

UNITED STATES PATENT OFFICE.

HERCULE VIGNEAULT, OF WORCESTER, MASSACHUSETTS.

POWER-HAMMER.

SPECIFICATION forming part of Letters Patent No. 580,629, dated April 13, 1897.

Application filed November 4, 1896. Serial No. 611,056. (No model.)

To all whom it may concern:

Be it known that I, HERCULE VIGNEAULT, a subject of the Queen of England, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Power-Hammers, of which the following is a specification.

My invention relates to an improved form of power-hammer.

The especial objects of my invention are to arrange the dies of a power-hammer to allow free access thereto from three sides, to construct the dies so that they may be used for drawing out hoops or tires, and to provide an improved form of flexible connection between the movable ram and its crank-pin for allowing the necessary lost motion when the ram encounters a heavy resistance.

To these ends my invention consists of the parts and combinations of parts, as herein-after described, and more particularly pointed out in the claims at the end of this specification.

In the accompanying drawings, Figure 1 is a side view, partially broken away, of a power-hammer constructed according to my invention. Fig. 2 is a front view of the same. Fig. 3 is a partial front view, the parts being illustrated in a different relative position. Fig. 4 is a detail sectional view illustrating the flexible connection which I preferably employ, and Fig. 5 is a perspective view illustrating the dies.

In constructing a power-hammer according to my invention I preferably use a substantially plain pedestal or frame which is free from projections or angles which would interfere in any way with the free access to the dies from three sides thereof.

The dies themselves which I preferably use are provided with flat engaging surfaces and with semicylindrical projections which extend beyond the front face of the machine, so that a hoop or tire may be readily worked thereby.

As far as possible I have dispensed with all projecting bolts or nuts on the moving parts of the machine, so as to do away with all moving projections which would be liable to catch upon the work or which would be a source of danger to the user.

A flexible connection between the movable

ram and its crank-pin constructed according to my invention consists, essentially, of a flexible loop, the parts of said connection being arranged so that both sides of the loop will assist in raising the ram and so that the sides of the loop may be separated to allow lost motion when the ram encounters a heavy resistance.

Referring to the drawings and in detail, A designates a main pedestal or casting, which is provided with a transverse hole *a* to allow access to the rear face of the dies or the introduction of water thereto when desired.

A driving-shaft 10 is journaled in the upper part of the pedestal A. Secured on the rear end of the driving-shaft 10 is a pulley 11, which is counterbalanced or made solid, as at 12, so as to normally hold the movable ram in a raised position. Fastened on the front end of the driving-shaft 10 is a disk 13. Fitted into the disk 13 is a movable block 14, which can be shifted or adjusted by means of a screw 15. The movable block 14 carries a crank-pin 16. Threaded onto the crank-pin 16 and engaging a clamping-sleeve 17 (shown in section in Fig. 4) is a clamping-nut 18. The movable ram 19 is mounted in ways at the front of the pedestal A in the ordinary manner. A two-part connecting-rod 20 is pivotally connected to the movable ram 19 by means of a stud or screw 21. The stud or screw 21 is preferably countersunk into the ram 19, so as to be substantially flush with the face thereof, and is provided with a recess or wrench-socket. A turnbuckle 22 of ordinary construction may be used to adjust the length of the two-part connecting-rod 20. Secured upon the upper end of the two-part connecting-rod is a piece 23. Normally open spring-arms 24 and 25 are socketed into and pivotally connected to the piece 23. The tension of the spring-arms 24 and 25 can be adjusted by means of set-screws 26. Small rollers 27 are journaled in the upper ends of the spring-arms 24 and 25. A yoke-piece 28 is journaled on the crank-pin 16 outside of its sleeve 17. A strap 29, which may be made of leather or other flexible material, forms a loop extending around the rollers 27, the ends of the strap being secured to the yoke-piece 28. By means of this construction it will be seen that the leather strap forms a loop con-

necting the upper ends of the spring-arms and that the crank-pin is connected to the lower side of the loop only.

The spring-arms normally keep the loop extended to its full width. When, however, a heavy resistance is encountered by the ram, the spring-arms 24 and 25 will yield, allowing the loop to shorten, so that the parts will assume the position illustrated in Fig. 3. When the crank-pin is moving up so as to raise the movable ram, it will be seen that the crank-pin will be brought into engagement with the upper side of the loop and that both branches of the loop will assist in raising the ram. When the crank-pin is moving down, the tendency will be for the sides of the loop to separate, and the downward pull will be exerted only upon the lower side of the loop. It thus will be seen that I have provided a flexible connection for power-hammers which will act more positively or strongly in raising or lifting the ram than it does in forcing the same down, which is an extremely desirable point in practice. It will also be seen that by employing a connection in the form of a loop the spring-arms will need to have only a comparatively slight motion toward or away from each other, as each spring-arm will let out twice the length of strap compared with the distance through which it moves.

The form of dies preferably employed is most clearly illustrated in Fig. 5. The stationary die 30 is dovetailed into or secured in the pedestal A and the movable die 31 is carried by the ram 19. These dies are provided with flat substantially rectangular engaging surfaces 32 and with semicylindrical projections 33, which extend somewhat beyond the front face of the machine, thus permitting them to be used in working wagon-tires or similar hoops.

I am aware that changes may be made in the construction of my power-hammer by those who are skilled in the art, and that parts of my invention may be used in different locations and in different combinations without departing from the scope of my invention as expressed in the claims. I do not wish, therefore, to be limited to the form which I have shown and described; but

What I do claim, and desire to secure by Letters Patent of the United States, is—

1. In a power-hammer, the combination of a movable ram, means for operating the ram, and a connection between the ram and operating means constructed and arranged to yield more readily to resistances encountered on the downstroke of the ram than to resistances encountered on the upstroke thereof, substantially as described.

2. In a power-hammer, the combination of

a movable ram, a crank-pin for actuating the ram, and a connection comprising a flexible loop, the parts being arranged so that both sides of the loop will assist in raising the ram, and so that the sides of the loop may be separated to allow lost motion when the ram encounters resistances on its downstroke, substantially as described.

3. In a power-hammer, the combination of a movable ram, a crank-pin for actuating the ram, and a connection comprising a yoke-piece journaled on the crank-pin, normally open spring-arms, and a strap forming a loop having its under side connected to the yoke-piece, whereby both sides of the loop will assist in raising the ram, and so that the sides of the loop may be separated to allow lost motion when the ram encounters resistance on its downstroke, substantially as described.

4. In a power-hammer, the combination of a movable ram, a connecting-rod pivotally connected thereto, normally open spring-arms carried by said connecting-rod, means for adjusting the tension of said spring-arms, a driving-shaft, a disk secured thereon, a crank-pin adjustably mounted in said disk, a yoke journaled on said crank-pin, and a strap forming a loop connecting the upper ends of the spring-arms; the ends of said strap being secured to the yoke, substantially as described.

5. In a power-hammer, the combination of a movable ram 19, a two-part connecting-rod 20, a turnbuckle 22 for adjusting the length of the connecting-rod, a piece 23, spring-arms 24 and 25 socketed into and pivotally connected to the piece 23, rollers 27 journaled in the spring-arms, a disk 13, a crank-pin 16, and a flexible strap passing around the rollers 27; the ends of the strap being connected to the crank-pin, substantially as described.

6. In a power-hammer, the combination of a pedestal or frame, a stationary die, a movable ram, a die secured thereto, said dies being provided with flat engaging surfaces and semicylindrical projections which extend beyond the front face of the machine, means for operating the ram, and a connection between the ram and operating means constructed and arranged to yield more readily to resistances encountered on the downstroke of the ram than to resistances encountered on the upstroke thereof, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

HERCULE VIGNEAULT.

Witnesses:

LOUIS W. SOUTHGATE,
PHILIP W. SOUTHGATE.