May 29, 1923. 1,456,987

P. LUCAS

HAMMER

Filed Jan. 4, 1923

Fig1

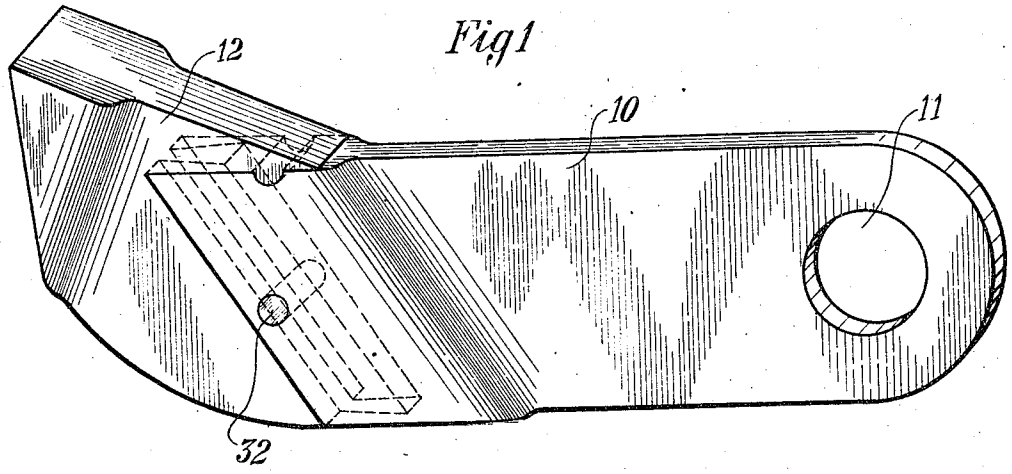


Fig2

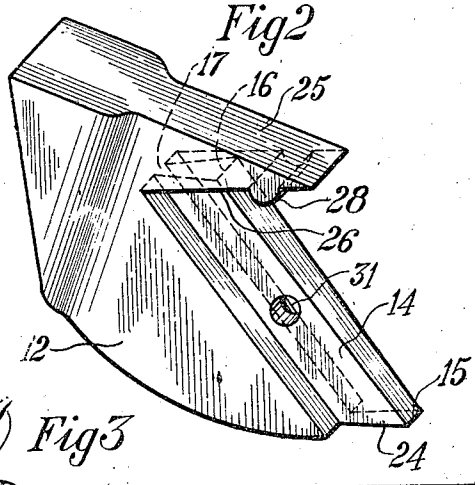
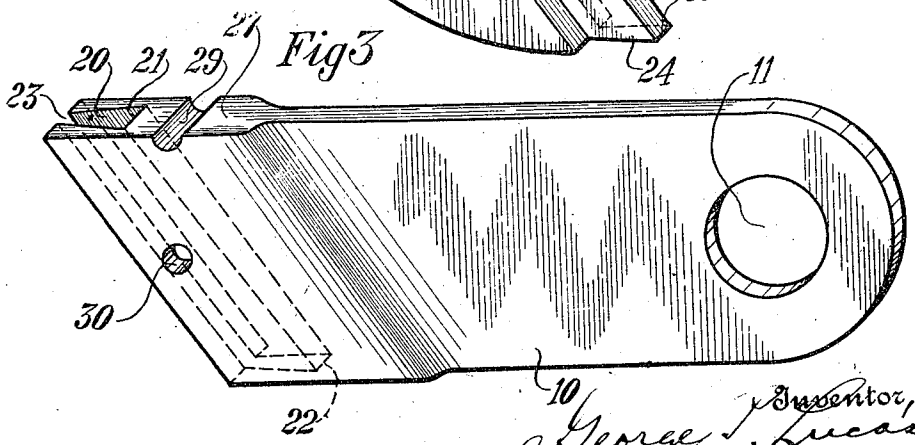


Fig3



Inventor,
George P. Lucas,
By his Attorney
Henry J. Lucke.

Patented May 29, 1923. 1,456,987

UNITED STATES PATENT OFFICE.

GEORGE P. LUCAS, OF JERSEY CITY, NEW JERSEY.

HAMMER.

Application filed January 4, 1923. Serial No. 610,628.

To all whom it may concern:

Be it known that I, GEORGE P. LUCAS, a citizen of the United States of America, residing at Jersey City, county of Hudson, State of New Jersey, have invented certain new and useful Improvements in Hammers, of which the following is a specification.

This invention relates to hammers and particularly to hammers of the centrifugal type, such as is disclosed in my copending application Serial No. 582,887, filed by me on the 19th day of August, 1922, and entitled Centrifugal hammers.

An object of the present invention is to provide a form of joint whereby the percussions and strains to which the head of each hammer is subjected tend to hold the removable head more firmly in position.

A further object of the invention is to provide a form of joint for the removable head to afford simplicity of casting, ready machinery of any of the parts if necessary, to simplify the assembly of the removable head on the arm of the hammer and the replacement of the head when desired.

Further features and objects of the invention will be more fully understood from the following detail description and the accompanying drawings, in which

Fig. 1 is a perspective view of a hammer of the centrifugal type, provided with a removable head embodying my invention;

Fig. 2 is a perspective view of the head of the hammer shown in Fig. 1; and

Fig. 3 is a perspective view of the arm of the hammer shown in Fig. 1.

Referring to the drawings, the hammer illustrated is of the centrifugal type and comprises generally the arm 10 having the pivot opening 11 for mounting the arm in the centrifugal device of the centrifugal mill, crushing machines or the like.

The head 12 of the hammer is preferably of lateral extension relative to the length of the hammer, that is to say, of the type shown in my aforesaid copending application Serial No. 582,887.

Preferably, the joint between the removable head 12 and the arm 10 is by means of wedge connection of the tongue and groove type, the wedge member being carried by the head and the groove member carried by the arm, or conversely the wedge member may be carried by the arm and the groove member carried by the head.

Such tongue and groove connection, as illustrated in the drawings, comprises preferably a wedge-shaped tongue 14 carried by the removable head 12, tapering longitudinally and transversely, that is to say, the width of the edge 15 at the outer free end of the length of the tongue 14 is less than the width of the edge 16, and the thickness of the tongue at the location 17 is less than the width of the edge 16. The groove 19 carried by the arm 10 of the hammer may be correspondingly shaped, that is to say, the width of the edge 21 is greater than the width of the edge 22, thereby giving rise to the longitudinal taper, and the width of the opening at the location 23 is less than the width of the edge 21, thereby giving rise to transverse tapering of the groove or slot 20. To effect the joint of the head and its arm, the end 24 of the tongue 14 is first passed into the groove 20 of the arm 10 and the tongue is pushed into the groove until it is fully seated therein.

Preferably, the head is formed as set forth in my aforesaid copending application, Serial No. 582,887, that is to say, upon fully seating the tongue 14 in its groove 20, the inner face 26 of the tail portion 25 is brought in plane to plane contact with the lateral face 27 of the lower, thickened portion of the arm 10.

To secure additional lodgment of the removable head 12 on its arm 10, the tail portion 25 is provided with the abutment lug 28 and the lateral face 27 of the arm 10 with a corresponding abutment groove 29; such lug 28 and groove 29 may be semi-circular as indicated in the drawings.

If desired, the tongue and groove connection may be provided with openings for receiving a connecting pin, and to this end, the oppositely disposed openings 30, in alignment with one another, are located in the walls of the groove or slot 20 and the opening 31 located in the tongue, at a position to be brought in register with the openings 30, to receive the connecting pin 32, see Fig. 1.

From the above, it will be perceived that in the use of the hammer for crushing coke or like material, as in centrifugal crushers, mills and the like, the degree of mutual engagement between the removable head and its arm is enhanced by the impacts received in the crushing operation, whereby the wedge 14 is more and more firmly seated within its groove 20. The abutment lug 28

and its groove 29 preclude movement of the head relative to its arm in the transverse direction.

The tongue and groove connection, as set forth hereinabove, presents to ready access, all parts requiring machining or other finishing.

It will be further noted that by reason of the extension of the terminal portion of the head laterally of the direction of length of the arm of the hammer, the effective leverage of the hammer head is increased without substantial longitudinal extension of the hammer as a whole.

As illustrated in the drawings, the forces of reaction to which the head and its arm are subjected are resolvable in directions at right angles to the plane of the joints of the connection between the head of the hammer and its arm, thereby relieving the tongue and slot interconnecting parts of substantially all sheering forces. The provision of the weighted end of the hammer at the tongue and groove connection and the weighted head relatively to the arm as a whole, enhances the momentum of the hammer for the speed or speeds of rotation of the centrifugal device. The provision of the enlarged adjacent portions of the arm and the head, also reduces the extent of wear of the contacting faces.

Whereas I have described my invention by reference to specific forms thereof it will be understood that many changes and modifications may be made without departing from the spirit of the invention.

I claim.

1. A hammer for a centrifugal device comprising an arm provided adjacent one end thereof with an opening for pivotal suspension, said arm extending at one of its lateral faces substantially rectilinearly for its entire length, the opposite end of said arm being cut away at an acute angle and provided with a dove-tail groove, and a removable head formed of material of greater refractory character than the material of said arm, said head having at one end thereof a dove-tail projection extending substantially the full length of said opposite end of said arm constructed to be received within said dove-tail groove of said arm, said head further including a projection extending laterally of said arm when said head is assembled on said arm and in face to face engagement with said lateral longitudinally extending face of said arm.

2. A hammer for a centrifugal device comprising an arm provided adjacent one end thereof with an opening for pivotal suspension, said arm extending at one of its lateral faces substantially rectilinearly for its entire length, the opposite end of said arm being cut away at an acute angle and provided with a dove-tail groove, and a removable head formed of material of greater refractory character than the material of said arm, said head having at one end thereof a dove-tail projection extending substantially the full length of said opposite end of said arm constructed to be received within said dove-tail groove of said arm, said head further including a projection extending laterally of said arm when said head is assembled on said arm and in face to face engagement with said lateral longitudinally extending face of said arm, the free end of said head being enlarged and extending laterally and in advance of said rectilinear lateral face of said arm.

3. A hammer for a centrifugal device comprising an arm provided adjacent one end thereof with an opening for pivotal suspension, said arm extending at one of its lateral faces substantially rectilinearly for its entire length, the opposite end of said arm being cut away for its full length at an acute angle and provided for its full length with a dove-tail groove, and a removable head formed of material of greater refractory character than the material of said arm, said head having at one end thereof a dove-tail projection extending substantially the full length of said opposite end and constructed to be received within said dove-tail groove of said arm, said head further including a projection extending laterally of said arm when said head is assembled on said arm and in face to face engagement with said lateral longitudinally extending face of said arm.

In testimony whereof I have signed this specification this 30th day of December 1922.

GEORGE P. LUCAS.