W. H. LUTZ.

COMPRESSION WRENCH.

APPLICATION FILED MAY 4, 1914.

1,166,467.

Patented Jan. 4, 1916.

2 SHEETS—SHEET 1.

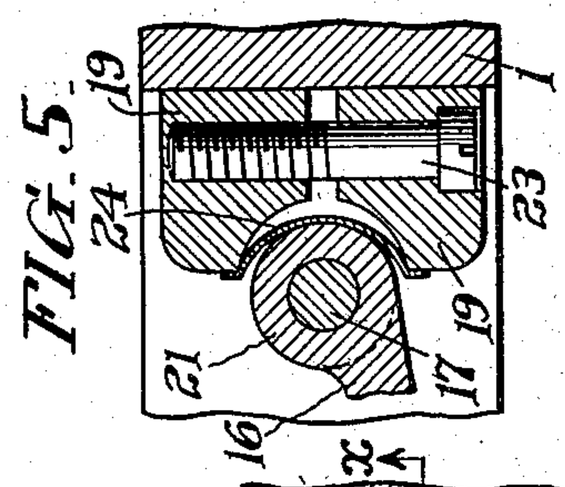

FIG. 5.

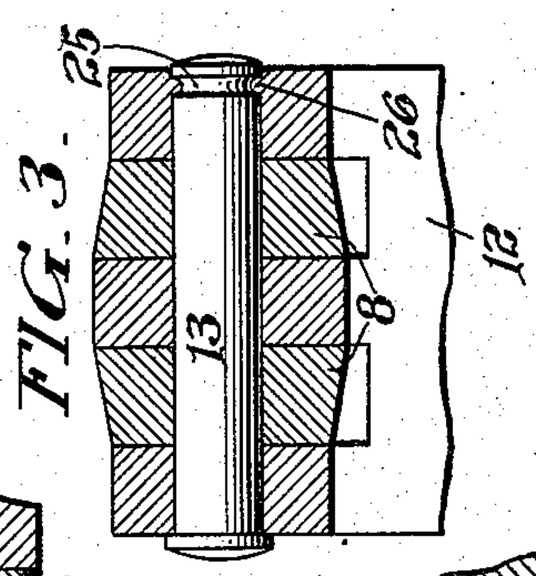

FIG. 3.

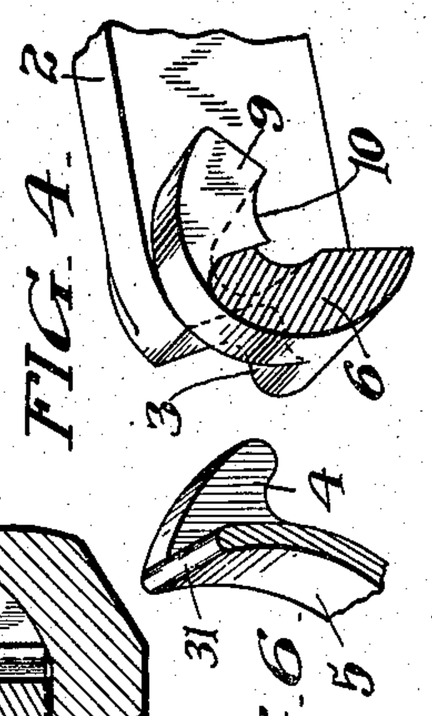

FIG. 4.

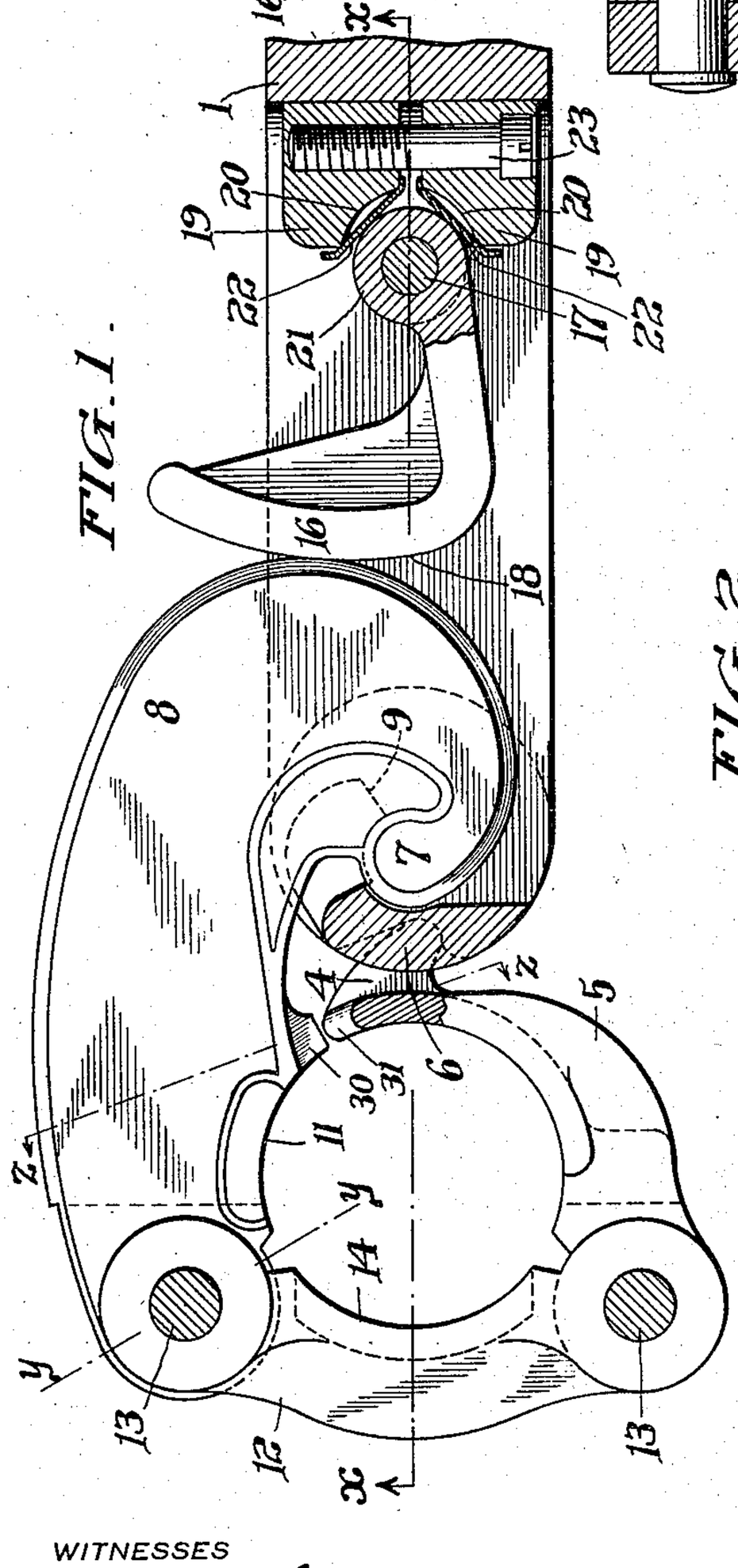

FIG. 1.

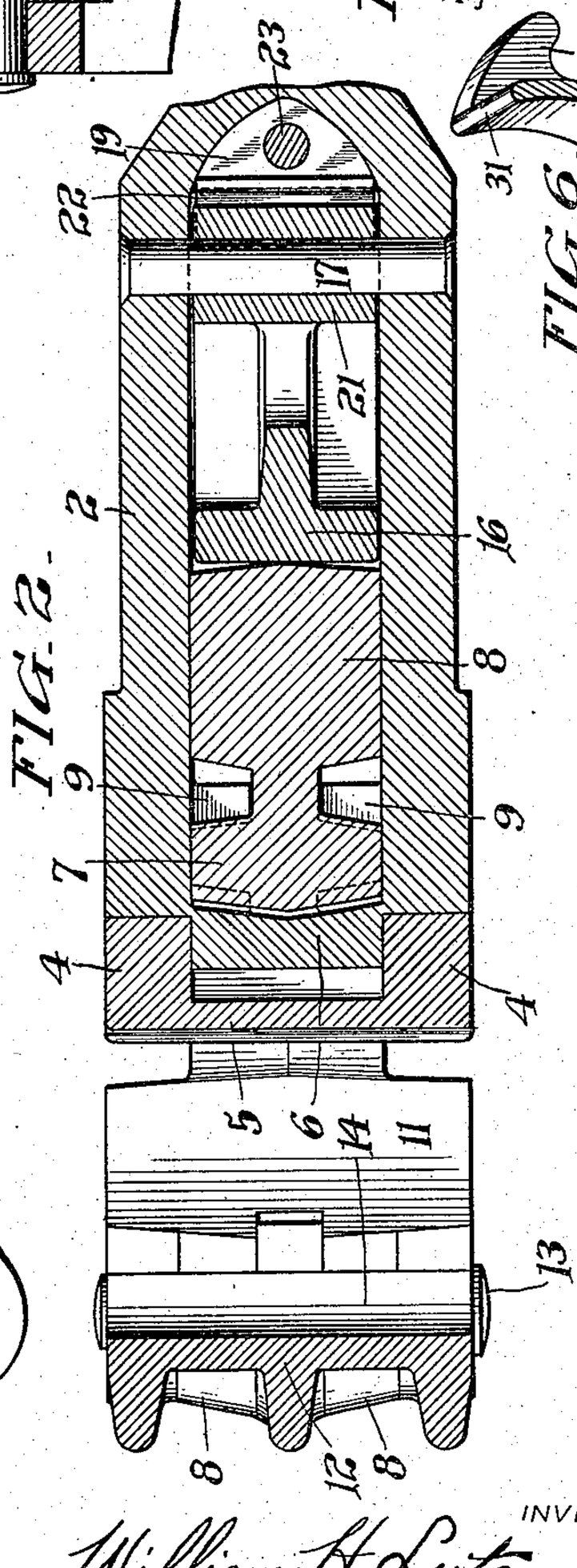

FIG. 2.

FIG. 6.

WITNESSES

Daniel Webster, Jr.

Clara H. Wissmann

INVENTOR

William H. Lutz

BY

Robert M. Barr

ATTORNEY

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

W. H. LUTZ.

COMPRESSION WRENCH.

APPLICATION FILED MAY 4, 1914.

1,166,467.

Patented Jan. 4, 1916.

2 SHEETS—SHEET 2.

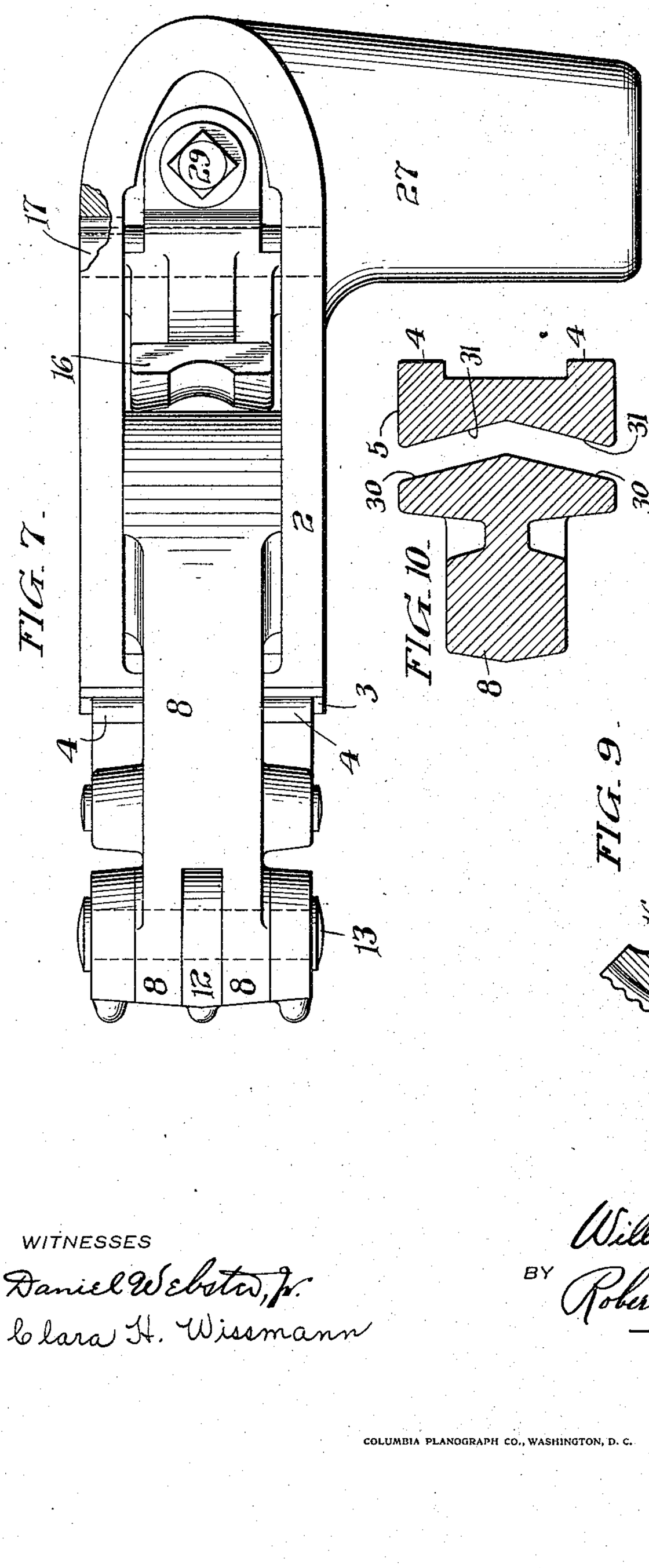

FIG. 7.

FIG. 10.

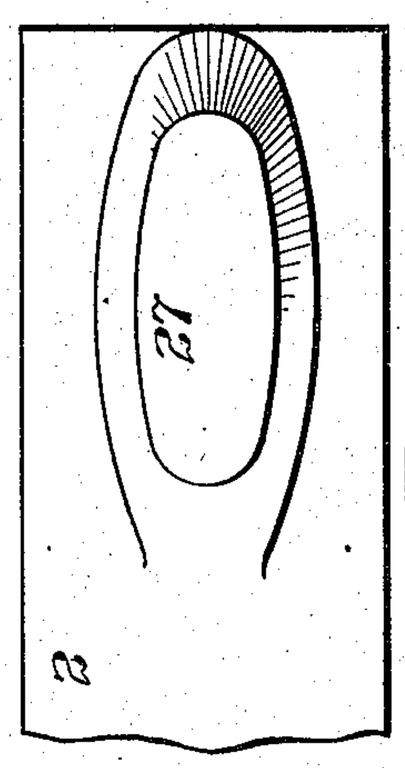

FIG. 8.

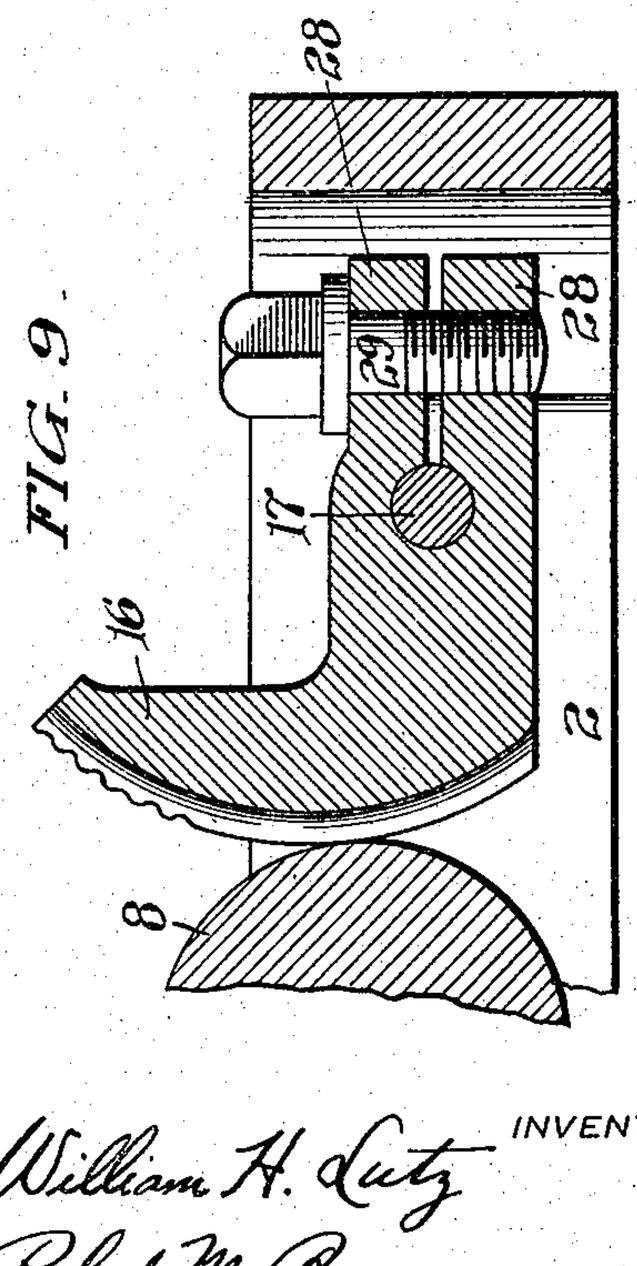

FIG. 9.

WITNESSES

Daniel Webster, Jr.

Clara H. Wissmann

INVENTOR

William H. Lutz

BY

Robert M. Barr

ATTORNEY

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM H. LUTZ, OF PHILADELPHIA, PENNSYLVANIA.

COMPRESSION-WRENCH.

1,166,467. Specification of Letters Patent. Patented Jan. 4, 1916.

Application filed May 4, 1914. Serial No. 836,077.

To all whom it may concern:

Be it known that I, WILLIAM H. LUTZ, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain new and useful Improvements in Compression-Wrenches, of which the following is a specification.

This invention relates to wrenches, more particularly of the type known as compression wrenches, and has for an object to provide an improvement upon the construction shown in my prior Patents, No. 1,054,700, March 4, 1913, and No. 1,081,684, December 16, 1913.

Its object is to provide a wrench capable of imparting a maximum clamping or gripping action upon a pipe or other article with a minimum of crushing or biting action, thereby firmly holding the surface of the article grasped by the wrench, but leaving the surface unmarred.

It has for a further object to provide a construction wherein the detachable parts of the wrench are retained in assembled condition through the medium of a manually operable latch member, the movement and action of which are under the control of an adjustable friction locking device adapted to be regulated and adjusted at will in such a manner as to definitely control the action of the aforesaid latch.

It has for a further object to provide a means for retaining the pivots for the girth members of the wrench in operative position without obstructing or interfering with the free movement of the parts.

It further consists of other novel features of construction, all as will be hereinafter fully set forth.

For the purpose of illustrating my invention, I have shown in the accompanying drawings one form thereof which is at present preferred by me, since the same has been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which my invention consists can be variously arranged and organized and that my invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown and described.

Referring to the drawings:—Figure 1 represents a side elevation of a compression wrench embodying my invention, in which certain parts have been broken away for clearness of illustration, and a portion of the handle omitted as an unnecessary showing; Fig. 2 represents a section on line *x—x* of Fig. 1; Fig. 3 represents a section on line *y—y* of Fig. 1, showing a novel feature of construction; Fig. 4 represents a perspective of a portion of one end of the wrench handle; Fig. 5 represents a section showing a modified form of the latch retaining mechanism; Fig. 6 represents a perspective of a portion of the girth member which coacts with the part shown in Fig. 4; Fig. 7 represents a plan showing a modified form of the wrench; Fig. 8 represents a side elevation of a portion of the same; Fig. 9 represents another embodiment of the latch retaining mechanism; Fig. 10 represents a section on line *z—z* of Fig. 1.

Similar reference numerals indicate corresponding parts.

1 designates the handle, or operating lever, of my improved compression wrench, provided with a yoke 2 at one end which forms a slot to receive certain adjuncts of the operating mechanism. The outer extremity of this yoke is provided at each side with a seat or depression 3 adapted to receive the tongues or toothed projections 4 of the girth member 5. Between the side members of the yoke 2 and interposed between the pair of depressions 3, the material of the handle forms a bridge piece 6, which serves the double function of strengthening the end of the handle adjacent the point at which the force is applied, and of acting as a trunnion bearing for the trunnions 7 of the body part 8, to which the girth devices are movably connected. In the present instance the bridge piece 6 is substantially U-shaped in plan and each lug 9 thereof is provided on its lower surface with a concave surface or recess 10 in which the said trunnions 7 respectively seat. The intermediate portion of these trunnions is substantially straddled by the lug portions of the bridge piece as will be readily understood.

By reference to Fig. 1 it will be noted that the body part 8 carries the trunnions 7 substantially in the form of a hook, so that when the said body is inserted within the yoke and drawn into position, the trunnion members 7 will each take a position beneath the bearing lugs 9, and while the parts are freely movable with respect to each other, the body member is held by suitable locking devices to be later described, against displacement. The body part 8 is

provided with a gripping surface 11 and has a plurality of girth members 12 hinged thereto by means of the pin 13. The girth members 12 are also each provided with a gripping surface as shown at 14, and in turn are pivoted or hinged through the medium of another pin 13 to the girth member 5. In assembled condition of the parts as shown in Figs. 1 and 2, the free end of the girth member 5 straddles the bridge piece 6 and has its tongues 4 each seated in one of the depressions or seats 3 of the handle, so that in the operation of the wrench, movement of the end of the handle in the proper direction will cause the girth member 5 to be drawn toward the body part 8, thereby causing the girth members 12 to swing on the pivots 13 to produce the required gripping action upon a pipe or other article encircled by the said gripping members. In this connection it will be noted that the fulcrum of the wrench is located along the line or point of contact between the trunnions 7 and the lugs 9, and the distance between this fulcrum and the point of the applied force upon the tongues 4 determines the degree of compression exerted by the members 5 and 12 upon an article.

It is of course desirable in this type of wrench to provide a gripping member which, while exerting an effective frictional engagement with the article so that the latter is held firmly, does not exert such a pressure as to crush or bite the surface of the article so that it is marred or scored. In my present construction I have provided the gripping member 5 with tongues which are spaced apart so that they may straddle the intervening bridge piece of the handle, thus reducing the distance between the fulcrum and the point of contact of the tongue 4 to such an extent as to give the desired gripping action without producing the undesirable crushing effect. It will further be noted that the result accomplished in this manner is attained without weakening the material of the handle, and the bridge piece 6 may be accurately proportioned to stand the maximum of strain under effective operation.

16 designates a latch member pivoted at 17 within the confines of the yoke 2 and having a cam face 18 for engagement with the body part 8 in order to hold the latter in proper relation as regards the fulcrum formed by the trunnion members. This latch member 16, while freely movable upon the pivot 17 is controlled by a friction lock comprising, in the present instance, a pair of blocks 19 positioned between the converging inner side walls of the yoke 2, one being preferably above the axis of the latch 16, while the other is below, as will be seen from Fig. 1. The face 20 of each of the blocks 19, juxtaposed with respect to the bushing 21 of the latch, is curved to follow the contour of the bushing so that, in case the two blocks should be drawn sufficiently close together, these faces will accurately abut the outer side face of the bushing 21.

22 designates a suitable pair of springs bearing upon the bushing 21 and held under compression by the respective blocks 19. Thus the curved face 20 of one block bears against one of the springs, while the other acts in a corresponding manner against the other. The friction between the aforesaid springs and the latch member may be regulated and adjusted by the screw 23 which passes through one of the blocks 19 and is threaded into the other. In this manner the latch is subjected to sufficient friction to hold it in any required position and yet the friction is not sufficient to prevent ready manual manipulation thereof.

In Fig. 5 I have shown a modified form of friction lock wherein a single spring 24 is employed, the same passing about the bushing 21 and from one block to another, the tension being applied in the manner heretofore described.

It will be understood that I do not wish to be restricted to the number of springs employed for this purpose or to any particular arrangement of a spring or springs in this connection, since as far as I am aware I am the first to devise an adjustable friction locking mechanism for a latch of the type here shown.

In Fig. 3 I have disclosed a novel form of pivot pin for the girth members, the same having a circumferential groove 25 suitably formed adjacent one end of the pin, and located in assembled condition just beneath the surface of one of the outer girth members. When desirable the pin is retained in operative position by subjecting the metal of the girth member to a plurality of hammer blows to swage or rivet the girth metal, as shown at 26, into the groove 25.

In the operation of the device the girth members 12 and 5 are placed about a pipe or other member so as to encircle the same, and the tongues 4 then seated in the respective depressions or seats 3 of the handle 1, the wrench then being ready to effect gripping of the member held thereby. In effecting this action, the handle 1 is moved in the proper direction to cause the grooved ends 3 thereof to draw the girth member 5 toward the body part 8, which results in the aforesaid girths drawing together with consequent clamping action. That a minimum of crushing effect accompanies the gripping of the article is due, as heretofore explained, to the comparatively short leverage provided between the point of the applied force on the tongues 4 and the fulcrum at the trunnions. This leverage may, of course, be

varied by cutting the seats 3 deeper in the handle so as to bring the straddling girth member 5 nearer to the fulcrum of the wrench as will readily be understood. This feature is particularly applicable to wrenches used in connection with work of small diameter, and insures not only an article of reduced diameter being firmly clamped and held by the wrench, but it is held without danger of crushing the material or of the girths biting into the material to mar its surface.

Attention is also directed to the friction locking means for the latch, which holds the detachable girth members to the handle, since the construction embodied as a part of my invention provides a means for varying the clamping action of the lock and prevents the latch from working loose and releasing the parts at a critical time. In case the springs 22 become weakened through use they may again be rendered efficient by a slight adjustment of the screw 23, which adjustment is only limited by the spacing of the blocks with respect to each other. In case the springs have substantially all their tension taken up by adjustment, the blocks themselves may become friction members which clamp directly upon the latch bushing.

It will also be noted that I have provided a simple and effective means for retaining the pivot pins 13 in place, giving in effect substantially the strength of a riveted construction without, however, impairing in any manner the free movement of any of the girth members with respect to the other.

The type of wrench here embodied as my invention has a wide range of use and may be applied to all kinds of pipes, shafting, to studs, to piston rods or the like, or may be used in connection with ratchet drills or reamers, or in modified form for holding an article undergoing machine work.

As an example of the latter form, I have shown in Fig. 7 the gripping mechanism or head portion of the wrench as provided with a comparatively short handle to which is attached a laterally disposed arm 27 for the purpose of coacting with or engaging power devices where the wrench is used in machine work. As will be seen from Fig. 8 this arm is substantially elliptical in section though I do not desire to be limited to any particular configuration in view of the fact that the shape is of minor consideration.

In Fig. 9 I have illustrated the latch member 16 as having extensions 28, forming in effect a split hub about the pivot pin 17. These extensions are threaded to receive a stud 29 by which they may be adjusted relative to each other and thus vary the frictional engagement of the latch member with its pivot pin.

In connection with the details of construction, particular attention is directed to the configuration of the juxtaposed or meeting ends of the girth members since the body part 8 is provided with oppositely beveled surfaces 30 while the outer girth link 5 is similarly provided with oppositely beveled surfaces 31 which are reversed with respect to the body surfaces so that when the two parts are drawn into close relation a portion of each member overlaps the other. The function of this construction will be readily understood when it is stated that the tendency of an article placed under compression is to become distorted or bulged outwardly along the center line and with the grain of the material. If the two abutting faces of the gripping member 5 and the body portion 8 were straight opposed surfaces there would be an opening between the two parts through which the material of the article held under compression might thus be forced through. In the present construction this disadvantage is overcome since the two parts upon being drawn close together overlap the center line of the stock, so that if there is any tendency to crush or distort the material it can only take place across the grain and consequently this danger is practically eliminated.

It will now be apparent that I have devised a novel and useful construction which embodies the features of advantage enumerated as desirable in the statement of the invention and the above description, and while I have in the present instance shown and described the preferred embodiment thereof which has been found in practice to give satisfactory and reliable results, it is to be understood that the same is susceptible of modification in various particulars without departing from the spirit or scope of the invention or sacrificing any of its advantages.

Having thus described my invention, what I claim and desire to protect by Letters Patent is:—

1. In a device of the character stated, a handle, a yoke formed on said handle having a pair of seats adjacent one end thereof, a bridge piece for said yoke located between said seats and forming a fulcrum bearing, a body part adapted to interfit with said yoke and engage said bearing, a girth member connected to said body part, and lugs or teeth on said girth member adapted in operative condition to straddle said bridge piece and engage the respective seats.

2. In a device of the character stated, a handle, a yoke formed on said handle having a pair of seats adjacent one end thereof, a bridge piece for said yoke located between said seats and forming a fulcrum bearing, a body part adapted to interfit with said yoke and provided with trunnions for engaging said bearing, a girth member connected to said body part, and lugs or teeth integral with said girth member and located respectively at each side of the free end of

said girth member in juxtaposed relation to the respective seats, said lugs or teeth being adapted in operative condition to straddle said bridge piece and engage the respective seats, whereby the applied force acting on the girth members operates in close proximity to the fulcrum of the device.

3. In a device of the character stated, a handle, a yoke formed on said handle, a bridge piece for said yoke forming a fulcrum bearing, a body part adapted to interfit with said yoke and engage said bearing, a girth member connected to said body part, and means adapted to straddle said bridge piece for removably connecting said girth member to said handle whereby the operative force applied to said girth member acts at a point or points in close proximity to the fulcrum of the device.

4. In a device of the character stated, the combination of a handle, a plurality of girth members carried thereby, a latch for maintaining operative relation between one of said members and said handle, means to movably connect the free end of another of said members to said handle, a friction device for controlling said latch, and means for regulating the degree of friction of said friction device.

5. In a device of the character stated, the combination of a handle, a plurality of girth members carried thereby, a latch pivoted to said handle for maintaining operative relation between one of said members and said handle, means to movably connect the free end of another of said members to said handle, a spring suitably mounted to bear against said latch to control the movement thereof, and means for varying the pressure of said spring upon said latch.

6. In a device of the character stated, the combination of a handle, a plurality of girth members carried thereby, a latch pivoted to said handle for maintaining operative relation between one of said members and said handle, means to movably connect the free end of another of said members to said handle, a spring suitably mounted to bear against said latch to control the movement thereof, a block movably mounted in said handle and bearing against said spring, and means to vary the position of said block whereby the pressure of said spring is varied at will.

7. In a device of the character stated, the combination of a handle, a plurality of girth members carried thereby, a latch pivoted to said handle for maintaining operative relation between one of said members and said handle, means to movably connect the free end of another of said members to said handle, a pair of blocks movably mounted in said handle, means for varying the distance between said blocks, and spring means between said blocks and said latch for producing friction upon said latch to prevent free movement of the latter.

8. In a device of the character stated, a gripping device comprising a body portion having oppositely beveled surfaces at one side thereof and a girth member pivotally connected to said body portion and provided with surfaces beveled in opposite directions and reverse to the direction of the beveled surfaces on the body portion whereby portions of said girth and body portion are adapted to overlap in operative positions of said parts.

In testimony that I claim the foregoing as my invention, I have hereunto signed my name this 28th day of April, 1914.

WILLIAM H. LUTZ.

In the presence of—
ROBERT M. BARR,
C. H. WISSMANN.