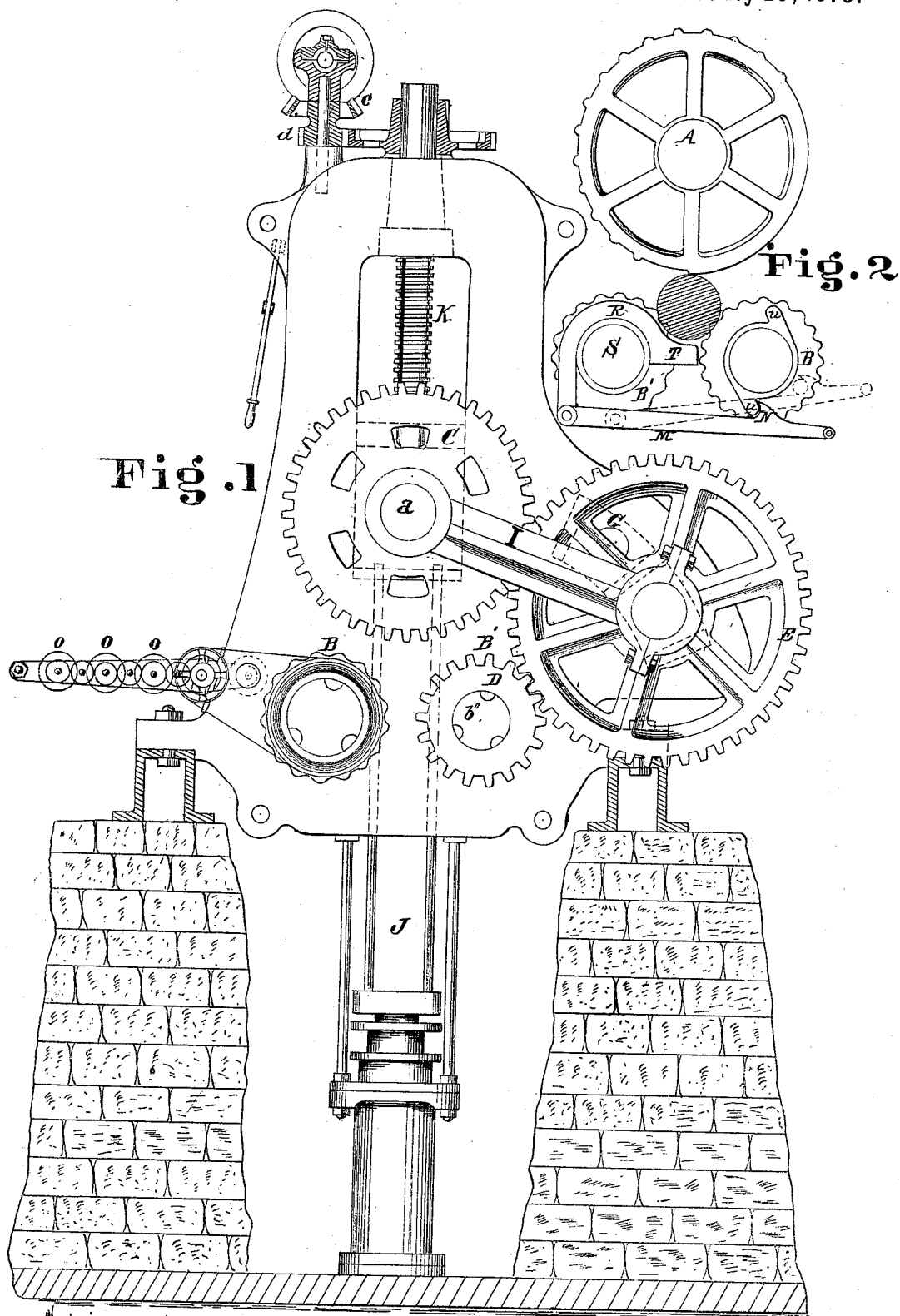




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Inventor:

Frank Danks

F. DANKS.
Puddlers' Ball-Squeezers.

No. 141,207.

Patented July 29, 1873.

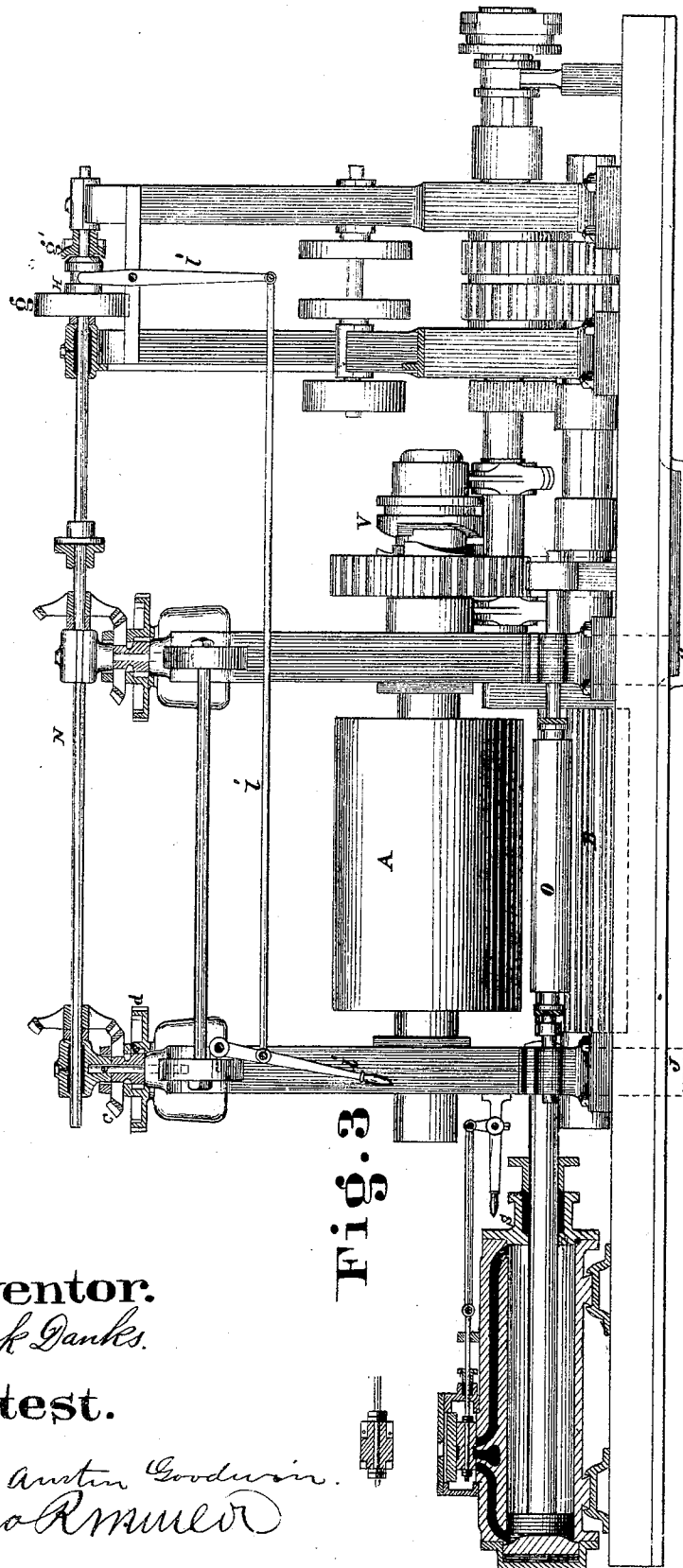


Fig. 3

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UNITED STATES PATENT OFFICE.

FRANK DANKS, OF CINCINNATI, OHIO.

IMPROVEMENT IN PUDDLERS' BALL-SQUEEZERS.

Specification forming part of Letters Patent No. **141,207**, dated July 29, 1873; application filed October 2, 1872.

To all whom it may concern:

Be it known that I, FRANK DANKS, of the city of Cincinnati, in the county of Hamilton and State of Ohio, have invented a certain new and useful Improvement in Squeezers for Compressing Puddle-Balls, of which the following is a specification:

My invention relates to that class of machines for squeezing puddle-balls in which the compressing-roll is made adjustable vertically, so as to be capable of working balls of any desired size or consistency, and reducing the same to blooms of any desired size; also, to a means of retaining the ball in the rolls, and to a device for ejecting them therefrom.

In the drawings, Figure 1 shows particularly the mode of gearing the compressing-rolls together; also, the location of the hydraulic jacks. Fig. 2 shows the discharging apparatus. Fig. 3 is a general front view of the machine.

Three rollers—the upper adjustable roll A, plain on a part of its periphery, and corrugated on a part, and two corrugated rollers, B B', running in the same direction with each other and with the roll A—constitute the compressing-rolls, to which motion is communicated from the pinion D on the neck of the corrugated roller B' by means of a spur-wheel, E, revolving in a sliding box that has its bearing in a curved slot, G, the arc of which is described from the center of the roller B', by which means the gearing of the spur-wheel with the pinion is maintained from all points of the slot G. The gearing of the spur-wheel E with the pinion D is secured by links I on each side of the wheels C and E. Links might also be used instead of the sliding journal-box and the curved slot G for the purpose of preserving the contact of the spur-wheel E and the pinion D; but such a construction would be deficient in firmness, and, besides, it would throw the whole weight of the heavy spur-wheel on the pinion D. The spur-wheel E may be relieved of the weight of the adjustable roll, in large measure, by means of hydraulic jacks J J placed beneath the journal-boxes in which the journals of the rolls rest. These jacks are sufficiently powerful to raise the roll, but are to be used in connection with the slotted screws K K, which slide ver-

tically in and receive their motion from a feathered pinion, c, operated by pinion d on the vertical shaft e, to which motion is transmitted by bevel-gear from the horizontal shaft M. Two loose pulleys, g g', running loosely on the shaft N, transmit their separate motion to it by means of a double clutch, H, sliding on a feather on the shaft, and operated by a lever, i. That pulley which imparts a descending motion to the screws is so proportioned as to transmit a slow movement to it, while the speed of the reverse pulley for elevating the screws, which, from the assistance of the hydraulic jacks J J, require but little power, is correspondingly accelerated.

By means of the adjusting mechanism for regulating the vertical position of the upper roll A, I am enabled gradually to reduce the distance between this roll and the lower roll as the ball is elongated.

The feed-rolls O O O, which are geared together, are driven by a belt running on a pulley keyed on the neck of the corrugated roller B.

By causing the roll A to revolve in the same direction with the rolls B B', the ball can be kept in the machine and subjected to the action of the rolls during any number of revolutions.

The puddle-ball as brought from the puddling-furnace is placed upon the feed-rolls, whence it passes to the compressing-rolls, by whose joint action it is brought into an elongated and cylindrical form. The ends are kept from extending beyond the ends of the rollers by a steam trip-hammer, S, or other appropriate devices.

In order to relieve the gearing mechanism, to some extent, from the great strain upon it, incident to the working of the metal as it begins to cool and harden, I employ a self-acting crab, V, which is caused, by means of a spring or any equivalent means, to engage with the wheel C on the shaft of the upper roll. The gearing of the compressing-roll is such that the normal rate of speed of the periphery of the upper roll is slower than that of the lower rolls; but as the metal hardens under the combined action of the rolls and is pressed by the lower rolls against the upper one, its friction against the latter begins to in-

crease its speed over that of the gear-wheel C. When this increase in the relative speed of the roll A and wheel C takes place the crab V slips over the detent on the face of the wheel C, and thus relieves the strain upon the gearing; but as soon as the relative rate of revolution of the roll A and the wheel C is restored the crab V again engages with the face of the wheel.

The device for ejecting the bloom from the squeezers consists of levers R R, curving over the necks on each end of the corrugated roller B. On the inner end of the curved lever is a shoe, T, projecting over close to the surface of the oppositeroller and under the bloom. The opposite end of the lever extends downward and is jointed to a horizontal rod, M, which extends under the neck of the opposite roller B', and is provided with a hook, N, that can at any time be caused to engage with the lugs *u u* on each end of the roller B'. These lugs carry the rod upward until it comes in contact with the neck of the roll, by which time the bloom will have been carried by the shoe T to the top of and over B', when it rolls away on an inclined plane, while the lever M, being released by the neck of the roll, falls

back to its original position, and the rolls are ready to receive another puddle-ball.

My invention may be varied from in non-essential particulars—as, for example, the rolls, either one or all of them, may, if desired, be somewhat flattened.

I claim—

1. The combination, with the gearing, of the links I I and the curved slots G G, by means of which the gearing of the pinion D with the wheel C upon the adjustable roll A is effected, and at the same time the pinion D is relieved from the weight of the intermediate spur-wheel E.

2. The self-adjusting crab V, in combination with the wheel C, the corrugated rolls B B', and the upper compressing-roll A, substantially as and for the purpose described.

3. The combination of the levers R M, the shoe T, and the rolls B B', when arranged and operating, substantially as described, to discharge the bloom from the machine.

FRANK DANKS.

Witnesses:

W. AUSTIN GOODMAN,
JNO. R. MINER.