

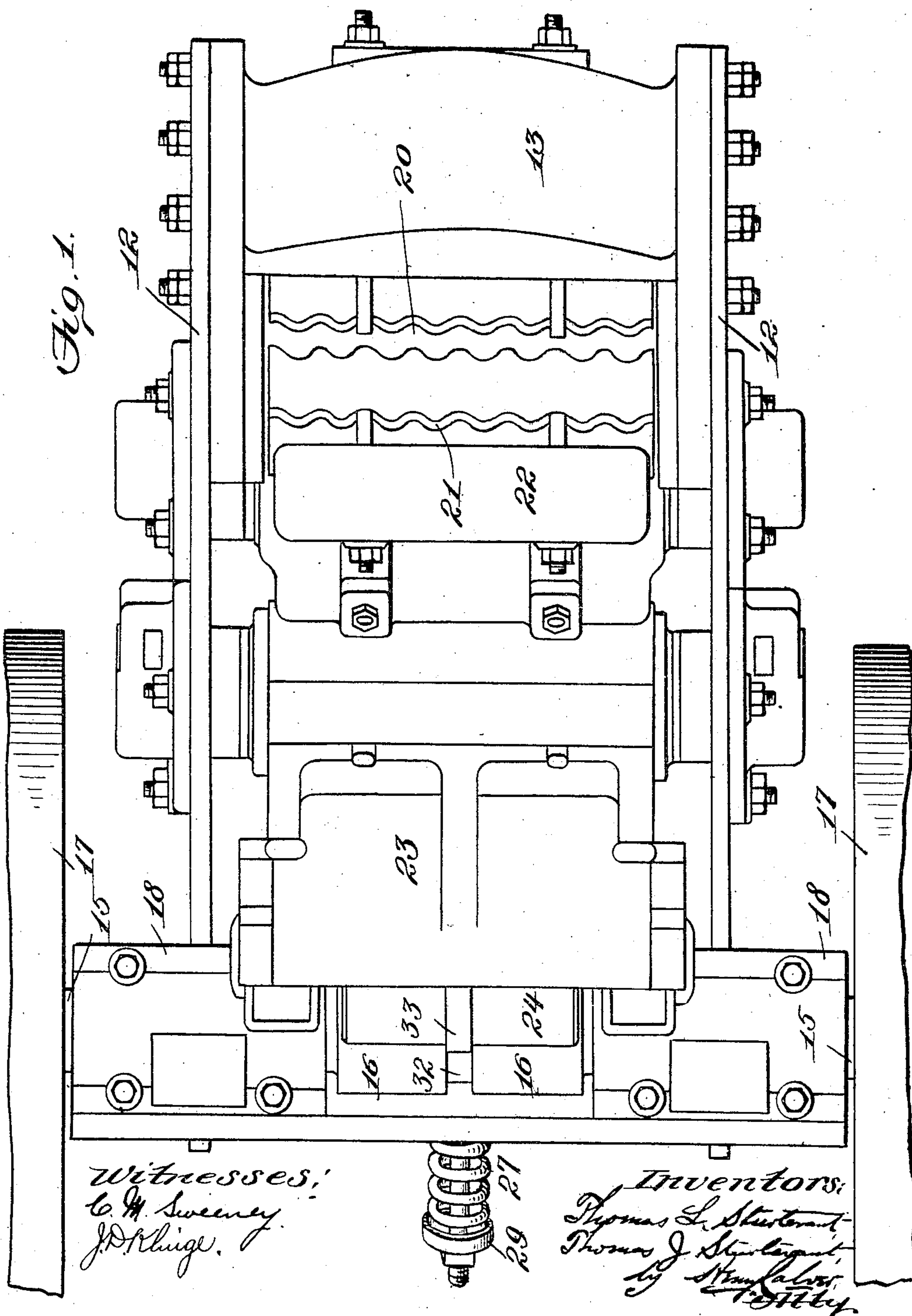
No. 859,348.

PATENTED JULY 9, 1907.

T. L. & T. J. STURTEVANT.  
CRUSHER.

APPLICATION FILED OCT. 4, 1906.

4 SHEETS—SHEET 1.



No. 859,348.

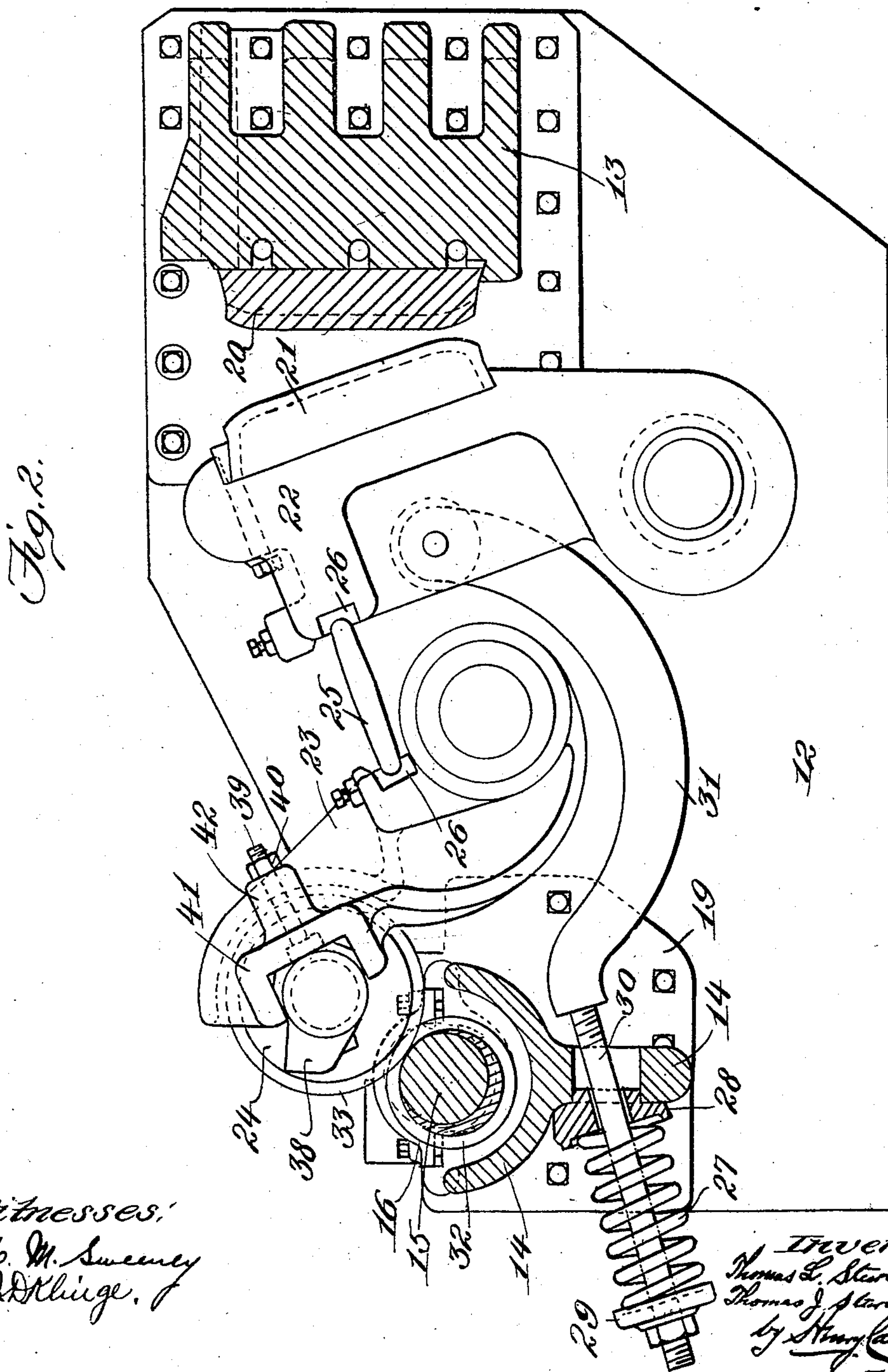
PATENTED JULY 9, 1907.

T. L. & T. J. STURTEVANT.

**CRUSHER.**

APPLICATION FILED OCT. 4, 1908.

4 SHEETS—SHEET 2.



Witnesses:  
C. M. Sweeney  
J. D. Klinge.

Inventors,  
Thomas L. Sturtevant  
Thomas J. Sturtevant  
by Henry Calver,  
Attys.

No. 859,348.

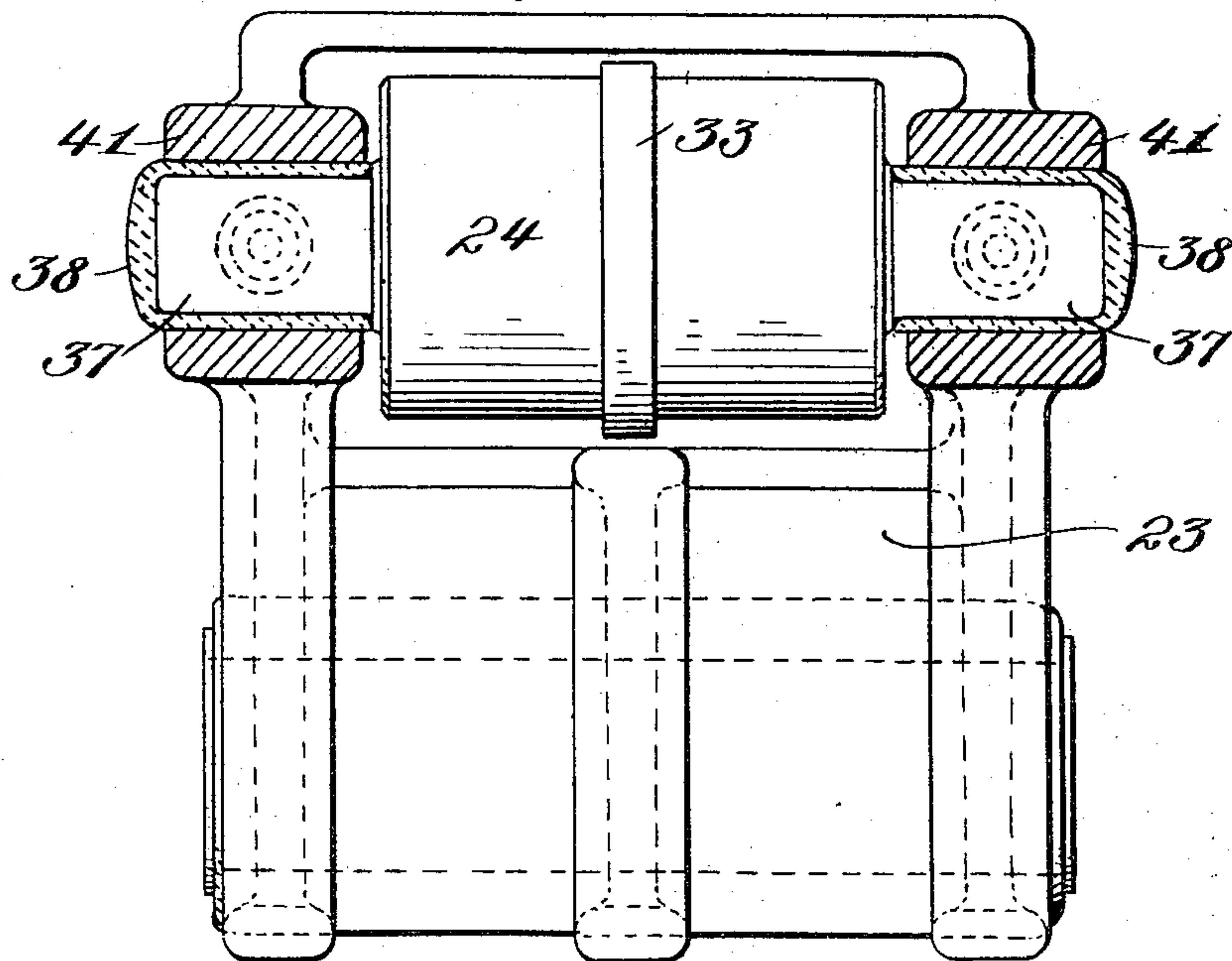
PATENTED JULY 9, 1907.

T. L. & T. J. STURTEVANT.  
CRUSHER.

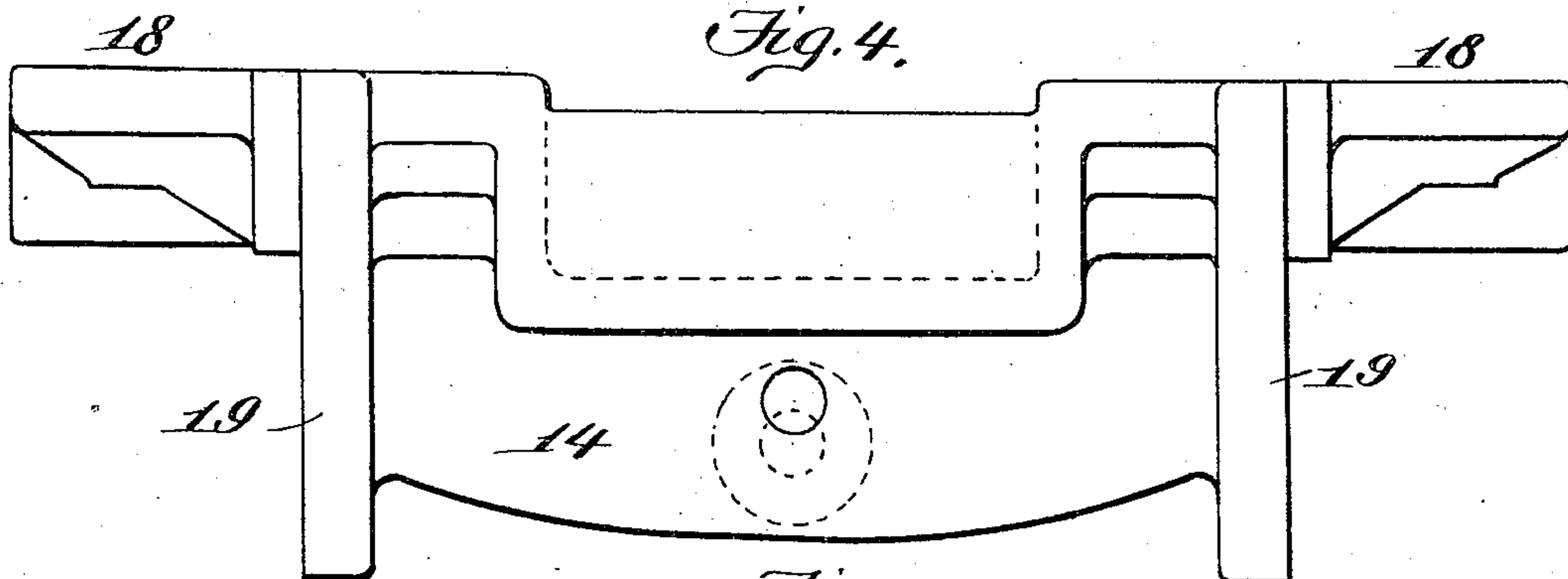
APPLICATION FILED OCT. 4, 1906.

4 SHEETS—SHEET 3.

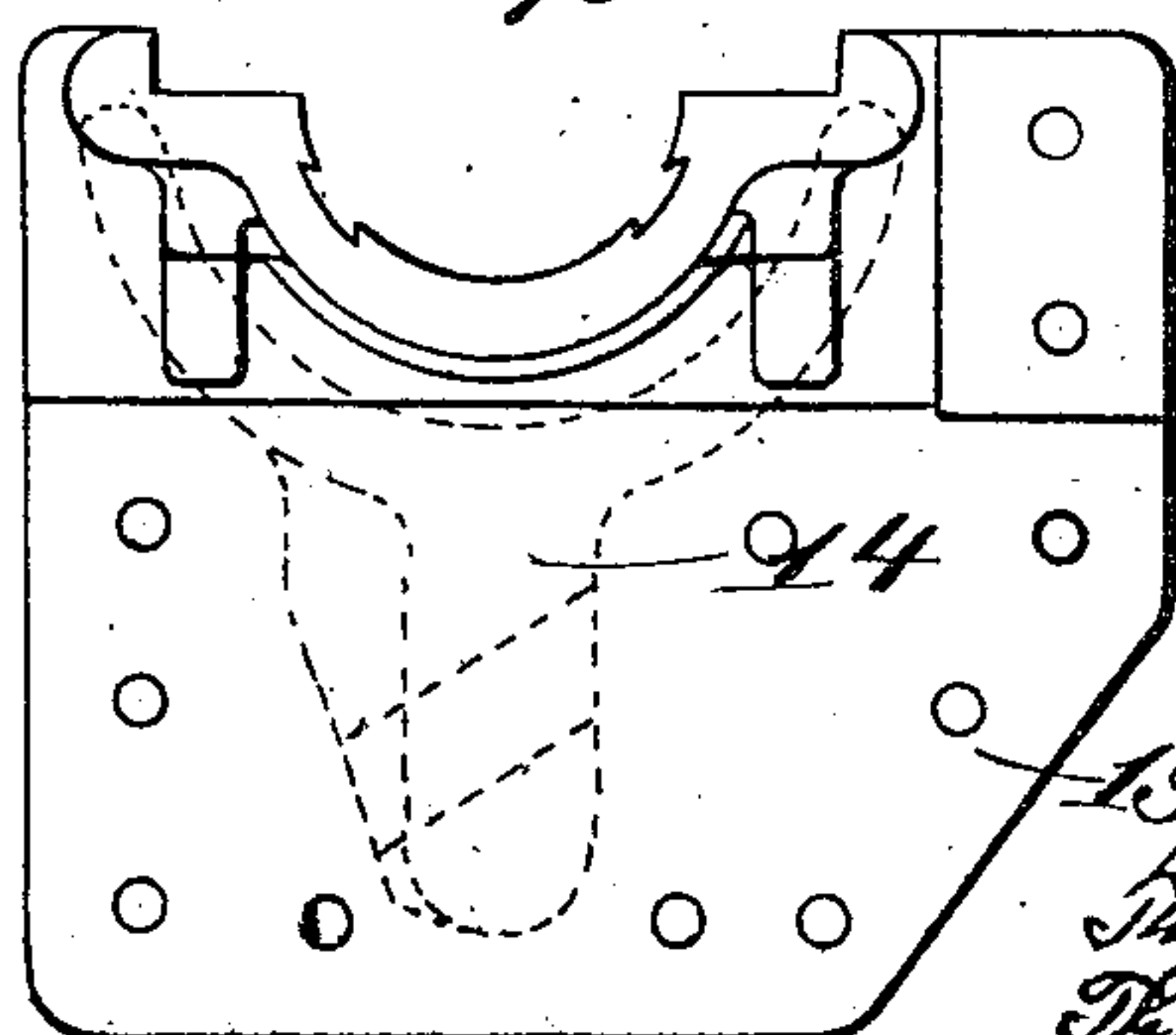
*Fig. 3.*



*Fig. 4.*



*Fig. 5.*



*Witnesses:*  
*C. H. Sweeney*  
*J. D. Thigb.*

*Inventors,*  
*Thomas L. Sturtevant,*  
*Thomas J. Sturtevant,*  
*by* *Wm. F. L. L.*  
*Att'y*



No. 859,348.

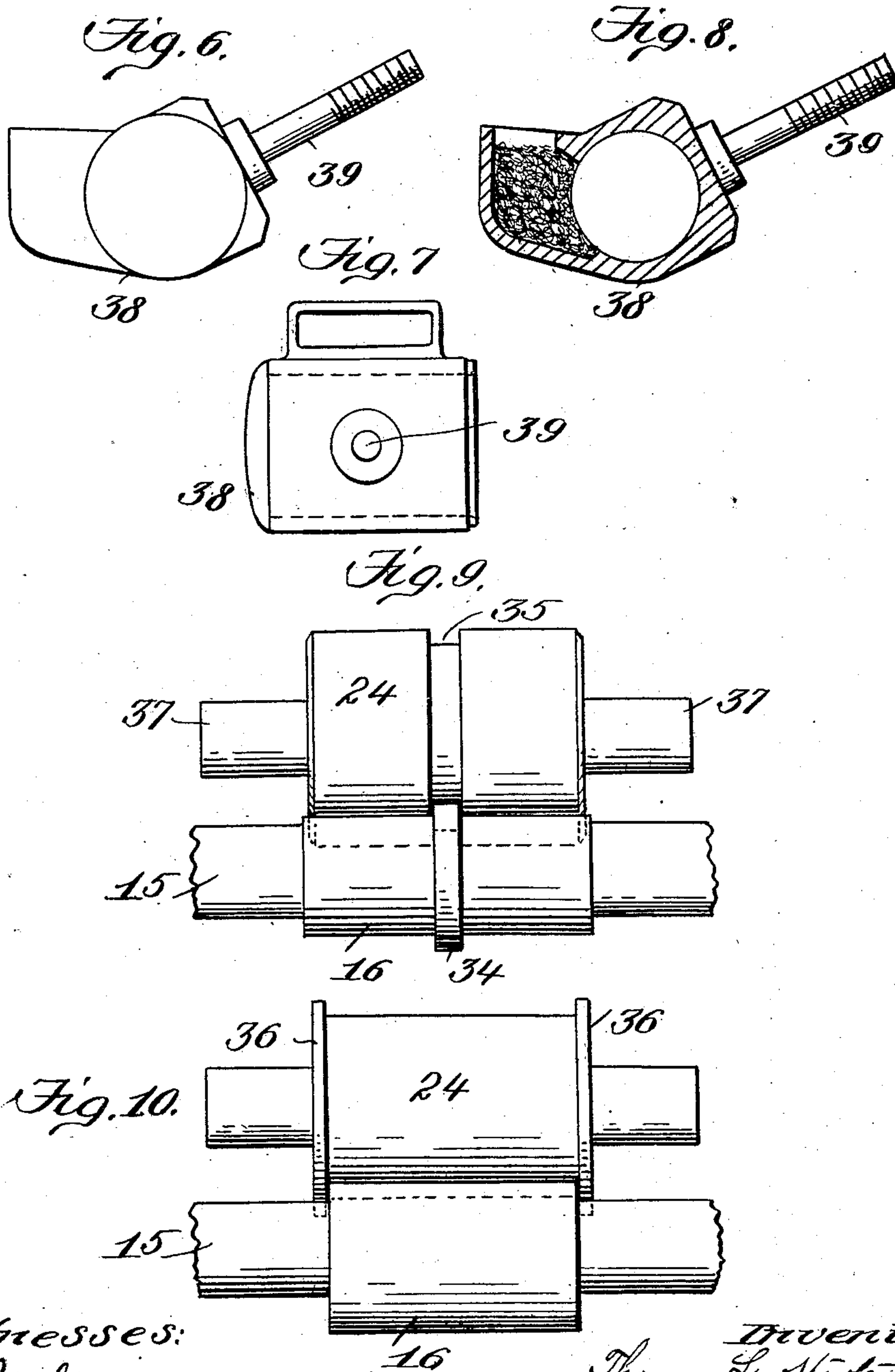
PATENTED JULY 9, 1907.

T. L. & T. J. STURTEVANT.

CRUSHER.

APPLICATION FILED OCT. 4, 1906.

4 SHEETS—SHEET 4.



Witnesses:  
C. M. Sweeney  
J. D. Klingoff.

Inventors:  
Thomas L. Sturtevant  
Thomas J. Sturtevant,  
by *Amf. Salver*  
*Att'y*

# UNITED STATES PATENT OFFICE.

THOMAS LEGGETT STURTEVANT, OF QUINCY, AND THOMAS JOSEPH STURTEVANT, OF WELLESLEY, MASSACHUSETTS, ASSIGNORS TO STURTEVANT MILL COMPANY, OF PORTLAND, MAINE, A CORPORATION OF MAINE.

## CRUSHER.

No. 859,348.

Specification of Letters Patent.

Patented July 9, 1907.

Application filed October 4, 1906. Serial No. 337,385.

*To all whom it may concern:*

Be it known that we, THOMAS LEGGETT STURTEVANT and THOMAS JOSEPH STURTEVANT, citizens of the United States, residing, respectively, at Quincy and Wellesley, in the county of Norfolk and State of Massachusetts, have invented or discovered certain new and useful Improvements in Crushers, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to a crusher of that class which comprises an oscillating or vibrating jaw co-operating with a fixed jaw in the reduction of the material; and the invention has for its object to provide a crusher, of this class, more especially adapted for fine crushing, 15 and which is of such a character as to combine durability with efficiency of operation and convenience and simplicity of construction.

In the accompanying drawings, Figure 1 is a plan view of the improved crusher. Fig. 2 is a side view 20 of the same with one of the side plates removed, and with some of the parts in vertical section. Fig. 3 is a detail view of the operating lever showing the bearing roll mounted therein, with the box-bearings for the shaft of said roll in section. Figs. 4 and 5 are side 25 and end views, respectively, of the rear cross-beam of the machine which supports the bearings for the driving shaft. Figs. 6, 7 and 8 are detail views of one of the box-bearings for the bearing-roll. Figs. 9 and 10 are detail views of the bearing-roll and its 30 operating cam or eccentric, illustrating slight modifications.

Referring to the drawings, the frame of the machine comprises the side-plates 12, a head block or front end cross-beam 13, bolted to said side-plates, 35 and a rear cross-beam 14 likewise bolted to said side-plates. In this class of crushers in which the side-plates are preferably of steel, and are comparatively thin or light, the side-plates of the frame have not been sufficiently stiff or were insufficiently braced at 40 their rear parts on which the bearings of the driving shafts carrying the cams or eccentrics for operating the crushing jaws have been mounted; and owing to the severe strains which come on the driving shafts this construction has proved to be faulty in that the 45 rear portions of the frames would spring more or less under heavy strains, thus putting the shaft bearing out of alinement, so that the machines would soon wear out, or were comparatively short-lived for efficient operation. This objection is obviated in the 50 present invention in which the driving-shaft 15, carrying the operating cam or eccentric 16 and the fly-wheels 17, is supported by the said rear cross-beam 14, said cross-beam having end portions 18 overhanging the said side-plates to which it is bolted by means of

flanges 19 preferably disposed between the said side 55 plates. The great strain on the driving shaft will therefore come immediately upon said rear cross-beam, and not directly on the side-plates; and the rear portion of the frame will be greatly stiffened by this heavy cross-beam and its flanges which are strongly 60 bolted to said side-plates.

The stationary crushing plate 20 is suitably fixed to the head block or front cross-beam 13, affording a stationary jaw, and the movable crushing plate 21 is 65 carried by the lever 22 pivoted at its lower part to the side-plates 12 and affording a movable jaw; the said lever 22 being actuated from the operating lever 23 carrying a roller 24 bearing against the cam or eccentric 16; the movements of said lever 23 being imparted 70 to the crushing lever 22 through a thrust-plate or toggle 25 interposed between said levers which are provided with bearing bars or blocks 26 for the said thrust plate or toggle.

It will be observed that the bearing of the thrust-plate or toggle on the operating lever 23 is compara- 75 tively near the fulcrum of said lever, and that the bearing for the said thrust-plate or toggle on the crushing lever 22 is near the free end of said crushing lever; and from this it results that the vibrating movements of the said crushing lever are comparatively slight or 80 short, causing but little wear, but are very powerful; and, as has been demonstrated, this construction is more efficient for fine crushing than the constructions heretofore employed in which the crushing le- 85 vers were pivoted or fulcrumed near their tops. In other words, in the improved machine, by pivoting the vibrating crushing lever near its bottom and operating it in the manner described the machine is much better adapted for fine crushing than other similar machines heretofore in use; while this construction is more de- 90 sirable than the old constructions in that it affords a more convenient access from above to the crushing plates and other parts.

The crushing lever is retracted and the bearing roll 24 held in contact with its operating cam or eccentric 95 16 through the medium of a spring 27 interposed between a block 28, abutting against the rear cross-beam 14, and a collar 29 on a rod 30, and which rod is, in turn, secured to a bar 31, so as to form an extension thereof, the said bar being pivotally connected with the said 100 crushing lever 22.

To prevent side-slip or lateral or endwise movement of the cam or eccentric 16 and the bearing roller 24, the one relative to the other, as is liable to occur when the machine becomes a little worn, one of these parts is 105 preferably provided with an annular groove and the other with an annular rib or tongue fitting in said groove. In the construction shown in Figs. 1 and 2 the



cam or eccentric 16 is provided with the groove 32 and the roller 24 with the rib or tongue 33 closely fitting in said groove so as to prevent relative lateral or side movement of these parts; but this construction may be reversed as shown in Fig. 9 in which the cam or eccentric 16 is provided with an annular rib or tongue 34 fitting a groove 35 formed in the roller 24. This result of preventing side-slip of these parts might be effected by providing one of the parts with end flanges overlapping the other part, as indicated in Fig. 10 in which the roller 24 is shown as being provided with the end flanges 36 overlapping the cam or eccentric 16.

The trunnions 37, constituting the shaft of the roller 24, are journaled in box-bearings 38 which are closed at their ends, so as to exclude dust and grit, and which are provided with rods 39 threaded at their ends for the reception of nuts 40. These bearing boxes provide wells or receptacles for oil with which cotton waste, or similar material, placed in these boxes may be saturated, as is usual in lubricating car axle boxes.

In assembling the parts the bearing boxes may be slipped endwise onto the shaft or trunnions of the roller 24, and the roller may then be placed in position by slipping the bearing boxes into the open-faced apertures or mortises formed for their reception in the top portion 41 of the operating lever 23; the rods 39 passing through bosses 42 formed in said top portion of said lever, and against which bosses the holding nuts 40 abut. This construction therefore contributes to ease in assembling or removing the parts, as well as efficiency of lubrication.

Having thus described our invention, we claim and desire to secure by Letters Patent:

1. In a crusher, an operating lever having a pair of recesses, a pair of dust-proof box bearings having closed ends and mounted in said recesses, means for removably holding said bearings in position in said recesses, and a roller journaled in said bearings.

2. A crusher frame consisting of relatively thin side plates, a head block or front cross beam, and a rear cross beam overhanging said side plates laterally and having flanges arranged within said side plates and firmly attached thereto so as to brace said side plates, combined with a driving shaft, the bearings of which are supported by said rear cross beam whereby said relatively thin side plates are relieved from the direct strain of the driving shaft, and a vibrating crushing jaw operated from said driving shaft.

3. In a crusher, the combination with a frame comprising relatively thin side plates, a front cross-beam, and a rear cross-beam separate from but secured to said side plates and supported thereby above the bottom thereof,

of a driving shaft, bearings for said driving shaft supported by said rear cross beam whereby said relatively thin side plates are relieved from the direct strain of the driving shaft, crushing jaws between said side plates, and operating means for said crushing jaws operatively connected with said driving shaft.

4. In a crusher, the combination with a frame comprising relatively thin side plates, a head block or front cross beam, and a rear cross beam separate from but secured to said side plates and overhanging said side plates laterally, of a driving shaft the bearings of which are supported by said rear cross beam whereby said relatively thin side plates are relieved from the direct strain of the driving shaft, a cam or eccentric carried by said driving shaft, stationary and movable crushing members, and means for operating said movable crushing member from said cam or eccentric.

5. In a crushing machine, the combination with a frame comprising relatively thin side plates, a head block or front cross beam, and a rear cross beam separate from but secured to said side-plates and supported thereby above the bottoms thereof, of a driving shaft the bearings of which are supported by said rear cross beam whereby said relatively thin side plates are relieved from the direct strain of the driving shaft, a cam or eccentric carried by said shaft, a stationary crushing plate, a crushing lever pivoted at its lower part to said side plates, a crushing plate mounted on said lever, an operating lever having a roller bearing against said cam or eccentric, a thrust plate or toggle interposed between said operating lever and the upper part of the said crushing lever, and a spring and suitable connections for retracting said crushing lever and for holding said bearing-roller in contact with said cam or eccentric.

6. A crusher frame consisting of relatively-thin side-plates, a head-block or front cross-beam rigidly attached to said side-plates, and a rear cross-beam having flanges arranged within said side plates and firmly bolted thereto so as to brace said side plates, combined with a driving shaft the bearings of which are supported by said rear cross-beam whereby said relatively thin side plates are relieved from the direct strain of the driving shaft, and a vibrating crushing jaw operated from said driving shaft.

7. In a crushing machine, the combination with a frame comprising side plates, a front cross-beam, and a rear cross-beam, of a driving shaft, a cam carried by said shaft, a stationary crushing plate, a crushing lever pivoted at its lower part to said side plates, a crushing plate mounted on said lever, an operating lever, a roller carried by said lever and bearing against said cam, a thrust plate interposed between said operating lever and said crushing lever, and a spring and suitable connections for retracting said crushing lever and for holding said roller in contact with said cam.

In testimony whereof we affix our signatures, in presence of two witnesses.

THOMAS LEGGETT STURTEVANT.  
THOMAS JOSEPH STURTEVANT.

Witnesses:

W. H. ELLIS,  
H. G. ALLBRIGHT.