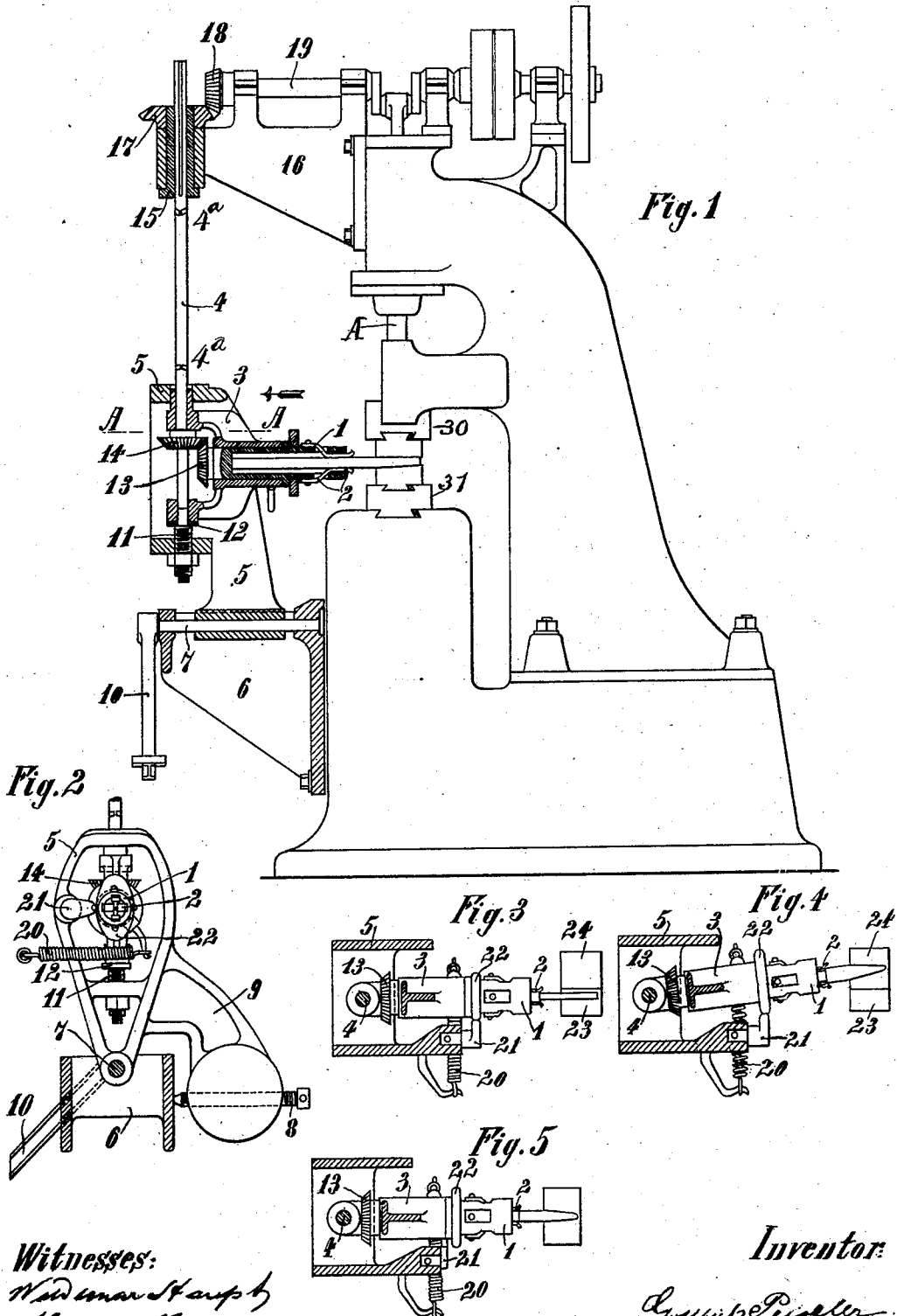


G. PEISELER.
FORGING MACHINE.
APPLICATION FILED NOV. 27, 1906.

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GOTTLIEB PEISELER, OF CHARLOTTENBURG, GERMANY.

FORGING-MACHINE.

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Specification of Letters Patent. Patented Sept. 14, 1909.

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To all whom it may concern:

Be it known that I, GOTTLIEB PEISELER, citizen of the German Empire, residing at Charlottenburg, in the Province of Brandenburg and Kingdom of Prussia, Germany, have invented certain new and useful Improvements in and Relating to Forging-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to forging-machines for forging articles having equilateral, rectangular or other cross-sections.

Forging-machines *per se* are of course well known. These older machines however are adapted to forge only such articles as have regular polygonal cross-sections. In contradistinction to this, a machine according to the present invention is so constructed that forgings of non-equilateral shape in cross-section can also be forged by it. This feature is obtained by, in these cases, automatically imparting to the holder for the article to be forged lateral movements in addition to the rotary or oscillatory motion serving to turn the article, by means of which lateral movements the article is brought under different swages. In this case the height-adjusting which has to be made in accordance with the heights of the swages is effected by adjusting the work-holder alone and not the whole holding device as is the case in the older machines, and the removal of the work or article to be forged from the swages by simply moving the holder laterally, so that a machine according to the present invention as contrasted with hitherto known machines in addition to possessing the advantage of being able to manufacture a far greater variety of articles has the additional substantial advantage that the work-holder is able to be adjusted more simply and quickly and that the forgings are able to be interchanged conveniently.

In the accompanying drawing one embodiment of the present invention is illustrated by way of example, Figure 1 being a part sectional side elevation of the machine and Fig. 2 the bearing frame containing the work-holder, seen in elevation when looking in the direction of the arrow shown in Fig.

1. Figs. 3-5 are cross-sections on the line

A—A Fig. 1, illustrating the action of the work-holder.

A designates the shank or rod of a power hammer, carrying a swage die 30, which co-operates with an anvil die, 31, as shown in Fig. 1. This shank or rod is reciprocated vertically by a crank on a power shaft, 19, and guided in a part of the fixed frame of the machine.

The work holder proper is designated by 1 and holds between its resilient jaws 2 the metal blank or work which is to be forged. This work holder proper, 1, is revoluble on its own axis in a bracket 3, which bracket is adapted to oscillate horizontally on a flexible vertical shaft 4. The shaft 4 is revolvably supported in a carrier 5, formed at its upper end as a housing, said carrier being fixed on a rock shaft 7, revolubly mounted on the bracket 6 screwed on the frame of the hammer, so that the carrier 5 and consequently also the work-holder 1 may be oscillated in a vertical plane. The joints of said shaft are indicated at 4^a of Fig. 1 and may be of any convenient construction permitting said shaft to bend in a plane at right angles to the axis of the work-holder. A counterweight-arm 9 (Fig. 2) arranged on the carrier and resting with its set-screw 8, against the bracket 6 tends to maintain the carrier 5 always in a definite position, or in other words always brings it back into this position when it has been moved out of it, for example, by depressing the treadle 10 provided on the shaft 7.

The oscillating bracket 3, which carries the work-holder proper 1 rests on a set screw 11 arranged on the carrier 5 or on a ring 12 carried by said set-screw, so that by aid of this screw 11 said part 3 together with the work-holder proper 1 can be adjusted in height.

The rotary motion requisite for turning the work about its own axis is imparted to the work-holder 1 from the shaft 4 by means of the bevel wheels 13, 14. Said shaft is provided at its upper end with a feather or groove so that while rotating with the sleeve 15 it can also move longitudinally relatively to the same. Said sleeve 15 is revolubly supported in a bracket 16, fixed on the hammer-frame and is set in rotation by means of the bevel wheels 17, 18, the latter of which is on the driving-shaft 19 of the hammer. This driving device uninterruptedly rotates

the work-holder about its own axis without thereby preventing the work-holder from oscillating about the axis of the shaft 4. The velocity-ratio of the pairs of bevel-wheels 13, 14 and 17, 18 is chosen according to the polygon to be forged, that is, so that the work-holder and consequently the work itself is turned between two strokes of the hammer through an angle which corresponds to the number of sides possessed by the polygonal section to be forged.

The oscillation of the work-holder 1 about the shaft 4 is limited by a spring 20, which is in tension and which engages the oscillating bracket 3 tending to hold said holder, or the work-holder proper 1 revolving in said holder in contact with the head of an abutment cam 21 arranged interchangeably on the carrier 5.

If rectangular or other cross-sections are to be forged the shape of the abutment-cam 21 is so selected that the rotating work-holder proper 1 rests with the cam 22, which is fastened on said work-holder, against said abutment-cam 21, so that consequently on rotating about its own axis it must oscillate with the bracket 3 about the shaft 4 in one direction, whereby the forging is shifted from one swage to a second swage on the hammer. Fig. 3 shows for example the work-holder with its cam 22 in a position in which the forging rests on the lower half of the swage 23. On the work-holder 1 being rotated further it is moved to such an extent to the side under the influence of the cam 22, that on the following stroke of the hammer the forging lies on the lower half of the swage 24. (See Fig. 4). Consequently during the forging operation the work holder 1 moves according to the velocity-ratio of the pairs of bevel-wheels 13, 14 and 17, 18 and the shaft of the cam 22 and therefore by varying at will the said velocity-ratio, the shape of the cam 22 and the number of the swages, as well as their form, the shape of the forging can be varied as desired.

In order quickly to set the articles to be forged in correspondence with the heights of the swages it is only necessary to set the oscillating bracket 3 at the proper height by means of the screw 11, while the set-screw 8 on the counterweight-arm 9 is employed for lateral adjustments.

In order to interchange forgings the carrier 5 together with the work-holder which is carried by it is turned by depressing the treadle 10, so that the work is moved laterally away from the swages and can therefore be conveniently removed and can be replaced by a new article to be forged. When the treadle is then released, the counterweight-arm 9 automatically brings the work-holder back again into the working position. The two motions, that is, the motion of the work-holder from swage to swage about a vertical

axis and the motion of the carrier 5 about a horizontal axis may of course take place inversely, viz. the former about a horizontal axis and the latter about a vertical axis. Likewise the path of motion of the chuck or work-holder proper from swage to swage may be varied according as is requisite for the article to be forged.

Having now explained the nature of my invention I declare that what I claim and desire to secure by Letters Patent is:

1. A power hammer and anvil, each provided with a pair of swaging dies, in combination with a rotary work-holder presenting the work between said hammer and anvil, a flexible, vertical, rotary shaft which drives said work-holder, and means for automatically shifting said holder and work laterally from one of the swages to another to vary the action of said hammer and anvil in forming faces on said work, substantially as set forth.

2. A power hammer and anvil, each provided with a pair of swaging dies, in combination with a rotary work-holder, presenting the work between said hammer and anvil, a flexible, vertical, rotary shaft which drives said work-holder, and a cam acting on said work-holder to rock it laterally and thereby shifting the work from one pair of dies to another, substantially as set forth.

3. A power hammer and anvil, each provided with a pair of swaging dies, in combination with a rotary work-holder presenting the work between said hammer and anvil, a vertical flexible rotary shaft and intervening gearing which drive said work-holder, a supporting device for said work-holder mounted pivotally on said shaft, a carrier affording bearings for said shaft and capable of lateral oscillation and means arranged between said holder and said carrier whereby the turning of said holder rocks said carrier on its pivot, thereby shifting the work from one swage to another, substantially as set forth.

4. A power hammer and anvil, each provided with a pair of swaging dies, in combination with a rotary work-holder, a flexible, vertical shaft and intermediate gearing for driving the said work-holder, means connecting said work-holder to said vertical shaft, but allowing its pivotal motion thereon, a rocking carrier supporting said shaft and work-holder, and means arranged to act on said carrier for shifting the work from one swage to another, substantially as set forth.

5. In combination with a power hammer and an anvil, each provided with a pair of swaging dies, a flexible shaft and a rotary work-holder arranged substantially at right angles to each other, gearing between them, pivotal connections between said work-holder and shaft, a pivotal frame constitut-

ing a carrier for said shaft and holder and cam surfaces on said rotary work-holder and said pivoted carrier, arranged to act on said carrier for shifting the work from one swage to the other, substantially as set forth.

6. A power hammer and anvil, each provided with a pair of swaging dies, in combination with a rotary work-holder, a flexible shaft approximately at right angles thereto, means for driving said shaft, a supporting device pivotally connecting said work-holder to said shaft, gearing for driving said work-holder from said shaft, a rocking carrier for said shaft provided with an internally presented cam, and a spring tending to hold carrier and work-holder in contact, the said work-holder being provided with an exterior cam surface arranged for contact with said cam and calculated to co-operate therewith for shifting the work from one swage to another, substantially as set forth.

7. A power hammer and anvil, each provided with a pair of swaging dies, in combination with a rotary work-holder, a flexible longitudinally movable shaft, gearing between said shaft and work holder, a support for said work-holder pivoted on said shaft, a sleeve in which said shaft is feathered, means for rotating said sleeve and shaft, a carrier for said work-holder and the

proximate part of said shaft, a rock-shaft on which said carrier is mounted to move therewith, a treadle for rocking said shaft and carrier at will, means for automatically replacing said carrier, and means interposed between said carrier and rotary work-holder for shifting said work-holder and the work carried thereby from swage to swage, substantially as set forth.

8. In combination with a power hammer and anvil, each provided with a pair of swaging dies, a work-holder having both a rotary motion and a lateral motion, whereby the work may shift from one swage to another, and supporting devices and driving mechanism, permitting and effecting said motions, such mechanism including a flexible rotary shaft, pivotal means for support connecting said work-holder thereto, a pivotal carrier for the lower end of said shaft said carrier and work-holder being held in contact and these last two elements being provided with cam faces, substantially as set forth.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

GOTTLIEB PEISELER.

Witnesses:

WOLDEMAR HAUPT,
HENRY HASPER.