

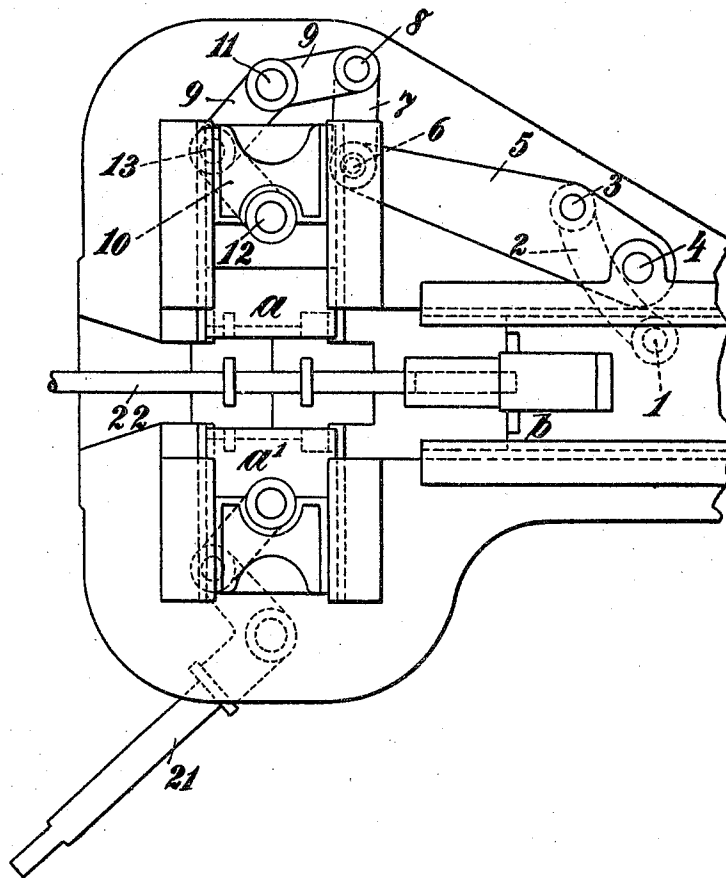
H. LICHTEIKER.  
FORGING MACHINE.  
APPLICATION FILED NOV. 25, 1910.

998,854.

Patented July 25, 1911.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses  
C. A. Walter.  
*Al. H. Hawley*

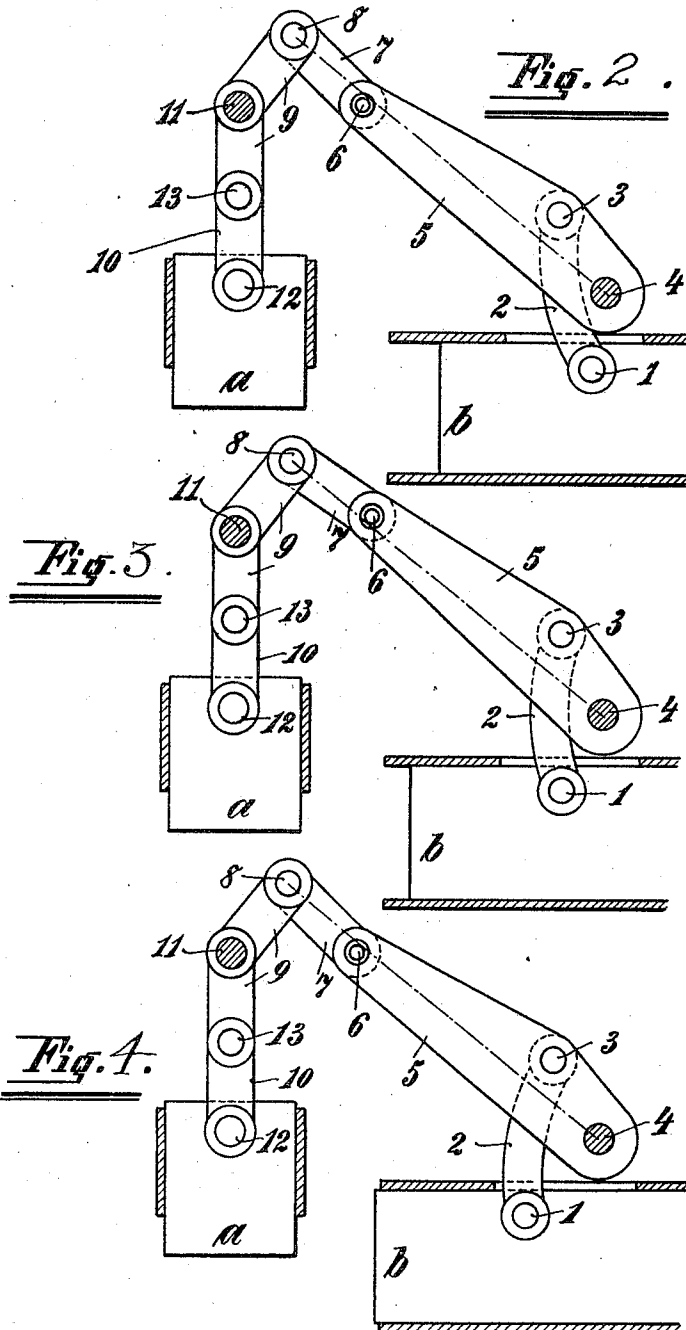
Inventor  
Hermann Lichteiker  
By *R. H. H. H. H.*  
Attorney

H. LICHTEIKER.  
FORGING MACHINE.  
APPLICATION FILED NOV. 25, 1910.

998,854.

Patented July 25, 1911.

2 SHEETS-SHEET 2.



Witnesses  
C. A. Walter  
R. H. Hawley

Inventor  
Hermann Lichteiker  
by R. H. Addams  
Attorney

# UNITED STATES PATENT OFFICE.

HERMANN LICHTEIKER, OF DUSSELDORF, GERMANY.

## FORGING-MACHINE.

998,854.

Specification of Letters Patent.

Patented July 25, 1911.

Application filed November 25, 1910. Serial No. 594,136.

*To all whom it may concern:*

Be it known that I, HERMANN LICHTEIKER, a subject of the Emperor of Germany, residing at Dusseldorf, in Germany, have invented a certain new and useful Improvement in Forging-Machines, of which the following is a specification.

This invention relates to upsetting and forging machines of the class wherein work is held by a slidable clamping or holding member while the upsetting or forging member or die acts thereon, the two members being connected to each other so that the holding member is actuated by the forging member during part of the movement of the latter and is held in operative position while the forging member is completing its stroke.

The object of the present invention is to provide mechanism whereby a longer stroke of the forging member is available after the holding member has been thrust into operative position.

The invention is illustrated in the accompanying drawing.

Figure 1 is a plan view in which the holding and upsetting members are in their initial positions. Fig. 2 a view in which the upsetting member is partly advanced and the holding member thrust into operative position. Fig. 3 a view in which the upsetting member has made a further advance, and Fig. 4 a view in which the upsetting member has completed its stroke.

In the drawing, *a* represents the holding member, and *b* the upsetting member, these members being slides working in rectilinear guides and furnished, if necessary, with suitable dies etc.

The link 2 pivoted at 1 to the upsetting member or slide *b* is pivoted at 3 to the lever 5, which is rotatable about the fixed pivot 4, the pivot 3 being so positioned that during the advance of the slide *b* from the position shown in Fig. 2 to that shown in Fig. 3 the pivot 3 travels backward, and ultimately (Fig. 4) lies to the rear of the pivot 1.

The lever 5 is connected by a link 7 to a bell-crank 9 which is pivoted at 11 and connected at 13 to a link 10 pivoted at 12 to the slidable holding member *a*.

The member *a* attains its lowest position before the link 2 is quite upright, but the subsequent rearward movement of this link

2 (relatively to the member *b*), imparts but very slight movement to the lever 5, and the effect of this movement is, moreover, reduced by the fact that it is in part upward and in part downward.

It will be seen by reference to Fig. 3 that movement of the pivot 1 to the left or right from the central position to either end position involves only a slight movement of the pivot 6, and the total path of the pivot 6 is cut exactly at the center by a straight line connecting the centers of the pivots 4 and 8, so that the pivots 8 and 13 make very short movements, the movements of the pivot 13 being equal to the right and left of the vertical connecting the pivots 11 and 12. This splitting up of the knuckle movement into right-hand and left-hand travel is an advantage of the improved mechanism, as it reduces the displacement involved. Another advantage of the mechanism lies in the fact that the lever 5 is comparatively long. These facts enable the mechanism to be designed to give a comparatively long stroke of the member *b* while the member *a* is firmly holding the work. Another advantage is the rapidity with which the member *a* is moved, enabling the path of said member to be made comparatively long, so that large pieces of work can be easily removed after treatment, and that the member *a* can be used as a hammer to assist in the forging operation.

The essential novel feature of construction, to which these advantages are due, consists in the pivoting of the actuating link 2 to the lever 5 at a point in advance of the fulcrum 4, but more remote than the latter from the path of the die, so that the link, acting as a toggle, has a dead-point position which is perpendicular to said path and occurs at or near the middle of the forging blow, *i. e.*, the period during which the work is held fast for the die *b* to act thereon.

Fig. 1 shows the mechanism combined with a thrust-block *a'* of known type, which is normally stationary but can be removed by means of a hand-lever 21 to facilitate removal of the work 22.

To prevent serious damage in case of overloading or the like, the pivot 6 may with advantage be used in conjunction with a shearing device by which it is sheared when a predetermined strain is exceeded, so that the member *a* is uncoupled from the member *b*.

What I claim as my invention and desire to secure by Letters Patent of the United States is:

1. In a forging machine the combination  
5 of a slidable forging member, a slidable  
work-holding member, a lever having a ful-  
crum adjacent the forging member, means  
connecting said lever to the work-holding  
member and enabling the latter to be thrust  
10 into operative position by actuation of the  
lever, and an actuating link which connects  
said forging member to said lever and is piv-  
oted to the latter at a point in advance of the  
lever fulcrum but more remote than the lat-  
15 ter from the path of the forging member, so  
that during the advance of the forging  
member the link swings rearward on the  
forging member to a dead-point position,  
and then past the latter, so that the move-  
20 ment imparted to the lever is reversed dur-  
ing this action, the said dead-point position  
occurring while the holding member is in  
operative position.

2. In a forging machine the combination  
25 of a slidable forging member, a slidable  
work-holding member, a lever having a ful-

crum adjacent the forging member, a bell-  
crank having its fulcrum behind the work-  
holding member, a link connecting one arm  
of said bell-crank to the work-holding 30  
member, a link connecting the other arm of  
said bell-crank to the lever, and an actuating  
link which connects said forging member to  
said lever and is pivoted to the latter at a  
point in advance of the lever fulcrum but 35  
more remote than the latter from the path  
of the forging member, so that during the  
advance of the forging member the link  
swings rearward on the same to a dead-point  
position and then past the latter, so that the 40  
movement imparted to the lever is reversed  
during this action, the said dead-point po-  
sition occurring while the holding member  
is in operative position.

In witness whereof I have signed this 45  
specification in the presence of two wit-  
nesses.

HERMANN LICHTEIKER. [L. s.]

Witnesses:

CHAS. J. WRIGHT,  
ALFRED HENKEL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,  
Washington, D. C."