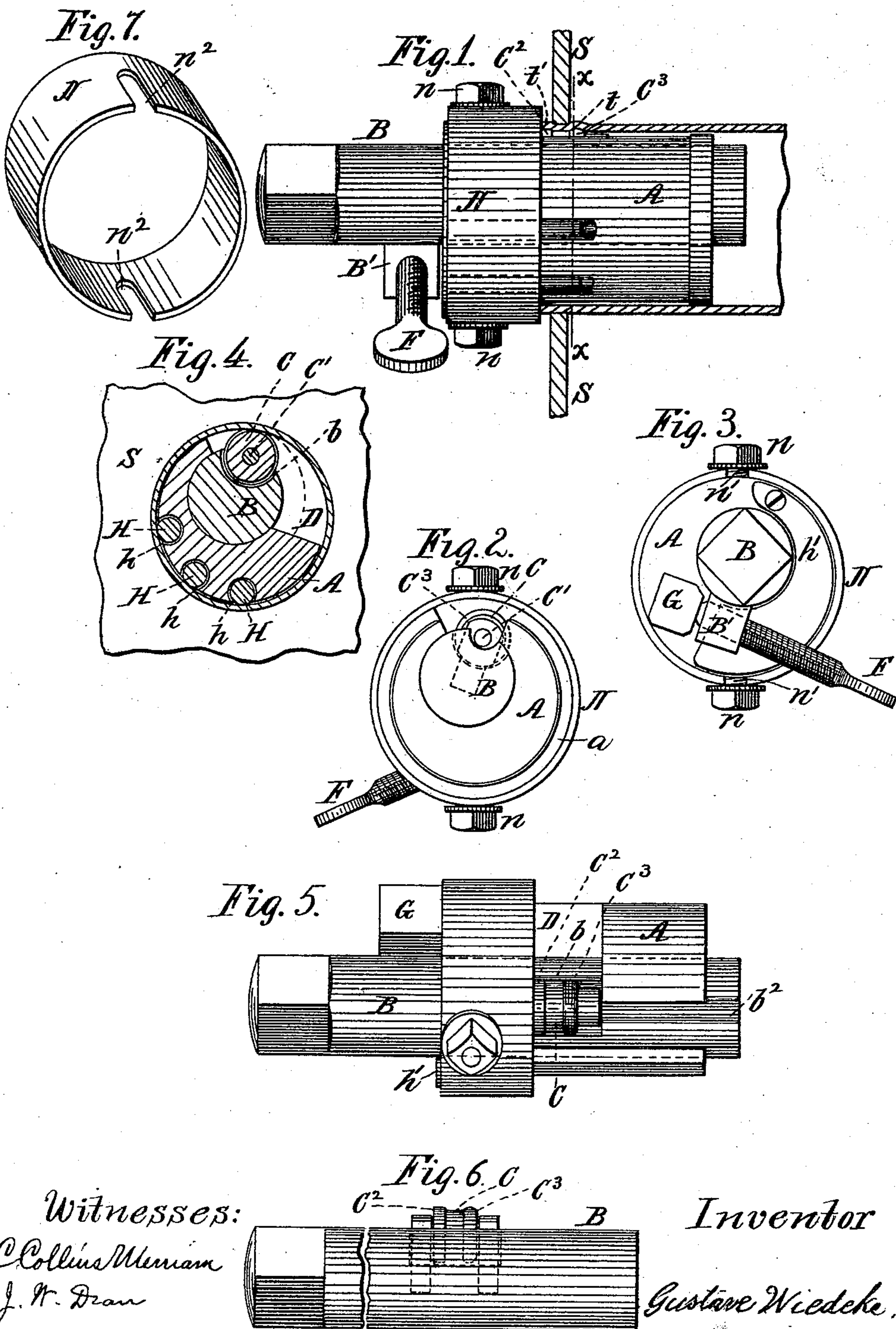


G. WIEDEKE.
CUT-OFF AND FLUE TIGHTENER.

No. 485,442.

Patented Nov. 1, 1892.



Witnesses:
C. Collins Merriam
J. W. Dean

Inventor

Gustave Wiedeke.

by Wm. Hubbell Fisher
Attorney.

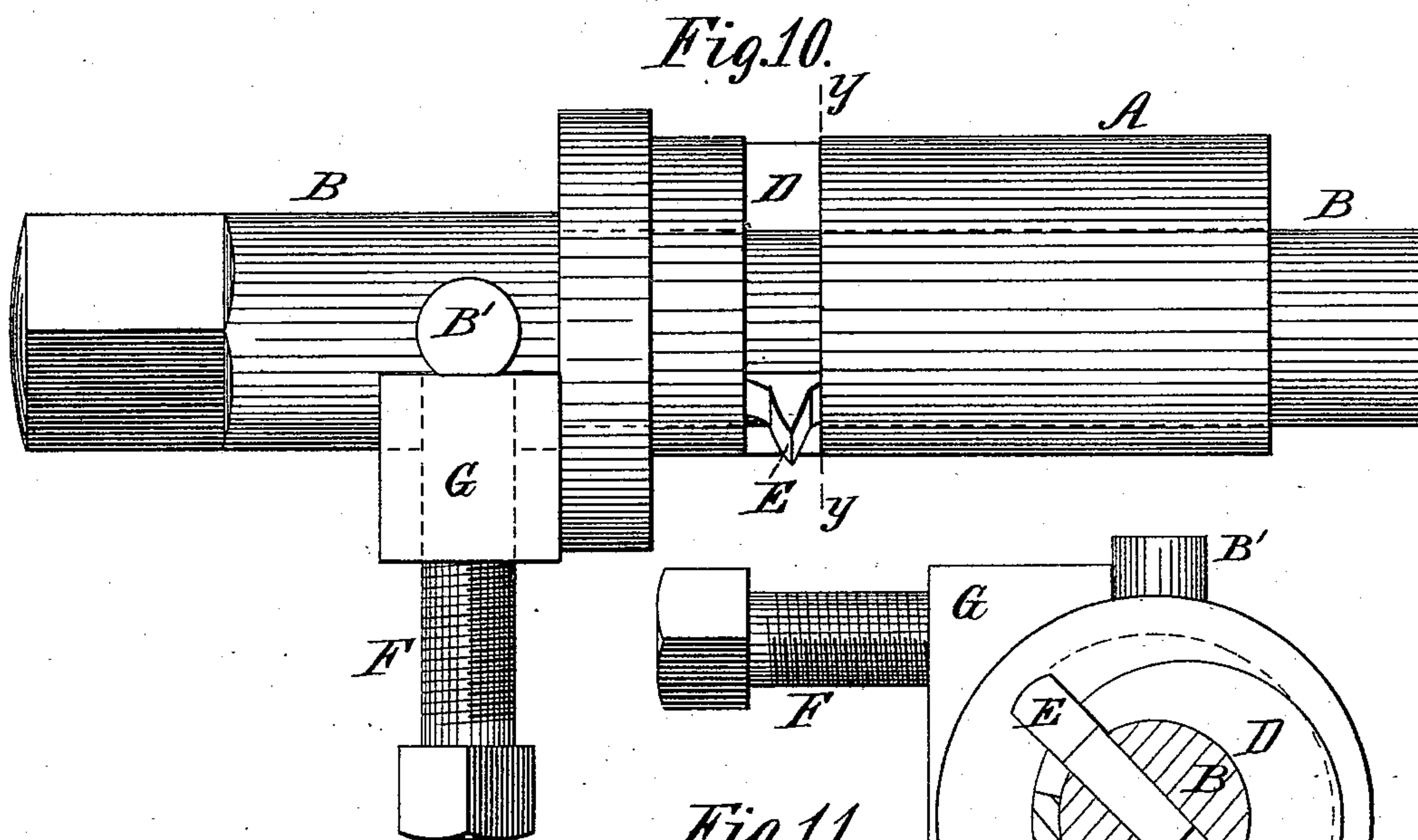
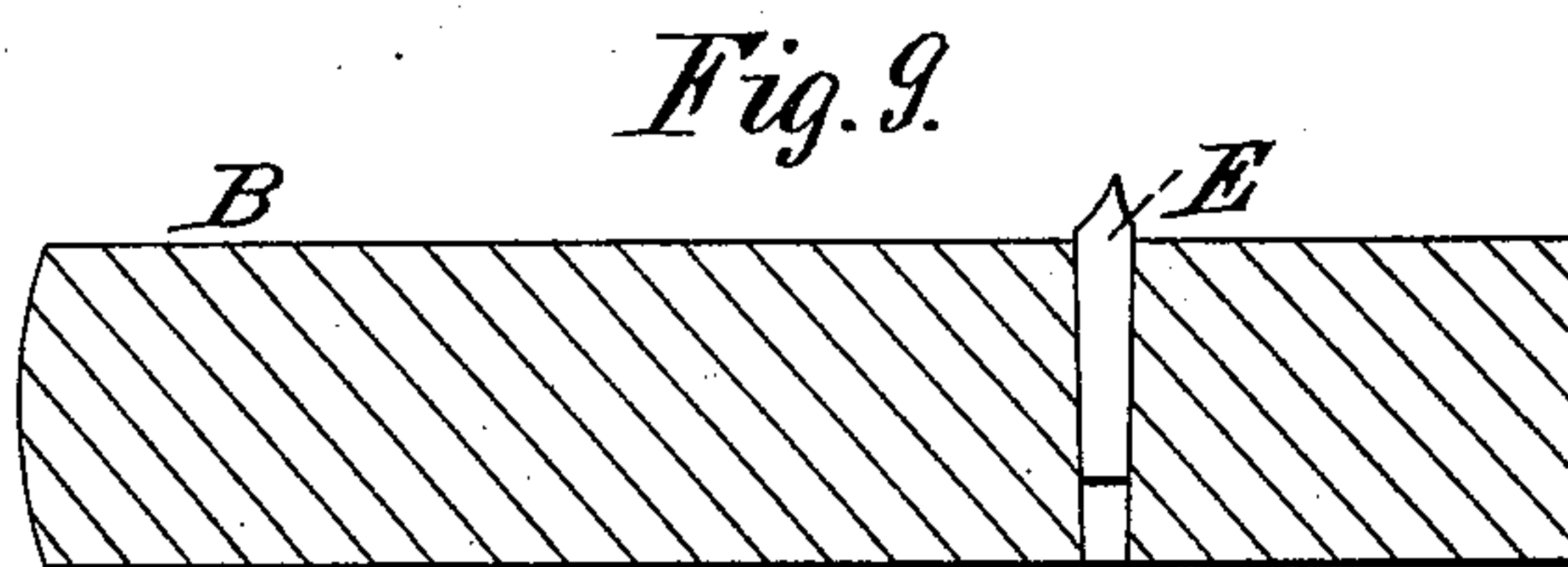
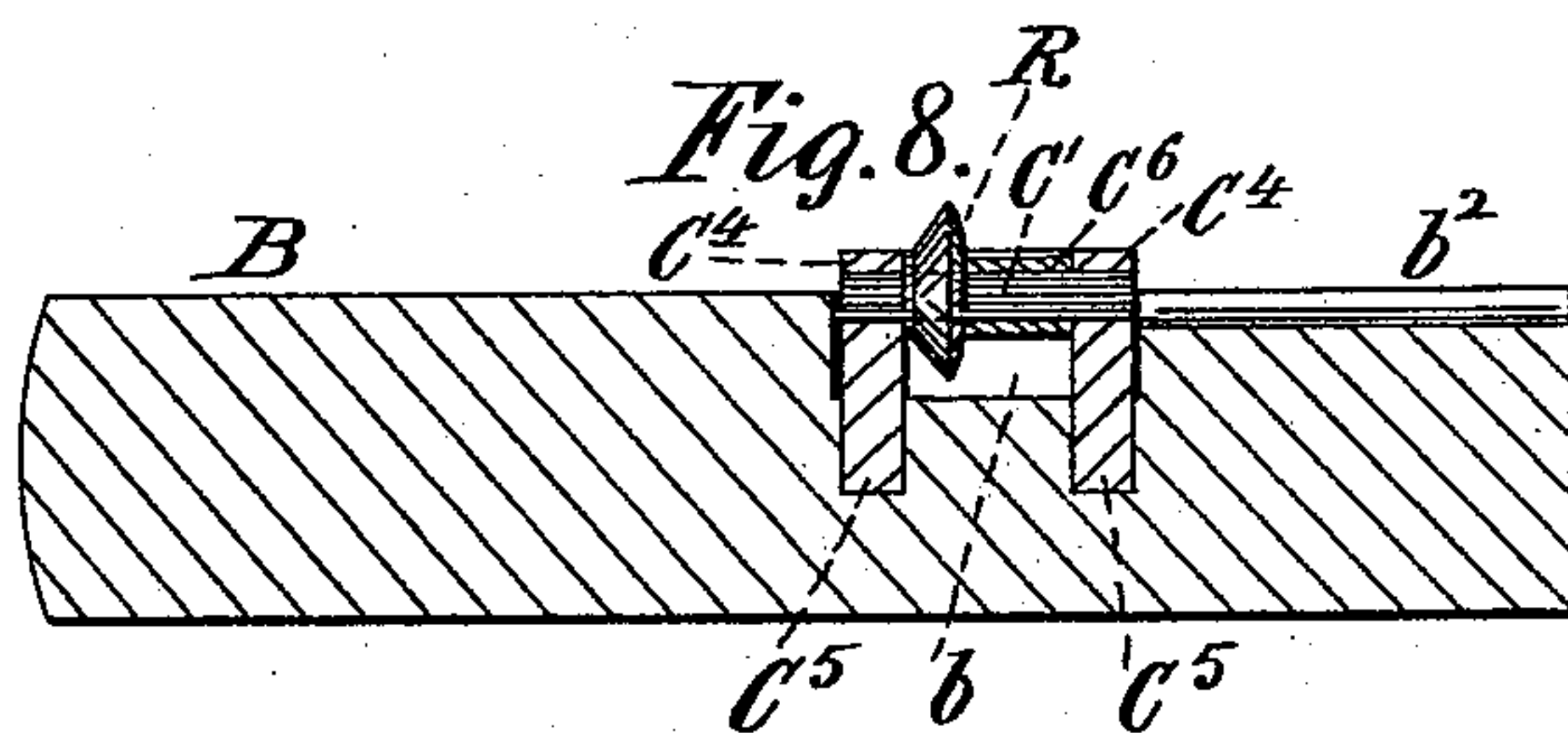
(No Model.)

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UNITED STATES PATENT OFFICE.

GUSTAVE WIEDEKE, OF DAYTON, OHIO.

CUT-OFF AND FLUE-TIGHTENER.

SPECIFICATION forming part of Letters Patent No. 485,442, dated November 1, 1892.

Application filed November 15, 1889. Serial No. 330,493. (No model.)

To all whom it may concern:

Be it known that I, GUSTAVE WIEDEKE, a citizen of the United States, and a resident of the city of Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Flue-Tighteners and Cut-Offs, of which the following is a specification.

The several features of my invention and the advantages arising from their use, conjointly or otherwise, will be apparent from the following description.

In the accompanying drawings, making a part of this specification, Figure 1 shows the device in position in a boiler-tube and commencing to form the shoulders which are to hold the tube in position. Fig. 2 is an elevation of the right-hand end of the device, as shown in Fig. 1. Fig. 3 is an elevation of the left-hand end. Fig. 4 is a section taken at the line xx of Fig. 1 and looking to the left. Fig. 5 is a view taken from a little beyond the top of the device as shown in Fig. 1. Fig. 6 is an elevation of the shaft carrying the shoulder-former and detached from the rest of the device. Fig. 7 is a perspective view of the adjusting-ring. Fig. 8 is a central section of the shaft bearing the roller-cutter. Fig. 9 is a central section of the shaft bearing the straight cutter. Fig. 10 is a view similar to Fig. 1, but showing the straight cutter in position instead of the shoulder-forming roller. Fig. 11 is a section taken at the line yy of Fig. 10.

The plug A is made to fit easily into the tube and is therefore made of different sizes to fit the different-sized tubes. It is perforated longitudinally to receive the shaft B. The shaft B, as shown in Figs. 4 and 11, is placed eccentrically in the plug A, but with its axis parallel to that of the plug. The shaft B is provided with the groove b , which accommodates the roller C. The journal-bearings C^4 are each provided with a shank C^5 , which is received in a suitable socket in the shaft B at the bottom of the groove b . The axle C' passes through the roller C and is supported in the journal-bearings C^4 . To permit the insertion of the axle C' , the shaft B is provided with the groove b^2 . The roller C has the two beads C^2 and C^3 projecting from its

cylindrical surface. The distance between the beads C^2 and C^3 varies in different rollers, being adjusted to the varying thickness of boiler-head into which the tubes are to be fastened. To accommodate the roller C as it is moved by the rotation of the shaft B, a segmental portion of the plug A is cut away, forming the recess D. In cutting tubes the knife E is substituted for the roller C, and to receive it a suitable socket is sunk into the shaft B at the bottom of the groove b , as in the case of the journal-bearings C^4 .

Instead of having a single shaft B adapted to carry both the knife E and the roller C, a separate shaft may be provided for each. A separate shaft for the cutter is shown in Figs. 9 and 10.

As shown in Fig. 9, the cutter E is preferably provided with one straight face and one curved face. Instead of the solid cutter, which is the preferable form, a roller-cutter R may be employed, as shown in Fig. 8. When the roller-cutter R is used, it is mounted on the axle C' , as is the roller C. To hold the roller-cutter R in its place between the bearings C^4 , a sleeve C^6 is slipped over the shaft C' between the cutter and the bearing.

The enlarged head a of the plug A is encircled by a band N, which is held in place by the clamp-nuts n . These latter are screwed onto the bolts n' , projecting from the plug. The band N is provided with the slots n^2 , by means of which its position on the plug may be adjusted and the distance which the plug is inserted into the tube be regulated. The enlarged head a and the band N are large enough to permit the latter to pass over the roller C when pushed in that direction. In consequence of this arrangement the band N may be used to regulate the distance the device is pushed into the tube.

In Fig. 1 the regulating-ring N is not shown in position against the boiler-head, as it normally is when fastening a tube in position, but is retracted so as to better show the position of the roller C.

The lug B' projects from the side of the shaft B, just outside of the plug A. It carries the set-screw F. In Fig. 10 the set-screw F is shown passing through the lug G instead of the lug B'. The arrangements are equiva-

lent. The lug G projects from the plug A in the track of the set-screw. The end of the shaft B, which projects somewhat beyond the plug A, is squared to receive a long-handled wrench, by means of which the shaft B is rotated.

To facilitate the rotation of the plug A in the tube, it is preferably provided with rollers H, which are received in cylindrical grooves *h*, bored into the plug, and are conveniently retained in place by the strip *h'*, which is secured to the end of the plug and covers over the ends of the grooves.

The mode of operation of the device is as follows: In Fig. 4 the dotted curved line shows the line of travel of the outer edge of the roller C as it is moved by the rotation of the shaft B. By reference to this line it will be seen that when the shaft B is rotated as far to the left—that is, to the right in Fig. 4—as the recess D will permit the outer edge of the roller C is within the circumference of the plug A; but as it is rotated to the right it gradually approaches the circumference of the plug A and finally passes beyond it. The amount of rotation of the shaft B in the plug A is regulated by the set-screw F and the lug G. The farther the screw F is screwed through the lug B' the more quickly will it impinge against the lug G, and hence the more quickly will it limit the rotation of the shaft B to the right—that is, to the left in Fig. 4. The more this rotation is limited the less the roller will project beyond the circumference of the plug A. Hence when it is desired to increase the amount of the projection of the roller, and in this way to increase the size of the bead thrown out on the tube, the distance between the lugs B' and G is lessened by unscrewing the set-screw F from the lug B', and when it is desired to diminish this bead thrown out on the tube to hold it in its place the screw F is screwed into the lug B', thus diminishing the extent of its travel. In these relations the lug G constitutes a stop, and the end of screw F, when projecting in front of lug B', constitutes an opposing stop. When the screw F is screwed back, so that it does not project beyond the lug B', the latter will be the opposing stop. When it is desired to fasten a boiler-flue in position, the plug A is passed into the flue until the roller C is under the edge of the boiler-head S. This position is automatically determined by the band N on the plug A coming in contact with the boiler-head. When the device is in position, the screw F is so set as to permit the roller C to project slightly beyond the circumference of the plug. A large wrench is now applied to the end of the shaft B and turned so as to rotate the shaft to the left. The shaft B is thus rotated until the screw F strikes against the lug G. At the same time the beads C² and C³ of the roller are embedded slightly into the tube, raising two slight projections on the tube—one just within and the other just without the boiler-head S—as indi-

cated in Fig. 1. Now when the wrench is turned further in the same direction the plug A partakes of the rotation and the roller C is carried completely around the tube, forming the shoulders *t* and *t'*, by means of which the tube is held in its place. In practice it is not desirable to so set the screw F that the shoulders *t t'* are formed by one rotation of the device, but rather to set the roller out gradually, so that two or three rotations will be required to complete the shoulders. When it is desired to cut a tube out of a boiler, one or the other of the cutters is substituted for the roller C, and by several rotations, in which the cutter is gradually set out more and more by the set-screw F, the tube is cut off. If the removed tube is to be replaced in the boiler, it is lengthened by attaching another piece of the tubing to it. The new tube may then be secured in its place by means of the same device with which it was removed, substituting only the roller for the cutter.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a cylindrical plug, a shaft eccentrically situated therein, stops for limiting the rotation of the shaft, and mechanism, substantially as described, for increasing or diminishing the distance between the said stops, and thereby adjustably regulating the amount of rotation of the said shaft, and a device carried by the shaft for operating on the tube or flue, substantially as and for the purposes specified.

2. The combination of a cylindrical plug, a shaft eccentrically situated therein, stops for limiting the rotation of the shaft, and mechanism, substantially as described, for increasing or diminishing the distance between the said stops, and thereby adjustably regulating the amount of rotation of the said shaft, and a roller carried by the shaft, substantially as and for the purposes specified.

3. In a flue-tightening device, the combination of a cylindrical plug A, provided with a projecting lug, and a shaft B, eccentrically located in said plug and provided with a stop adjustable on it, the said shaft in a direction transverse to the length of the shaft and in the line of travel of the lug, and a roller carried by the shaft, substantially as and for the purposes specified.

4. The combination of the plug A, provided with recess D, shaft B, eccentrically situated in plug A, lugs G and B', attached, respectively, to the plug A and the shaft B, set-screw F, and devices mounted in shaft B for operating on the tube or flue, substantially as and for the purposes specified.

5. In a flue-tightening device, the combination of a cylindrical plug A, provided with a projecting lug, and a shaft B, eccentrically located in said plug and provided with a stop adjustable in relation thereto in a direction substantially transverse to the plane of the axis of the shaft and substantially coincident with the periphery of the latter, the stop be-

ing in the line of travel of the lug, and a roller carried by the shaft, substantially as and for the purposes specified.

6. The combination of the plug A, provided with enlarged head a and with recess D, shaft B, eccentrically situated in plug A, and lugs G and B', attached, respectively, to the plug A and shaft B, set-screw F, and devices mounted in shaft B for operating on the tube or flue, and regulating-band N, substantially as and for the purposes specified.

7. The combination of the plug A, provided with recess D, shaft B, eccentrically situated in plug A, lugs G and B', attached, respectively, to the plug A and shaft B, set-screw F, and roller C, provided with beads C^2 and C^3 and mounted in shaft B, substantially as and for the purposes specified.

8. The combination of the plug A, provided with enlarged head a and with recess D, shaft B, eccentrically situated in plug A, and lugs G and B', attached, respectively, to the plug A and shaft B, set-screw F, and devices mounted in shaft B for operating on the tube or flue, and regulating-band N, and friction-rollers H, substantially as and for the purposes specified.

9. The combination of the plug A, provided with enlarged head a and with recess D, shaft B, eccentrically situated in plug A, and lugs G and B', attached, respectively, to the plug A and the shaft B, set-screw F, roller C, provided with beads C^2 and C^3 and mounted in shaft B, and regulating-band N, substantially as and for the purposes specified.

10. The combination of the plug A, provided with enlarged head a and with recess D, shaft B, eccentrically situated in plug A, and lugs G and B', attached, respectively, to the plug A and the shaft B, set-screw F, roller C, provided with beads C^2 and C^3 and mounted in shaft B, and regulating-band N, and friction-rollers H, substantially as and for the purposes specified.

11. The combination of the plug A, provided with recess D, shaft B, eccentrically lo-

cated in the plug, stops for limiting the rotation of said shaft in said plug, and a device mounted on said shaft for operating on the tube or flue, and friction-rollers H, located when within the tube in the plane of the tube-sheet of the boiler, substantially as and for the purposes specified.

12. The combination of the plug A, provided with recess D, shaft B, eccentrically located in the plug, stops for limiting the rotation of said shaft in said plug, and a device mounted on said shaft for operating on the tube or flue, and friction-rollers H, located in cylindrical grooves in the plug and retained in place by a strip, as h' , substantially as and for the purposes specified.

13. The combination of the plug A, provided with recess D, shaft B, eccentrically located in the plug, stops for limiting the rotation of the said shaft in said plug, and a band N, provided with slots N^2 , and respective securing-bolts, respectively received into said slots, substantially as and for the purposes specified.

14. The combination of the plug A, provided with recess D, shaft B, eccentrically located in the plug, stops for limiting the rotation of the said shaft in said plug, and a band N, adjustable without reversal, and, substantially as described, to and from the radial frame in which the device for directly operating on the flue rotates, substantially as and for the purposes specified.

15. The combination of the plug A, provided with recess D, shaft B, eccentrically located in the plug, stops for limiting the rotation of the said shaft in said plug, and the roller having means for directly operating on the flue or tube, and journal-bearings C^4 C^4 , provided with shanks received into the shaft, substantially as and for the purposes specified.

GUSTAVE WIEDEKE.

Attest:

WILLIAM H. GILLIS,
A. L. HERRLINGER.