

(No Model.)

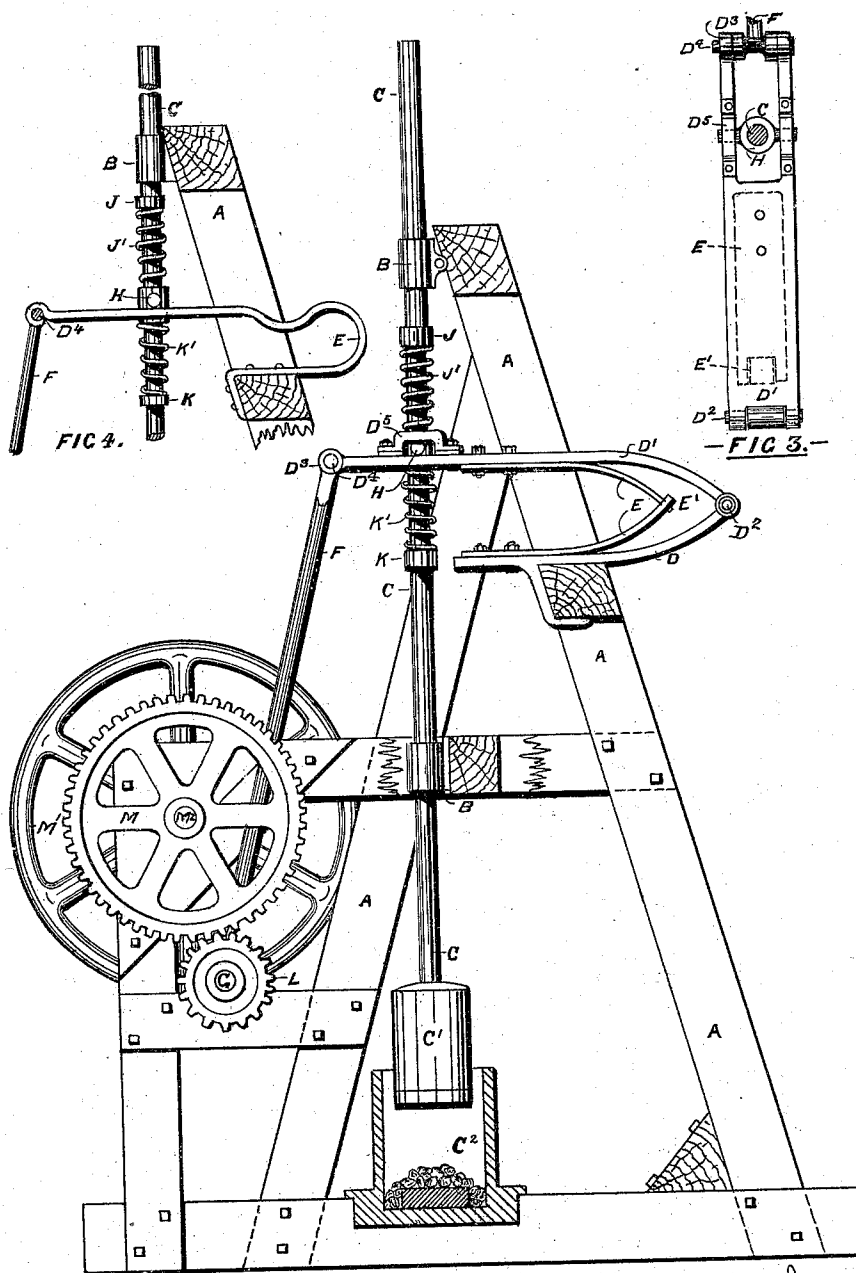
2 Sheets—Sheet 1.

A. G. SAUNDERS.

STAMPER BATTERY FOR DISINTEGRATION OF METALLIFEROUS ORES.

No. 547,184.

Patented Oct. 1, 1895.



Witnesses
H. van Oldenmeel
C. A. Scott

— FIG. 1. —

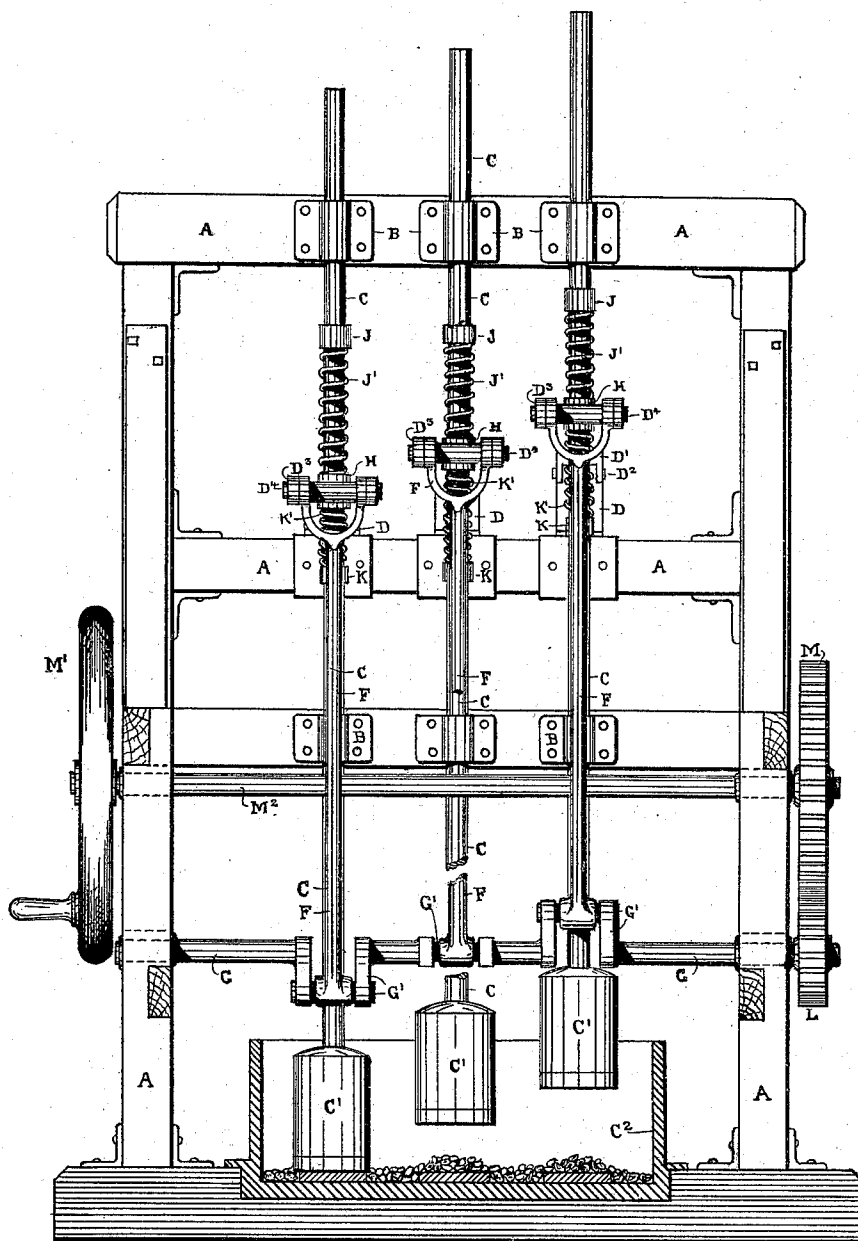
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Attorneys

(No Model.)

2 Sheets—Sheet 2.

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—FIG 2—

Witnesses
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UNITED STATES PATENT OFFICE.

ALFRED GEORGE SAUNDERS, OF ADELAIDE, SOUTH AUSTRALIA.

STAMPER-BATTERY FOR DISINTEGRATION OF METALLIFEROUS ORES.

SPECIFICATION forming part of Letters Patent No. 547,184, dated October 1, 1895.

Application filed July 8, 1895. Serial No. 555,269. (No model.)

To all whom it may concern:

Be it known that I, ALFRED GEORGE SAUNDERS, engineer, of Gouger Street, Adelaide, in the Province of South Australia, have invented an Improvement in Stamper-Batteries for the Disintegration of Metalliferous Ores, of which the following is a specification.

My invention relates to certain improvements in that class of machinery usually known as "stamper-batteries" and employed for the purpose of disintegrating metalliferous ores and the like, in which operation the matrix is submitted to a series of blows from a falling weight or stamp until it becomes more or less finely pulverized, as required.

The special object of my invention is to provide certain mechanism whereby the power required for actuating such machines may be more economically employed and the operation of stamping the ore be performed at a greater speed than is at present customary for such purpose.

In order to obtain the aforesaid object, I dispense with the revolving cam-shaft, and also the cams which are usually employed for raising the stamp-rods, and substitute certain springs, as well as a cross-head, connecting-rod, and crank-shaft in lieu thereof.

In my invention motion is transmitted to the stamp-rod through the springs and cross-head by means of the connecting-rod, in conjunction with the crank-shaft, the latter being caused to revolve by applying power to suitable gearing connected therewith.

In order that my invention may be the better understood, I will further describe the same in detail, having reference to the accompanying illustrations, in which—

Figure 1 is a side elevation of the machine in part section. Fig. 2 is a front elevation of the same; Fig. 3, plan of carrier device for main spring; Fig. 4, sketch illustrating alternative device for main springs.

Throughout the drawings similar letters of reference are used to denote similar parts.

A is the framework of the machine, upon which the guides B are placed for steadying the stamp-rods C, which terminate in the stamp-shoes C', a stamp-box C² being provided for the reception of the ore.

The lower arm D of a hinged spring-carrier

is securely bolted to the framework of the machine, the upper arm D' of the said carrier being hinged to the lower arm at D². The upper arm is preferably forked, so as to pass on either side of the stamp-rod C, and the free end of the said arm terminates in a link-boss D³, into which the cross-pin D⁴ is inserted. Upon the upper arm D' of the spring-carrier a bearing D⁵ is provided, and is so arranged as to allow sufficient room for a slight radial movement in the working parts. A slide-block may be added to the mechanism, if so desired. Between the upper and lower arms of the spring-carrier a stout spring E is arranged, and is preferably formed by securing one end of a plate or plates of spring-steel to each limb of the spring-carrier. The contour of the plates is such as will enable their free ends to impinge upon each other at E', as illustrated in the drawings, at which point they may be hinged together, if so desired, by means of an ordinary pin and eye or other well-known device. I do not, however, confine myself to this class of spring, but as an alternative may employ (with or without a spring-carrier) a spring or springs, such as illustrated in Fig. 4, or any suitable equivalent thereof.

For the purpose of actuating the machine a connecting-rod, such as F, is attached to the link-boss D³ by means of the cross-pin D⁴, and is fastened to the crank G' of the crank-shaft G in any convenient manner. Upon the stamp-rod C a sliding collar and cross-head device H is placed, and is arranged so as to impinge upon or work within the bearing D⁵. At a short distance above the working position of the sliding collar and cross-head a fixed collar J is mounted, the space between the said fixed collar and the cross-head being occupied by a spiral spring J', to be hereinafter referred to as the "compensating" spring. The tension of the compensating spring is such as will enable the said spring to carry the weight of the stamper-rod and shoe complete without material deflection. At a short distance below the working position of the sliding collar and cross-head a fixed collar K is mounted, the space between the said fixed collar and the cross-head being occupied by a spiral spring K', to

be hereinafter referred to as the "buffing-spring." The tension of the buffing-spring is less than that of the compensating spring.

When it is desired to use my invention, the matrix or ore to be broken is fed into the stamp-box C² in the ordinary manner. The crank-shaft G is then caused to revolve, motion being imparted thereto by means of a pinion-wheel, such as L, attached to the said crank-shaft G and geared into a spur-wheel, such as M, and a belt-pulley or a driving-wheel for hand-power, such as M', may be attached to the common spindle M² for motive purposes. As the crank-shaft rotates, bringing the crank upward, so that the connecting-rod is lifted, thus releasing the tension of the main spring and at the same time elevating the bearing D⁵, upon which the cross-head H is dependent for its movement, it will be seen that the compensating spring J' rests upon the sliding collar of the cross-head device H. It will also be seen that the movement of upper end of the said spring is checked by the collar J, which is a fixture upon the stamp-rod C. It will therefore be readily understood that when the cross-head is lifted by the upward movement of the bearing D⁵ upon the spring the stamp-rod C will also be lifted, the tension of the compensating spring when set being sufficiently strong to resist compression due to the dead weight of the rod and shoe, as hereinbefore stated. After passing the top center the crank, as it descends, carries the connecting-rod downward, thus lowering the bearing and allowing the stamper to descend until it strikes the ore beneath. In so doing the buffing-spring K', which is weaker than the compensating spring J', is more or less compressed, the slack space caused by the impact being immediately taken up by the compensating spring. In event of an extra large or unbreakable block of ore being placed beneath the stamps a further compression of the buffing-spring enables the crank-shaft to pass the bottom dead-center. By means of the springs employed in the manner described

and illustrated an amount of what is known as "give and take" is obtained from the several working parts of the mechanism, and in actual experiment is found to be productive of the beneficial results required. When metalliferous ores of dissimilar consistency are to be treated, the length of stroke may be varied by altering the position of the collars J and K and adjusting the throw of the crank to suit, or as an alternative means for obtaining the same object the distance between the link-boss D³ and the bearing D⁵ may be increased or decreased, as required. In the specification the working parts of gearing for a single stamp have been described; but it is to be understood that several head of stamps may be worked by my system in one and the same battery, as indicated in Fig. 2 of the illustrations.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. In combination, the stamper rod, the cross head thereon, the collars above and below the cross head, the springs interposed between the collars and crosshead, the pitman with operating means, the spring carrier and the main frame to which it is connected, said spring carrier being connected with the pitman and engaging the cross head, substantially as described.

2. In combination, the main frame, the stamper and its rod, the cross head, the collars above and below the same, the springs between the collars and cross head, the pitman, the movable carrier between the pitman and main frame arranged to rise and fall with the pitman, said carrier engaging the cross head, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

ALFRED GEORGE SAUNDERS.

Witnesses:

FRANK HAMBRIDGE,

JOHN HERBERT COOKE.