

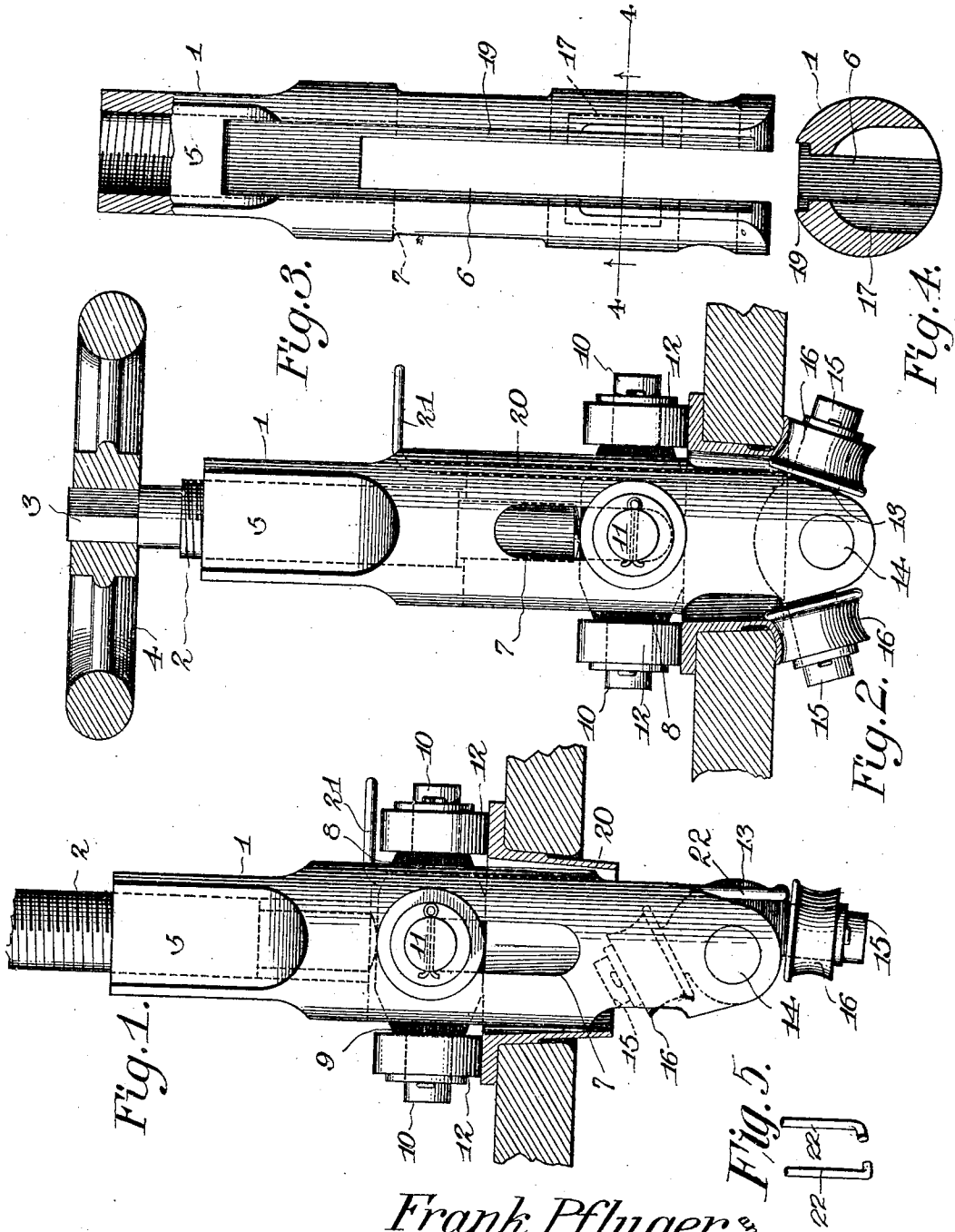
No. 810,431.

PATENTED JAN. 23, 1906.

F. PFLUGER & E. CHRISTENSEN.

COMBINED EXPANDER AND FLANGER FOR BUNG HOLE BUSHINGS.

APPLICATION FILED FEB. 20, 1904. RENEWED SEPT. 20, 1905.



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FRANK PFLUGER AND EMIL CHRISTENSEN, OF PORTLAND, OREGON.

COMBINED EXPANDER AND FLANGER FOR BUNG-HOLE BUSHINGS.

No. 810,431.

Specification of Letters Patent.

Patented Jan. 23, 1906.

Application filed February 20, 1904. Renewed September 20, 1905. Serial No. 279,312.

To all whom it may concern:

Be it known that we, FRANK PFLUGER and EMIL CHRISTENSEN, citizens of the United States, residing at Portland, in the county of Multnomah and State of Oregon, have invented a new and useful Combined Expander and Flanger for Bung-Hole Bushings, of which the following is a specification.

This invention relates to a combined expander and flanger for use in applying bushings to bung-holes; and it consists in an improved form of implement especially designed for the application of bushings of the character described in our companion application, Serial No. 193,156.

The principal object of the present invention is to provide an implement by means of which bung-hole bushings of suitable character may be applied to bung-holes quickly with the expenditure of a minimum amount of energy and without injuring the bushing in applying it.

A further object of the invention is to improve the construction of implements of the character specified by eliminating as completely as possible the friction of operation, adapting them for ready insertion into and withdrawal from the bung-hole, and so constructing and arranging the parts thereof that the implement will prove durable in service.

With the objects above mentioned and others in view, which will appear as the invention is more fully disclosed, the same consists in the novel construction and combination of parts of a bung-hole-bushing flanger and expander, as hereinafter fully described and claimed, and illustrated in a preferred form of embodiment in the accompanying drawings, forming part of this specification, it being understood that changes in the form, proportions, and exact mode of assembly of the elements exhibited may be made without departing from the spirit of the invention or sacrificing the advantages thereof.

In the drawings, Figure 1 is a view in elevation of the bushing expander and flanger, showing the mode of introducing the same into a bung-hole, the portions of the stave adjacent to the bung-hole and the bung-hole bushing being shown in section and the hand-wheel by means of which the feed-screw is advanced and retracted being omitted to save space. Fig. 2 is a view in elevation of the bushing expander and flanger, showing the parts thereof in the position occupied at the

end of the expanding and flanging operation, the portions of the stave adjacent to the bung-hole and the bushing being shown in section. Fig. 3 is a view, partly in elevation and partly in section, of the stock of the bushing expander and flanger. Fig. 4 is a sectional view on the line 4 4 of Fig. 3. Fig. 5 is a detail view of the lower portion of the device for shifting the position of the pivotal expander member.

Referring to the drawings, in which corresponding parts are designated by similar characters of reference throughout the several views, 1 designates the stock or mandrel of the implement. The stock 1 is longitudinally bored in the upper end and is internally threaded in the bore for engagement with the threads upon a feed-screw 2, which is operative in the bore of the stock and is preferably provided at its upper end with a square shank 3, upon which a hand-wheel 4 or other suitable device for imparting rotary movement thereto is fitted. The upper end of the stock 1 is externally squared, as shown at 5, so that the stock may be fitted into a suitable socket or engaged by a wrench. Below the bore in the upper end the stock 1 is provided with a longitudinal slot 6, extending entirely through the stock and affording space for the movement within the stock of the flanging and expanding devices hereinafter to be described. At right angles to the slot 6 and extending outward slightly below the middle point of the stock a slot 7 is formed, which also extends entirely through the stock. In the upper portion of the slot 6 an axle 8, comprising a flat body portion 9 and gudgeons 10, is arranged for movement longitudinally of the stock, the axle itself being disposed transversely, as shown in the drawings. The axle 8 is secured in position in the slot by means of a round axle or pin 11, which extends through the slot 7 and is secured in a central opening in the axle 8. The axles 8 and 11 form the supports for pressure-rollers 12, which engage with the outer flange of the bung-hole bushing during the operation of expanding and flanging the bushing at its inner end, as shown in Fig. 1.

At the lower end of the stock 1 an axle 13 is disposed transversely through the slot 6 and is secured therein by means of a pivot-pin 14, which extends through the stock from side to side and serves as an axis about which the axle 13 may be turned when it is desired to bring the axle into approximate alinement

with the stock in order to introduce the stock into the bung-hole. The axle 13 is provided at its ends with gudgeons 15, upon which concave flanging and expanding rollers 16 are rotatably mounted, and the stock 1 is recessed upon one side, as shown at 17, to receive one of the rollers 16 when the axle is turned into the position shown in dotted lines in Fig. 1. In order to swing the axle 13 into approximate alinement with the stock and to restore the axle to its normal transverse position, the slot 6 is wider at one side, as shown at 19, and a bridle 20, consisting, preferably, of a single piece of wire bent into inverted substantially U shape to present a handle portion 21 and parallel connecting portions 22, provided at their lower ends with inwardly-bent terminals for engagement with an opening provided therefor in the axle 13, is arranged in the channel 19.

When the bushing expander and flanger, as above described, is to be used in securing the bushing in position, the bridle 20 is pressed downward by pressure upon the handle portion 21 until the axle 13 takes the position shown in dotted lines in Fig. 1, the concave roller at the then upper end of the axle being disposed within the recess 17 in the stock and the roller at the opposite end being brought approximately into alinement with the lower end of the stock, so that no difficulty will be experienced in passing the lower end of the stock through the bushing. Before introducing the stock into the bung-hole the feed-screw 2 is withdrawn sufficiently to permit the axles 8 and 11 to rise to the upward limit of their movement in order to give sufficient play for the axle 13 when the bridle 20 is raised to restore the axle to its normal transverse position in the stock. When the axle 13 has been brought into its normal transverse position within the cask or other vessel in which the bung-hole is formed, the feed-screw is turned in the bore of the stock to force the axle 8 and the structures connected therewith downward until the rollers 12 contact with the flange at the outer end of the bushing, and the concave flanging and expanding rollers 16 are brought into contact with the inner end of the bushing. The stock is then rotated in the bung-hole and the feed-screw is simultaneously operated to force the axles 8 and 13 closer together. This simultaneous movement of the stock in the bung-hole and the feed-screw in the stock causes the inner end of the bushing to be expanded and formed into an outwardly-disposed flange which engages with the inner surface of the stave adjacent to the bung-hole and holds the bushing securely in the bung-hole. As the rollers 16 travel around the bushing at the same time that they are drawn upward toward the pressure-rollers 12, a uniform action is produced upon all parts of the inner end of the bushing and the expanding and flanging

take place so gradually and uniformly that no tearing or splitting of the inner end of the bushing results. The rotative movement of the stock within the bung-hole during the operation of expanding and flanging the bushing at its inner end may be brought about by turning the stock with a wrench applied to the squared upper end of the stock, the cask or other vessel being held stationary, or the stock may be clamped in a stationary socket and the cask or other vessel may be turned about the stock, any suitable rotating support for the cask or other vessel being used to effect the turning movement of the vessel.

After the expanding and flanging operation has been completed and the flange at the inner end of the bushing is brought into close contact with the inner surface of the stave the implement may be withdrawn from the bung-hole by first withdrawing the feed-screw to permit the separation of the axles 8 and 13 to a sufficient distance and then swinging the axle 13 into approximate alinement with the stock by lowering the bridle 20 to the position shown in dotted lines.

A special feature of the operation of the bushing expander and flanger as above described is the rolling contact of the pressure-rollers and the expanding and flanging rollers with the outer and inner ends of the bushing, respectively. By using rollers for the pressure members and the flanging members of the implement the friction incident to the operation thereof is reduced to a minimum, and the time in which the inner end of the bushing may be successfully expanded and flanged is accordingly reduced.

A further advantage resulting from the use of rollers for pressure members and expanding members lies in the gradual application of the necessary force to the bushing, the gradual application of the force being especially desirable in lessening the strain upon the bushing during the expanding and flanging operation and giving opportunity for the metal to flow to the extent necessary to produce a uniform flange.

In the construction of the combined expander and flanger any suitable material may be employed; but steel is preferable in many respects, as when constructed of steel the implement has a maximum of durability and does not become distorted or inoperative from the strains to which it is subjected in use.

Having thus described the construction and operation of our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a device of the character specified, a stock, means carried by the stock for applying pressure to one end of a bushing, and flanging means also carried by the stock and including an axle having rollers for engage-

ment with the other end of the bushing, said axle being held normally in a position transverse to the stock and capable of being adjusted to a position of approximate alignment with the stock.

2. In a device of the class described, a stock, a pressure device carried by the stock and movable thereon, means for adjusting said pressure device longitudinally of the stock, and a flanger including an axle carried by the stock and provided with rollers for engagement with the inner end of a bushing, said axle being disposed transversely of the stock during the operation of the device and capable of being adjusted into approximate alignment with the stock to permit of the device being inserted through a bushing.

3. In a device of the character specified, a longitudinally-slotted stock, a pressure device disposed transversely of said stock in said slot, means for adjusting said pressure device longitudinally of the stock, and a flanger also carried by said stock in the slot thereof and held normally in a position transverse to the stock, said flanger being adjustable into approximate alignment with the stock.

4. In a device of the class described, a stock, a feed-screw threaded in said stock, a pressure device mounted to move longitudinally upon the stock and engaged with the feed-screw for movement therewith, and a flanger carried by the stock independently of the feed-screw for engagement with the inner end of a bushing.

5. In a device of the class described, the combination with a rotatable longitudinally-slotted stock having a bore intersecting the outer end of the slot, and provided with a threaded portion of a presser member adjustable longitudinally within the slot and projected at opposite sides thereof externally of the stock for engagement with one end of the bushing, a screw-threaded adjusting device fitted in the bore of the stock and engaging the screw-threaded portion thereof for controlling the presser device, and a flanger member carried by the stock with the presser

member located between the flanger and the screw-threaded adjusting means.

6. In a device of the class described, the combination of a rotatable longitudinally-slotted stock having one edge of the slot enlarged, a flanger pivoted within the slot and capable of being tilted into substantial alignment with the stock, an adjusting device slidable in the enlarged edge of the slot with one end connected to the flanger and its opposite end provided with an outwardly-directed handle, a presser member slidable within the slot with its opposite ends projected externally of the stock, and means carried by the stock for adjusting the presser member therein to draw said member and the flanger into engagement with the opposite end of a bushing.

7. In a device of the class described, the combination of a rotatable stock which is bifurcated at one end and provided at its opposite end with a longitudinal bore intersecting the back of the bifurcation and having a threaded portion, one edge of the bifurcation being enlarged to form a channel, an axle pivoted within and adjacent the open end of the bifurcation and provided with terminal flanger-rollers, another axle slidable within the bifurcation and projected externally at opposite sides of the stock, rollers carried by the projected ends of said axle, a longitudinally-slotted controlling device slidable in the channel of the stock with its slot receiving the adjacent projected end of the slidable axle, one end of the controlling device being connected to the pivoted axle and its opposite end being formed into an outwardly-directed handle, and an adjusting-screw fitted in the screw-threaded bore of the stock in operative relation with the slidable axle.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

FRANK PFLUGER.
EMIL CHRISTENSEN.

Witnesses:

R. L. STEVENS,
E. G. BURKE.