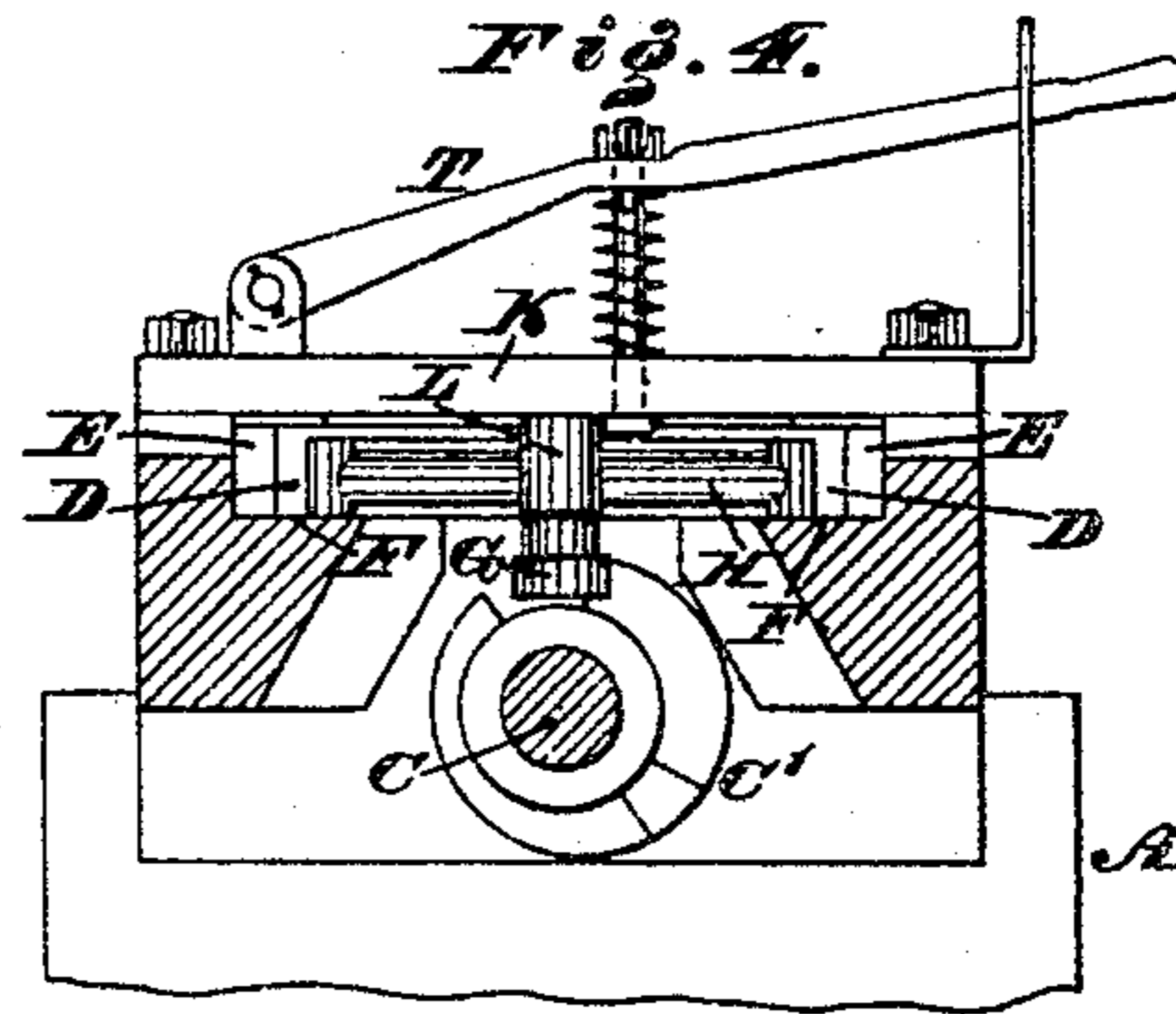
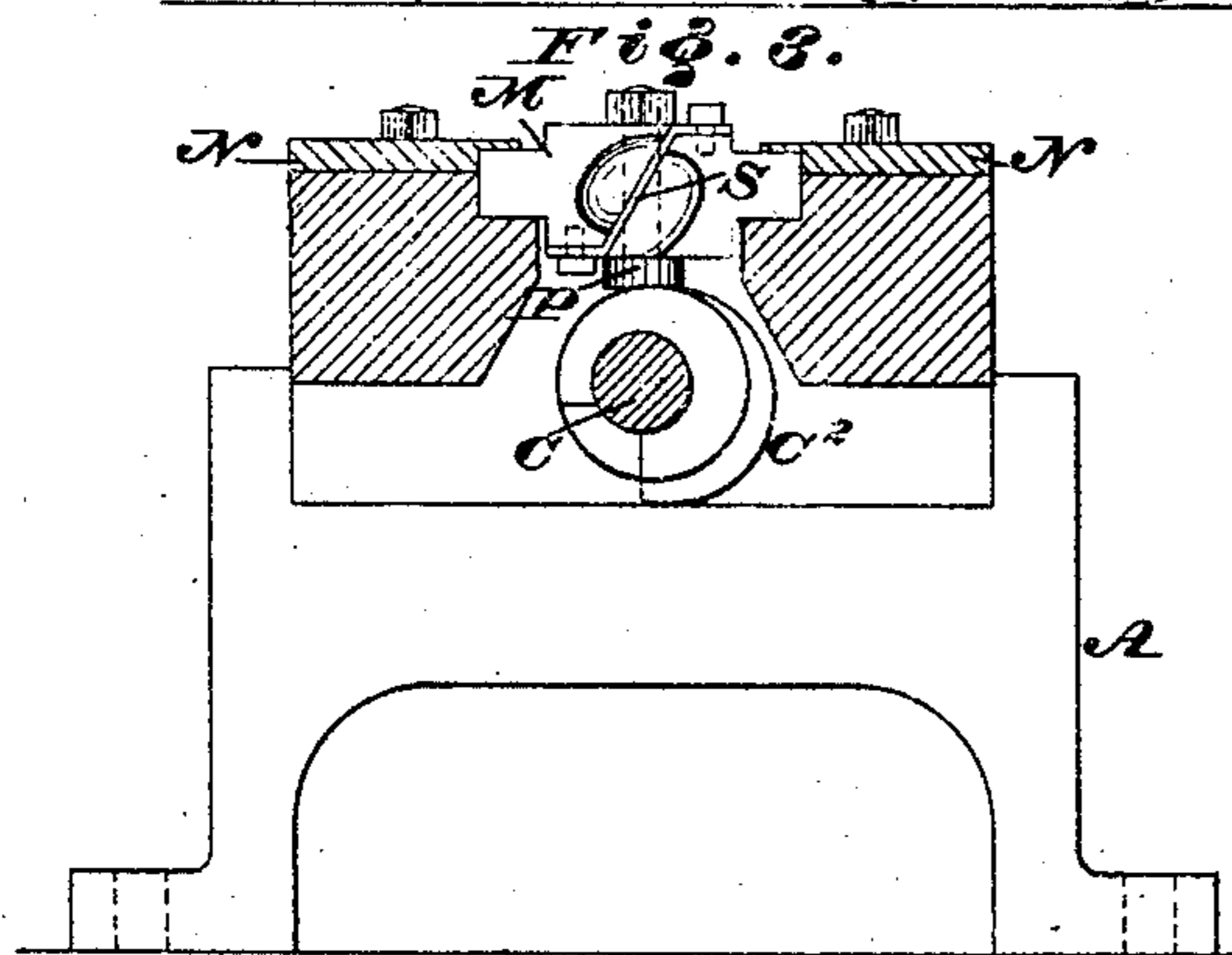
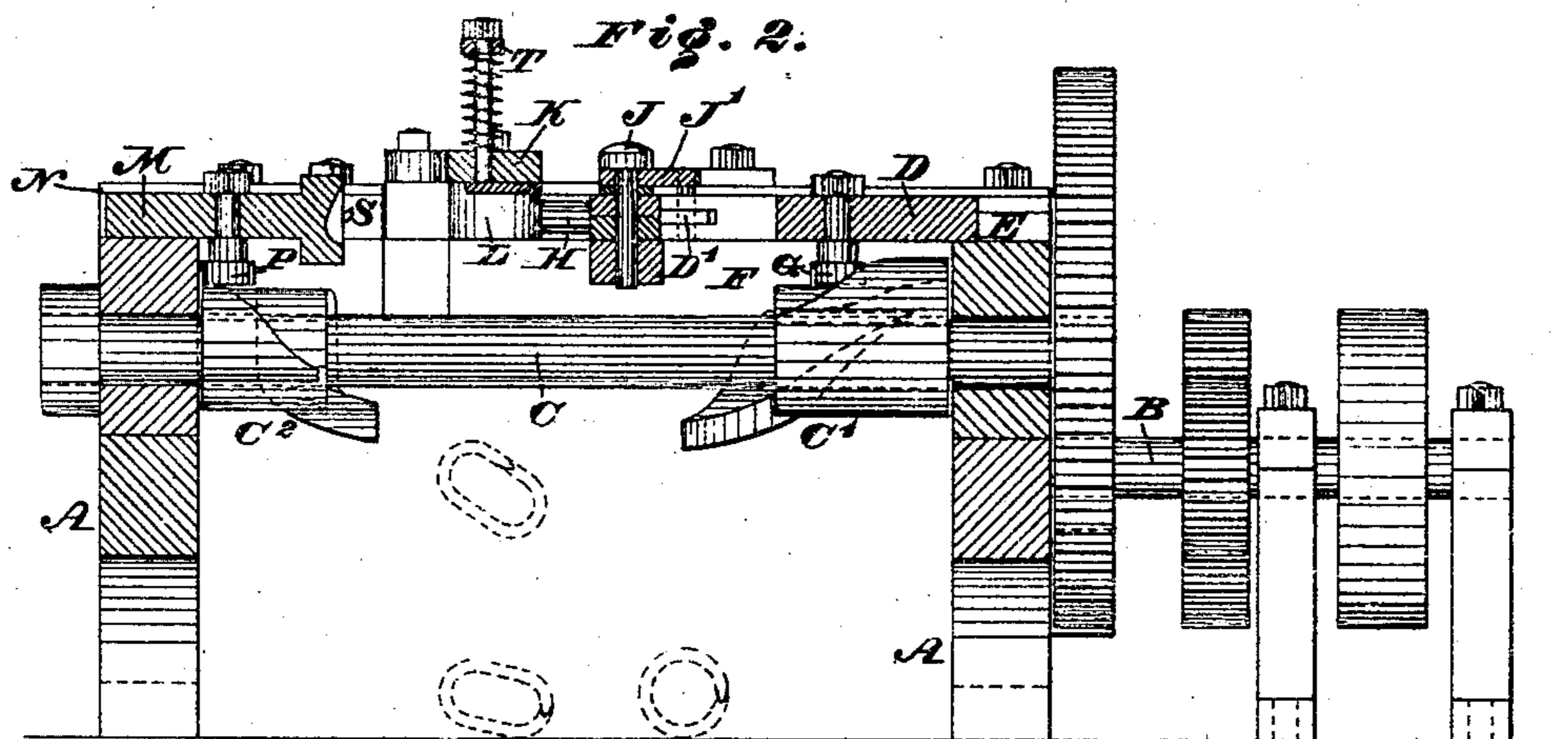
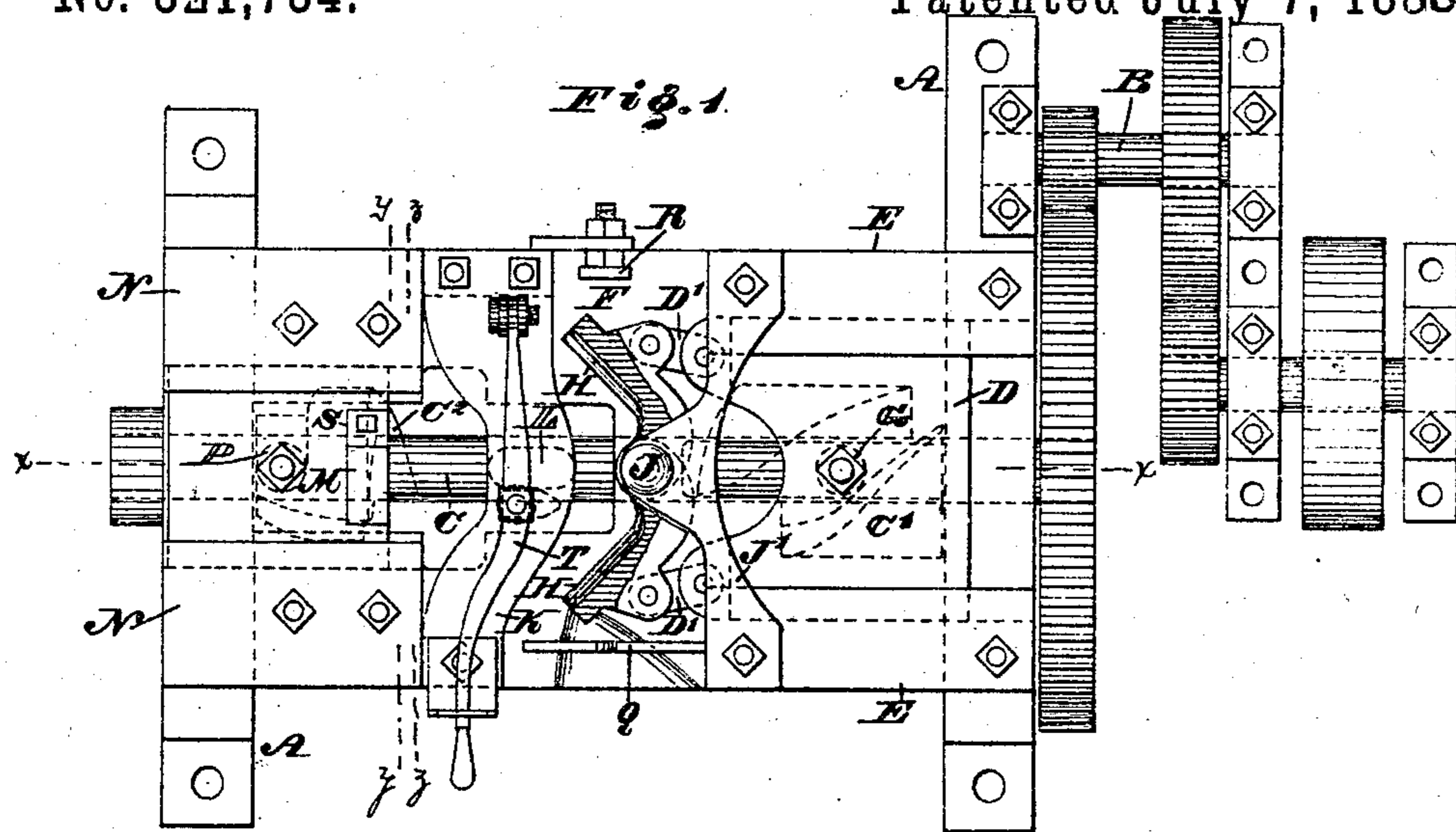


(No Model.)

W. R. LEWIS.
LINK BENDING MACHINE.

No. 321,734.

Patented July 7, 1885



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WILLIAM R. LEWIS, OF PHILADELPHIA, PENNSYLVANIA.

LINK-BENDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 321,734, dated July 7, 1885.

Application filed April 22, 1885. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM R. LEWIS, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Link-Bending Machines, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 represents a top or plan view, partly broken away, of a link-bending machine embodying my invention. Fig. 2 represents a vertical section thereof in line *x x*, Fig. 1. Fig. 3 represents a transverse vertical section in line *y y*, Fig. 1. Fig. 4 represents a transverse vertical section in line *z z*, Fig. 1.

Similar letters of reference indicate corresponding parts in the several figures.

My invention consists of a link-bending machine having hinged or pivoted jaws for bending the blank, the friction between the jaws and blank being reduced, whereby the work is accomplished with greater ease than where a sliding jaw is employed.

It further consists of a die having means for bending the ends of the bent blank in a direction toward each other and preventing said ends from coming in contact and closing.

It also consists of a former adapted to be removed, so that different shapes and sizes of the same may be employed.

Referring to the drawings, A represents the frame of the machine, on which is mounted a driving-shaft, B, which, by means of suitable gearing, communicates motion to a cam-shaft, C, which is also mounted on the frame A, said shaft C having a cam, C' C², at opposite ends thereof. D represents a sliding plate, which is mounted in suitable ways, E, on the table F of the machine, and has on its under side a stud, G, which latter engages with the cam C', the said cam being formed, as shown in Figs. 1 and 2, with grooves, the walls of which incline in opposite directions around the shaft C, said walls extending beyond each other at opposite ends in such manner that a partial revolution of the shaft C is had without moving the plate D, and a reciprocal motion of the said plate is effected by the contact of the stud G with the walls of the cam-grooves.

The inner end of the plate D has pivoted or

hinged to it, by means of links D', the bending-jaws H, whose axis or axial pin J is secured to a cross-bar or cross-head, J', attached to the ways E or the table of the machine, whereby as the plate D is advanced the jaws H are brought together or closed, and when said plate is returned the jaws are separated or opened. Depending from a cross-head or cross-bar, K, in front of the axis of the jaws is a former, L, the contour of which is that of the inner side of a link to be formed.

M represents a sliding die, which is fitted to guides N of the table of the machine and located thereon opposite to the jaws H, and having on its under side a stud, P, which engages with the cam C², the said cam being so formed that the continuous rotation of the shaft C will impart a successive forward and backward or reciprocal motion to the said die M.

The inner faces of the jaws H are grooved relatively to the shape of the exterior of the link to be formed, and the working-face of the die M has depressions of the form of the ends of the partially-closed link.

The operation is as follows: When the jaws and die are separated, a piece or bar of metal or blank suitable for forming a link, having its ends scarfed, is placed on the table F of the machine and rested against the guide and gage Q R thereon. Power being applied to the main shaft causes the rotation of the cam-shaft, whereby the plate D is advanced and the jaws H moved against the blank on the table. As the plate D continues its advanced motion the jaws are closed or brought toward each other, in which operation the blank is bent around the former L in U shape and held tightly thereagainst, owing to a dwell of the plate D caused by the peculiar shape of the cam C', it being noticed that during the bending of the blank the strain on the jaws is transmitted to the plate D and the cross-bar or cross-head J'. Meanwhile the die M advances and reaches the projecting ends of the bent blank, and, pressing against the same, bends said ends inwardly, so they overlap each other and are left open, ready for the subsequent operation of welding, it being noticed that the link as formed encircles the former L by the further or continued rotation of the driving-shaft B, and consequently of the cam-shaft C. The jaws H and the die M

now recede from the former and said jaws separate and open, the parts returning to their first position, and as the link is no longer supported it falls or drops from the former, and
 5 may be carried away and receive further manipulations elsewhere. A fresh blank is now placed on the table in front of the jaws, the plate D then advancing, the jaws closing, thus bending the blank, the die M acting on the
 10 ends of the bent blank or link as formed, the subsequent operations being similar to those hereinbefore described.

On the face of the die M, between the depressions thereof, is a rib or wall, S, which
 15 separates said depressions, so that when the ends of the bent blank enter the depressions said ends are prevented from closing against each other, and are thus formed in proper shape, producing the open portion of the link.

20 It will be seen that the rib or wall is removably attached to the die M, and consequently may be changed for one of different thickness, the object of which is to regulate the size of the opening left in the link to correspond to the thickness of the iron used in
 25 making the link, it being evident that for the purposes where heavier links are required the space between the scarfs must be left wider to readily receive the links of a chain, &c., prior
 30 to welding.

The cross-head K, to which the former is attached, is made removable, so as to permit the application of cross-heads having formers of
 35 different shape and sizes, and, as is evident, the jaws H are also removable, so that they may be replaced by jaws of different shapes and sizes.

Should the bent link stick on the former, it may be readily stripped therefrom by any
 40 suitable means, that shown in the drawings consisting of a head, T, to which is attached an operating-lever, said head being located adjacent to the upper end of the former, so that when depressed it bears against the link
 45 and forces the same downwardly, stripping it from the former.

The shape of the grooves of the jaws and that of the depressions of the dies may be varied to suit the shape of the link to be bent, as it is evident the links may be made oval, 50 circular, bowed, or straight-lined.

By properly turning the former at a right angle to that shown the opening of the link may be at the end or side, as desired.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a link-bending-machine, the bending-jaws H, in combination with links D', slide D, and means to give a reciprocal motion to said
 60 slide D, substantially as described.

2. In a link-bending machine, bending-jaws hinged or pivoted to a stationary cross-bar of the machine and to a slide on the machine, substantially as described. 65

3. A link-bending machine having a cam-shaft, a slide engaging therewith, and bending-jaws pivoted or hinged to said slide and to a stationary part of the machine, substantially as described. 70

4. In a link-bending machine, a die for bending the ends of the blank, formed with depressions, between which is a separating rib, substantially as described.

5. In a link-bending machine, the die M, 75 having its working-face formed with depressions for bending the ends of the blank and made laterally adjustable, substantially as described.

6. The former L, connected with a removable cross-head or support, K, in combination with hinged jaws H and die M, substantially as described. 80

7. The cam-shaft, slide, hinged jaws, former, and die, constructed, combined, and operating substantially as and for the purpose set forth. 85

WILLIAM R. LEWIS.

Witnesses:

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