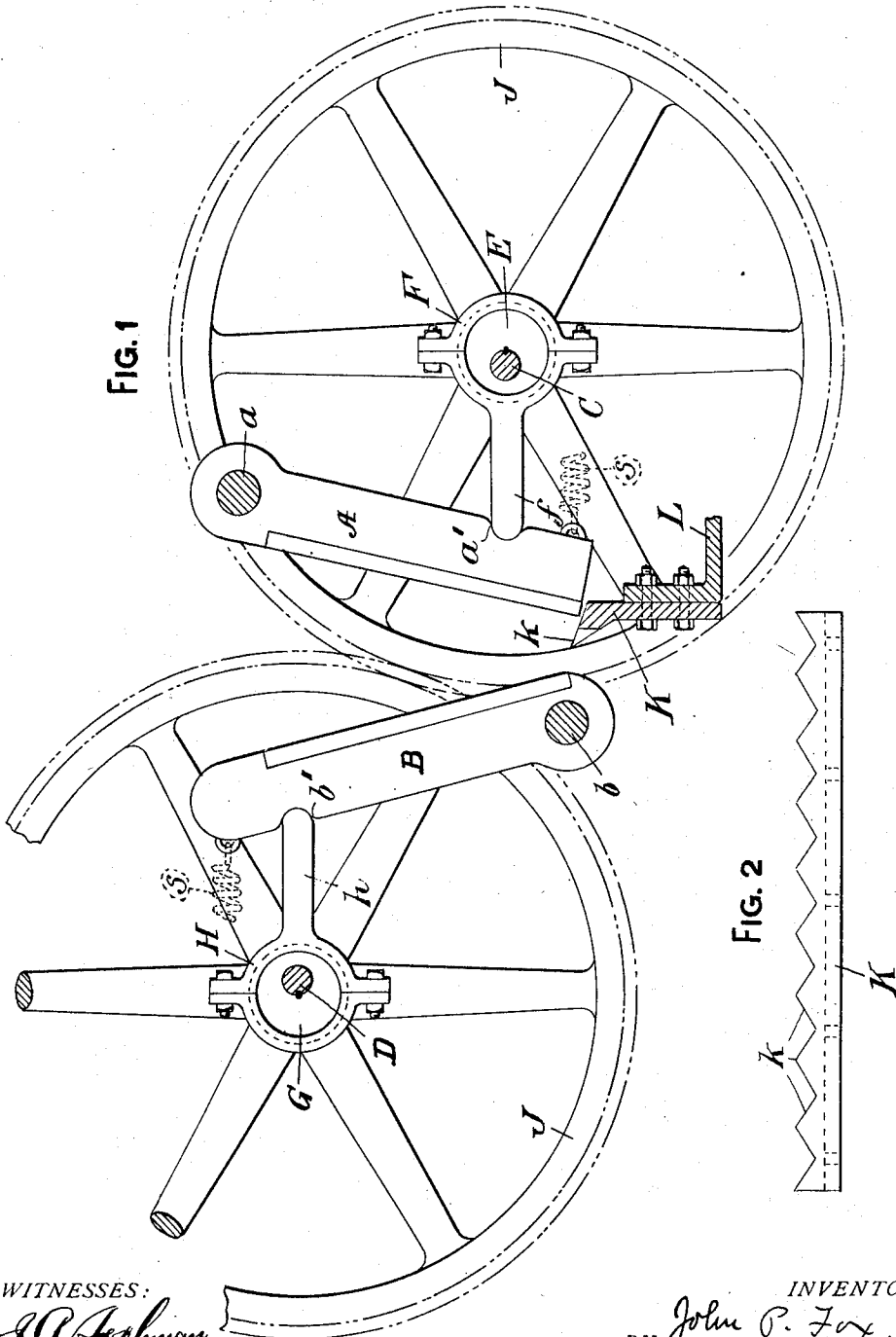


J. P. FOX.
CRUSHER.

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1,007,935.

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WITNESSES:

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JOHN P. FOX, OF PITTSBURGH, PENNSYLVANIA.

CRUSHER.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JOHN P. FOX, a subject of Great Britain, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented new and useful Improvements in Crushers, of which the following is a specification.

My invention relates to crushers for stone, ore, and other materials.

10 The object of my invention is to increase the durability and the capacity of crushers. Preferably I employ two movable jaws, one being pivoted at the top and the other at the bottom, and two separate actuating shafts, provided preferably with eccentrics for converting the rotary motion of the actuating-shafts into reciprocatory or oscillatory motion, the two actuating shafts being connected together so as to turn together in the desired directions. Crushers of the type shown are subject to heating and rapid wear, owing to the very heavy pressures that they have to withstand and to the high speeds at which they usually run. By properly distributing the driving power through two separate eccentrics or their equivalents, a much more durable machine is obtained, which will crush about twice the usual amount of stone before wearing out its working parts.

Another object of my invention is to prevent the passage through the jaws of objects larger than a predetermined size.

Referring to the accompanying drawing, Figure 1 shows, diagrammatically, a vertical section taken transversely of the jaws. Fig. 2 is a plan of the gage or stop at the bottom of one of the jaws.

On the drawing, A and B represent two oscillatory or pivoted crusher jaws inclined downwardly and toward each other. The jaw A oscillates on the pivot or rod *a* which is at or near the upper end of the jaw A, and the jaw B oscillates on the pivot or rod *b*, which is at or near the lower end of the jaw B.

C and D are two parallel driving, or actuating, shafts, the shaft C being at the right of the jaw A and opposite the lower portion thereof; and the shaft D at the left of the jaw B and opposite the upper portion thereof. The shaft C has thereon the eccentric E on which rides the eccentric collar or sleeve F provided with the arm *f* with its free end working in the notch *a'* in the rear side of the lower portion of the jaw A. The

shaft D has thereon the eccentric G on which rides the eccentric collar H, provided with the arm *h* with its free end working in the notch *b'* in the rear side of the upper portion of the jaw B. The shafts C and D are provided with the spur gear wheels I and J, respectively, which are geared together. It is to be understood, however, that various other means for converting the rotary motion of the shafts into the oscillatory motion of the jaws, and for causing the shafts to rotate together may be devised.

K represents a shelf or gage located beneath the end of the jaw A, or the jaw with its swinging lower end, and secured to the bracket or support L. Preferably the gage K will have teeth *k* as shown in Fig. 2 and the lower face of the shelf will be beveled so as to provide a sharp forward edge and offer as little resistance as possible to the flow of stone. In the ordinary stone crusher, if it is desired that stone not larger than one inch shall be discharged, it is necessary to set the jaws so that their greatest distance apart at the bottom shall be one inch. Under these conditions it is hardly practical to give the jaw a stroke of more than about three-eighths of an inch, causing the distance apart of the jaws at the bottom to vary from one inch to five-eighths of an inch. With my crusher, if it is desired to crush stone so that no stone larger than one inch shall be discharged, I provide such a size of gage K that the space between it and the opposing jaw shall be one inch. By providing the gage, I can make the space between the jaws at the bottom work between the limits of one and three-quarters inches and fifteen-sixteenths of an inch, and thereby obtain far greater capacity.

In a stone crusher a large stroke is desirable. A part of the stroke in any crusher does not accomplish useful work, because absolute rigidity of the machine cannot be obtained, lost motion exists during the wear and play of the working parts, and stones at first generally present to the jaws only a few projecting faces or points, which are during the first portion of the travel of the jaws crushed down without breaking the stone. These causes absorb a far greater percentage of the motion of a small stroke than a large one. Also, as the pressure on the jaws is nearly the same for a small stroke as for a large one, the work lost in

friction of the working parts is not much more for a large stroke than for a small one, while the work actually done in crushing stone is far greater. My invention allows, both at the top and bottom of the jaws, a greater stroke than can be advantageously used on existing machines known to me.

I do not limit my invention to any definite number of jaws nor to any details and combinations provided these come fairly within the scope of the appended claims.

I claim—

1. In a crusher, a pair of opposing jaws, one pivoted to crush objects between them, at its upper portion and the other at its lower portion, a separate driving shaft for each jaw, means connecting each shaft to its respective jaw for oscillating the same,

and means for causing the jaws to operate toward and from each other in unison.

2. In a crusher, a pair of opposing jaws, a pair of driving shafts, means connecting one shaft to the upper portion of one of the jaws to cause its crushing movement toward and from the opposite jaw, means connecting the other shaft to the lower portion of one jaw to cause its crushing movement toward and from the opposing jaw, and means for causing the said jaw portions to move toward and from each other in unison.

Signed at Pittsburgh, Pa., this 6th day of March, 1911.

JOHN P. FOX.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."