

No. 639,418.

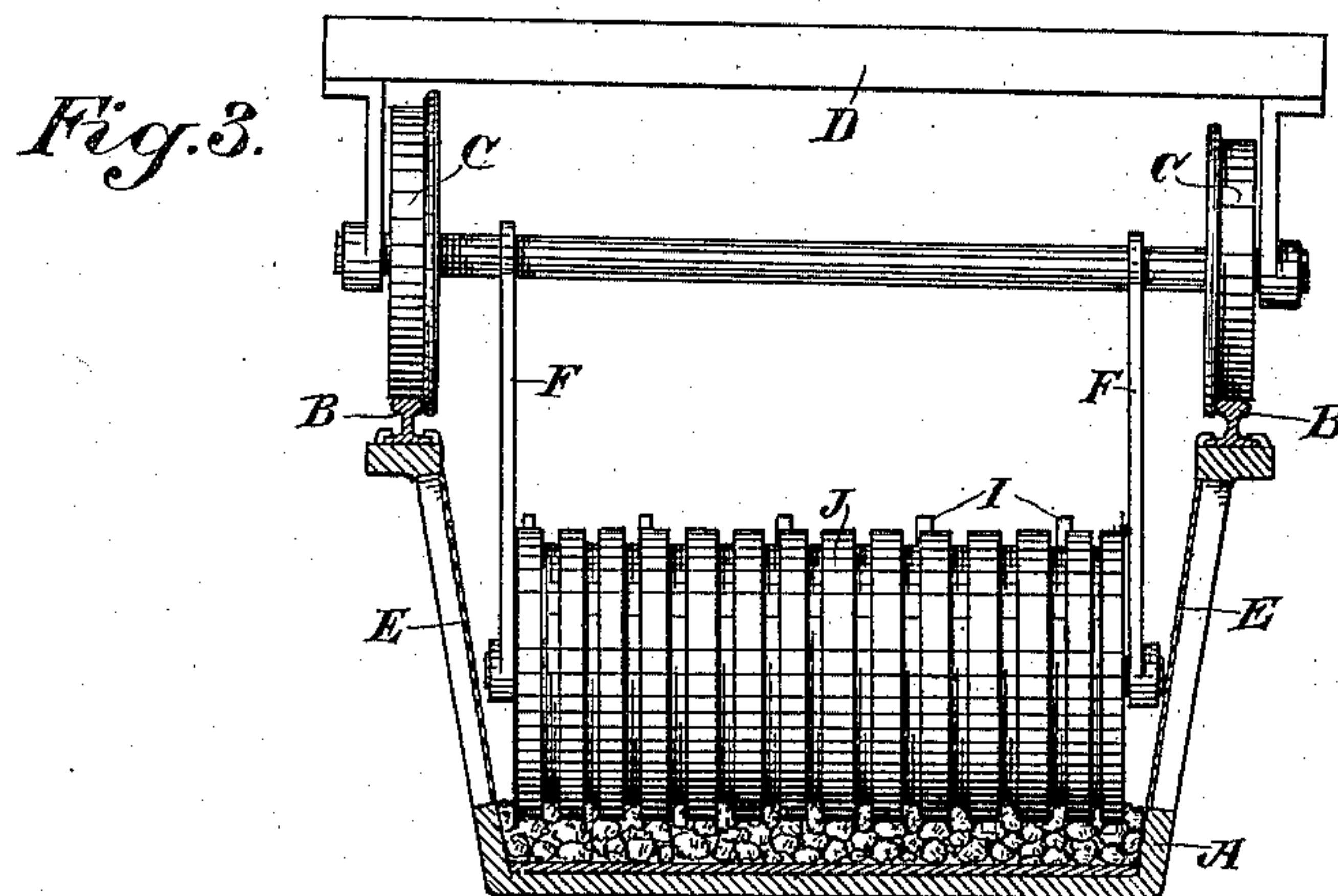
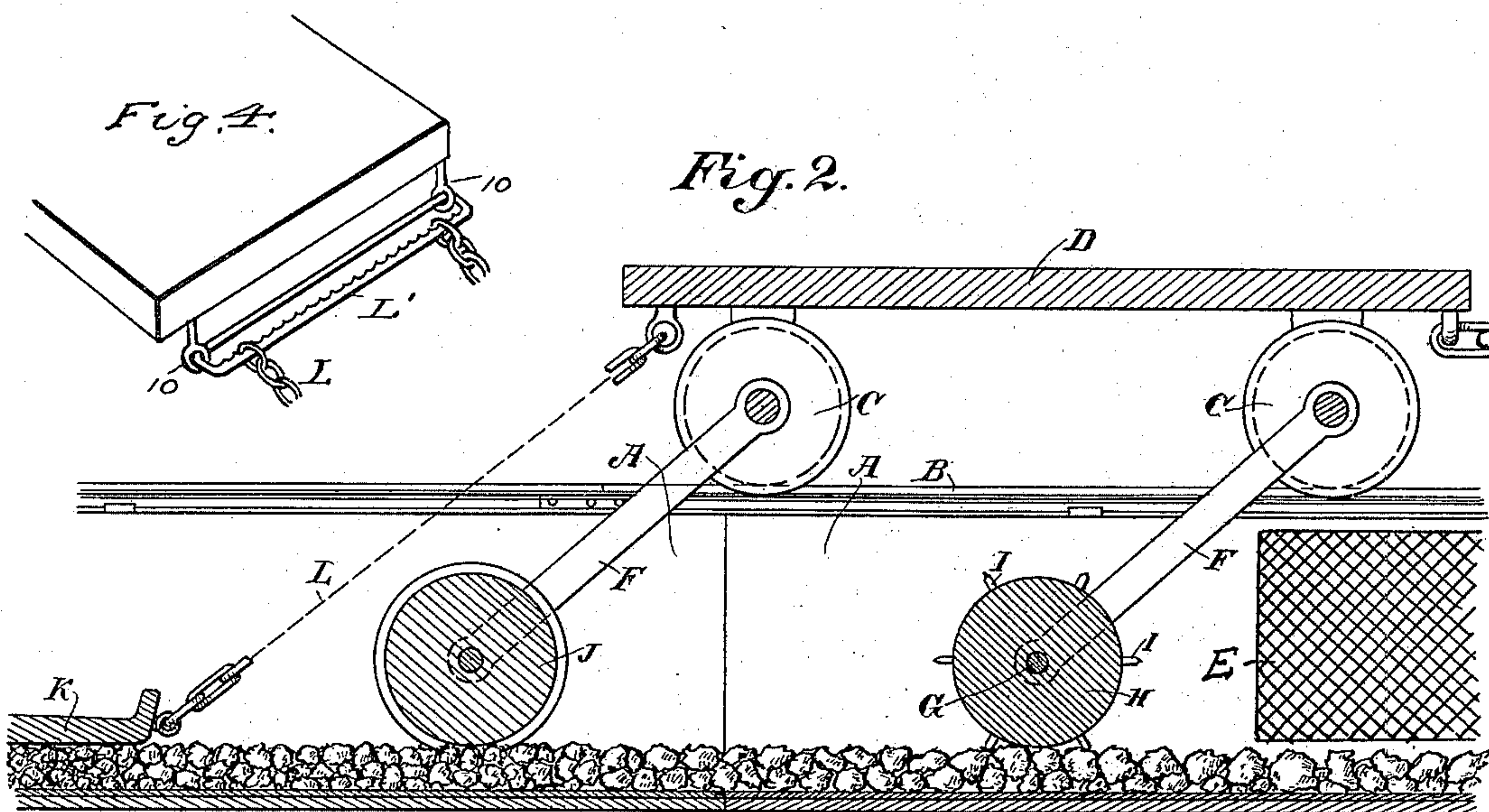
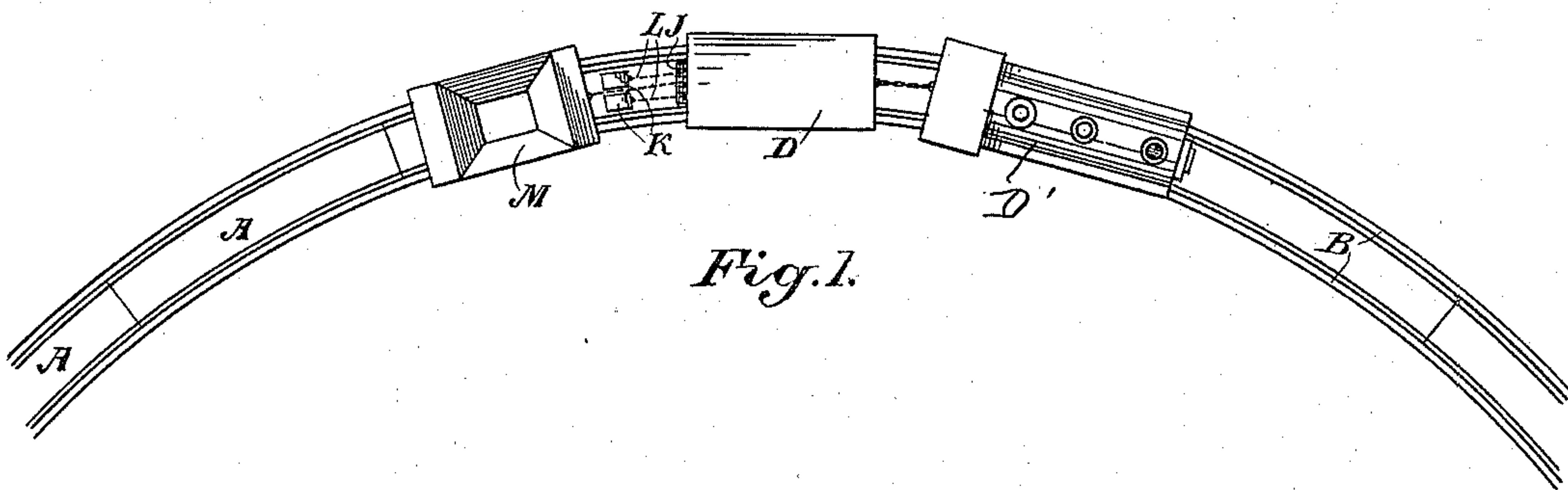
Patented Dec. 19, 1899.

H. MANN.


RAILWAY ORE PULVERIZER.

(Application filed Aug. 18, 1898.)

(No Model.)



Witnesses,
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UNITED STATES PATENT OFFICE.

HOUSTON MANN, OF PIUTE, CALIFORNIA.

RAILWAY ORE-PULVERIZER.

SPECIFICATION forming part of Letters Patent No. 639,418, dated December 19, 1899.

Application filed August 18, 1898. Serial No. 688,879. (No model.)

To all whom it may concern:

Be it known that I, HOUSTON MANN, a citizen of the United States, residing at Piute, county of Kern, State of California, have
5 invented an Improvement in Railway Ore-Crushers; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to an apparatus which
10 is especially designed for crushing and pulverizing ore or similar material and reducing it to a condition of fine pulp, and it is especially useful in crushing ores which carry valuable metals.

15 It consists in details of construction, which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a plan view of the device. Fig. 2 is a vertical longitudinal section through the
20 car and trough. Fig. 3 is a transverse section showing the trough supplied with screens. Fig. 4 is a detail showing the means for adjusting the chains or links L.

The object of my invention is to provide a
25 means for crushing ore or other material on a sufficiently large scale and an economical application of power so that low-grade or other ores can be reduced in large quantities and with rapidity.

30 In carrying out my invention I build a circular trough or trench of from fifty feet upward in diameter. This trough is preferably made of sections A of cast-iron, and these sections may be made with the rails B formed
35 directly with them, or the surfaces of the outer flanges of the trough may be adapted to receive the rails, which are bolted or otherwise secured thereon, thus forming a tramway upon which the wheels C of the car D are
40 adapted to travel.

In order to reduce the friction and cause the car to travel easily about the circle, the wheels upon the outer end of the axles are made proportionately larger than those upon
45 the inner ends, so that the car will always travel easily upon the track without climbing the rails, as is the case in turning curves with wheels of equal diameter.

50 The ends of the trough-sections are abutted and may be made with overlapping joints, if desired, to make a tight bottom, the joint also

being filled; if preferred, so that the trough will be absolutely tight.

The sides of the trough-sections may be, if desired, formed with openings adapted to receive screens E, fitted into the openings, so
55 that when the material within the trough has been sufficiently reduced the pulp will discharge through the screens, or the troughs may be made to be cleaned up periodically when
60 the pulp is in the proper condition therefor.

If screens are used, then receiving-troughs upon the outside will be arranged so that the pulp will be received therein and conveyed
65 to any point for further operation.

The car D may either carry its own motor or it may be drawn by an independent motor D', either steam, electrical, or other force, running upon the tracks and propelling the
70 car D around the circumference of the circle.

Connected with the front portion of the car or its axle are links F, extending downwardly and rearwardly and supporting in the lower ends the shaft G, upon which is mounted a
75 roller H, preferably having projecting arms or spikes I irregularly arranged around its periphery. To the rear of this roller is journaled a second roller J, similarly connected by links and adapted to travel over the surface of the material within the trough. This
80 second roller may be made of independent sections turning loosely upon the shaft or otherwise formed and may also be made with alternate corrugations, so that it presents ridges and intermediate depressions which
85 will act to crush the material over which the roller passes with greater rapidity. From a point on the car behind this roller is connected a drag or drags K by suitable flexible
90 connections. I prefer to employ two of these drags, which are simply heavy weights made thinner and lighter at the front and slightly upturned, so as to be drawn over the material in the troughs. Two of these drags are
95 placed side by side, not occupying quite the full width of the bottom of the trough, and the chains or links L, by which they are connected with the car, may be made movable outwardly or toward the center, so as to separate the drags or bring them close together,
100 and they may thus be made to travel over all parts of the pulp by adjusting them as needed.

The method of adjusting them is shown in Fig. 4, as by means of the links connecting with a longitudinally-slotted bar L', which extends across the rear of the car and is supported by eyebolts 10. The links of the chains may thus be slipped one way or the other in this longitudinally-slotted bar to adjust the drags as desired. At some point in the train, preferably behind the car D, is a feed-hopper or car M, which is also drawn by the motor and is loaded from time to time, and it is provided with any suitable form of gate or gates, so that the contents can be delivered at any point around the circle as the condition of the contents of the trough requires.

In the operation of the device the trough is supplied with a moderate quantity of ore which is already broken to small lumps, and the motor being set in operation the rollers and drags will be continually drawn over the contents of the trough, crushing and grinding it into a fine pulp. The forward roller will by the aid of the diggers I dig and loosen up the ore from the bottom, so that any lumps which have not been properly crushed will be continually brought up and subjected to the action of the apparatus. The second roller passing over this assists in crushing, while the drags will add to the crushing force, and when the material is sufficiently fine they are most serviceable upon the pulp in the trough.

From time to time ore may be discharged from the ore-hopper at points along the trough, and if screens are used upon the sides the work can be made continuous.

It will be understood that amalgamation may also be carried on within the trough in the same manner as with an arrastre or similar mill.

The trough may be also provided with removable bottom dies, so that when these are worn they can be replaced by others without destroying the trough-sections.

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

1. An ore-crushing apparatus, consisting

of a single circular trough, formed of short segmental segments, abutting and forming tight joints at their meeting ends, said sections having upwardly-diverging sides and flanges at the top, rails secured upon said flanges and a crushing apparatus consisting of a motor with wheels traveling upon said rails, a car drawn by said motor, having a roller with spiked surface, loosely connected with the front by links, a second crushing-roller following and similarly connected with the rear of the car and a plurality of weighted drags following the second roller substantially as described.

2. In an ore-crushing apparatus, a sectional circular trough having the rails of a track fixed upon the flanges forming the top of the trough, a motor, the wheels of which are adapted to travel upon said track, a second car connected with and drawn by said motor, links loosely connected with the front and rear axles, and inclining backwardly therefrom, a spiked crushing and digging roller, the shaft of which is journaled to the front set of links, a corrugated crushing-roller similarly connected with the rear set of links, a plurality of heavy, flat-bottomed drags with chains extending from the front of the tracks to the rear of the car, and a mechanism by which the drags may be moved to or from each other, substantially as described.

3. In an ore-crushing apparatus, a continuous circular trough having rails upon the upper flanges thereof, a motor mounted upon wheels adapted to travel upon said rails, a continuous loosening crushing and grinding mechanism drawn by said motor and comprising a preliminary spiked roller by which the material in the trough is loosened up, a following crushing-roller and supplemental heavy flat-bottomed drags, a traveling feed device and discharge-screens in the sides of the trough.

In witness whereof I have hereunto set my hand.

HOUSTON MANN.

Witnesses:

S. H. NOURSE,
JESSIE C. BRODIE.