

(No Model.)

2 Sheets—Sheet 1.

C. G. COLLINS.
STONE AND ORE CRUSHER.

No. 519,566.

Patented May 8, 1894.

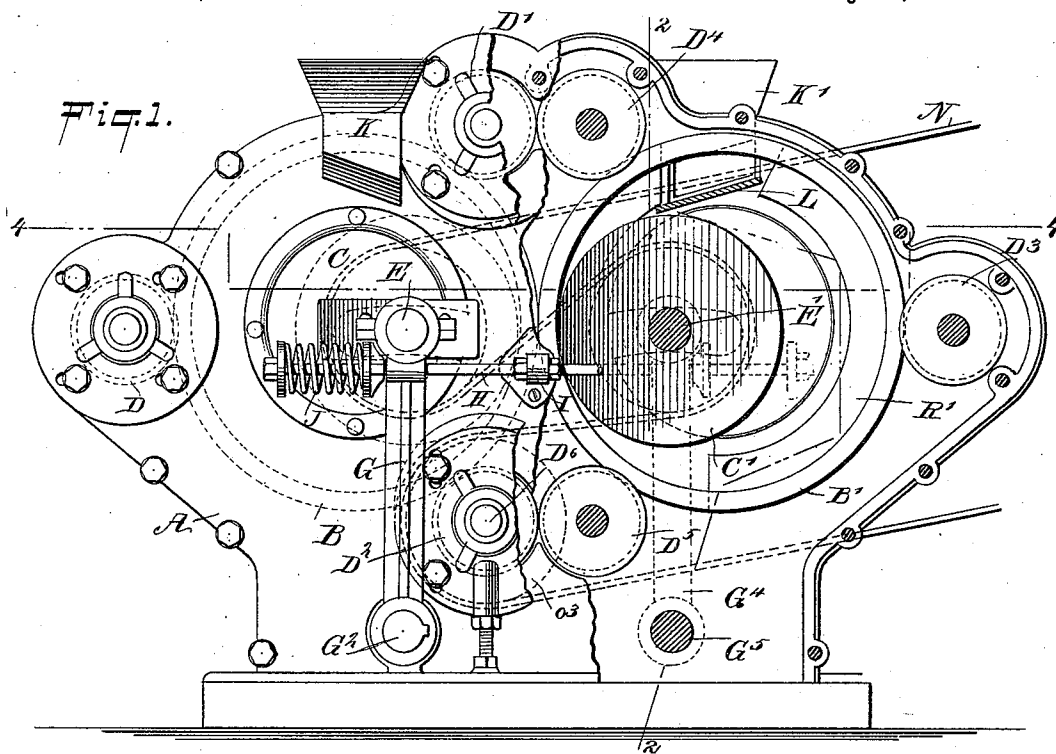
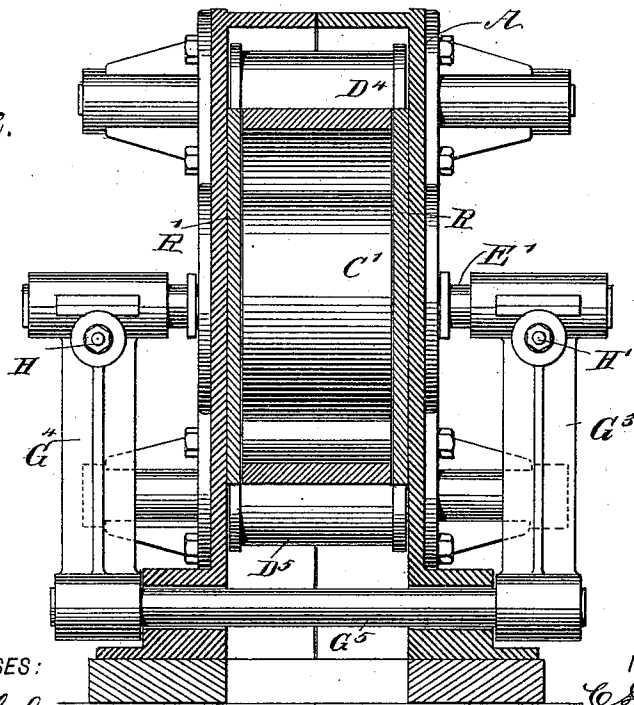


Fig. 2.



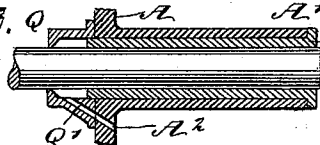
WITNESSES:

William Goebel.
C. Sedgwick

INVENTOR

C. G. Collins

Fig. 3.



BY

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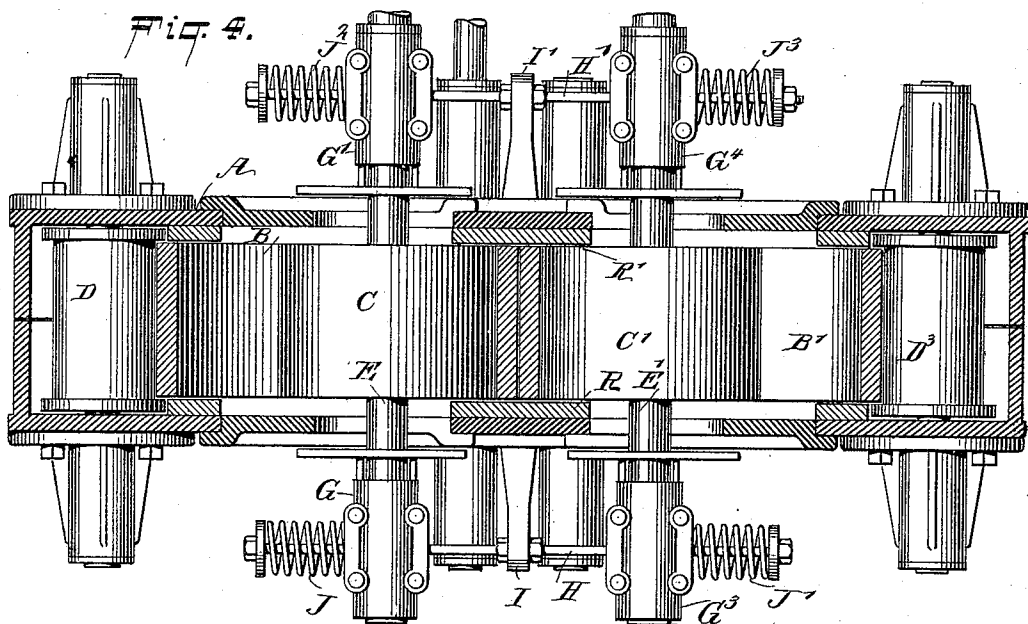
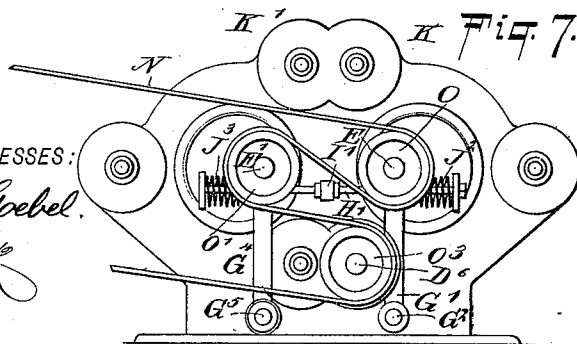
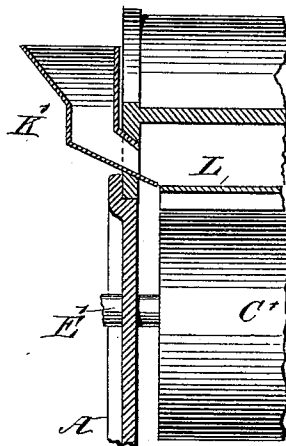
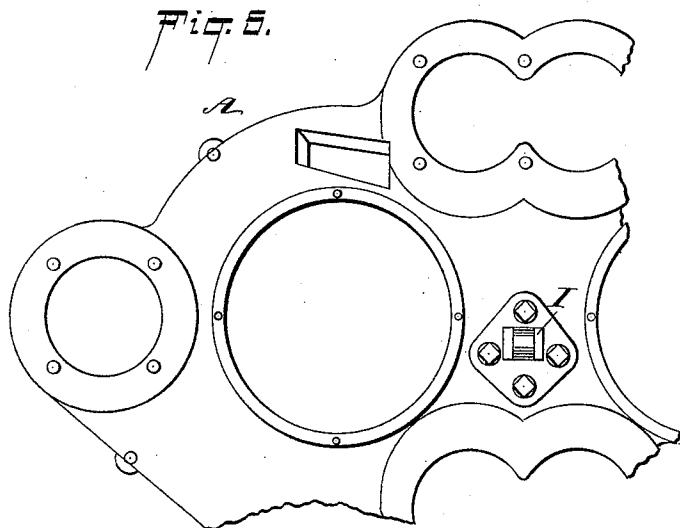


Fig. 5.



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UNITED STATES PATENT OFFICE.

CALEB GROZIER COLLINS, OF WOODSBURG, NEW YORK.

STONE AND ORE CRUSHER.

SPECIFICATION forming part of Letters Patent No. 519,566, dated May 8, 1894.

Application filed July 28, 1893. Serial No. 481,721. (No model.)

To all whom it may concern:

Be it known that I, CALEB GROZIER COLLINS, of Woodsburg, in the county of Queens and State of New York, have invented a new and Improved Stone and Ore Crusher, of which the following is a full, clear, and exact description.

The invention relates to crushers for reducing stones, ores and other hard and refractory substances to a pulverized state, and in which a revoluble roll and ring are employed for the purpose.

The object of the invention is to provide a new and improved crusher, which is simple and durable in construction, very effective in operation, and arranged to greatly reduce the friction and consequent loss of power and to increase the capacity of the machine.

The invention consists of certain parts and details and combinations of the same, as will be hereinafter described and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the improvement with parts broken out. Fig. 2 is a transverse section of the same on the line 2—2 of Fig. 1. Fig. 3 is a sectional side elevation of one of the bearings for the shaft. Fig. 4 is a sectional plan view of the improvement on the line 4—4 of Fig. 1. Fig. 5 is a side elevation of part of the casing. Fig. 6 is a transverse section of the feed mechanism; and Fig. 7 is a reduced rear elevation of the machine showing more particularly the driving mechanism.

The improved crusher is provided with a suitable casing A, preferably made in two longitudinal parts fastened together by transverse bolts, as plainly illustrated in the drawings. Within the casing A are arranged two rings B and B' in peripheral contact with each other, and within the rings are arranged crushing rolls C and C' respectively, in frictional contact with the interior of the rings directly opposite the contact point of the rings B and B'. The ring B is supported on guide rolls D, D' and D² journaled in suitable bearings in the sides of the casing A and similar rolls D³, D⁴, D⁵ support the other ring B' within the

casing A. Each of the guide rolls D, D', D², D³, D⁴ and D⁵, is preferably formed at its ends with annular flanges extending over the sides of the rings so as to hold the same in proper position.

The crushing rolls C and C' are secured on transversely-extending shafts E and E' respectively, of which the shaft E is journaled outside of the casing A in suitable bearings formed on the rocker arms G and G' extending downwardly and secured on the ends of a rock shaft G² journaled in suitable bearings in the lower part of the casing A. The other crushing roll C' has its shaft E' journaled in bearings arranged on the rock arms G³ and G⁴ both attached at their lower ends on a rock shaft G⁵ also journaled in the sides of the casing A. Through the rocker arms G and G³ passes loosely a rod H secured at its middle between the two rocker arms in a bracket I attached or formed on the front side of the casing A. A similar rod H' supported in a bracket I' extends loosely through the rocker arms G' and G⁴ on the rear side of the machine, as plainly shown in the drawings.

On the outer ends of the rods H and H' are coiled the springs J, J', and J², J³ respectively, pressing on the said rocker arms near their free ends, so as to force the crushing rolls C and C' in frictional contact with the interior surfaces of the rings B and B'. By adjusting the nuts on the outer ends of the rods H and H', the tension of the several springs may be increased or diminished, so as to force the said crushing rolls C and C' with more or less force, in contact with the interior surface of the rings B and B' respectively. By this arrangement, the rings B and B' are likewise forced with more or less force in contact with each other, as the crushing rolls are located on opposite sides of the contact point of the rings B, B' and are forced toward each other by the action of their respective sets of springs J, J² and J', J³. The shafts E and E' pass loosely through segmental slots in covers fitted over openings in the sides of the casing A, the said covers when removed permitting a removal of the crushing rolls C and C' in case of damage or for other purposes.

On the sides of the casing A are arranged the feed hoppers K and K' discharging on

the inclined feed tables L arranged within the casing A, directly above the crushing rolls C and C', the said feed tables being inclined inwardly and downwardly, so as to deliver the material from above between the crushing rolls and their corresponding rings; see Figs. 1 and 6.

In order to drive the machine, I employ a belt N connected with suitable driving machinery so as to impart a traveling motion to the belt, the latter passing first over a pulley O secured on one outer end of the shaft E of the crushing roll C, and then over a second pulley O' attached to the shaft E' of the crushing roll C' and then the belt passes over a third pulley O² secured on the shaft D⁶ of the guide roller D³, as plainly indicated in Figs. 1 and 7. It will be seen that by this arrangement the belt revolves the crushing rolls C and C' and at the same time, exerts a pressure on the said pulleys in such a manner as to force the crushing rolls C and C' toward each other, thus aiding the springs J, J² and J', J³. As illustrated in Fig. 3, each of the several shafts for the guide rollers employed, has its bearing in a sleeve P fitted into a corresponding boss A' projecting from the respective side of the casing A.

The inner end of each sleeve P terminates in a cup Q fastened to the inner surface of the respective side of the casing A and each cup is provided in its bottom with a channel Q' extending downwardly and outwardly to register with an aperture A² likewise inclined and formed in the corresponding side of the casing A. Thus, any oil that works along the sleeve P and shaft accumulates in the cup Q and drains from the latter to the outside of the casing by the channel Q' and opening A². Thus, no lubricant flows to the inside of the casing, and into the working parts and the material treated by the same. The inside of the casing is preferably lined with wearing strips R, R', bolted or otherwise secured to the sides of the frame and adapted to engage the side edges of the rings B and B' and crushing rolls C and C'.

When the machine is in operation, the material is fed through the hoppers K and K' to the crushing rolls C and C' at the top thereof, the material then being carried by the corresponding roller between it and its ring to be crushed by the ring and its roller coming in frictional contact with each other.

The crushed material passes from the sides of the rings into the lower open part of the casing to be discharged at the bottom thereof. It will be seen that by this arrangement the rings B and B' are forced in frictional contact with each other by their crushing rolls C and C' respectively, and the three points of frictional contact are in alignment with each other as plainly shown in Fig. 1 and described above.

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

1. A stone and ore crusher comprising revoluble rings in peripheral contact with each other, crushing rolls in interior frictional contact with the said rings, and at points in alignment with the peripheral contact point of the said rings, rocker arms carrying the shafts for the said crushing rolls and guide rolls carrying the said rings, substantially as shown and described.

2. A stone and ore crusher comprising revoluble rings in peripheral contact with each other, crushing rolls in interior frictional contact with the said rings, and at points in alignment with the peripheral contact point of the said rings, rocker arms carrying the shafts for the said crushing rolls and springs pressing on the said rocker arms to regulate the frictional contact between the rolls and rings, substantially as shown and described.

3. A stone and ore crusher, comprising two rings in peripheral contact with each other, guide rolls for supporting the said rings, crushing rolls in interior peripheral contact with the said rings, rocker arms carrying the shafts of the said crusher rolls, and springs pressing on the free ends of the said rocker arms to move the said crushing rolls toward each other to regulate the frictional contact with the rings, substantially as shown and described.

4. A stone and ore crusher, comprising two rings in peripheral contact with each other, guide rolls for supporting the said rings, crushing rolls in interior peripheral contact with the said rings, rocker arms carrying the shafts of the said crushing rolls, springs pressing on the free ends of the said rocker arms to move the said crushing rolls toward each other to regulate their frictional contact with the rings, and fixed rods passing loosely through the said rocker arms and carrying the said springs, the said rods being also provided with means for regulating the tension of the said springs, substantially as shown and described.

5. A stone and ore crusher, comprising rings in peripheral contact with each other, guide rolls for supporting the said rings, crushing rolls in interior peripheral contact with the said rings, pulleys on the shafts of the said crushing rolls and on the shaft of one of the said guide rollers, and a driving belt passing over the said pulleys in such a manner as to rotate the crushing rolls and move the same toward each other, substantially as shown and described.

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Witnesses:

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