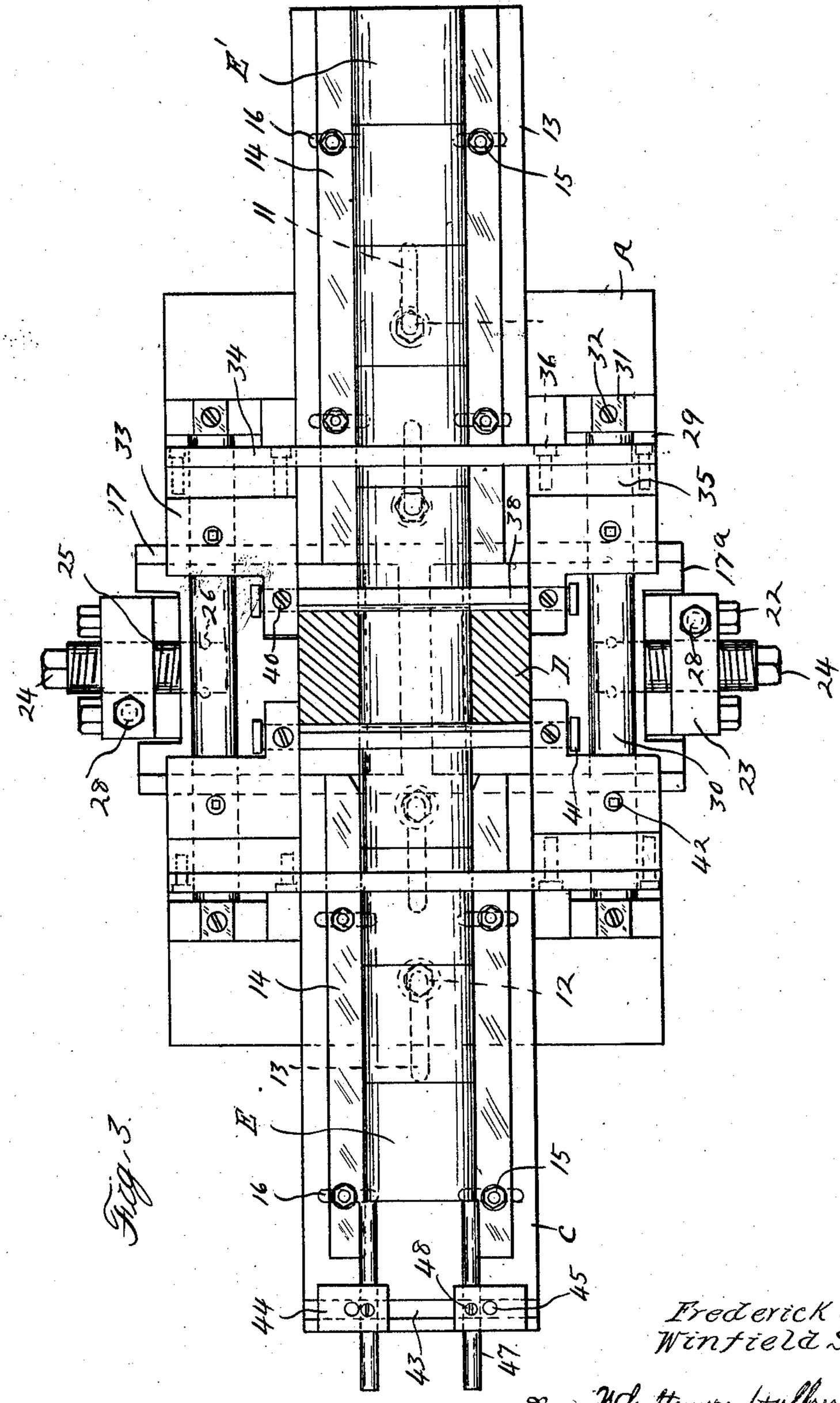

Fig. 3.

Inventors
Frederick C. Jones
Winfield S. Enderich

By Whittemore Hulbert Whittemore
& Belknap Attorneys

Oct. 7, 1930. F. C. JONES ET AL 1,777,567

FIXTURE FOR FORMING BEARINGS

Filed Dec. 28, 1925 3 Sheets-Sheet 3

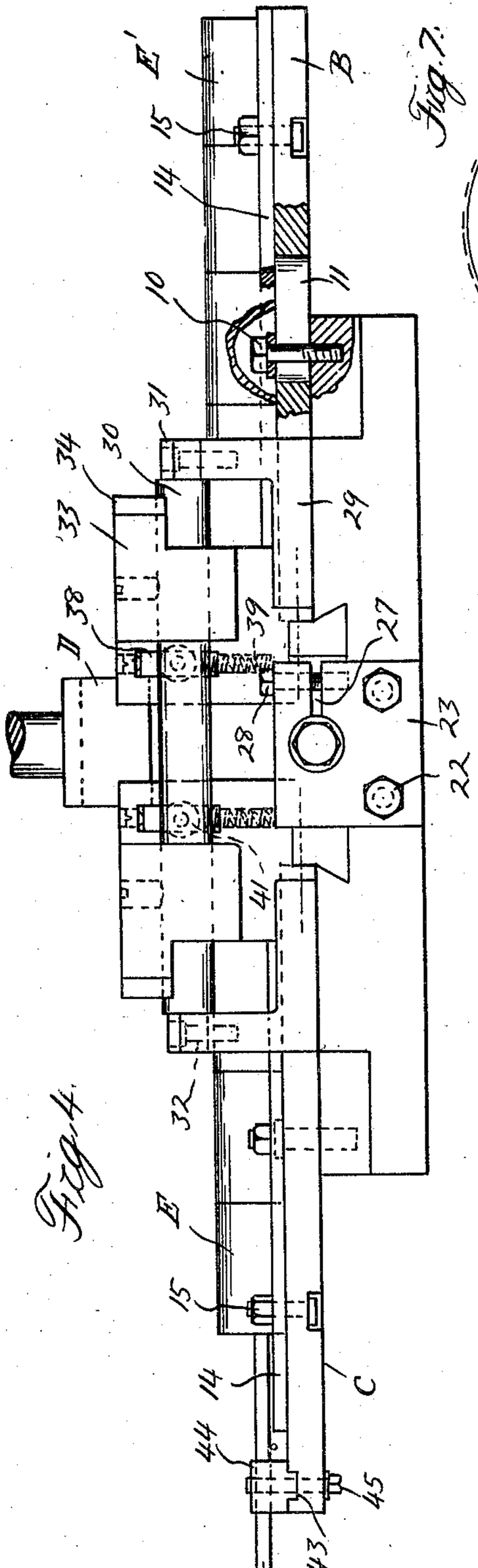

Fig. 4.

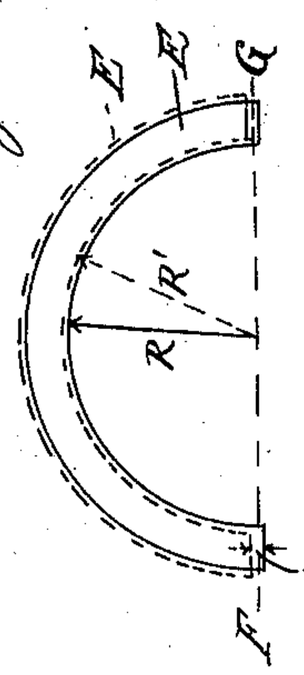

Fig. 7.

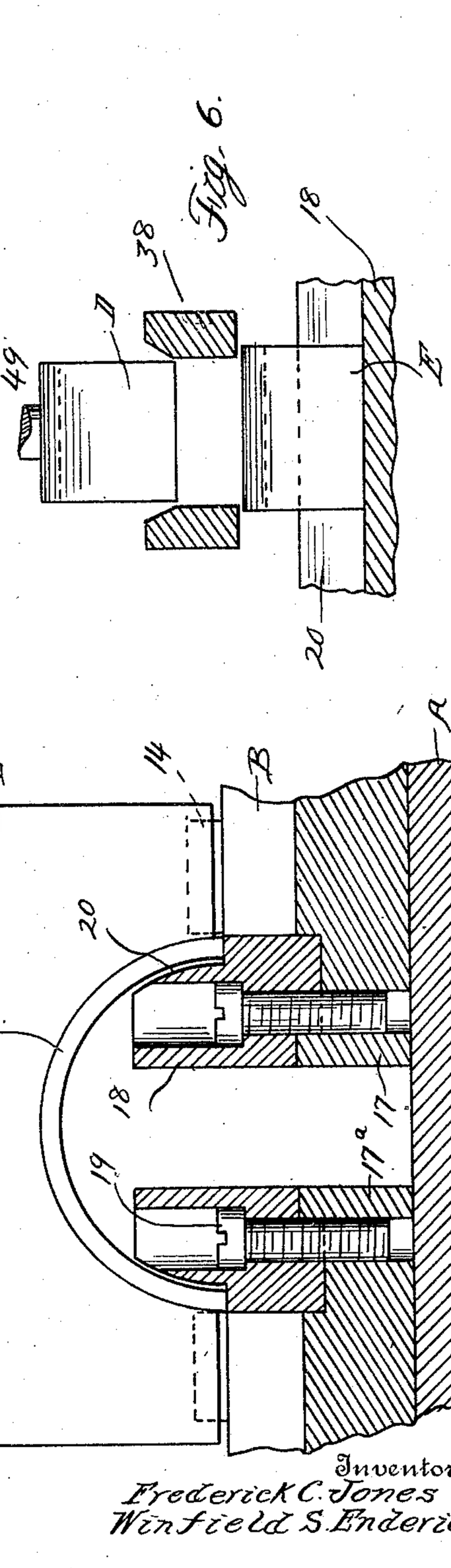

Fig. 6.

Fig. 5.

Inventors
Frederick C. Jones
Winfield S. Enderich

By Whittemore Hulbert Whittemore & Belknap Attorneys

Patented Oct. 7, 1930 1,777,567

UNITED STATES PATENT OFFICE

FREDERICK C. JONES AND WINFIELD S. ENDERICH, OF DETROIT, MICHIGAN, ASSIGNORS TO BOHN ALUMINUM & BRASS CORPORATION, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN

FIXTURE FOR FORMING BEARINGS

Application filed December 28, 1925. Serial No. 78,031.

The invention relates to metal working and refers more particularly to a fixture for forming bearing, bushing or like segments.

In the manufacture of bearings, bushings and the like, the bearings are preferably cast in cylindrical form from a suitable material such as brass, bronze, etc. This cylindrical casting is preferably of a larger diameter than desired in the final product. The cylindrical bearing is diametrically severed to produce two segmental bearing members. The edges of these members must then be machined and with this in view the cylindrical castings are made over size as aforesaid. Before this machining operation takes place, the radii of the bearing segments are reduced to the final desired dimension, this closing-in operation providing bearing segments of greater than semi-circular shape in transverse cross section so that when the edges are machined a true semi-cylindrical bearing segment of the desired radius will be obtained. Thus, by reason of the closing-in operation, sufficient material is afforded at the edges of the bearing segments to permit machining of the edges. Before the closing-in operation, it was common practice to cast the cylindrical bearings to the final desired radial dimension necessitating destroying one-half of the casting, the cut being made so as to provide one of the resulting segments with sufficient material at the edges to permit machining to the final semi-circular cross section, the other of the segments, being less than a semi-circle in cross section, was scrapped.

One of the objects of the invention is to provide a method of closing-in bearing segments.

A further object of the invention resides in the provision of a fixture permitting successive feeding of the bearing segments into position for the closing-in operation.

With these and other objects in view, the invention resides in the novel features of construction and combination and arrangements of parts as more fully hereinafter described and claimed.

Referring to the accompanying drawings in which like reference characters indicate corresponding parts;

Figure 1 is a perspective view showing the fixture;

Figure 2 is an elevation view of the same looking at the left side as shown in Figure 1;

Figure 3 is a plan view of the fixture;

Figure 4 is a front elevation view thereof;

Figure 5 is a detail view in elevation showing the close-in die;

Figure 6 is a detail elevation view showing the close-in die in raised position and the stripper bars; and

Figure 7 is a diagrammatic view illustrating the cross sectional shape of the cylindrical bearing segment before and after the close-in operation.

In the drawings reference character A represents the base which may be supported in any suitable manner such as by table or the like (not shown). Adjustably supported on the base is a loading platform B, headed fasteners 10 serving to clamp the platform B to the base A. The platform is preferably provided with longitudinal slots 11 engageable by the fasteners 10 so as to permit adjustment of the platform B relative to the base A to accommodate any desired number of bearing segments. C represents an unloading platform, which like the platform B, is adjustably secured to the base A by reason of the headed fasteners 12 and slots 13. For guiding the cylindrical bearing or like segments during movement thereof, along the platform B toward the platform C, we have provided the guide bars or strips 14 which extend longitudinally at opposite sides of the platforms B and C respectively. These guide bars are preferably secured to the respective platforms by reason of the headed fasteners 15 engageable in slots 16 whereby the guide bars of each platform B and C may be relatively adjusted so as to accommodate bearing segments of varying widths.

Positioned between the platforms B and C, are the complementary buffer plates 17 and 17ª, these latter plates being adapted to receive the bearing segments from the platform B for operation thereof by the reciprocatory close-in die D. In order to properly

position the bearing segments on the buffer plate 17 for operation thereon by the die D, the plates 17 and 17ª are respectively provided with the positioning and guide bars 18 as best shown in Figure 5, these bars being secured to the plates 17 and 17ª by suitable headed fasteners 19. It will be noted that the positioning bars 18 are provided with outer curved surfaces 20 engageable with the inner wall of the bearing segments so as not to interfere with the movement of the die D as the latter is moved by any suitable mechanism (not shown) into engagement with the bearing segments for closing-in the same to secure the desired radial dimension of the cylindrical segments. The buffer plates 17 and 17ª are preferably mounted to slide in the guides 21 whereby the buffer plates may be adjusted toward or away from each other so as to accommodate bearing segments of varying width. Secured by suitable headed fasteners 22 to the front and rear of the fixture respectively, are the brackets 23. 24 are adjusting members having threads 25 engageable in the brackets 23 respectively, these members 24 being anchored at 26 with the buffer plates 17 and 17ª respectively. Thus, by rotating the adjusting members 24 the buffer plates 17 and 17ª and consequently the positioning bars 18 may be adjusted toward or away from each other. The brackets 23 may be slotted at 27, to provide for clamping the adjusting members 24 in various positions of rotative adjustment. 28 represents a suitable clamping bolt for forcing together the slotted portions of the bracket 23 to produce the clamping action on the adjustment members 24.

Secured to the base A are the L-shaped brackets 29, a pair of these brackets being located at the front and rear of the fixture as shown in Figure 1 for supporting the rods 30. The rods 30 are preferably formed with the square ends 31, the brackets 29 being formed with suitable openings for receiving these square ends 31. Headed fasteners 32 serve to connect the ends of rods 30 with the respective brackets 29. Mounted on each of the rods 30 is a pair of stripper brackets 33, these brackets being formed with a suitable opening for receiving the rods 30. 34 represents a pair of cross bars serving to connect a bracket 33 on each of the rods 30 by reason of the filler blocks 35 and fasteners 36. The brackets 33 are provided with vertical slots 37 through which extend the stripper bars 38. As shown in Figure 2, these bars are normally urged upwardly by reason of coil springs 39. For positioning the bars 38 at varying heights in the slots 37, adjusting screws 40 are provided, these adjusting screws serving to fix the upper limit of travel of the stripper bars 38. The bars 38 are thus capable of vertical adjustment so as to clear bearing segments of varying radii. The ends of the stripper bars 38 are preferably provided with the fasteners 41 which serve to prevent longitudinal movement of the bars in the slots 37. 42 represents set screws adjustable in the brackets 33 and engageable with the rods 30 whereby the pairs of brackets connected by the cross bars 33 and carrying the stripper bars 38 respectively may be moved toward or away from each other in order to accommodate bearing segments of varying length. As shown in Figure 6, the stripper bars 38 are located at opposite sides respectively of the path of movement of the die D, the lower inner edges of the stripper bars slightly overlapping the respective ends of the cylindrical bearing or like segments E so as to engage the bearing segments to strip or eject the same from the die D.

The unloading platform C is provided with a transverse groove 43 adjacent the outer edge thereof and slidable within this groove are the abutment brackets 44. As shown in Figure 2, the brackets 44 are adjustable toward or away from each other sliding in the groove 43, the brackets being clamped in various positions of adjustment by reason of the clamping fixtures 45 slidably engaging slots 46 of the unloading platform C. The abutment brackets 44 respectively carry abutment rods 47 which are slidable therein and clamped thereto in various positions of adjustment by reason of the set screw 48.

The operation of the fixture is as follows: The guide bars 14 are adjusted to receive the bearing segments E therebetween as shown in Figure 3. Likewise, the adjusting members 24 are actuated to limit the positioning bars 18 relative to each other so as to accommodate and properly position the bearing segments E preparatory for operation thereon by the closing-in die D. The stripper bars 38 are also relatively adjusted as shown in Figure 6 so as to permit passage therebetween of the die D and to position the lower inner edges of the stripper bars in slightly overlapping relation with the opposite ends respectively of the bearing segments E. The stripper bars 38 are also properly positioned vertically in the slots 37 so as to position the bars 38 above the bearing segments E whereby the latter may be passed beneath these bars.

Referring to Figure 7 we have shown in dotted lines E′, somewhat exaggerated for purpose of illustration, the cylindrical bearing or like segment before the close-in operation. After operation of the close-in die D, the radius of the segmental bearing is decreased from R′ to R, the latter radius being desired in the final product. By reason of this close-in operation, the longitudinal edges of the bearing segment are forced below the original diameter F—G so as to provide an

amount of material 49 of the bearing segment E in excess of a true semi-cylinder. Thus, the edges of the bearing segment E may then be machine finished by removing the material 49 so as to finally produce a bearing segment of the desired radius and of a true semi-cylindrical shape.

The bearing segments E′ are placed on the loading platform B preferably arranged tandem as shown in Figure 3 and 4, the adjacent cylindrical segments being in contacting relation. The operator thus moves the line of bearing segments toward the die D by exerting a pushing force on the bearing segment E′ last positioned on the loading platform. The bearing segments are thus moved between the guide bars 14 and around the positioning and guide bars 18 until the platforms B and C and the buffer plates 17 and 17ª are substantially filled. The abutment rods 47 are positioned toward each other and axially so as to engage the end of the line of segmental bearings as shown in Figure 3, the rods 47 being axially adjusted so as to properly position a bearing segment in line with the vertical movement of the close-in die D. With the parts in this position the die D is caused to move downwardly into engagement with the aligned bearing segment so as to perform the close-in operation decreasing the radius R′ of the bearing segment E′ to the radius R of the bearing segment E as illustrated in Figure 7. On the return upward stroke of the die D, the bearing segment E will be engaged by the stripper bars 38 so as to eject the bearing segment from the die D.

The operator will then remove the bearing segment at the end of the line engaged by the rods 47 and the whole line of bearing segments will be advanced from the loading platform, the length of one of the bearing segments in order to place the next segment in proper position for engagement and operation by the close-in die D. As soon as the line of bearing segments is advanced, the operator places on the loading platform at the beginning of the line of segments, another bearing segment E′ and the cycle is thus repeated.

It will be apparent that we have provided a fixture for successive operation on a plurality of bearing segments for closing-in the same, the bearing segments being guided in continuous fashion into proper position for the closing-in operation. It will further be noted that we have provided a fixture which is adjustable for accommodating varying size cylindrical bearing or like segments.

While it is believed from the foregoing description, the nature and advantage of our invention will be readily understood, we desire to have it understood that we do not limit ourselves to what is herein shown and described and that such changes may be resorted to when desired as fall within the scope of the claims.

What we claim as our invention is:—

1. A fixture for closing-in cylindrical bearing or like segments comprising a reciprocable close-in die, means for successively guiding a plurality of the cylindrical segments through a predetermined path into position for operation thereon by said die, and means affording sliding supporting engagement with the longitudinal edges of the cylindrical segments during the movement thereof through the said predetermined path.

2. A fixture for closing-in cylindrical bearing or like segments comprising a reciprocable close-in die, and means for supporting and guiding a plurality of the cylindrical segments into position successively for operation thereon by said die, said supporting means affording a sliding supporting engagement with the longitudinal edges of the cylindrical segments.

3. A fixture for closing-in cylindrical bearing or like segments comprising a loading platform, an unloading platform, a reciprocable close-in die, means for guiding a plurality of the cylindrical segments arranged tandem with adjacent cylindrical segments in contacting relation during movement thereof from the loading to the unloading platform, said die being positioned for operation on the cylindrical segments as they are successively moved from the loading to the unloading platform.

4. A fixture for closing-in cylindrical bearing or like segments comprising a reciprocable close-in die, means for supporting and guiding a plurality of the cylindrical segments into position successively for operation thereon by said die, and stripper mechanism cooperating with the die and engageable with the cylindrical segment operated on by said die for stripping same from the latter.

5. A fixture for closing-in cylindrical bearing or like segments comprising a reciprocable close-in die, means for successively guiding a plurality of the cylindrical segments through a predetermined path into position beneath the path of travel of said die for operation thereon by said die, and stripper mechanism cooperating with the die and engageable with the cylindrical segment operated on by said die for stripping same from the latter.

6. A fixture for closing-in cylindrical bearing or like segments comprising a loading platform, an unloading platform, a reciprocable close-in die, means for guiding a plurality of the cylindrical segments during movement thereof from the loading to the unloading platform, said die being positioned for operation on the cylindrical segments as they are successively moved from the loading to the unloading platform, and stripper mechanism cooperating with the die and engage-

able with the cylindrical segment operated on by said die for stripping the same from the latter.

7. A fixture for closing-in cylindrical bearing or like segments comprising a reciprocable close-in die, means for supporting and guiding a plurality of the cylindrical segments into position successively for operation thereon by said die, and a pair of stripper bars respectively arranged on opposite sides of the path of movement of the die for cooperating therewith to eject the cylindrical segments therefrom.

8. A fixture for closing-in cylindrical bearing or like segments comprising a loading platform, an unloading platform, a reciprocable close-in die, means for guiding a plurality of the cylindrical segments during movement thereof from the loading to the unloading platform, said die being positioned for operation on the cylindrical segments as they are successively moved from the loading to the unloading platform, and a pair of stripper bars respectively arranged on opposite sides of the path of movement of the die for cooperating therewith to eject the cylindrical segments therefrom.

9. A fixture for closing-in cylindrical bearing or like segments comprising a reciprocable close-in die, means for supporting and guiding a plurality of the cylindrical segments into position successively for operation thereon by said die, a pair of stripper bars respectively arranged on opposite sides of the path of movement of the die for cooperating therewith to eject the cylindrical segments therefrom, said stripper bars extending transversely of said cylindrical segments and above the same.

10. A fixture for closing-in cylindrical bearing or like segments comprising a reciprocable close-in die, means for supporting and guiding a plurality of the cylindrical segments into position successively for operation thereon by said die, a pair of stripper bars respectively arranged on opposite sides of the path of movement of the die for cooperating therewith to eject the cylindrical segments therefrom, said stripper bars extending transversely of said cylindrical segments and above the same, and means permitting relative adjustment of the stripper bars.

11. A fixture for closing-in cylindrical bearing or like segments comprising a loading platform, an unloading platform, a reciprocable close-in die, means for guiding a plurality of the cylindrical segments during movement thereof from the loading to the unloading platform, said die being positioned for operation on the cylindrical segments as they are successively moved from the loading to the unloading platform, said guiding means comprising relatively adjustable guide bars.

12. A fixture for closing-in cylindrical bearing or like segments comprising a reciprocable close-in die, means for supporting and guiding a plurality of the cylindrical segments into position successively for operation thereon by said die, bars engageable interiorly of the cylindrical segments and cooperating with the die for positioning the cylindrical segments and means for relatively moving said bars for accommodating varying width cylindrical segments.

13. A close-in fixture for cylindrical bearing or like segments comprising a buffer plate adapted to receive a cylindrical segment, positioning means carried by the buffer plate and engageable interiorly, of said cylindrical segment, and a reciprocable close-in die adapted for movement toward the buffer plate for operation on the cylindrical segment for securing the desired radial dimension thereof.

14. A close-in fixture for cylindrical bearing or like segments comprising a buffer plate adapted to receive a cylindrical segment, positioning means for properly locating the cylindrical segment on the buffer plate, a reciprocable close-in die adapted for movement toward the buffer plate for operation on the cylindrical segment to secure the desired radial dimension thereof, and means for stripping the cylindrical segment from the die.

15. A close-in fixture for cylindrical bearing or like segments comprising a buffer plate adapted to receive a cylindrical segment, positioning means for properly locating the cylindrical segment on the buffer plate, a reciprocable close-in die adapted for movement toward the buffer plate for operation on the cylindrical segment to secure the desired radial dimension thereof, and a pair of stripper bars respectively arranged on opposite sides of the path of movement of the die for cooperating therewith to eject the cylindrical segment therefrom.

16. A close-in fixture for cylindrical bearing or like segments comprising a buffer plate adapted to receive a cylindrical segment, positioning means for properly locating the cylindrical segment on the buffer plate, a reciprocable close-in die adapted for movement toward the buffer plate for operation on the cylindrical segment to secure the desired radial dimension thereof, a pair of stripper bars respectively arranged on opposite sides of the path of movement of the die for cooperating therewith to eject the cylindrical segment therefrom, and means permitting relative adjustment of said stripper bars axially of the cylindrical segment.

17. A close-in fixture for cylindrical bearing or like segments comprising a buffer plate adapted to receive a cylindrical segment, positioning means carried by the buffer plate and engageable interiorly, of said cylindrical seg-

ment, and a reciprocable close-in die adapted for movement toward the buffer plate for operation on the cylindrical segment for securing the desired radial dimension thereof, said positioning means comprising a pair of members relatively adjustable transversely of the cylindrical segments.

18. A fixture for closing-in cylindrical bearing or like segments comprising a reciprocable close-in die, means for supporting and guiding a plurality of the cylindrical segments into position successively for operation thereon by said die, including relatively adjustable members engageable with the longitudinal edges of said cylindrical segments, and adjustable means cooperating with the die for positioning the cylindrical segments.

19. A fixture for closing-in bearing or like segments comprising a loading platform and unloading platform, a reciprocable close-in die, means for guiding a plurality of the cylindrical segments arranged tandem with adjacent cylindrical segments in contacting relation during movement thereof from the loading to the unloading platform, said means including members positioned upon said loading and unloading platforms and being adjustable relatively to one another for accommodating bearings of varying widths.

20. A fixture for closing-in cylindrical bearing or like segments, comprising a reciprocable close-in die, supporting means for the bearing segments extending upon opposite sides of the die, and means upon the supporting means for guiding a train of segments to and beyond the die with adjacent segments in contacting relation, and means for accurately positioning the segments in alignment with the die to be operated on thereby.

21. A fixture for closing-in cylindrical bearing or like segments comprising a reciprocable close-in die, supporting means for the bearing segments extending upon opposite sides of the die, means upon the supporting means for guiding a train of segments to and beyond said die with adjacent segments in contacting relation, and means cooperating with the bearing segments beyond the die for arresting movement of the train of segments to position a bearing segment in accurate alignment with the die to be operated on thereby.

22. A fixture for closing-in cylindrical bearing or like segments comprising spaced loading and unloading platforms arranged in substantially the same plane and in alignment with each other, means for positioning a plurality of the cylindrical segments in alignment and in contacting relation with each other on said loading and unloading platforms, and a reciprocable close-in die interposed between the two platforms in a position to operate upon the segments as they are moved from the loading to the unloading platform.

23. A fixture for closing-in cylindrical bearing or like segments comprising loading and unloading platforms, means for guiding a train of cylindrical segments with adjacent segments in contacting relation during movement thereof along both platforms, a reciprocable close-in die positioned for operation upon the cylindrical segments as they are successively moved from the loading to the unloading platform, and means upon the unloading platform cooperating with the bearing segments thereon to accurately position the segments upon the unloading platform in proper alignment with said die.

24. A fixture for closing-in cylindrical bearing or like segments comprising loading and unloading platforms, means for guiding a plurality of cylindrical segments with adjacent segments in contacting relation during movement thereof along both of said platforms, a reciprocable close-in die positioned for operation on the cylindrical segments as they are successively moved from the loading to the unloading platforms, and means upon the unloading platform including a stop arranged in predetermined spaced relation to the die and engageable with the end bearing segment on the unloading platform to place the first bearing segment on the latter in a position to arrest the adjacent bearing segment in accurate alignment with the die to be operated on thereby.

In testimony whereof we affix our signatures.

FREDERICK C. JONES.
WINFIELD S. ENDERICH.