(No Model.)

F. L. ELLIS.

TOGGLE JOINT.

No. 322,531. Patented July 21, 1885.

Fig. 1

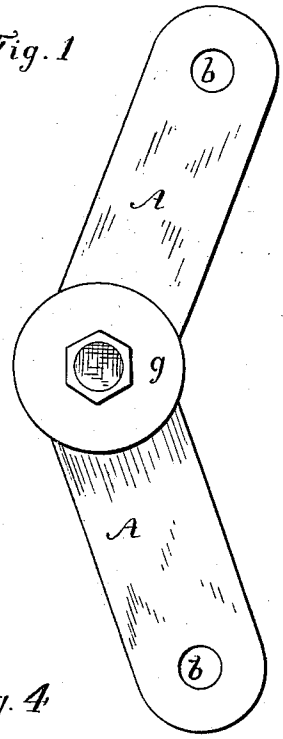


Fig. 2

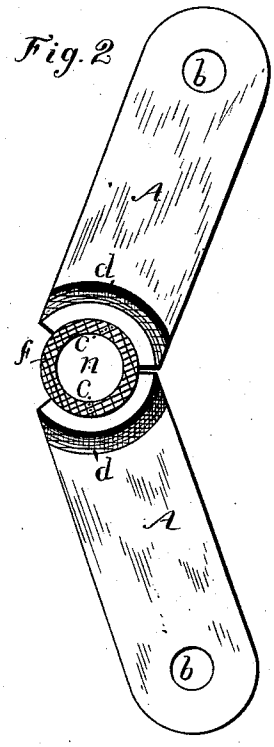


Fig. 4

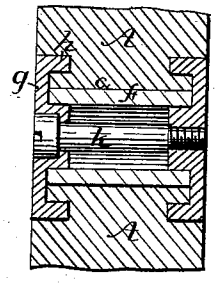


Fig. 3

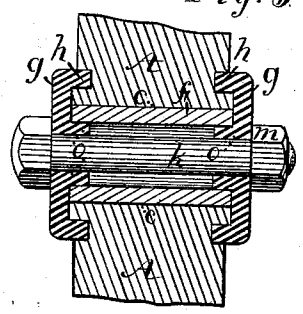
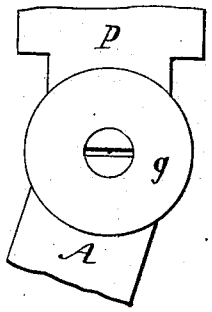


Fig. 5



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TOGGLE-JOINT.

SPECIFICATION forming part of Letters Patent No. 322,531, dated July 21, 1885.

Application filed December 31, 1884. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK L. ELLIS, a citizen of the United States, residing at New Haven, in the county of New Haven and State of Connecticut, have invented a new and useful Improvement in Toggle-Joints, of which the following is a specification.

My invention relates to an improved toggle-joint for presses and other machines.

The toggle-joint is an old, well-known, and extensively-used mechanical device for exerting pressure; and it consists, essentially, of two links hinged together end to end and connected at their opposite ends to the mechanism to be operated. These joints as ordinarily made are expensive and difficult of construction; and the object of my invention is to provide a superior toggle-joint which shall be free from the objections above named, and consists in the peculiar construction of the joint, as hereinafter more fully described and claimed.

In the accompanying drawings, Figure 1 represents a side view of a press-toggle fitted with my improved joint; and Fig. 2, a side view of the same with the caps of the joint removed, showing the construction. Fig. 3 is a vertical section centrally through the joint. Fig. 4 is a modification. Fig. 3 and Fig. 5 show the connection of the toggle to a part of a press.

In the drawings, A designates the links of a toggle adapted for use in presses and similar machinery.

The methods of operating the toggle in presses are varied, well known, and not here described.

The toggle is not shown in connection with a press or machine, and the links are shown with simple pin-holes *b* in the ends which attach to the parts of the press; but it is understood that these ends are also to be fitted with my improved joint, as shown in Fig. 5, in which P designates the stationary part of the press, to which the toggle is attached. The end of each link is formed with an inwardly-curved surface, *c*, which is a cylindrical arc less than a semicircle, and forms a journal-bearing. Adjacent the curved surface *c*, and concentric with it, are grooves *d*, formed one in each side of each link, and all of similar width and depth. The curved surfaces *c* abut against and move upon a hollow cylinder, *f*, which is of the same length as the surfaces *c*. The links are held in position against the cylinder by two caps, *g*, which have annular ribs *h*, fitting the grooves *d*, and are arranged one at either end of the cylinder. The caps are clamped rigidly by a bolt, *k*, passed centrally through them and also through the cylinder, and secured by a nut, *m*.

To insure greater stability of the joint, I prefer to make the hole *n* in the cylinder larger in diameter than the bolt, and form an annular rim, *o*, on the cap around the bolt-hole, which rim fits snugly within the hole *n* in the cylinder.

The caps *m* may be sunk into the links until their surfaces are coincident with the surfaces of the links, and the bolt *k* may screw into the cap and have a screw-head countersunk into the opposite cap, as shown in Fig. 4, and this style for small toggles is preferred.

The cylinder *f* may be dispensed with and the bolt *k* made sufficiently large to act as an equivalent; but I prefer to use the cylinder.

In operation the links of the toggle oscillate upon the cylinder *f* and the rims *h* of the caps *g*. The rims *h* retain the links in their position against the cylinder *f*, and the bolt *k* clamps all the parts securely together. The strain on the links is principally a crushing strain, which the cylinder is well adapted to sustain, and the entrance of the rims *o* into the ends of the cylinder further strengthens the same.

It is obvious that the rims *o* can enter the cylinder to any desired depth or that they may be dispensed with and the bolt *k* be turned to accurately fit the hole in the cylinder.

I prefer to make the joint as shown.

As an article of manufacture my improved joint is easily constructed, as all the finished surfaces upon it can be shaped by ordinary boring and turning, and thus require no hand-finishing, as in the case of ordinary toggles.

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

1. In a toggle-link, circular grooves *d*, formed concentric with a bearing, *c*, at one end of the link, for the purpose described.

2. In a toggle-joint, a link formed with a circular bearing, *c*, at one end and grooves *d* concentric therewith, in the manner substantially as described.

3. In a toggle-joint, the hollow cylinder *f*, clamped in position by means of caps *g* and bolt *k* in the manner substantially as described.

4. In a toggle-joint, the caps *g*, having rims *h*, adapted to fit the grooves *d* in the links, as and for the purpose specified.

5. The combination, with the toggle-links A, of the caps *g* and bolt *k*, for the purpose substantially as described.

6. The combination, with the toggle-links A, of the cylinder *f*, caps *g*, and bolt *k*, in the manner and for the purpose set forth.

FREDERICK L. ELLIS.

Witnesses:
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M. E. WARD.