No. 683,656. Patented Oct. 1, 1901.

E. H. MOYLE.

DEVICE FOR SECURING CAMS OR LIKE HUBS UPON THEIR SHAFTS.

(Application filed Feb. 25, 1901.)

(No Model.)

Fig. 2.



Fig. 3.

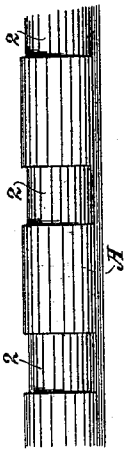


Fig. 4.

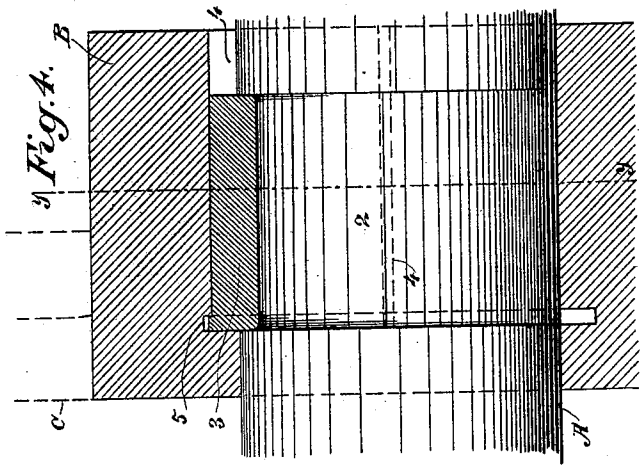
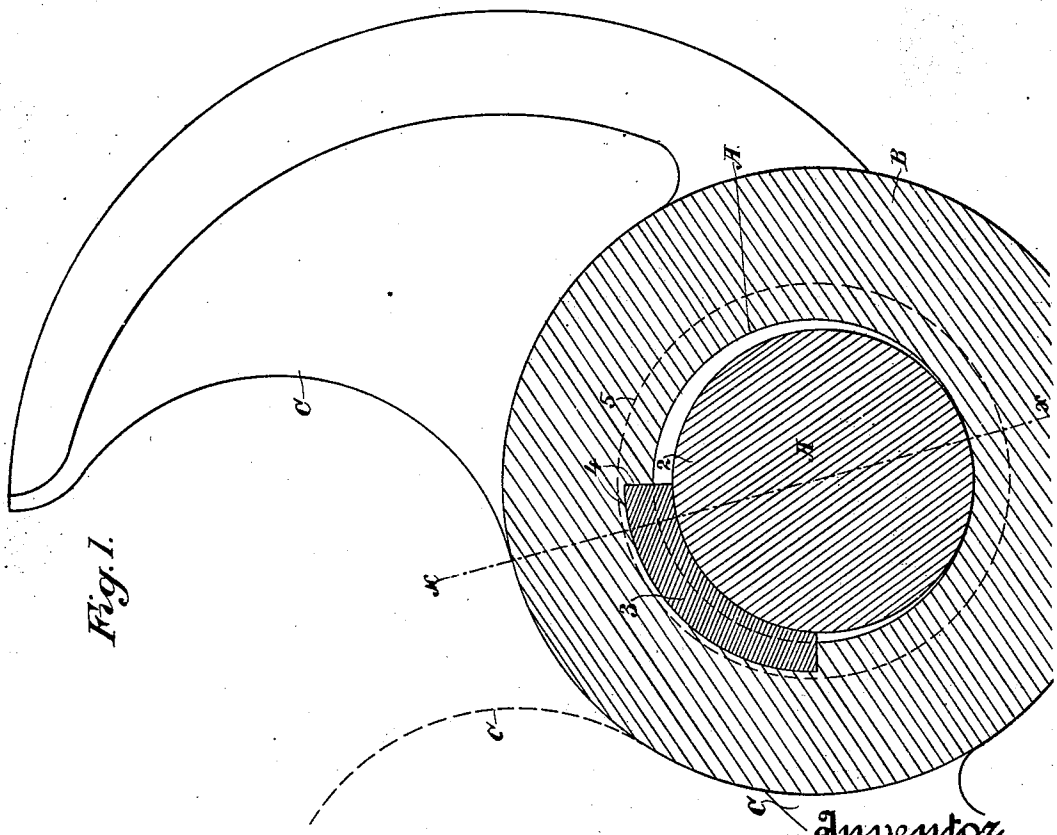


Fig. 1.



Witnesses,
C. F. Wesse
H. F. Ascheck

Inventor,
Edward H. Moyle
By Dewey Strong & Co
Attys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

EDWARD H. MOYLE, OF SAN FRANCISCO, CALIFORNIA.

DEVICE FOR SECURING CAMS OR LIKE HUBS UPON THEIR SHAFTS.

SPECIFICATION forming part of Letters Patent No. 683,656, dated October 1, 1901.

Application filed February 25, 1901. Serial No. 48,693. (No model.)

To all whom it may concern:

Be it known that I, EDWARD H. MOYLE, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Devices for Securing Cams or Like Hubs upon Their Shafts; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a means for securing cams, pulleys, and the like upon shafts.

It consists of the parts and the constructions and combinations of parts hereinafter described and claimed.

Figure 1 is a cross-section on the line *y y* of Fig. 4. Fig. 2 is a view of the key. Fig. 3 is a view of the shaft, showing the eccentrics formed in it. Fig. 4 is a longitudinal section on line *x x* of Fig. 1.

In the operation of stamp-mills for crushing ore the stamps are commonly lifted by means of cams fixed upon a horizontal revoluble shaft in such relation with the vertically-moving stamp-stems that they will alternately engage and release tappets or lifters which are fixed upon the stamp-stems. The constant jar and variation of pressure caused by lifting the great weight of the stamp and releasing it makes it difficult to properly secure the cams upon their shaft; and it is the object of my invention to provide a means by which the cams may be firmly fixed in place and easily removed when desired. It is also applicable to pulleys, gears, cranks, and any device which is to be similarly secured.

As shown in the drawings, A is a shaft, and B is the hub of a cam, of which C indicates the arms which engage the tappet and serve to lift the stamp-stem. A cam-shaft may have fixed to it as many cams as there are stamp-stems to be actuated by this shaft, and the cams are so arranged with relation to each other that the time of lifting the stamp will be as nearly evenly divided as possible. In my invention the shaft, which is turned cylindrical, has eccentrics 2 turned or formed upon it. The eccentrics may be formed with different centers, or the hubs may have the key-slots so arranged that they will occupy the proper positions with relation to each other. The illustration shows a very suitable way of forming these eccentric sections of the shaft, which is by turning them on the shaft, as shown.

3 is a key the inner curvature of which is adapted to fit into the depression of the eccentric turned in the shaft, and the outer curvature fits into a channel or keyway 4, which is formed in the interior of the hub B of the cam. This key is shorter than the length of the hub. When the hub is to be fixed upon the shaft, the key is laid into the lowest part of the depression 2 of the eccentric, and the hub can then be slipped over the outside of the key. The hub thus extends beyond the key at each end, so that both ends of its bore have a bearing upon the shaft to resist the pressure of the eccentric, which forces the key against the interior of its seat in the hub. When the hub is in place, both it and the key are turned around the shaft, and the key being shorter than the bore of the hub will bind between the eccentric portion of the shaft and the keyway in the interior of the hub and the bore of the hub against the shaft by reason of the different curves of the eccentric and the diameter of shaft, thereby locking the hub firmly upon the shaft. The meeting surfaces of the interior of the keyway in the hub and the exterior of the key are preferably roughened, so that they will bite or interlock when the hub is turned and the pressure brought upon them. The hub has an annular channel or counter-bore 5 turned in it of larger diameter than the bore which fits upon the shaft, and into this the end of the key projects longitudinally when the cam is in its proper position. The main bore of the hub which fits the shaft extends beyond this annular channel, as shown. When the hub is locked by the key, as previously described, the roughness of this projecting end will form a bur transversely or radially into the counterbored channel, and will thus form a sufficient interlock to prevent the hub slipping longitudinally upon the shaft in one direction, while the end of the key abutting against the opposite side of the channel 5 prevents the hub from moving in the other direction. The rotation of the shaft and the contact of the cam with the tappet or the pressure brought upon the pulley, crank, or other device causes the hub to turn until the key wedges between the eccentric

and the key-seat and the bore of the hub against the shaft. This serves to lock and retain the hub firmly upon the shaft; but it can be loosened and removed by force applied to turn it in the opposite direction until the key has been again loosened in its seat.

The device heretofore described as applicable to cams is equally useful to secure pulleys, gears, sprockets, cranks, or any device to which circular motion is to be given, and it will be seen that the eccentric surface allows the device carried by the shaft to be locked against turning in either direction.

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

1. The combination of a shaft having an eccentric portion and a hub having a keyway concentric with its bore said shaft and hub being turnable one with relation to the other, and a curved key tapering in the direction of its curvature and disposed in the keyway of the hub and adapted to lock the hub to the shaft when one of these parts is turned upon the other.

2. The combination of a shaft and a hub one of said parts having a concentric keyway and the other part having an eccentric portion, and a curved key tapering in the direction of its curvature and fitting said keyway and adapted to lock the hub to the shaft by axial movement of one of these parts with relation to the other part said key being shorter than the bore of the hub.

3. The combination of a shaft having an eccentric portion, a hub having a keyway concentric with its bore extending through one end of the hub, and a segmental key fitting said keyway and locking the hub to the shaft when the former is turned axially about the latter.

4. The combination of a shaft having an eccentric portion, a hub having a keyway, and a segmental key fitting said keyway and having its outer surface roughened or corrugated, said hub having, also, in its bore an annular groove into which the roughened burs of the key project when the hub is locked upon the shaft.

5. The combination of a shaft having an eccentric portion, a hub having a bore and a keyway and an enlarged annular groove or channel at one end of said keyway, and a segmental key fitting the keyway and having a roughened outer surface and extending across the annular groove so as to abut against its side.

6. The combination of a shaft having an eccentric portion, a hub having a bore and a keyway therein and extending longitudinally through one end of the hub said hub having, also, an annular groove or channel and a segmental key in the keyway and extending across the groove or channel and abutting against the side thereof.

In witness whereof I have hereunto set my hand.

EDWARD H. MOYLE.

Witnesses:
S. H. NOURSE,
JESSIE C. BRODIE.