(No Model.)

2 Sheets—Sheet 1.

P. McKELLAR.

MACHINE FOR PULVERIZING ROCK

No. 526,788. Patented Oct. 2, 1894.

Fig. 1.

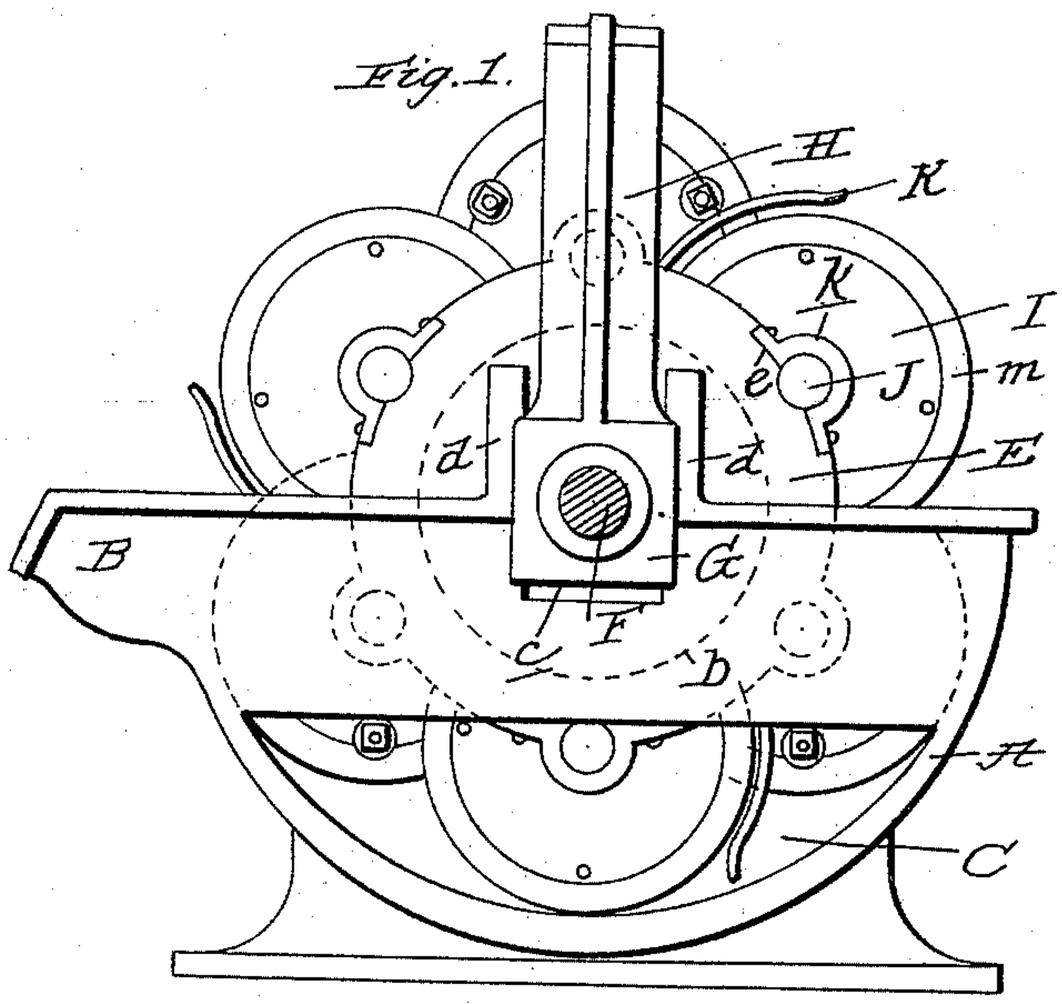


Fig. 2.

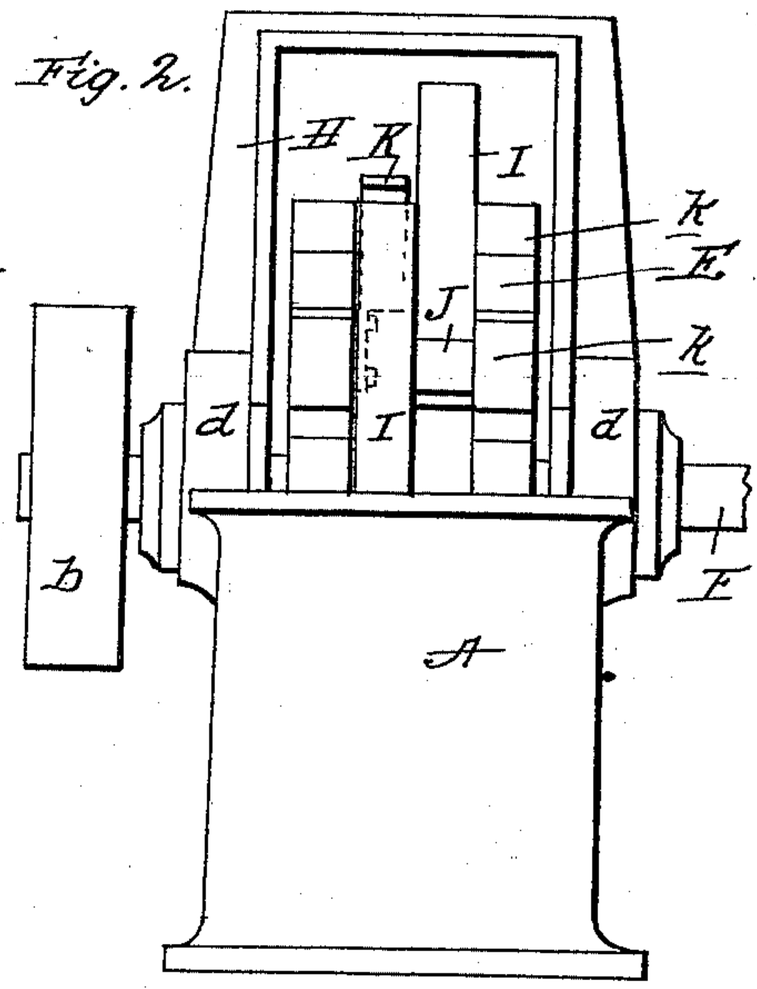


Fig. 3.

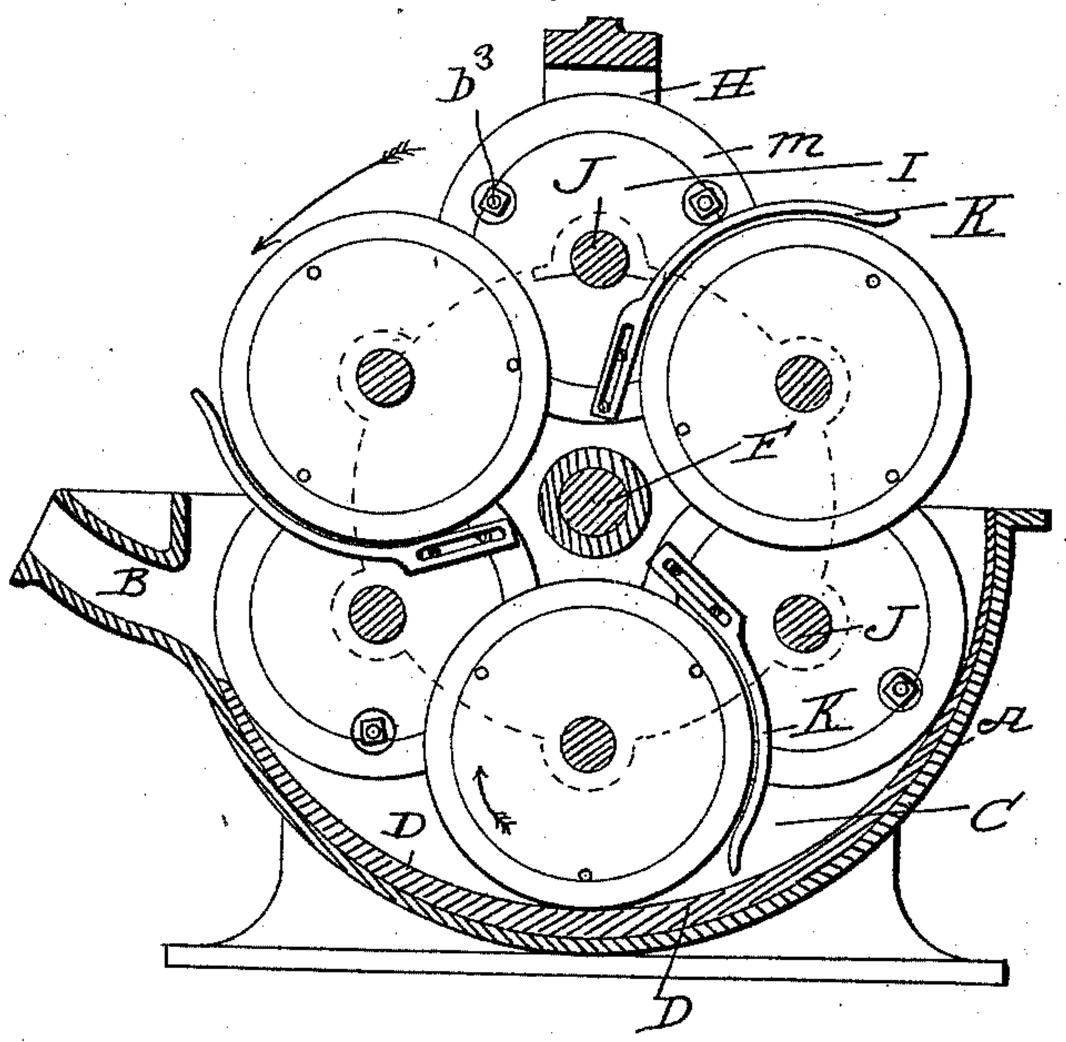
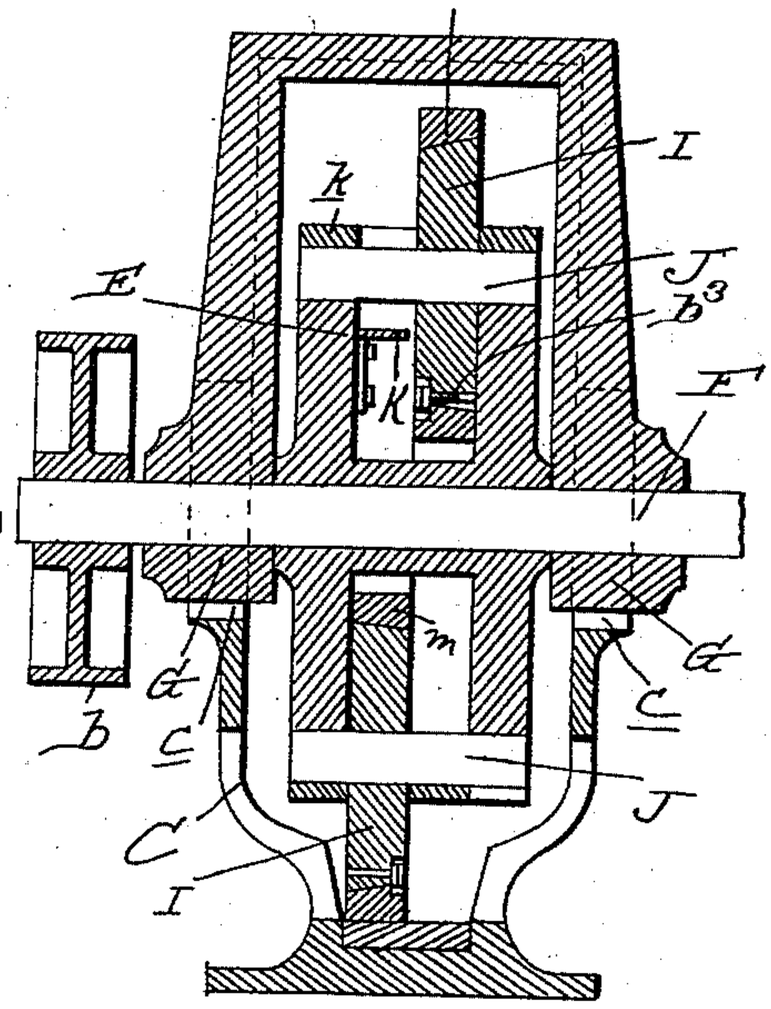


Fig. 4.



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Attorney

(No Model.) 2 Sheets—Sheet 2.

P. McKELLAR.

MACHINE FOR PULVERIZING ROCK.

No. 526,788. Patented Oct. 2, 1894.

Fig. 5.

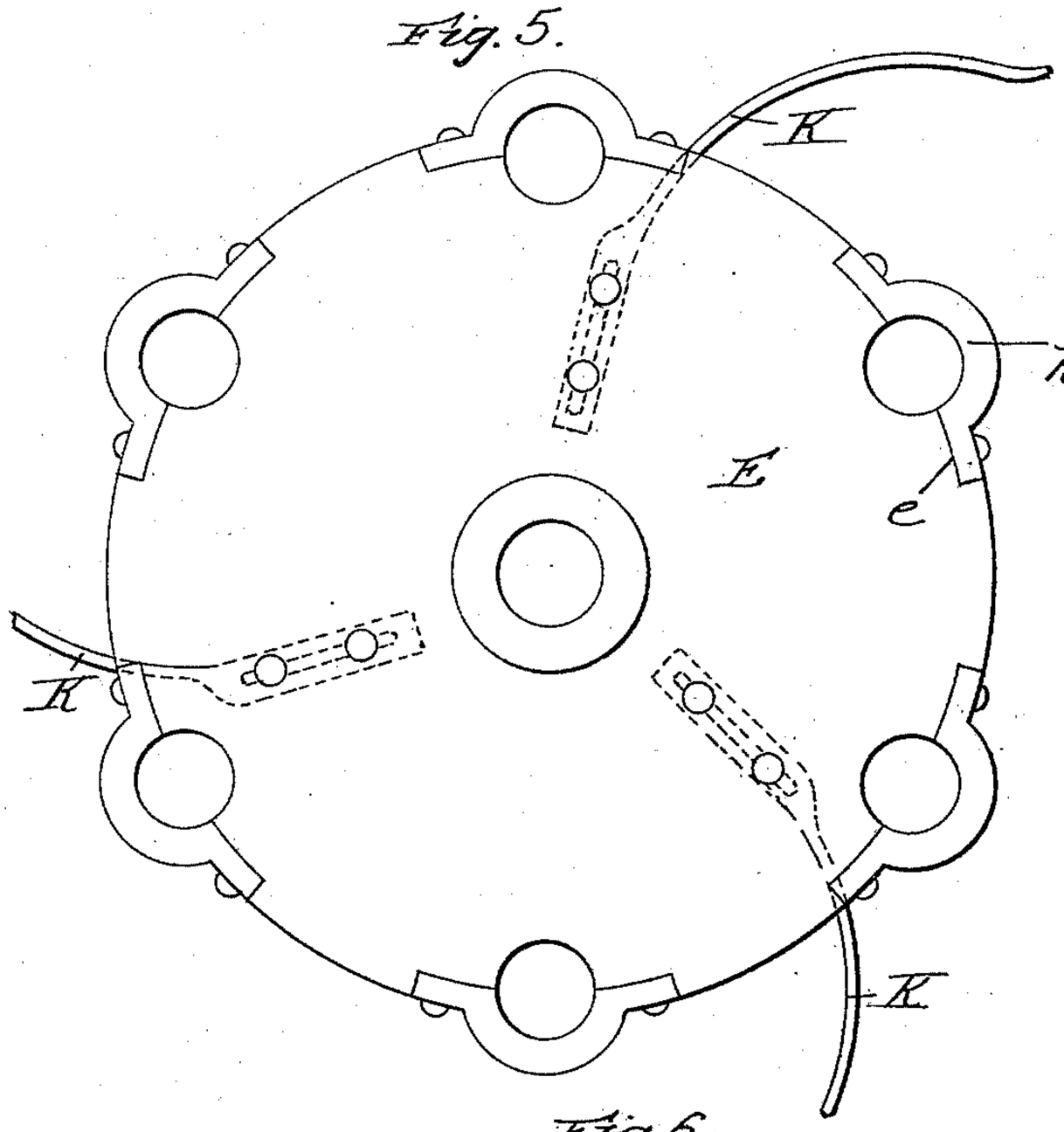


Fig. 7.

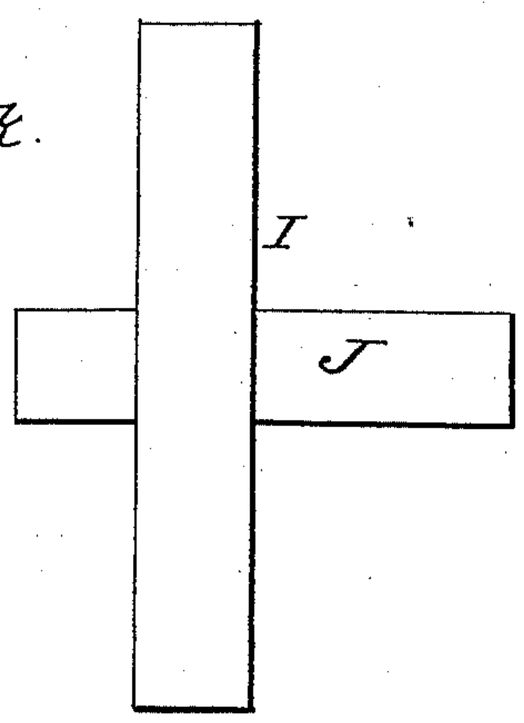


Fig. 6.

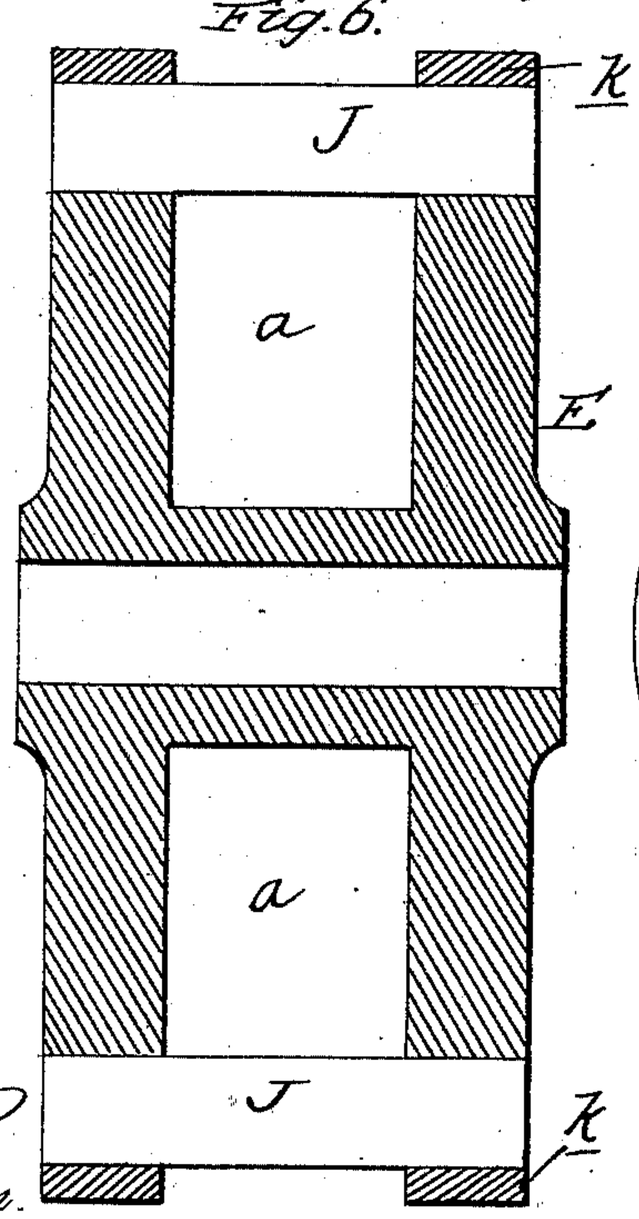
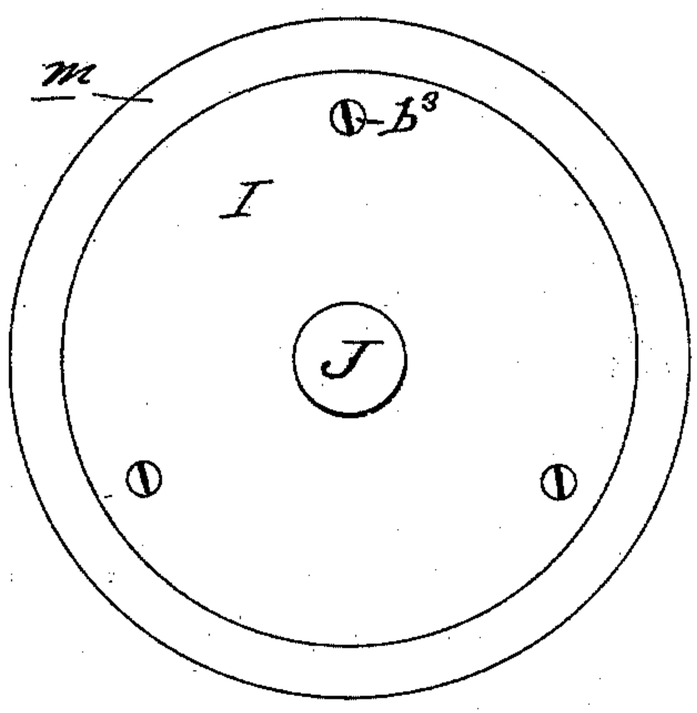


Fig. 8.



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UNITED STATES PATENT OFFICE.

PETER McKELLAR, OF FORT WILLIAM, CANADA.

MACHINE FOR PULVERIZING ROCK.

SPECIFICATION forming part of Letters Patent No. 526,788, dated October 2, 1894.

Application filed February 9, 1894. Serial No. 499,603. (No model.)

To all whom it may concern:

Be it known that I, PETER McKELLAR, a subject of the Queen of England, residing at Fort William, in the district of Thunder Bay, in the Province of Ontario and Dominion of Canada, have invented certain new and useful Improvements in Machines for Pulverizing Rock, Mineral, or Ore; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

My invention relates to improvements in machines for pulverizing rock, ore, and the like, and it has for its general object to provide a pulverizing machine embodying such a construction that the full weight of the impact rolls and the wheel carrying the same will be imposed upon the rock or ore so as to facilitate the crushing of the same; and one in which the impact rolls are so disposed on the wheel as to balance the same and enable it to turn easily and in which the parts most subjected to wear may be readily renewed at slight cost.

Other objects and advantages of the invention will be fully understood from the following description and claims when taken in connection with the annexed drawings, in which—

Figure 1, is a side elevation of my improved machine in an operative position. Fig. 2, is an end elevation. Fig. 3, is a vertical, longitudinal section. Fig. 4, is a vertical, transverse section. Fig. 5, is an enlarged, detail side elevation of the wheel which carries the impact rolls. Fig. 6, is a diametrical section of the same, and Figs. 7, and 8, are enlarged views of one of the impact rolls.

Referring by letter to said drawings: A, indicates the mortar of my improved machine which is preferably of a general semi-circular form as shown, and has the inlet or mouth B, at one end and the outlet openings C, in its opposite sides adjacent to its bottom.

D, indicates the curvilinear shoe or reinforce piece of hardened steel which is placed in the bottom of the mortar to protect the same and is designed to be readily removed when worn and be replaced by a new shoe or reinforce piece, and E, indicates the wheel which carries the impact rolls and is designed to be rotated in the mortar, as will be presently described. This wheel E, is preferably cast or otherwise formed in one piece and has a peripheral recess *a*, better shown in Fig. 6, to receive the impact rolls, and it is fixed upon a shaft as F, upon which may also be fixed a hand crank or belt pulley as *b*, to receive a belt from a suitable motor.

The shaft F, of the wheel E, is journaled in suitable bearing-blocks G, at the ends of a yoke H, and the said bearing blocks are arranged to slide in the openings *c*, in the side walls of the mortar and between the guides *d*, which rise from the upper edges of said walls, whereby it will be seen that the full weight of the wheel E, and the impact rolls and other parts connected therewith will be imposed upon the ore or rock in the bottom of the mortar to facilitate the crushing thereof, and the wheel E, will also be enabled to accommodate itself to the amount of ore or rock in the mortar.

I, indicates the impact rolls which are provided with tires or rims *m*, of hardened steel which are detachably connected by the threaded bolts b^3, and are designed to be readily removed and replaced at slight cost by new tires or rims when they have become worn or broken. These impact rolls have their shafts J secured by removable caps K, in seats *e*, formed at equi-distant points in the periphery of the wheel E, and the said rolls are fixed upon their shafts at such points that three of the rolls will rest in a vertical plane parallel to that of the other three so as to enable them to overlap each other as shown in Fig. 3. By thus arranging or disposing the impact rolls they are enabled to balance each other and one roll at least will always be in contact with the ore or rock to be crushed, so that although the full weight of the wheel, &c., is imposed on the ore or rock said wheel requires but a minimum amount of power to rotate it which is a desideratum.

K, indicates curvilinear scrapers which are slotted and adjustably connected to the wheel E, by bolts and nuts preferably in the manner shown, and are arranged in advance of the impact rolls so as to level the material

ahead of the rollers, and thereby facilitate the crushing of the same and render the rotation of the wheel E, more easy. By connecting the said scrapers K, to the wheel E, in the manner shown, they may be adjusted to take up wear and may also be adjusted and adjustably fixed to suit rock and ore of various kinds.

In the practice of the invention, the rock or ore to be pulverized is fed into the mortar through the mouth or inlet B, and the wheel E, is rotated in the direction indicated by arrow, by hand or other power, when the impact rolls engaging the ore or rock will be caused to rotate in the opposite direction as indicated. The pulverized ore which collects in the bottom of the mortar finds free egress through the openings J, and the different screens used as required.

It will be observed from the foregoing that my improved machine is very simple, compact and light of weight and that it is therefore especially adapted for use in mountainous or remote mining districts where it can be easily transported and operated by hand power. It will also be observed that the machine is easily cleaned and repaired and that it is complete in itself which admits of it being set down and operated without the necessity of providing a foundation for it.

Having described my invention, what I claim is—

1. In a machine for pulverizing ore, rock, and the like, the combination of a mortar or receptacle having vertical guides, a movable yoke arranged in the guides of the mortar or receptacle, and a wheel carrying impact rolls, arranged to turn in the mortar or receptacle and having its shaft mounted in the yoke, substantially as and for the purpose set forth.

2. In a machine for pulverizing ore, rock, or the like, the combination of a mortar or receptacle having vertical guides, a movable yoke having its ends arranged in said guides, a wheel arranged to turn in the mortar or receptacle and having its shaft mounted in the ends of the yoke, and a series of rotatable impact rolls carried by the wheel and so arranged that they overlap each other, substantially as and for the purpose set forth.

3. In a machine for pulverizing ore, rock, and the like, the combination of a mortar or receptacle having vertical guides, a movable yoke having its ends arranged in said guides, a wheel arranged to turn in the mortar or receptacle and having its shaft mounted in the ends of the yoke, a series of rotatable impact rolls carried by the wheel, and the curvilinear scrapers also carried by the wheel and arranged in advance of the rolls, substantially as and for the purpose set forth.

4. The herein described machine for pulverizing ore, rock, and the like, comprising the mortar or receptacle having the removable, curvilinear reinforce piece or shoe D, and also having vertical guides, the movable yoke having its ends arranged in said guides, the wheel arranged to turn in the mortar or receptacle and having its shaft mounted in the ends of the yoke, a series of rotatable impact rolls carried by the wheel and having removable rims or tires, and the curvilinear scrapers also carried by the wheel and arranged in advance of rolls, substantially as and for the purpose set forth.

In testimony whereof I affix my signature in the presence of two witnesses.

PETER McKELLAR.

Witnesses:
FREDERICK BROWN,
E. L. ROBERTSON.