

No. 749,707.

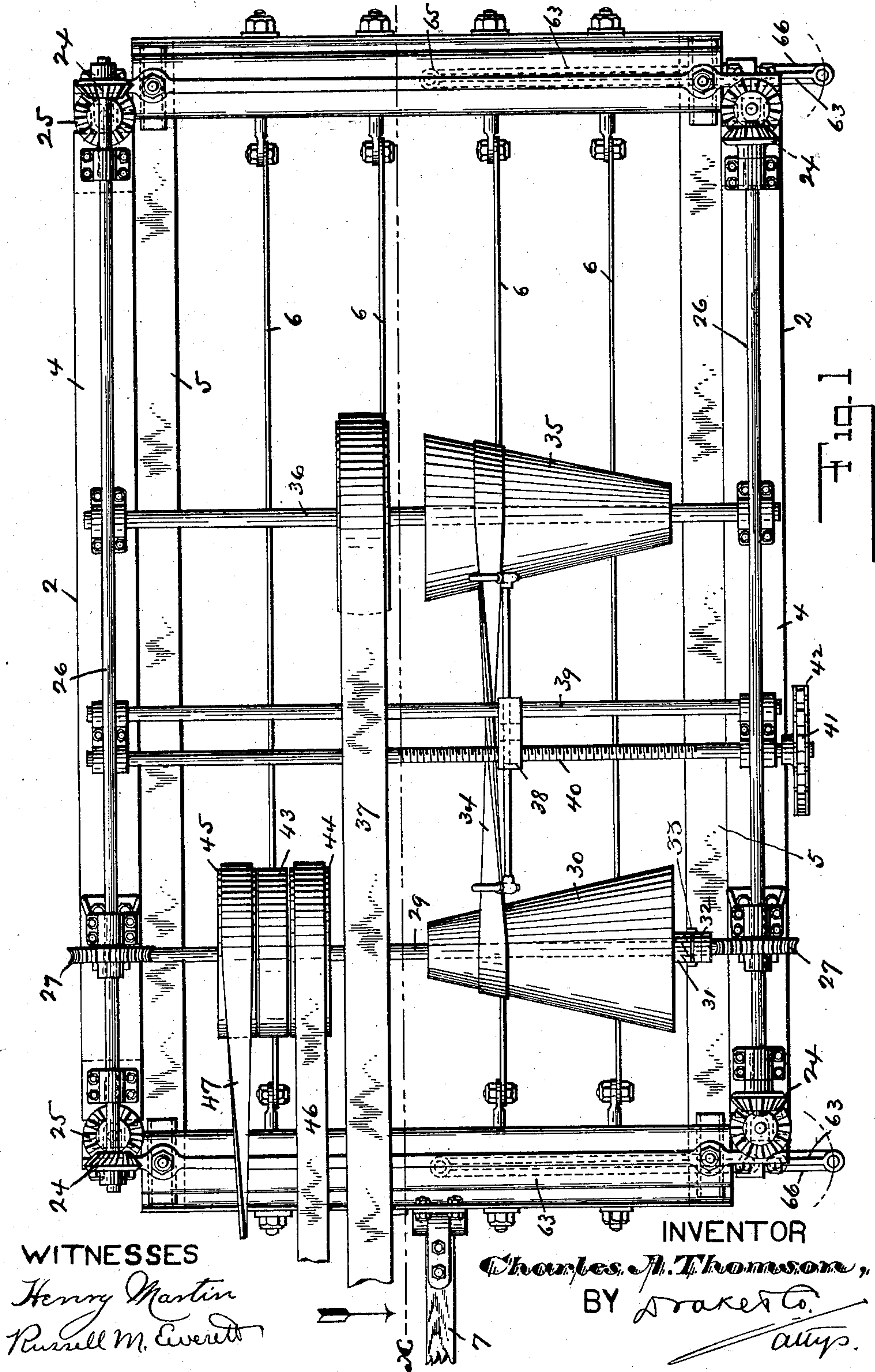
PATENTED JAN. 12, 1904.

C. A. THOMSON.
STONE SAWING MACHINE.

APPLICATION FILED FEB. 26, 1902.

NO MODEL.

5 SHEETS—SHEET 1.



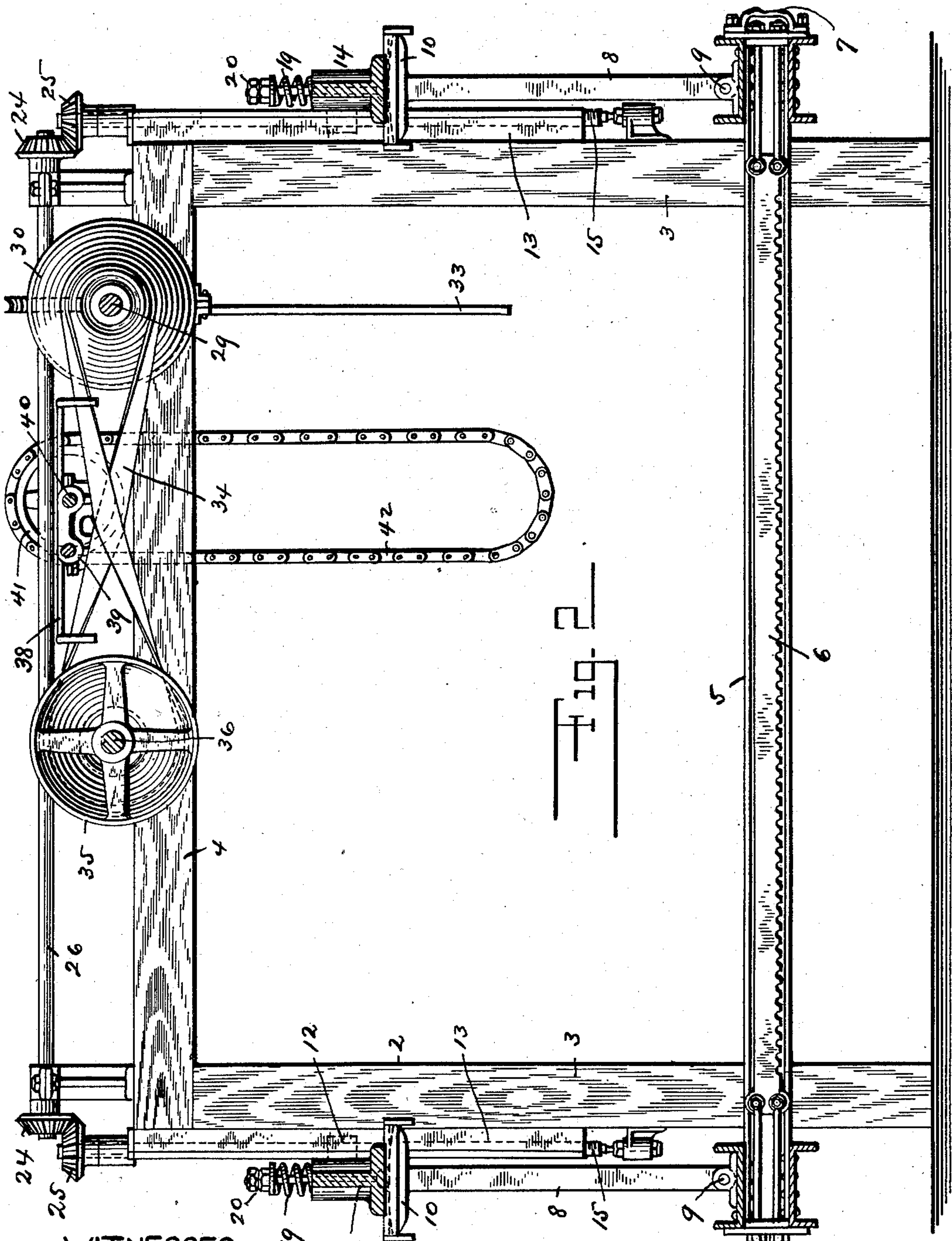
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5 SHEETS—SHEET 2.



WITNESSES

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Russell M. Everett

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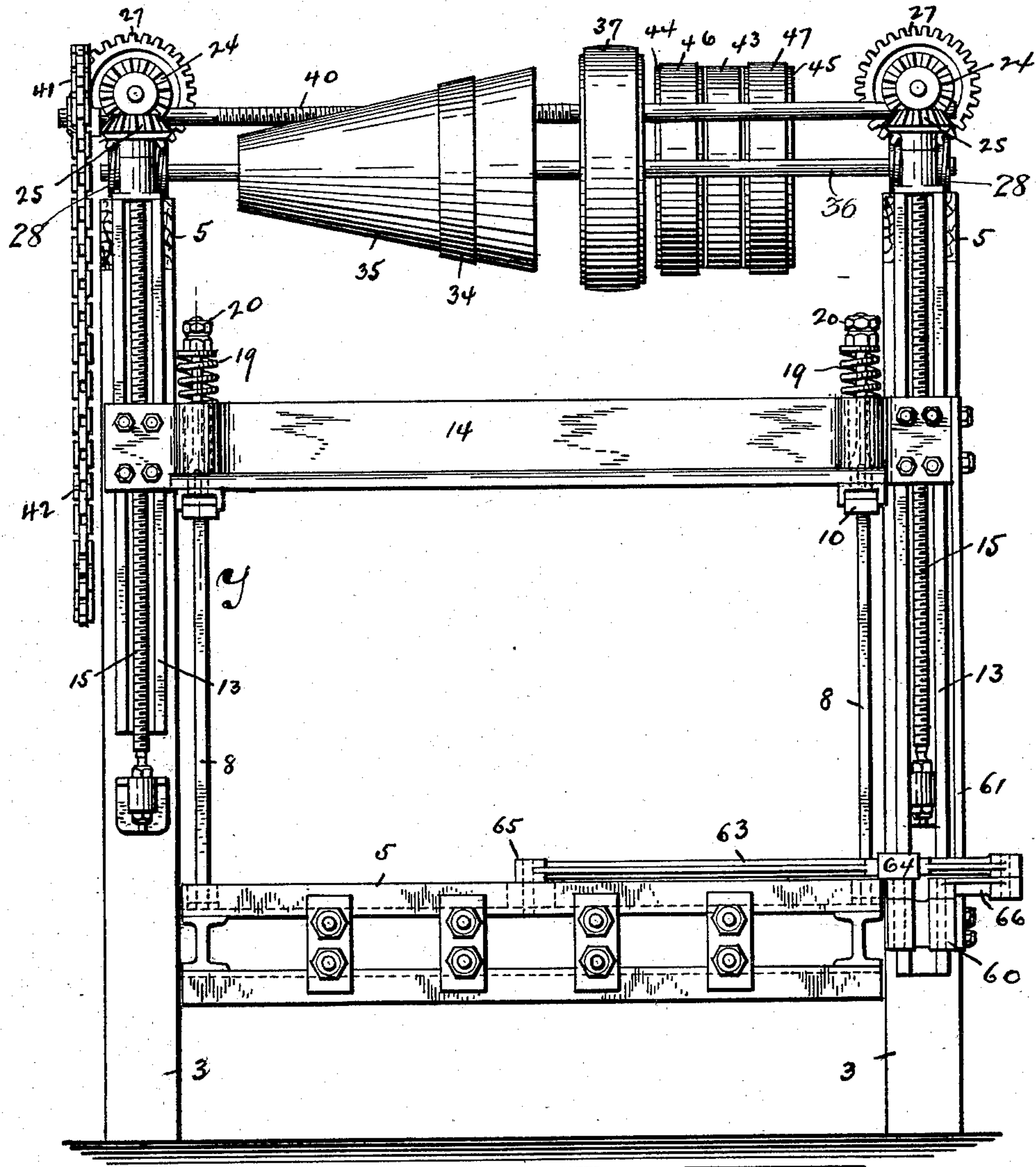
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5 SHEETS—SHEET 3.



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Fig. 3

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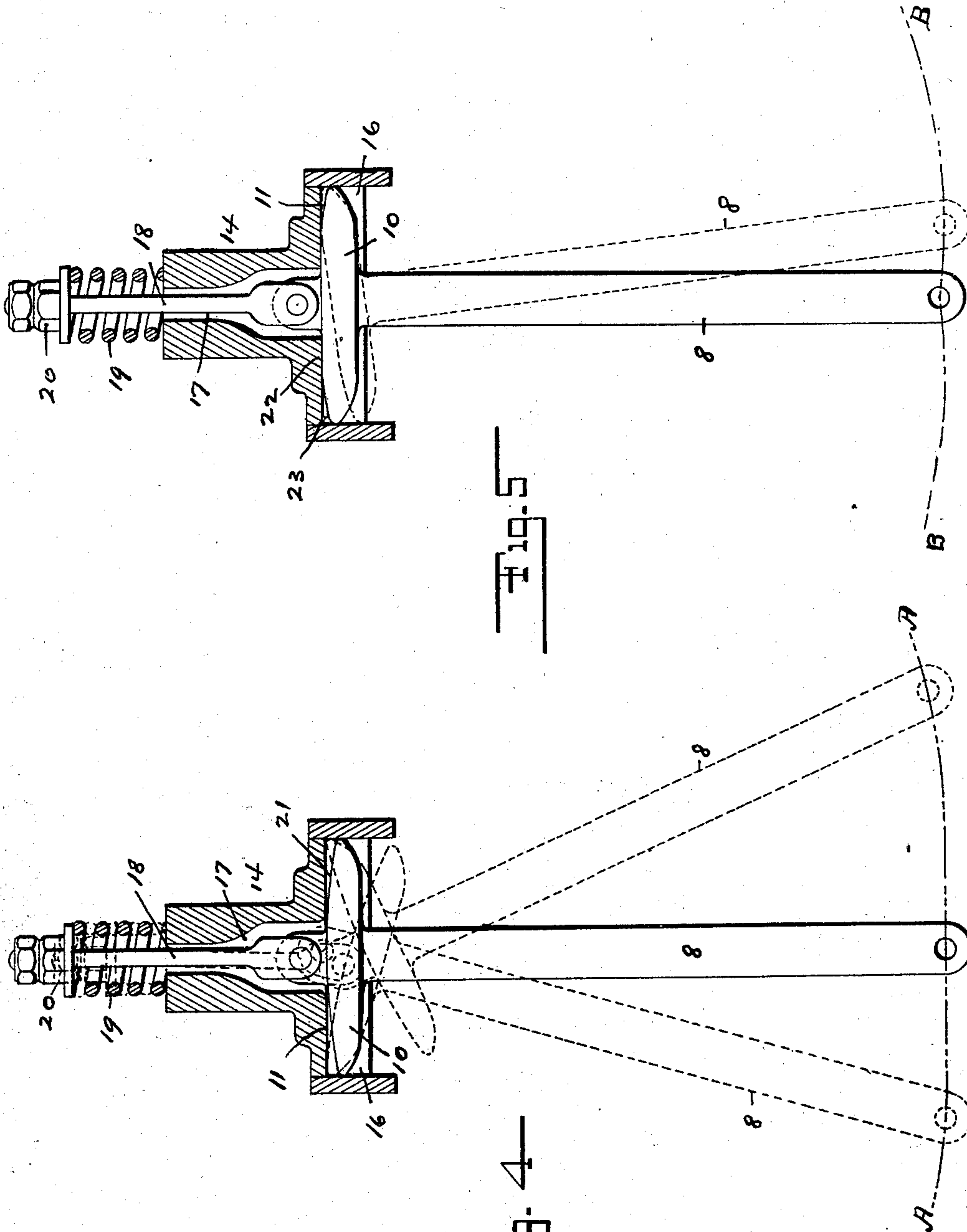
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5 SHEETS—SHEET 4.



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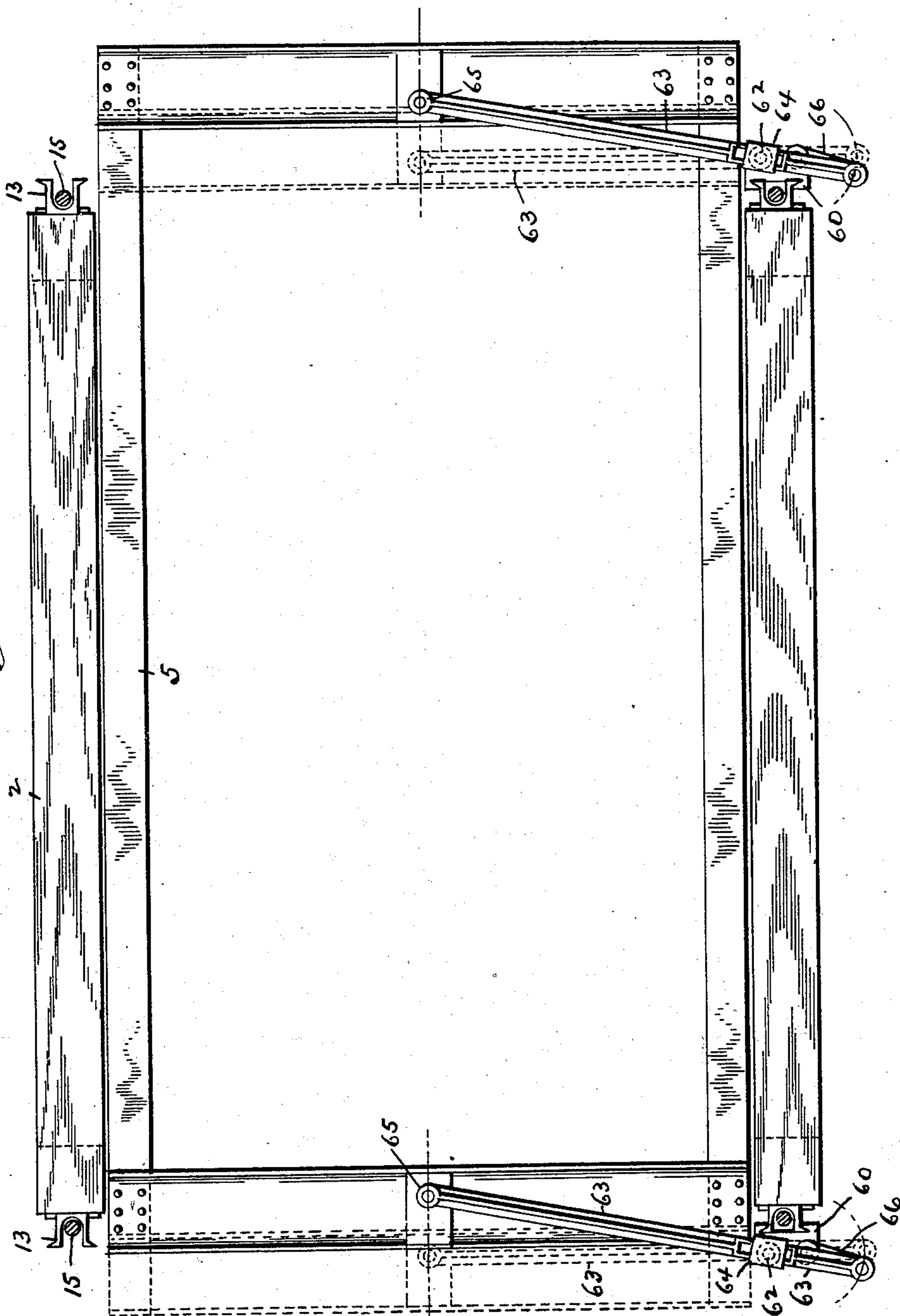
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NO MODEL.

5 SHEETS—SHEET 5.

Fig. 6.



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UNITED STATES PATENT OFFICE.

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STONE-SAWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 749,707, dated January 12, 1904.

Application filed February 26, 1902. Serial No. 95,659. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. THOMSON, a citizen of the United States, residing at Belleville, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Stone-Sawing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to that class of stone-sawing machines described in my prior application, Serial No. 73,248, filed August 26, 1901, the objects of the present invention being to provide improved means for retaining the horizontal position of the saw; to enable such means to be modified to secure a downthrust of the saw at any desired point or points; to secure a cushioning effect at the ends of the saw-stroke which will serve to counteract the momentum usually acquired by the saw at those points; to thus relieve the crank-pin of extreme strain; to secure an impetus at the beginning of the stroke which will assist the crank as it leaves its dead-centers; to provide improved feed means for the saw by which it can be quickly moved into position without loss of time and which will enable it to be fed to its work with a continuous motion capable of being regulated in speed at will; to prevent sidewise displacement of the saw-frame and saws in operation, and to secure other advantages and results some of which may be referred to hereinafter in connection with the description of the working parts.

The invention consists in the improved stone-sawing machine and in the arrangements and combinations of parts of the same, all substantially as will be hereinafter set forth, and finally embraced in the clauses of the claim.

Referring to the accompanying drawings, in which like letters of reference indicate corresponding parts in each of the several fig-

ures, Figure 1 is a plan of my improved stone-sawing machine. Fig. 2 is a vertical longitudinal section of the same on the line *x*, Fig. 1. Fig. 3 is an end elevation of the machine. Fig. 4 is a detail section as on line *y*, Fig. 3, showing more particularly the operation of a saw-supporting arm; and Fig. 5 is a similar view of a modified form of such an arm adapted to impart to the saw a downthrust at two points of its stroke, and Fig. 6 illustrates in plan certain guiding means for preventing sidewise displacement of the saw-frame.

In said drawings, 2 indicates the frame of my improved machine, which is of any suitable form, comprising uprights 3 and a horizontal support 4 at the top. The stone to be sawed is adapted to be placed beneath the said frame, as is usual, the saw or saws 6 being secured in a horizontally-disposed saw-frame 5, of any ordinary construction, lying between the lateral uprights of the machine and adapted to be reciprocated by connections, as at 7, with any suitable source of power. It is to the means of supporting said saw-frame 5 that my invention more particularly relates, and said means in the preferred form comprise arms 8, arranged one at each corner of the saw-frame and extending upward therefrom. Each of said arms is pivotally hinged to the saw-frame at its lower end, as at 9, and at its upper end is T-shaped or has a cross-head 10, which extends longitudinally of the saw-frame. The upper surface of said cross-head 10 lies against an impact surface 11, which is preferably the bottom of a transverse recess 16 at the under side of a beam or carrier 14, extending across the direction of movement of the saw-frame. Said beam 14 has at or near its opposite ends projections 12 at one side, which engage by dovetailing or otherwise vertical slideways 13 on the uprights 3 of the machine, and screw-shafts 15, arranged on said uprights and passing through threaded perforations in said projections, enable the beams 14, and thus the saw-frame and saws, to be adjusted up or down, as required and as will be hereinafter more particularly described.

Above the transverse recess 16 of the beam 14 said beam is vertically bored or perforated, as at 17, to receive a tension-rod 18, pivoted at its lower end to the cross-head 10, as shown in Fig. 4. The upper end of said rod 18 projects above its seat or perforation 17 and receives a spiral spring 19 and retaining-nut 20, normally forcing said nut away from the post. The parts are so adjusted that the spring 19 holds the cross-head 10 firmly against the impact surface 11, provided at the lower surface of the beam or carrier 14.

As the saw-frame swings to give the saw its stroke the arms 8 at their lower ends swing with it, and each as it departs from a vertical position is thrown by the engagement of its cross-head 10 with the impact surface 11 downwardly away from the supporting beam or carrier 14, as shown in Figs. 4 and 5.

By giving the upper or contact surface of the cross-head 10 an appropriate shape or form the lower end of the arm 8 may thus be caused to move as desired. For instance, a continuous curve, as shown at 21 in Fig. 4, will cause the lower end of the arm, and therefore the saw, to move in a perfectly horizontal line for the distance of its stroke and lift upward at the ends of said stroke to admit the shot beneath, as indicated by the line A A in said Fig. 4. By forming the middle portion of the cross-head straight, as at 22, and curving the ends, as at 23 in Fig. 5, an uplift of the saw will be secured at the middle of its stroke, as indicated by line B B in said Fig. 5.

Another very important result of the construction described upon the action of the saw is that the strain of the momentum of the saw-frame at the ends of its stroke or of destroying such momentum to change the direction of the saw is borne of the spring 19, and thus the crank-pin of the driving-engine is relieved, for it will be noticed that the further the arm 8 is deflected from vertical position the greater the compression of the spring and the more power needed to compress it yet further. Again, the expansion of the spring 19 as the arm 8 starts to return from its outermost position and at which time the driving-crank is turning its dead-centers imparts an initial impetus to said arm, which materially aids in passing such dead-centers, as will be understood.

One important object of my invention is to enable the saw-frame to be properly fed downward to its work, and to this end each screw-shaft 15, before referred to, has at its top a bevel-gear 25, and the two gears at the same side of the sawing-machine are connected by means of cooperating bevel-gears 24 24 and a longitudinally-extending shaft 26, on which said gears are fast. Said shafts 26 thus located one at each side of the machine and above the frame 2 carry worm-wheels 27, which are adapted to engage worms 28 on a trans-

verse driving-shaft 29, also provided with bearings upon the frame 2. Rotation of said shaft 29 therefore serves to feed the saw downward or upward, its four corners all moving at equal rates.

To rotate the shaft 29 at a suitable rate of speed to properly feed the saw to its work, I provide upon the said cross-shaft 29 a cone-pulley 30, loose thereon and carrying at one end a clutch member 31, adapted to engage with a cooperating clutch member 32, keyed on the shaft 29, and adapted to be thrown into engagement by means of a hand-lever 33. From the said cone-pulley 30 a belt 34 extends to an oppositely-disposed cone-pulley 35 on a parallel shaft 36, said shaft being driven by means of a belt 37 from any suitable source of power. The belt 34, connecting the cone-pulleys 30 35, is provided with a belt-shifter 38, which slides transversely of the machine upon a steadying-rod 39 by means of a screw-shaft 40, which can be rotated by the operator at will, as by the sprocket-wheel 41, and endless chain 42, hanging down within reach of the operator. The saws are thus fed uniformly and continuously to their work by the construction described, the speed being regulated by shifting the belt 31, connecting the cone-pulleys. This feed can obviously be employed with either shot or diamond saws.

When it is desired to feed the saw-frame rapidly from one position to the other, I disengage the clutch members 31 32 and drive the shaft 29 by means of a fixed pulley 43, stationed on said shaft between loose pulleys 44 45. Said loose pulleys receive belts 46 47, one open and the other crossed, from any suitable source of power, which belts continually rotate their loose pulleys 44 45 at rapid speed in opposite directions. When it is desired to raise or lower the saws and saw-frame, one of said belts 46 47, according to the direction in which it is desired to move the saw-frame, is shifted upon the pulley 43 to effect such movement with quickness and dispatch.

Obviously other means for supporting the saw-frame in horizontal position than those above described may be employed with my improved feed mechanism, such as are shown in my prior application, Serial No. 73,248, filed August 26, 1901, as are otherwise known in the art.

Another feature of my invention consists in means for preventing the saw-frame from crowding sidewise against the supporting-frame or otherwise moving laterally edgewise in its plane, said means being shown more particularly in Figs. 1, 3, and 8. For this purpose I arrange on the vertical slide-ways 13 of the uprights 3 at one side of the machine lower sliding blocks 60, adapted to lie at or near the level of the saw-frame 5 and being connected by strips 61 to the beam 14 above to move therewith. On the top of said block 60 is a pivoted pin 62 for a lever

63, lying in horizontal plane and projecting at one end in over the saw-frame and at the other end outward. Said lever is slotted to take the pin 62, and said pin also preferably has at its head a box 64 to clasp around said lever for greater strength, longitudinal shifting of the lever with respect to its fulcrum being thus permitted. The inner end of the lever 63 is pivoted, as at 65, to the saw-frame, and its outer end is pivotally linked by a rigid link 66 to a fixed part of the sliding head 60, which lies outward from the fulcrum 62 with respect to the saw-frame. This construction is similar to that described in my said prior application, Serial No. 73,248, for suspending the saw-frame, and the same compensating principle of action causes the inner end of the lever, pivoted, as at 65, to the saw-frame, to move in a straight line. The saw-frame cannot therefore crowd laterally to either one side or the other, and a true vertical saw-cut is secured in the stone.

Having thus described the invention, what I claim as new is—

1. In a sawing-machine, the combination with a saw-frame, of a supporting-arm pivoted at one end thereto and at the other end having a cross-head, an adjustable stationary beam providing an impact surface for said head to lie against, and a stationary spring mounted on said beam and holding said head seated.

2. In a sawing-machine, the combination with a saw-frame, of an adjustable stationary carrier having a central vertical passage or aperture, a swinging arm pivotally connected at one end of the saw-frame, and having at the other end a cross-head lying against said carrier, a headed bolt passed through the passage or aperture of said carrier and pivotally linked to the middle of said cross-head, the ends of said cross-head being free, and a spring between the head of said bolt and the carrier.

3. In a sawing-machine, the combination with a saw-frame, of a vertically-adjustable support recessed at its under surface and centrally perforated upward from said recess, a swinging arm at its lower end pivoted to the saw-frame and having at its upper end a cross-head lying in the recess of said support, and

means extending through said perforation of the support and connected to the middle of the cross-head to hold the same resiliently to its seat, the ends of said cross-head being free.

4. In a sawing-machine, the combination with a saw-frame, of a carrier-beam providing a seat at its lower surface and being centrally apertured upward therefrom, a swinging arm pivoted at its lower end to said saw-frame and having at its upper end a cross-head adapted to lie against the said seat on the carrier-beam, a bolt passed loosely through the aperture in said beam above said cross-head and being pivotally connected at its lower end to the middle of the cross-head, a spiral spring on said bolt above the beam, and retaining means on said bolt above the spring.

5. In a sawing-machine, the combination with a saw-frame, of a support 14, providing a plane impact surface, an arm pivoted at one end to said saw-frame, a cross-head at the other end of said arm and having a curved surface adapted to engage the said impact surface, and means for resiliently holding said cross-head seated.

6. In a sawing-machine, the combination with a saw-frame, upwardly-extending swinging supporting-arms for said frame, and means for moving said arms longitudinally as they swing, of other arms lying in a horizontal plane and having one end pivoted to the saw-frame and means at the other end of said arms for shifting them longitudinally as they swing.

7. In a sawing-machine, the combination with a horizontal saw-frame, of a horizontally-disposed arm pivoted at one end to said frame and projecting at the other end out over the frame, a block fixed relatively to the saw-frame, a fulcrum on said block slidably engaging the arm intermediate of its ends, and a link pivotally connecting said block and the outer end of the arm beyond said fulcrum.

In testimony that I claim the foregoing I have hereunto set my hand this 24th day of February, 1902.

CHARLES A. THOMSON.

Witnesses:

CHARLES H. PELL,
C. B. PITNEY.