

No. 741,892.

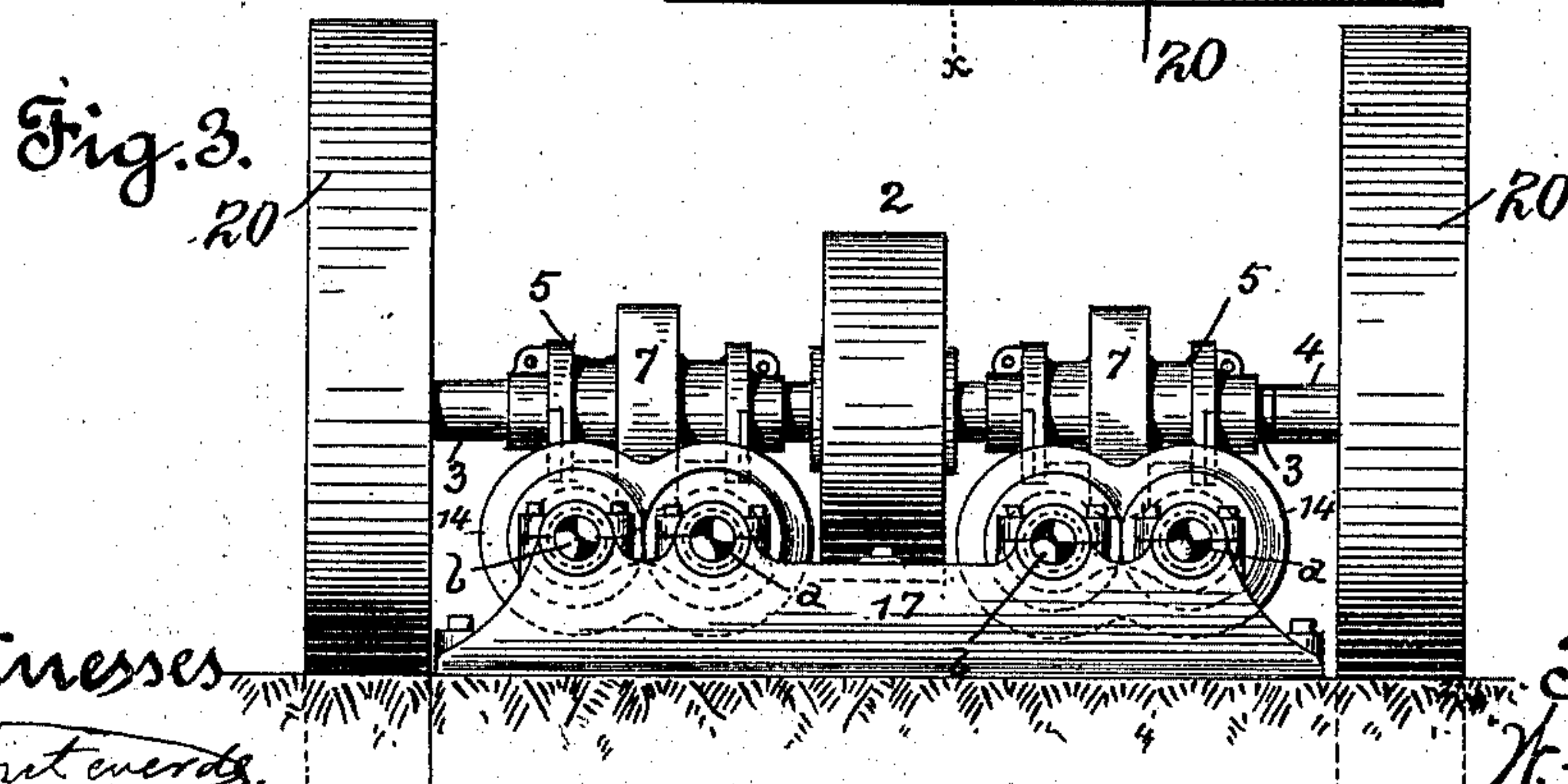
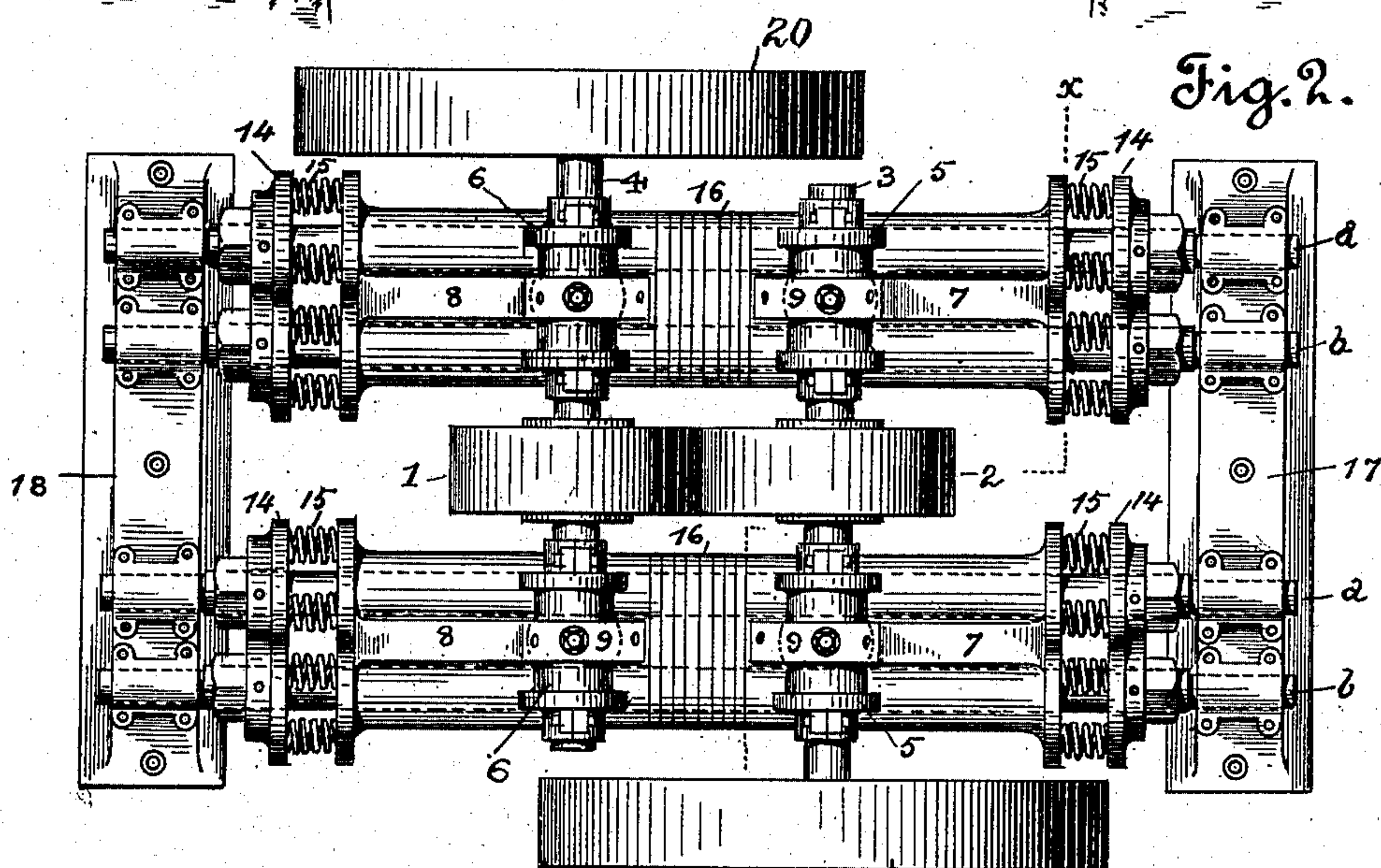
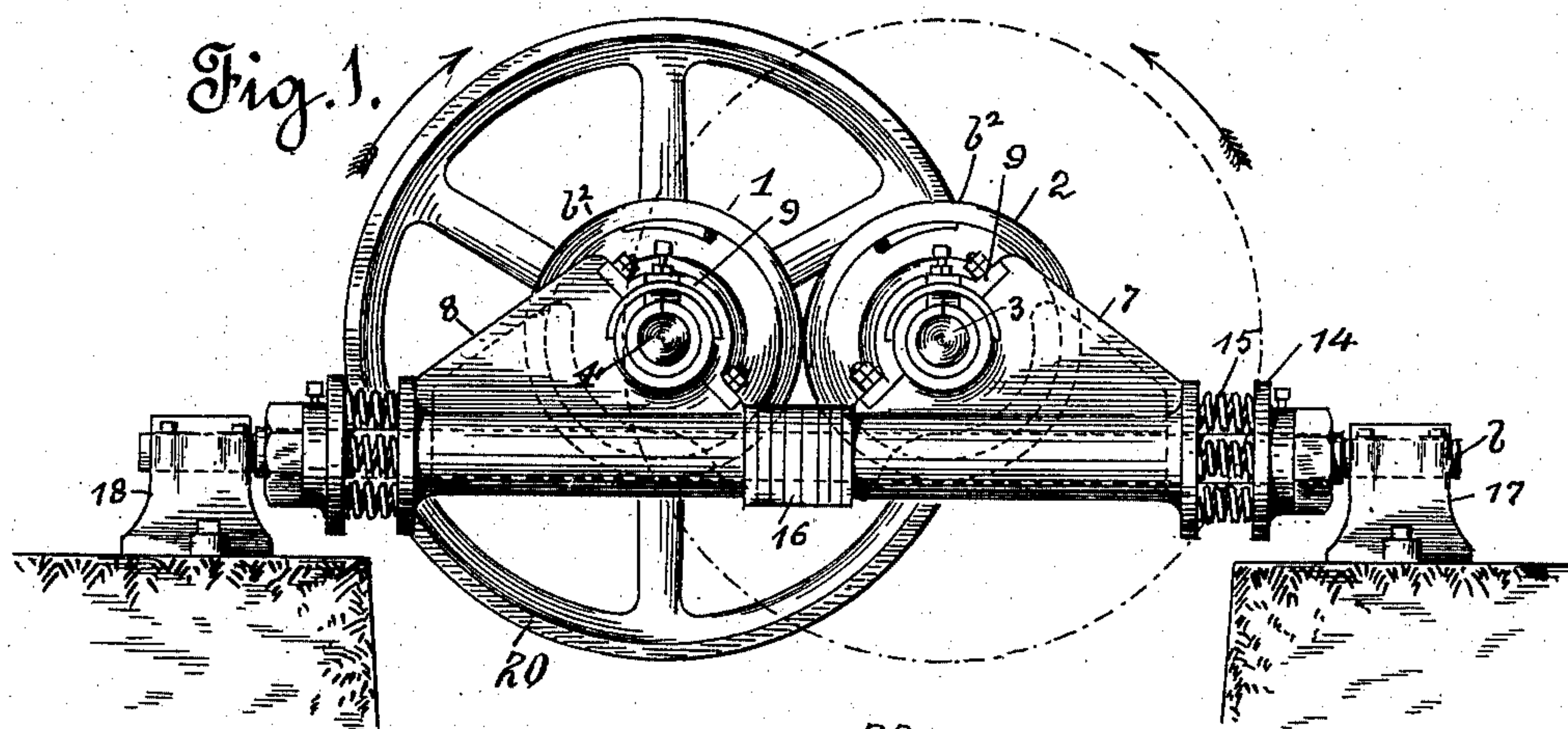
PATENTED OCT. 20, 1903.

W. G. DODD.
CRUSHING ROLLS.

APPLICATION FILED MAY 1, 1901.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses
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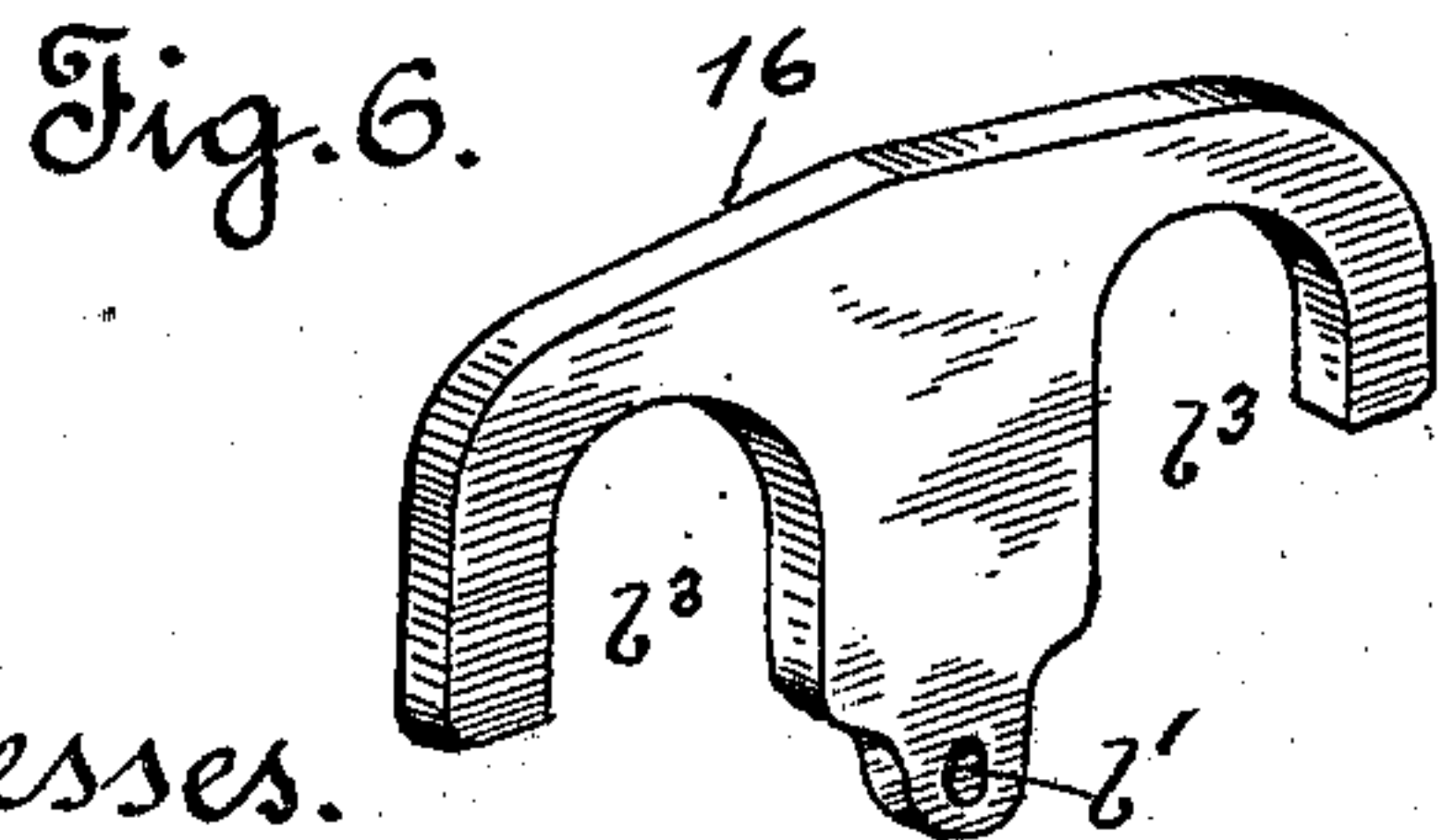
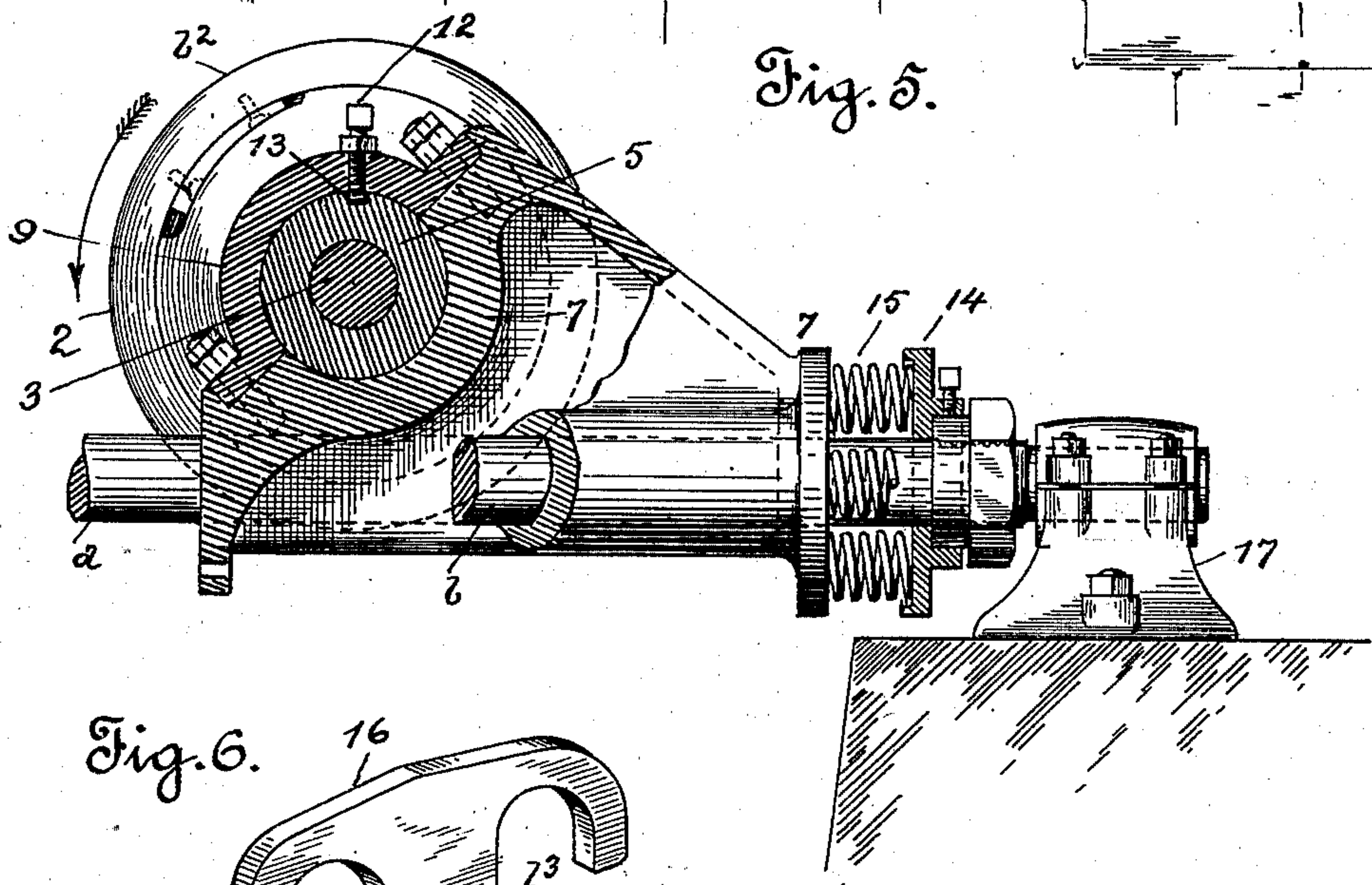
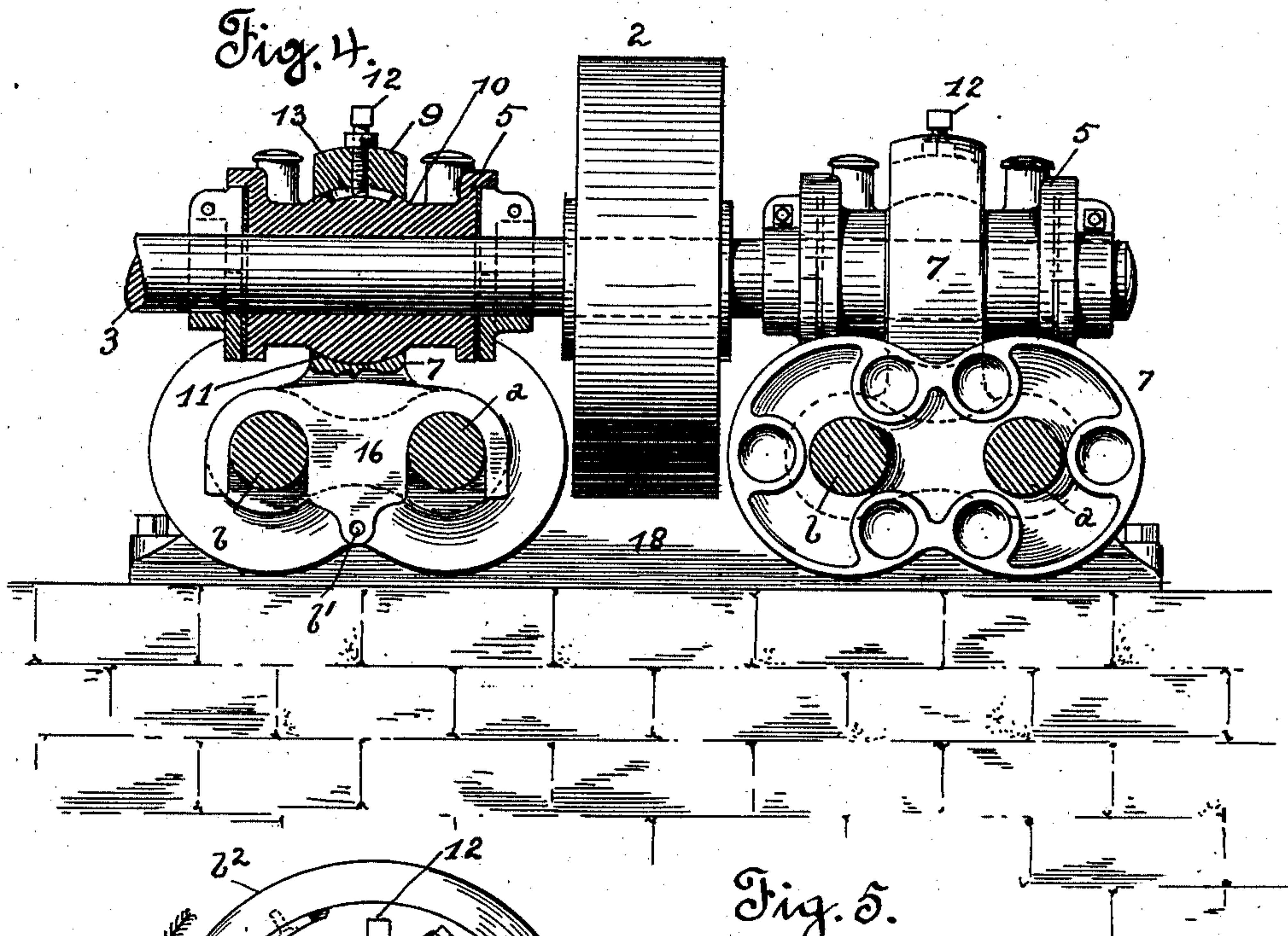
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2 SHEETS—SHEET 2.



Witnesses.

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UNITED STATES PATENT OFFICE.

WILLIS G. DODD, OF SAN FRANCISCO, CALIFORNIA.

CRUSHING-ROLLS.

SPECIFICATION forming part of Letters Patent No. 741,892, dated October 20, 1903.

Application filed May 1, 1901. Serial No. 58,270. (No model.)

To all whom it may concern:

Be it known that I, WILLIS G. DODD, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Crushing-Rolls; and I do hereby declare the following to be a full, clear, and exact description of the same.

The present invention relates more particularly to that class of crushing machinery known as "cornish-rolls," usually employed for the crushing or pulverization of stone, quartz, or metal-bearing ores; and the invention resides more especially in the novel construction of the supporting mechanism for the crushing-rolls, whereby the heavy supporting frame or base ordinarily used in connection with this class of machinery is dispensed with. Heretofore crushing-rolls of this class have been constructed with a heavy or massive supporting frame or base on which one of the crushing-rolls is mounted in rigid journal-brackets, the other crushing-roll being mounted in sliding or adjustable bearing-brackets. Inasmuch as the rolls when crushing ore develop severe strains and are subjected to heavy shocks, it is required, as one of the rolls is rigidly connected, that the supporting frame or base be of sufficient strength to withstand the strains and shocks thus produced. For this reason a massive supporting frame or base has been found necessary for crushing-rolls of this character.

The main object of the present invention is to dispense with the necessity of employing this heavy supporting frame or base and to so construct the supporting means for the crushing-rolls that the strains and shocks will be evenly distributed and taken up by the tension-rods.

The wearing parts of the rolls consist of the tires or shells fastened to the roll-centers. These tires are of steel and are usually from two and one-half inches to three inches in thickness, and in constant service they last but a short time. As they wear away the standard distance between the crushing-rolls must be maintained. Where one of the crushing-rolls is mounted in sliding or adjustable bearing-brackets and the opposing

roll in fixed bearing-brackets, there is an uneven wear of the tires and considerable time is required to adjust the rolls to compensate for the uneven wear.

A further object of the present invention resides in permitting each roll to adjust itself proportionately to the wear of the tires and distributing the wear equally between the tires and to maintaining the standard distance between the crushing-faces of the rolls.

A further object of the invention is to obtain between the bearing-brackets an equal distribution of the severe strains, shocks, and jars produced while the machine is in operation, thus enabling the crushing-rolls to run steadily and in balance without the employment of a base-frame.

A further object of the invention is the production of a comparatively light and inexpensive crushing apparatus, one that may be readily taken apart and set up for operation and a machine which may be conveniently transported from place to place or into mountainous regions.

In order to comprehend the invention, reference should be had to the accompanying sheets of drawings, wherein—

Figure 1 is a side view of the crushing-roll in working position. Fig. 2 is a top plan view of the mechanism disclosed by Fig. 1 of the drawings. Fig. 3 is an end view in elevation of the machine. Fig. 4 is an irregular cross-sectional view in elevation taken on line *x x*, Fig. 2. Fig. 5 is an enlarged detail sectional view of one of the bearing-brackets, disclosing one of the crushing-rolls, journal-box therein, and tension-rods upon which the bearing-bracket is mounted; and Fig. 6 is a perspective view of one of the space-plates for holding the bearing-brackets apart.

The numerals 1 2 are used to indicate the crushing-rolls, which rolls are secured to or form a part of the shafts 3 4, respectively. There is no distinction between the rolls as being main or second rolls, as each roll may be said to constitute a main roll, inasmuch as each roll is adjustable toward its opposing roll. The shaft 3 works in circular journal-box 5 and shaft 4 in the circular journal-box 6. These journal-boxes rest, respectively, in

bearing-brackets 7 8, being held in place by cap 9. Each journal-box is formed with a convex face portion 10, which rests within the concave circular seat 11 in the head of the bearing-brackets. By means of the convex face of the journal-boxes the same are permitted to swing or oscillate within the bearing-brackets, although prevented from rotation by means of the set-screw 12. This set-screw projects through the cap 9 of the bearing-brackets and rests within the transverse groove 13, cut in each journal-box, Fig. 4 of the drawings. The bearing-brackets are slidably mounted upon the tension-rods *a b*, being held thereon by collars 14. Between these collars and the outer end of the bearing-brackets are interposed the heavy springs 15. These springs maintain a constant inward pressure upon the bearing-brackets and hold the same together. The bearing-brackets are held apart at the center of the tension-rods by the space-plates 16, which plates are cut away, as shown at *b*³, Fig. 6, so as to straddle the tension bars or rods *a b*, and said plates are held together by means of a longitudinal bolt passed through the opening *b*¹ of the plates. By means of these space-plates the bearing-brackets are held apart a given distance, sufficient to maintain the faces or tires *b*² of the crushing-rolls separated. The projecting ends of the tension-rods are united by the cross-tie plates or supports 17 18, Fig. 2.

When the parts are arranged as described, the crushing-rolls are adapted for the work of crushing stone, quartz, or ore, the only requirement being that the cross-tie plates be bolted or otherwise anchored. In Fig. 1 of the drawings these cross-tie plates are illustrated as being secured to permanent foundations or pillars 19. However, this feature is immaterial, as the cross-tie plates may be bolted to beams having sufficient height to clear the crushing-rolls of the ground.

Each roller-shaft is provided with a belt-wheel 20, which is driven from any suitable source of power by means of a belt. (Not shown.)

As the periphery or tires of the crushing-rolls wear away the said rolls are forced inward by the pressure of the springs 15, so as to maintain a standard distance between the crushing-surfaces. The pressure of these springs acts upon the crushing-rolls through the medium of the slide bearing-bracket, and the inward movement of these is limited by the space-plates. Consequently to compensate for the frictional wear of the tires it is only required to remove the space-plates one at a time as the wear takes place. For instance, eight space-plates are indicated interposed between the bearing-brackets. The thickness of each tire is, say, two and one-half inches or total tire thickness of five inches. After five-eighths of an inch of the tire thickness have worn away one space-plate, which

is five-eighths of an inch thick, is removed. In this manner the relative position of the crushing-rolls is maintained throughout the life of the tires or wearing-surfaces. Inasmuch as each crushing-roll is mounted to rotate in sliding bearing-brackets, the strains, jars, or shocks of the rolls will be equally distributed between the said brackets, which is not the case where one crushing-roll is rigid and the opposing roll movable longitudinally. Again, the crushing pressure is equally distributed between the rolls and the rolls permitted to run steadier, smoother, and more evenly balanced where the rolls are independently movable upon the tension-rods. By reason of the concavo-convex bearing for the journal-boxes the crushing-rolls are permitted to tilt or swing, if so desired, during the operation of crushing.

In this class of machinery it is required for successful work that the feed-hopper be so arranged as to deliver the ore to be crushed directly over the center or between the crushing-rolls. Where one crushing-roll is a fixed one and the opposing roll mounted in slidable bearing-brackets, it is necessary as said movable roll is adjusted to compensate for wear of the tires that the position of the feed-hopper be changed, else the feed of the material to be crushed will not be over the center or between the crushing-faces of the rolls, but to one side thereof. This adjustment of the feed-hopper I desire to overcome, as it requires much time to so adjust. This I accomplish by mounting each roll in the self-adjustable or slidable bearing-brackets. When thus mounted, the wear of the tires is evenly distributed between the crushing-rolls, and by the spring-pressure upon the bearing-brackets the crushing-rolls are maintained a standard distance apart. Consequently the rolls remain at all times directly beneath the feed-hopper, so that the feed of the material to be crushed is over the center or between the crushing-faces of the rolls. Thus it is not required to adjust the position of the feed-hopper with the wear of the tires, as the wear is automatically taken up by the self-adjustment of the rolls.

To dismantle the machine for transportation or other purposes, it is only required that the cross-tie plates be removed and the rolls released by unfastening the caps 9. The rolls may then be removed or separated from the bearing-brackets. If desired to separate the bearing-brackets, the tension-rods are removed from the cross-tie plates and the collars 14 released. The bearing-brackets may then be slipped from off the tension-rods and the parts readily packed for shipment or transportation.

Having thus described the invention, what is claimed as new, and desired to be protected by Letters Patent, is—

In a roller-crusher, the combination with the grinding-rolls, of separated rods arranged

in the same horizontal plane at each side of
the rolls and between which said rolls work,
means at the respective ends of the rods for
supporting the same, a pair of slidable bear-
5 ing-brackets for each crushing-roll, each of
said brackets being sleeved upon a pair of
rods, means for exerting an inward pressure
upon said bearing-brackets, and universal

bearings carried by said brackets upon which
the crushing-rolls are suspended. 10

In witness whereof I have hereunto set my
hand.

WILLIS G. DODD.

Witnesses:

LEE D. CRAIG,
N. A. ACKER.