

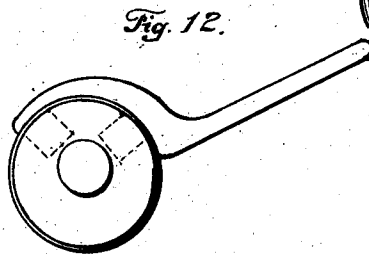
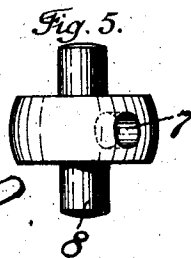
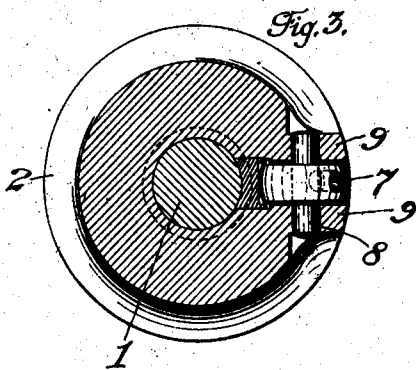
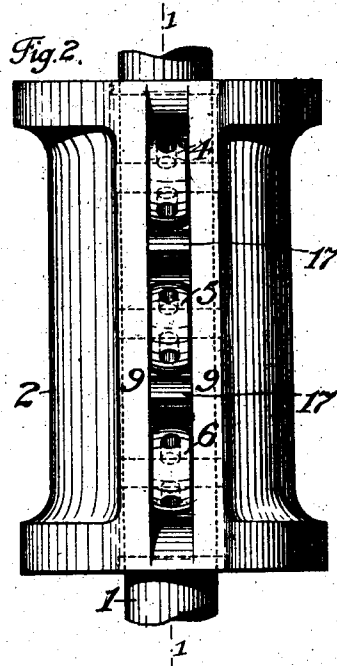
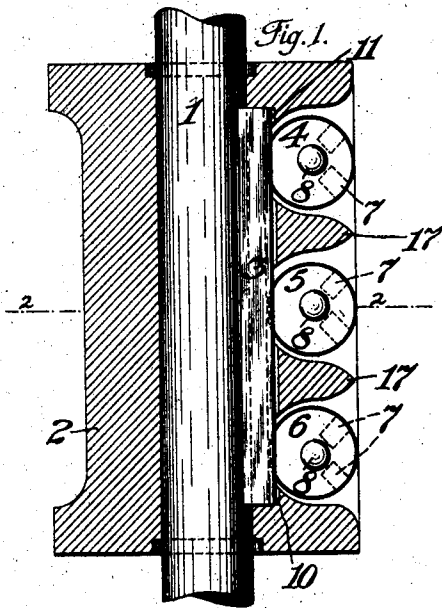
No. 834,385.

PATENTED OCT. 30, 1906.

P. KIRKEGAARD.
STAMP MILL.

APPLICATION FILED SEPT. 17, 1904.

2 SHEETS—SHEET 1.



WITNESSES:

Walter M. Chapin
Joseph J. Dennis

INVENTOR

P. Kirkegaard.

BY

Rosenbaum & Stockbridge
ATTORNEYS

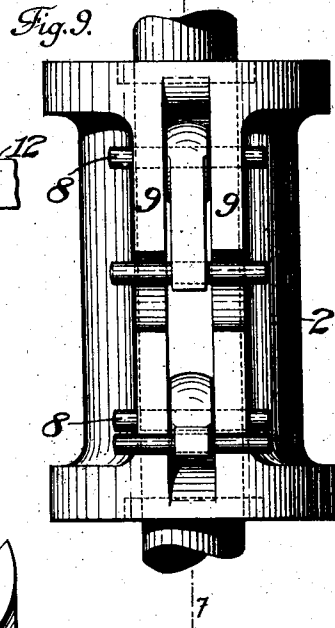
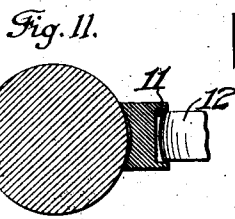
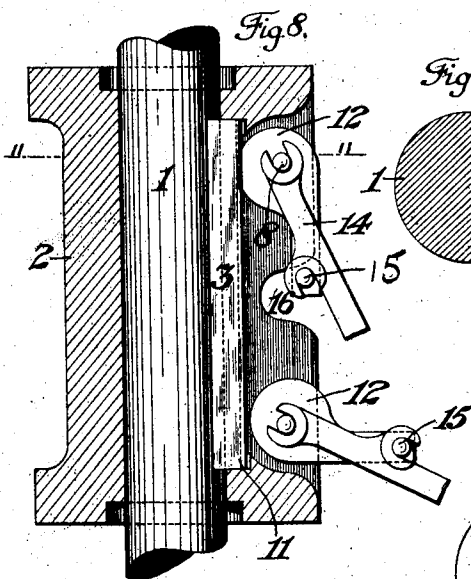
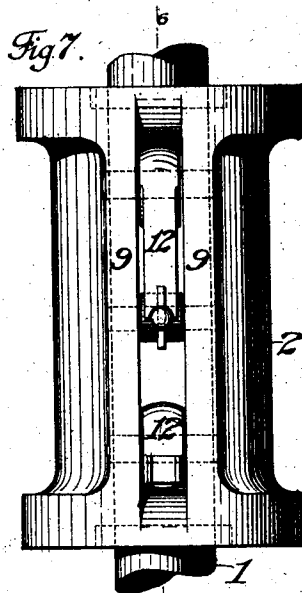
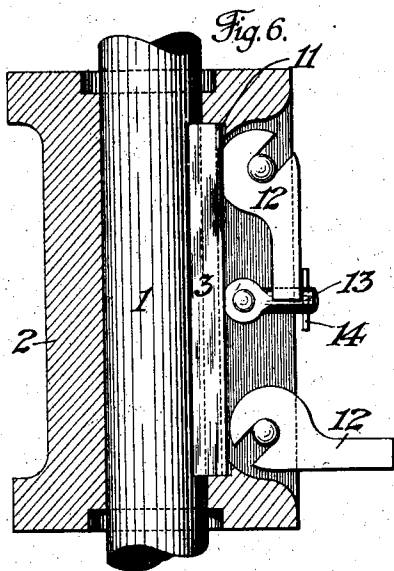
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P. KIRKEGAARD,
STAMP MILL.

APPLICATION FILED SEPT. 17, 1904.

2 SHEETS—SHEET 2.



WITNESSES:

Waldo M. Chapin
Joseph J. Hennes

INVENTOR

P. Kirkegaard

BY

Rosenbaum & Stackhouse
ATTORNEYS

UNITED STATES PATENT OFFICE.

PETER KIRKEGAARD, OF DELORO, ONTARIO, CANADA.

STAMP-MILL.

No. 834,385.

Specification of Letters Patent.

Patented Oct. 30, 1906.

Application filed September 17, 1904. Serial No. 224,883.

To all whom it may concern:

Be it known that I, PETER KIRKEGAARD, a citizen of the United States, residing at Deloro, in the county of Hastings, Ontario, Dominion of Canada, have invented certain new and useful Improvements in Stamp-Mills, of which the following is a full, clear, and exact description.

The present mode of securing tappets to stamp-stems in ore-crushing mills is by means of wedges or keys. The use of wedges and keys is objectionable from the fact that the keys or wedges must be driven in very hard in order to have the necessary friction or grip required to hold the tappet securely on the stem against the blow and lifting effect of the stamp by the cam and the natural tendency of the tappet to slip down by virtue of its own weight and the shock when the stamp strikes the die.

Another very serious objection is that the constant hard driving of the keys or wedges swells and burs the latter, causing long, serious, and costly delays in moving tappets, while very frequently the swelling of the keys causes a splitting of the tappets, thus destroying them and necessitating the stopping of a whole battery of stamps to facilitate renewal.

In manipulating tappets as at present constructed there is great difficulty by reason of their natural close proximity to each other, making it at times well nigh impossible to get out the keys, thus leading to missed blows of the hammer, burring up of keys, and other attendant evils.

It will be understood that every moment a stamp is out of operation means a corresponding reduction in the output, and in large plants these small delays multiplied become very serious. This feature becomes important in view of the fact that the position of tappets on stamp-stems is changed at frequent intervals, for which reason it is important to have a quick and reliable method of accomplishing the change.

My invention is designed to avoid and obviate the above-named defects and to facilitate the handling of stamps, the quick movement of tappets in either direction without the use of hammers or keys and without any liability of bursting or splitting the tappets, and by these means greatly increasing the efficiency of ore-crushing stamp-mills.

More specifically, the object of this invention is to provide quick and reliable means for fastening the tappets of stamp-mills securely on the stems of stamps in any desired position to do away with the keys or wedges now universally used and to greatly facilitate the setting of stamps in relation to the cams and by these means to regulate the drop of the stamps.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal section of a tappet as applied to a stamp-stem, the latter being shown in full lines. Fig. 2 is an elevation of a tappet applied to a stamp-stem, the view being taken at right angles to that shown in Fig. 1. Fig. 3 is a transverse section of a tappet and a stamp-stem to which the tappet is applied. Figs. 4 and 5 are detail views. Figs. 6 and 7 are views corresponding, respectively, to Figs. 1 and 2, but illustrating a modified form of locking and unlocking means for the tappet. Figs. 8 and 9 are respectively similar views showing still other modifications; and Figs. 10, 11, and 12 are further detail views.

Referring to the earlier figures of the drawings, 1 is a stamp-stem, and 2 the tappet applied thereto. The means for fastening the tappet to the stem consist of eccentric disks 4, 5, and 6, provided with holes or openings 7, to which a suitable tool may be applied for bringing the eccentrics to bear upon a gib 3, interposed between the eccentrics and the stem. The eccentrics are mounted upon short shafts or axles 8 8 8, mounted in lips or flanges 9 9 on the tappet.

By referring to Fig. 5, it will be seen that the faces of the eccentrics (one such eccentric being shown in the said figure) are slightly rounded for the purpose of reducing friction to a minimum.

It will also be seen that the eccentrics are reversible and made to clamp in either direction. For example, referring to Fig. 1, the eccentrics 4 and 6 are shown as being adapted to exert a clamping influence by a downward motion of the tool which operates them, while the eccentric 5 is adapted to exert a similar influence by an upward motion of its operating-tool. By virtue of this arrangement the eccentrics 4 and 6 are in a position such that when forced home they tend to clamp themselves still further when the tap-

pet is being lifted by the cam, whereas the eccentric 5 tends to tighten itself against any tendency there might be of the tappet slipping due to its own weight when the stamp strikes the die.

It is obvious that the arrangement of these eccentric disks may be reversed and all may be made to tighten in one direction or any two in one direction with any one in the opposite direction.

It is also obvious that the eccentric or rolling wedges 4 5 6 may be used for fastening pulleys on shafts or the like and that the eccentrics may be used with or without handles attached without departing from the spirit of the present invention.

The gib 3 is made concave, of a radius slightly smaller than the diameter of the stamp-stem, for the purpose of more securely clamping the tappet in position, and the gib is also made to fit tightly within a recess 10, provided for it in the tappet to obviate all tendency to lateral movement.

To stiffen the gib 3 without unduly enlarging it, grooves 11 are provided in it longitudinally corresponding to each eccentric. This leaves extra metal around the recess or grooves to stiffen the gib and at the same time permits of the eccentric being made of as large a diameter as possible within the limit of what has been found by long practice to be a suitable size of tappets on any given weight of stamp.

The shafts or journals 8, upon which the eccentrics revolve, are made to fit snugly into the lips 9 9, while the eccentric disks are themselves made to fit loosely, so as to permit their moving without undue friction when necessary. The holes 7 7 7 serve as well for loosening as well as for tightening the eccentrics, an appropriate tool being applied in each instance.

When the eccentrics are provided with short stems or handles, a wrench may be used for locking and unlocking the same. Such a construction is shown in the latter figures of the drawings. One such eccentric is shown at 12 in Fig. 6. The upper eccentric in this figure is shown as being locked in position by means of a post 13 and a key 14, the same being inserted between the lips 9 9 on the tappet 2. The lower eccentric 12 in Fig. 6 is shown as unlocked, but as being capable of being moved upward by its handle so as to exert pressure on the gib 3 and to be itself locked in position after having been forced home.

With the eccentric shown in Figs. 6 and 7, the mode of applying the said eccentric to the shafts or axles 8 is perfectly clear. Such application can be made readily without removing the shafts or axles or disturbing the tappet or pulley in any way.

With the form of eccentric shown in Figs. 6 and 7, having a gap, as shown, it becomes

easy to change the eccentrics without disturbing any other part, as will be clearly understood.

A double wrench 14' is shown in Fig. 8 for the purpose of locking or unlocking the eccentrics. This wrench engages with an external prolongation of the shaft or axle 8, upon which the eccentric is journaled, one of the jaws of the wrench engaging with the said prolongation, while the other engages with a pin 15 upon the outer end of the handle of the eccentric. The wrench is so constructed that by simply turning it upside down it will present its greatest strength for either fastening or unfastening. It is obvious that two wrenches may be used at the same time, one on each side of the tappet, thus giving double leverage, if required at any time, and such leverage will be evenly balanced.

At 16 in Fig. 8 a gap is shown in the body of the tappet. This is for the purpose of receiving the pins 15 in the ends of the eccentric-handle when these are in the locked position, thereby protecting them within the circumference of the tappet against being caught by an adjacent tappet.

The recesses or grooves in the gib are made flat, Fig. 11, both parallel and at right angles to the stamp-stem, and the gib is preferably hardened at these points for the purpose of resisting wear.

The clamping faces or edges of the eccentric are made slightly rounded or convex for the purpose of preventing undue friction and for the purpose of being fastened or unfastened and to give them a more secure grip, and these faces in both forms of eccentric are preferably hardened to withstand wear.

The side of the tappet in which the gib and eccentrics are placed is made the full diameter of the working face of the tappet, and in this are the recesses for accommodating two or more eccentrics, as desired, and it is obvious that the sides or lips 9 9 can be made as heavy as desired to give the necessary strength and also that bridges, as 17 17, can be left for the same purpose.

For the disk eccentrics the wrench illustrated in Fig. 12 may be used. The action is obvious.

I claim as my invention—

1. In a stamp-mill, a stamp-stem, a tappet thereon, a gib in the tappet, the said gib having recesses parallel to its length and corresponding to the position and number of eccentrics, and one or more eccentrics secured in the tappet and adapted to press the gib against the stem.

2. In a stamp-mill, a stamp-stem, a tappet thereon, a gib in the tappet and one or more eccentrics adapted to press the gib against the stem.

3. In a stamp-mill, a stamp-stem, a tappet thereon, a gib in the tappet, the said gib having recesses parallel to its length, and one or

more eccentrics secured in the tappet and adapted to press the gib against the stem, the metal immediately in and around the recesses being hardened.

5 4. As a means for securing a tappet to a stamp-stem, a gib in the tappet and one or more eccentrics bearing on said gib.

10 5. In a stamp-mill, a stamp-stem, a tappet thereon, a gib in the tappet and one or more eccentrics bearing on said gib having means for fastening and unfastening the same.

15 6. In a stamp-mill, a stamp-stem, a tappet thereon, a gib in the tappet, and one or more eccentrics bearing on said gib, the said eccentric or eccentrics being provided with a handle or handles, each handle having a pin at its end for engaging with a wrench or tool when locking or unlocking.

20 7. In a stamp-mill, a stamp-stem, a tappet thereon, a gib in the tappet and eccentrics having a rounded working face engaging said gib.

25 8. In a stamp-mill, a stamp-stem, a tappet thereon, a gib in the tappet, and eccentrics having rounded working faces bearing on said gib, the said working faces being hardened to reduce wear and insure smoothness.

30 9. In a stamp-mill, a stamp-stem, a tappet thereon, a gib in the tappet, and reversible eccentrics for pressing the gib against the stem.

35 10. In a stamp-mill, a stamp-stem, a tappet thereon, a gib in the tappet, and one or more eccentrics for pressing the gib against the stem, the said eccentrics being supported

upon shafts or axles firmly secured in the tappet and affording free motion to the eccentrics upon them.

11. In a stamp-mill, a stamp-stem, a tappet thereon, a gib in the tappet, and one or more eccentrics for pressing the gib against the stem, the eccentrics being supported upon shafts or axles firmly secured in the tappet, and affording free motion to the eccentrics upon them, and the shafts or axles being extended so as to afford fulcrums to wrenches for fastening or unfastening the eccentric.

12. In a stamp-mill, a stamp-stem, a tappet thereon, a gib in the tappet, one or more eccentrics for pressing the gib against the stem, the said tappet being reinforced by having upon one side lips in which recesses are formed for accommodating the eccentric or eccentrics.

13. In a stamp-mill, a stamp-stem, a tappet thereon, a gib in the tappet, one or more eccentrics for pressing the gib against the stem, the said tappet having upon one side lips in which recesses are formed for accommodating the eccentric or eccentrics, and the said lips being also provided with a gap for receiving pins in the ends of the eccentric handles.

In witness whereof I subscribe my signature in the presence of two witnesses.

PETER KIRKEGAARD.

Witnesses:

W. A. HUNGERFORD,
G. FRANK FRIES.