

No. 719,722.

PATENTED FEB. 3, 1903.

B. E. BECHTEL.
BRICK CUTTER.

APPLICATION FILED AUG. 30, 1902.

NO MODEL.

2 SHEETS—SHEET 1.

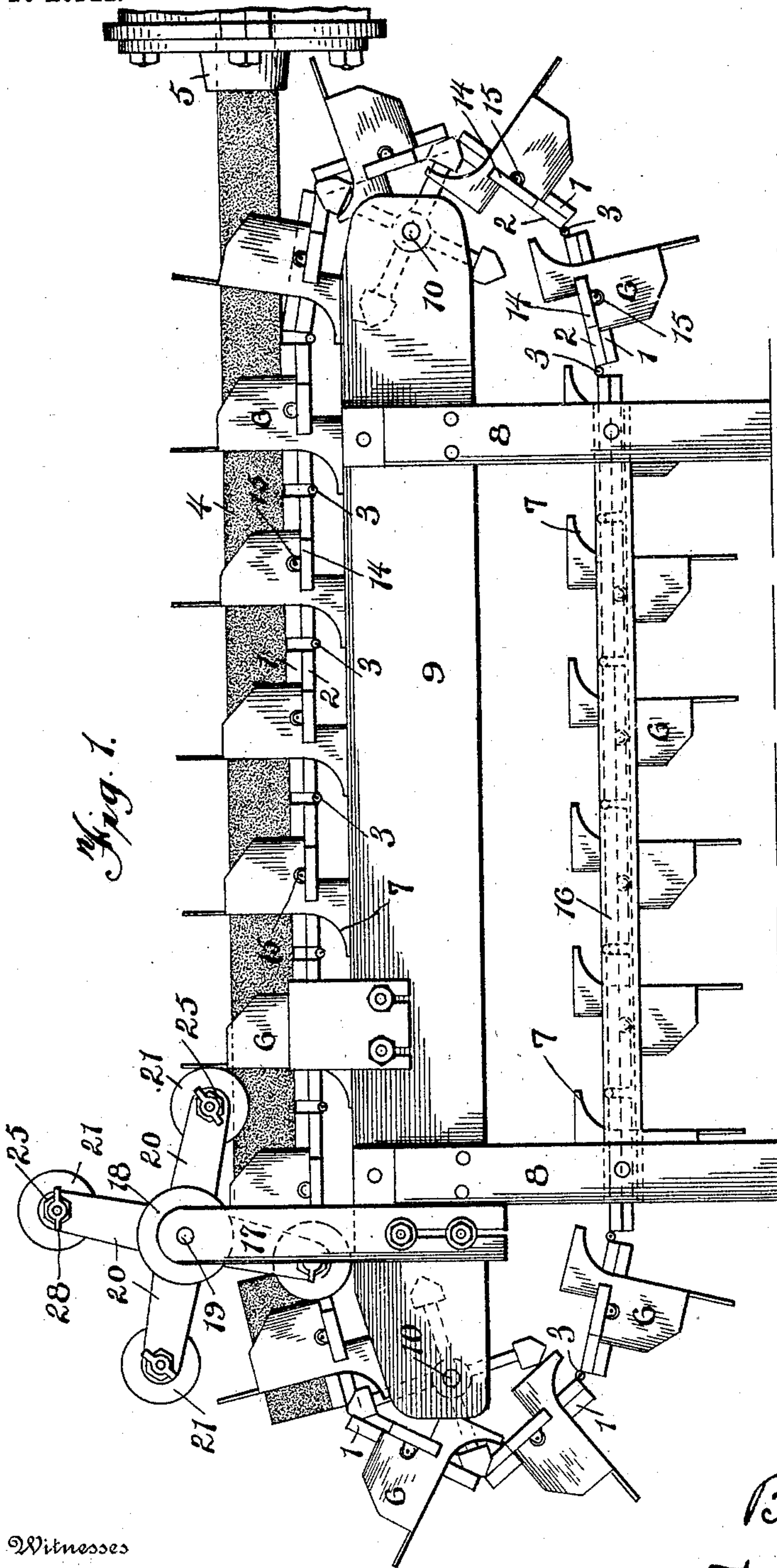


Fig. 1.

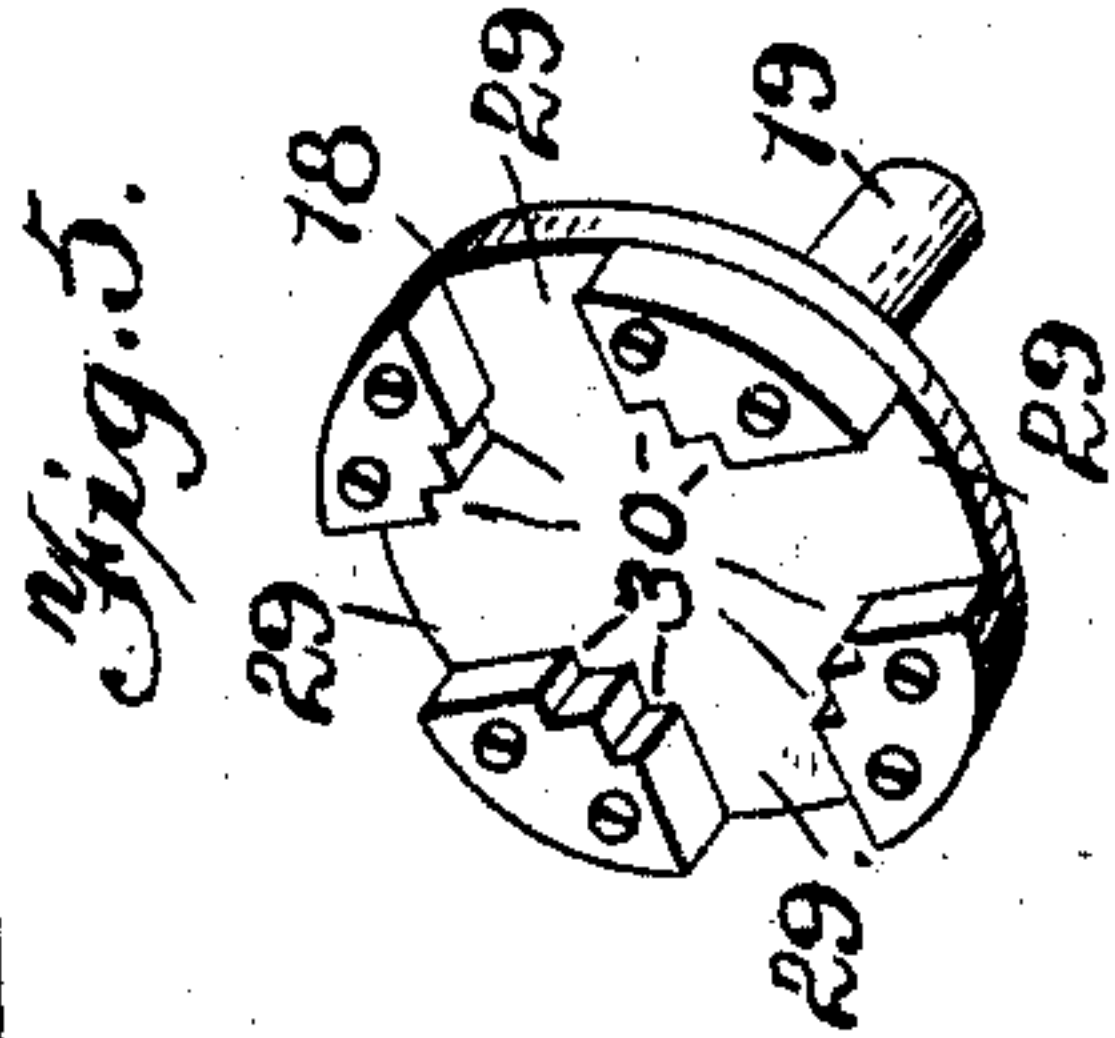


Fig. 5.

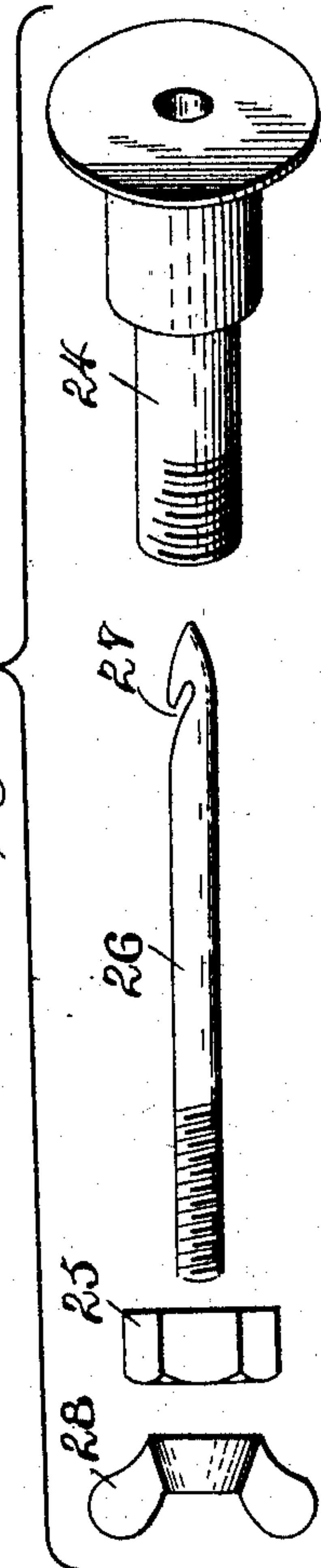


Fig. 2.

Witnesses

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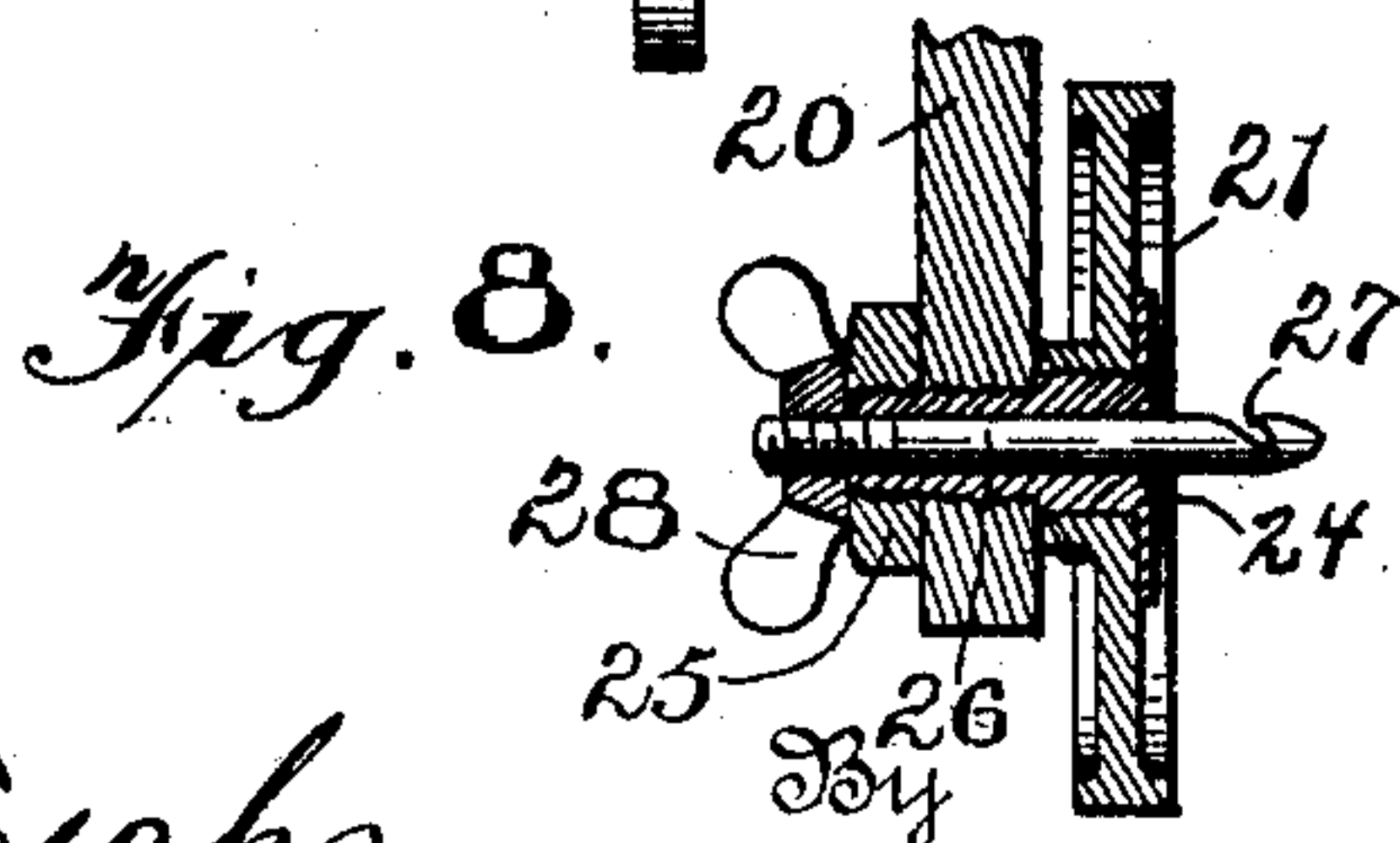
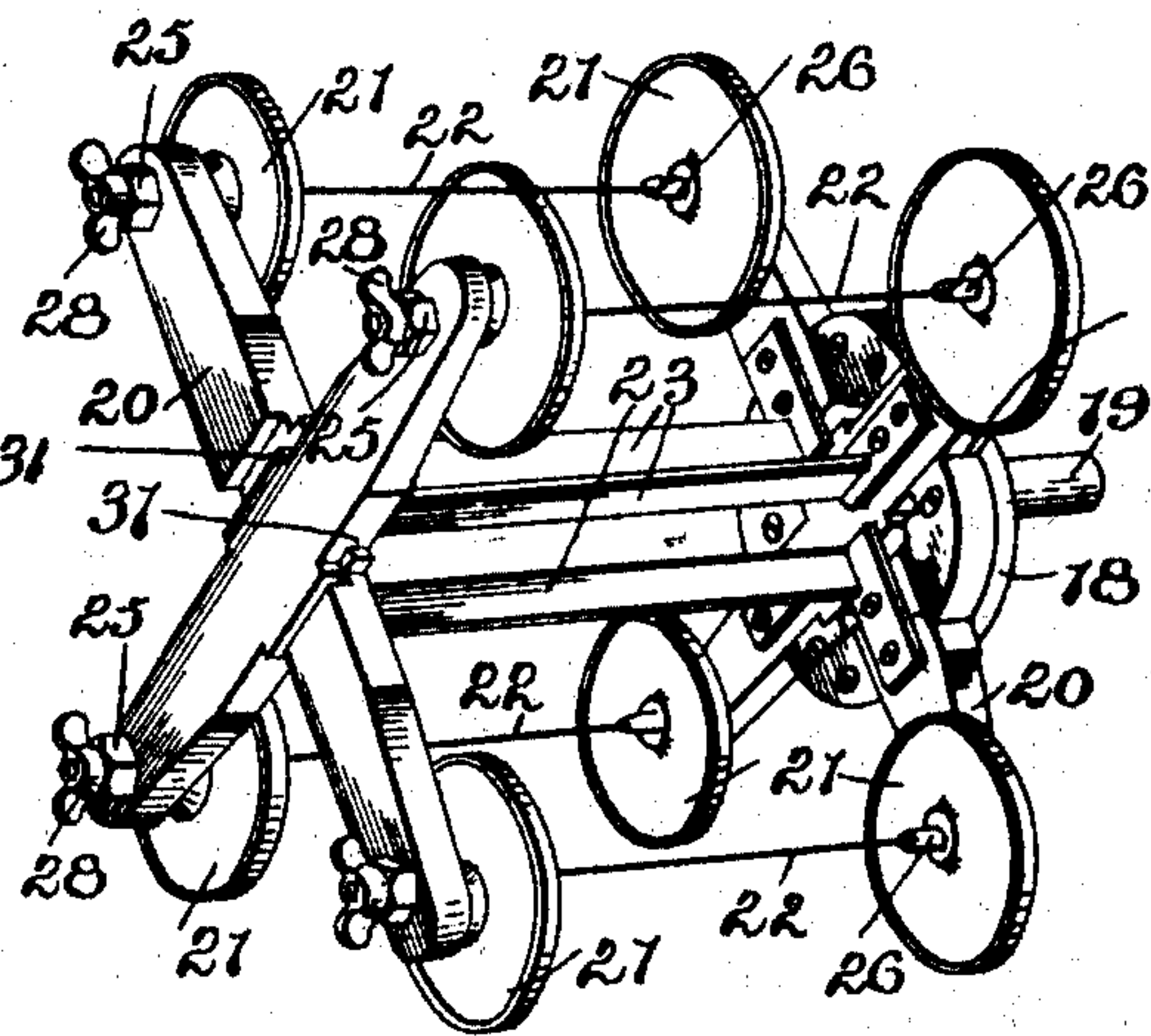
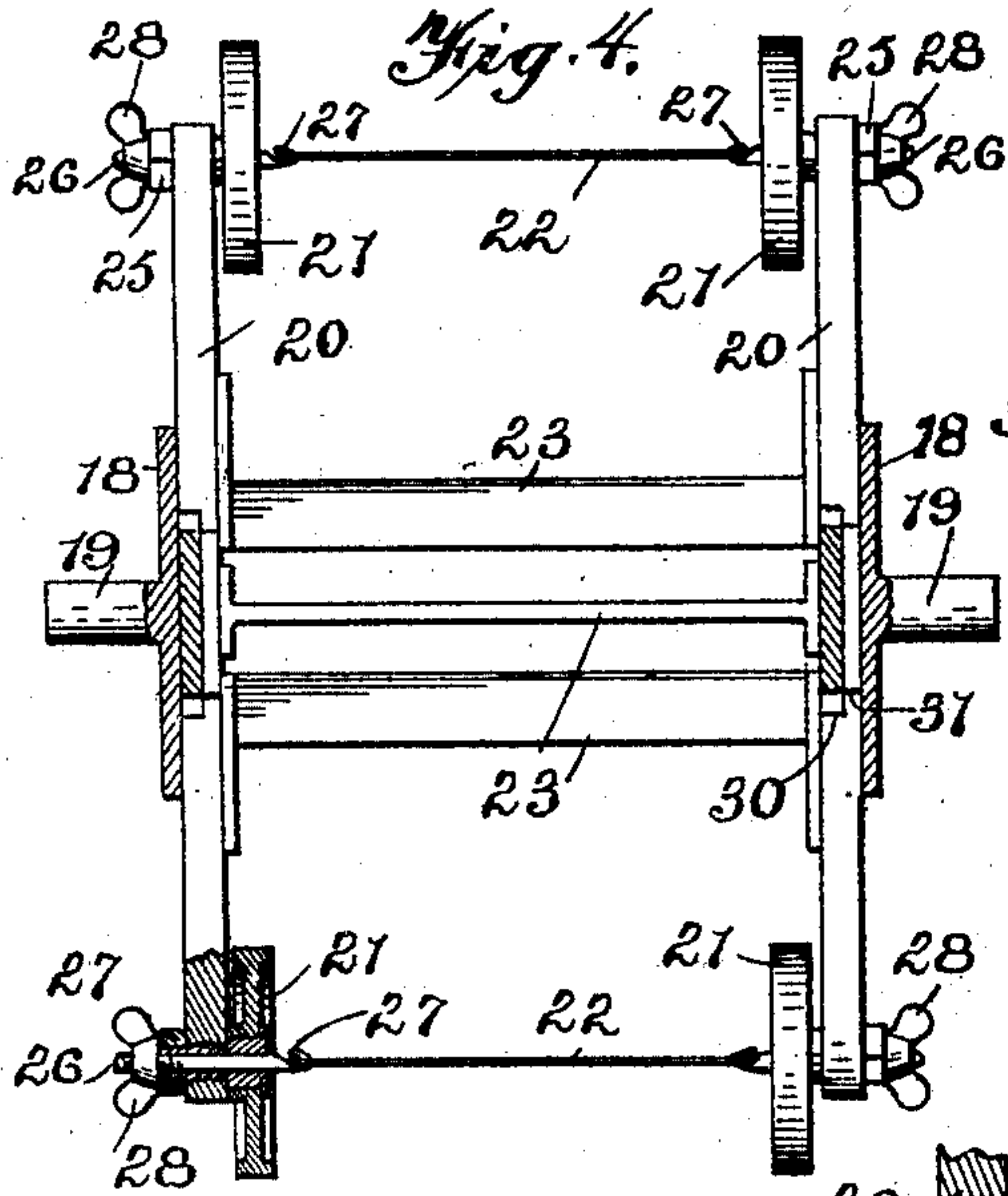
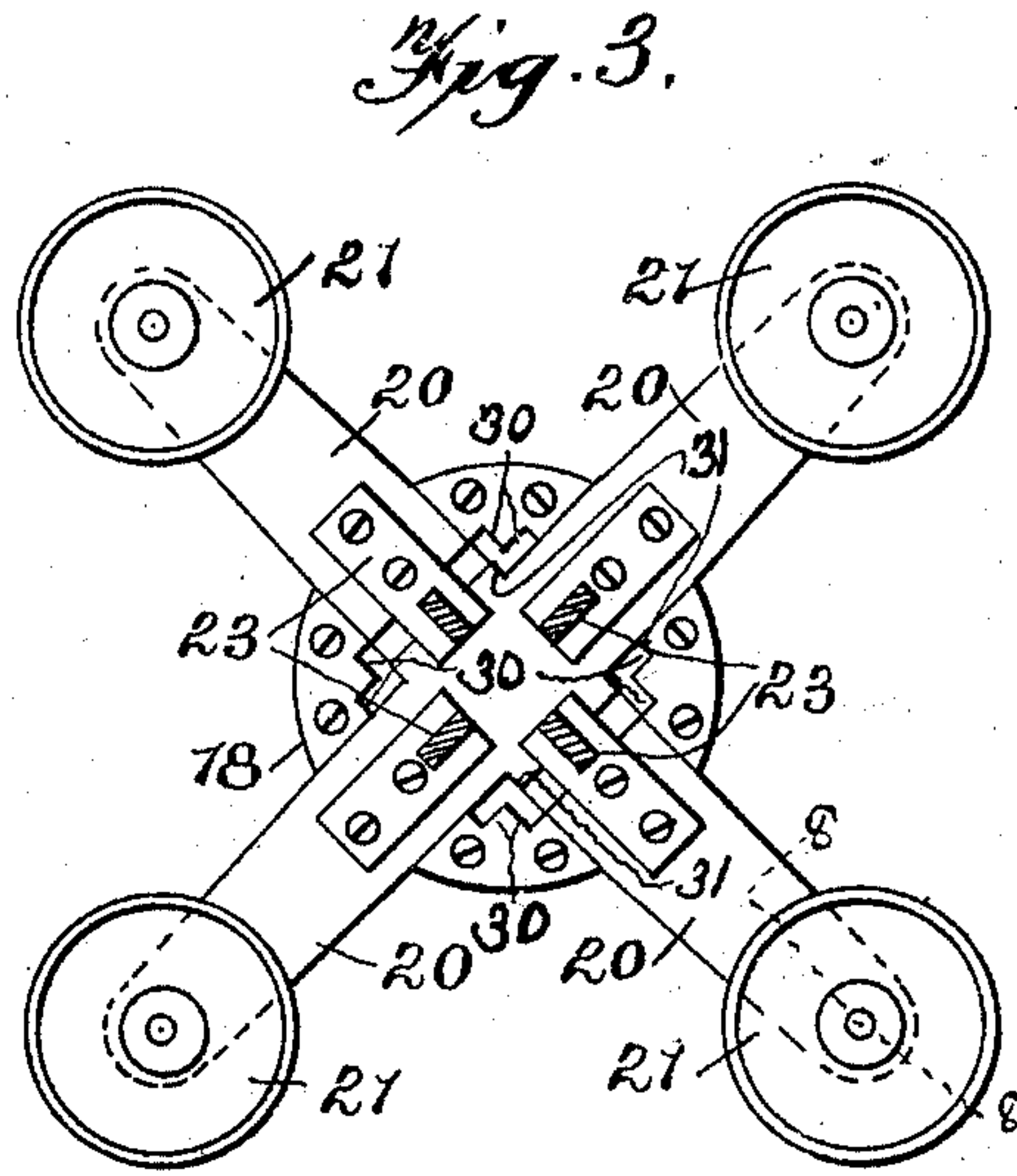
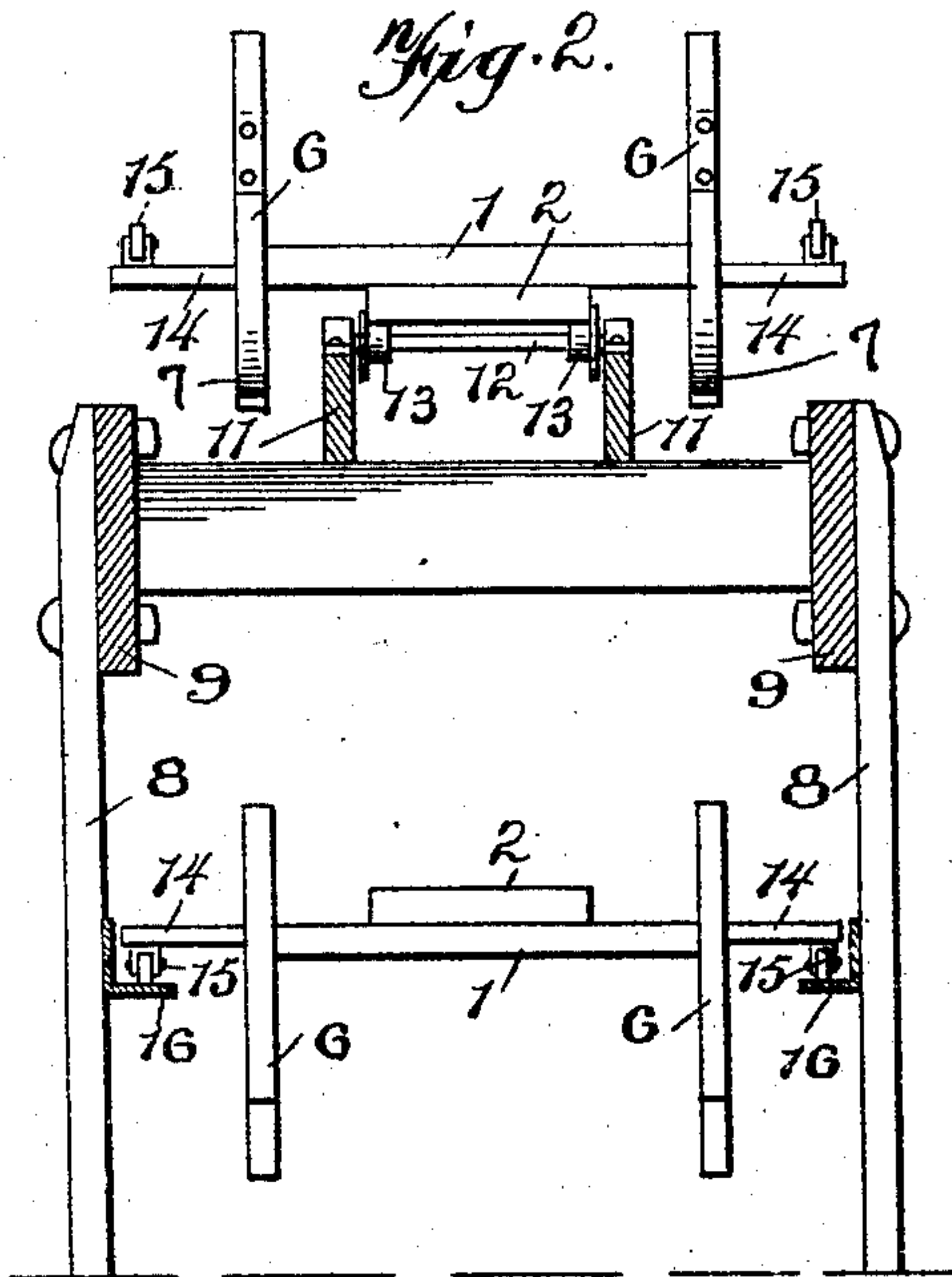
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2 SHEETS—SHEET 2.



Witnesses

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UNITED STATES PATENT OFFICE.

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BRICK-CUTTER.

SPECIFICATION forming part of Letters Patent No. 719,722, dated February 3, 1903.

Application filed August 30, 1902. Serial No. 121,657. (No model.)

To all whom it may concern:

Be it known that I, BYRON E. BECHTEL, a subject of the King of Great Britain, residing at Waterloo, Province of Ontario, Dominion of Canada, have invented certain new and useful Improvements in Brick-Cutters; 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.

This invention relates to certain improvements in brick and tile machinery, and relates more particularly to improvements in brick, tile, or block cutters.

An object of the invention is to provide an improved, automatic, simple, and durable cutter for cutting the continuous bar of clay expressed from a die or continuous bar-brick machine into similar blocks or bricks and wherein the outward or progressing movement of the bar of clay from the brick-machine preferably propels or operates the cutting mechanism.

The invention consists in certain novel features in construction and in combinations or arrangements of parts, as more fully and particularly pointed out and specified hereinafter.

Referring to the accompanying drawings, which for purposes of explanation show one form of my invention merely as an example, Figure 1 is a side elevation of an endless carrier or cutting-table and the cutting-reel operated thereby, a bar of clay being shown moving from a die onto and moving the table, a brick being shown as just cut off from the bar by the reel. Fig. 2 is a vertical cross-section through the cutting-table. Fig. 3 is a detail longitudinal section of the cutting-reel. Fig. 4 is a cross-section thereof. Fig. 5 is a detail perspective of one of the reel hubs or heads detached. Fig. 6 is a detail perspective of the cutting-reel detached, with one of its end heads or hubs removed. Fig. 7 is a detail perspective view of one of the hollow journal-bolts and the wire-tension bolt separated therefrom. Fig. 8 is a detail sectional view on the dotted line 8 8, Fig. 3.

The cutting device illustrated is employed with that type of brick-machine which forms and forces out one or more continuous bars

of clay, the clay being continuously forced through a suitable die which forms and properly shapes the clay into the constantly outwardly moving or progressing bar. Devices are required to receive and support this continuously-moving bar of clay and protect the same from injury and to cut the same into bricks or blocks of the desired size and uniformity. In the accompanying illustrations I show an endless carrier or cutting-table receiving the bar of clay and preferably moved or propelled by the bar of clay and a cutting-reel mounted adjacent to the rear or discharge end of the carrier and preferably rotated by the progressing movement of the carrier to sever the bar of clay into uniform blocks or bricks, which are thereafter discharged or removed from the carrier. Without so limiting my invention, I show, as an example, a series of loosely-connected links or sections forming the endless chain or carrier. The sections or links are preferably all alike, and each consists of a usually rectangular board, plate, or block 1, having a flat outer face in length equal to the length of each brick to be cut. Each plate is formed centrally along its inner face with a bearing-block 2, rigid therewith and usually located centrally between the side edges of the plate and having its under face flat or otherwise formed to slide along over suitable supports, and thereby uphold the plate. The bearing-blocks 2 extend to the ends of the plates 1, and the endless chain or carrier is formed by pivotally uniting said bearing-blocks at the inner faces of their meeting ends, usually by flat hinges 3. The arrangement is such that the end edges of the plates 1 approximately meet along the top ply of the carrier with the outer flat faces of the plates all in the same horizontal plane to form a long flat floor for the bar of clay 4 expressed from the discharge die or nozzle 5 of the brick-machine and constantly progressing therefrom onto the carrier, and thereby constantly moving the carrier along. Each section or link of the carrier is provided with two cheek-pieces 6, arranged at opposite side edges of and rigid with the plate thereof and projecting above and below the plane thereof. The cheek-pieces are arranged about midway between the ends of the plate and are arranged at

right angles to the plane thereof, so that the bar of clay rests longitudinally of the plate and between the cheek-pieces, and the front edges of the inner projected ends of the cheek-pieces (of the top ply of the carrier) are curved downwardly and forwardly or otherwise formed with stops 7, as hereinafter set forth. A framework is provided, carrying tracks and supporting devices for the carrier. For instance, I show a framework comprising posts or standards 8, to the upper portions of which the longitudinal side beams 9 are secured. 10 represents the two end sprockets between the ends of said side beams 9 and having horizontal axes mounted therein. The endless carrier travels over said sprockets with the top ply thereof moving rearwardly from the brick-machine and receiving and carrying the clay bar. Between said sprockets the side beams 9 are connected by cross-bars carrying longitudinal parallel bars 11, usually separated a distance apart and at suitable intervals provided with horizontal cross-shafts 12, provided with flanged rollers 13. The top ply of the endless carrier is supported in the desired horizontal position and carrying and upholding the heavy clay bar by said flanged rollers 13, supported, for instance, in the manner just described. The inner bearing blocks or surfaces of the links or plates of the carrier rest on the flanged rollers and move rearwardly over the same, and the said top ply is thereby properly guided and upheld and friction is reduced. The return or bottom ply of the carrier is supported by rods 14, rigidly secured to and projecting laterally from each section or link of the carrier and usually provided at their ends with rollers 15, which travel on the horizontal flanges of angle-irons 16, secured to the lower portions of the frame uprights or standards. The front end of the top ply of the carrier is arranged adjacent to the brick-machine die, so that the clay bar moves from the die directly onto the carrier, and the sprockets and top-ply-supporting track at the opposite or rear end of the apparatus are so arranged that each plate will leave the track and incline downwardly as it passes to the sprockets.

The rotary cutting-reel is arranged transversely of and above the top ply of the carrier and is mounted in suitable vertical upwardly-projecting standards or supports 17 from the side beams 9. The reel consists of two circular end heads, hubs, or disks 18, each provided with an outwardly-extending horizontal spindle or axle stub 19, mounted to turn freely in the upper ends of said standards, between which the reel is located, and two pairs of sliding diametrical arms or bars 20, carrying end guide-rollers 21 and the cutting-wires 22. The parallel diametrical bars 20 of each pair are preferably similar in dimensions and are rigidly secured together by cross-bars 23 to form a diametrical sliding wire-carrying frame. The outer ends of arms

20 are formed with transverse holes or openings, through which hollow journal-bolts 24 are passed. These bolts are rigidly secured by nuts 25 on their outer threaded ends. The inner ends of the bolts are flanged and formed with enlarged bearing portions abutting the inner faces of arms 20. The loosely-mounted or idler guide-rollers 21 are mounted on said bearing portions of the bolts and are confined between the flanges thereof and the inner faces of the arms. The cutting-wires 22 (four being employed in the example shown) are carried by tension-bolts 26, each of which passes loosely and longitudinally through a hollow journal-bolt and at its inner projecting end 27 is formed hook-shaped or notched to receive and hold the cutting-wire, which can be looped at its ends to catch on the hooks of the two tension-bolts provided for each wire. The outer end of each tension-bolt is threaded and at its outer projecting end provided with an adjustable stop, such as a thumb or wing nut 28, screwing against the outer end of the journal-bolt, so that the tension of each wire can be properly maintained and adjusted independently of the journal-bolts and rollers. It will hence be noticed that each cutting-wire is concentric with or located in the axial line of the two guide-rollers arranged at the ends of the wire. In the specific example illustrated I show the reel comprising two diametrical frames crossing each other at right angles and at their ends carrying four parallel and equally-spaced cutting-wires, each wire having the two end guide-rollers; but as at present advised I do not wish to so limit my invention. Each reel-hub 18 at its inner face is formed with two diametrical guide or slide ways 29 for the bars 20, arranged at right angles to each other and intersecting at the center of the inner face of the hub. If desired, each slideway can be provided with edge stops 30 to limit the diametrical or sliding movement of the bars 20 in both directions. In order to maintain the inner faces of the bars 20 approximately flush with the inner faces of the hub-disks and to maintain the guide-rollers of each end of the reel in approximately the same vertical plane, I can transversely recess or reduce the central or crossing portions of the bars 20, so that the two bars at an end of the reel will be located approximately in the same vertical plane. Each reduced portion is longer than the width of the opposite bar passing through said reduced portion to permit the desired free sliding movement of one bar across the other bar at the same end of the reel. The bars 20 are confined to freely reciprocate in the slide-ways 29 and are held from dropping from the faces of the hub-disks by the means holding said hubs against movement away from each other or away from the bars 20 of the reel. I usually provide each bar 20 with edge stop-shoulders 31, located between the shoulders of stops 30 of its respective slideway, to limit the reciprocation of the bar in both direc-

tions. The reel is so arranged with respect to the endless carrier that the edges of the cheek-pieces engage the guide-rollers and rotate the reel through the medium of said cheek-pieces and rollers to carry each cutting-wire transversely down through the bar of clay to sever a block or brick therefrom and then carry each wire upwardly from the clay bar and through the previously-made cut therein. The arrangement is such that a pair of rollers 21 is always in engagement with cheek-pieces of the endless carrier, so that the reel rotates constantly with the carrier. The cheek-pieces along one side of the carrier are equally spaced and are also equally spaced with those on the opposite side of the carrier. The rollers 21 are of comparatively large and of equal diameter, and the diameter of each roller is approximately equal or slightly less than the distance between the adjacent vertical edges of two cheek-pieces on the same side of the carrier. As the carrier moves forward the rearmost guide-rollers of the reel will be engaged by the upper ends of the front vertical edges of a pair of opposite cheek-pieces and the rollers will move down in the vertical spaces between vertical edges of adjacent cheek-pieces and will travel down against said front edges of the cheek-pieces forming the rear wall of said vertical space. The cutting-wire will thereby be carried down through the bar of clay to form a clean cut accurately perpendicular or at right angles to the longitudinal axis of said clay bar, and the arrangement of the cheek-pieces is such that the cut will be formed directly over and in the plane of the joint or meeting edges between two adjoining plates 1 of the carrier. Each pair of rollers moves downwardly along the front edges of the pair of cheek-pieces and engages the curved extended edges or lower ends 7 thereof below the plane of the clay bar and until the cutting-wire between said rollers has passed through and dropped below the clay bar. At about this moment the carrier-section immediately in advance of said cutting-wire begins to tilt downwardly and the said rollers pass the lowest point in their circle of movement and move upwardly and forwardly and along the rear edges of the cheek-pieces in advance, the reel being now propelled by the next succeeding pair of rollers coming into engagement with the next succeeding pair of cheek-pieces. The reel is so arranged as to constantly change or vary its radii, or, in other words, the reel is eccentrically mounted, and as the reel revolves the distance or radius between the axis of the reel and a cutting-wire is constantly varying within certain fixed limits. This differential movement is necessary in order to form clean perpendicular cuts through the bar of clay and then return the cutting-wires back or up again through the cuts and preserve the cut edges from injury or recutting by the returning wires. Each connected pair of diametrical bars car-

rying the cutting-wires is hence mounted to slide longitudinally a limited distance diametrically of the reel and independently of the remaining pairs of bars to move the cutting-wire in a path eccentric to the axis of the reel. As each pair of bars 20 carries rollers and wires at both ends, said bars will freely reciprocate back and forth, as their cutting-wires successively cut through the clay bar without the employment of springs or like returning devices. When the rollers at the end of a diametrical frame of the reel engage and are moved down by the front edges of a pair of advancing cheek-pieces, said frame is at its limit of upward movement and the stop-shoulders 30 and 31, limiting such movement, are in engagement. The advancing cheek-pieces rotate the reel and carry the wire down through the clay bar at a point in the vertical plane of the joint between two plates 1 of the carrier. The instant the wire passes through the clay bar the diametrical frame (comprising bars 20) drops or moves diametrically by its weight until the guide-rollers thereof rest on the curved lower ends or stops 7 of the cheek-pieces. As the carrier moves onward and the diametrical frame recedes from the perpendicular said frame drops lower until its limit of downward movement is reached, which is determined by the stops 30 31. As each diametrical frame drops to its limit of downward movement the rollers of the other frame are engaged by the cheek-pieces.

The construction of the reel is exceedingly simple and durable and very accurate and effective in operation and does not require the employment of a separate or additional belt conveyor to receive the bricks from the end of the carrier.

It is evident that various changes might be made in the forms, constructions, and arrangements of the parts described without departing from the spirit and scope of my invention. Hence I do not wish to limit myself to the exact constructions and arrangements shown.

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

1. A rotary cutting-reel having radial diametrically-sliding arms provided with cutting devices, substantially as described.
2. A rotary brick-cutting reel comprising diametrically-movable arms provided with the cutting-wires, substantially as described.
3. An endless carrier or table for the bar of clay, in combination with a rotary brick-cutting reel cooperating with said carrier to sever said bar into bricks and rotated by engagement with the carrier and comprising radially-sliding members provided with brick-cutting means, substantially as described.
4. A rotary cutting-reel comprising crossed diametrically-slidable frames provided at their ends with the longitudinal cutting-wires, substantially as described.
5. A rotary brick-cutting reel comprising

end hubs having diametrical slideways, and diametrical bars carried by said hubs and mounted to slide longitudinally in said slide-ways, said bars at their outer ends provided
5 with guide-rollers and longitudinal cutting-wires, substantially as described.

6. An endless carrier and its supporting-frame, said carrier having cheek-pieces arranged in pairs, in combination with a rotary brick-cutting reel arranged transversely
10 above the carrier and comprising radially-movable members provided with the longitudinal cutting-wires, and guide-rollers loosely carried by said members and arranged to be
15 engaged and guided by said cheek-pieces to rotate the reel, substantially as described.

7. A traveling carrier for the bar of clay comprising sections loosely joined and provided with equally-spaced cheek-pieces having inner end stops, in combination with a
20 rotary brick-cutting reel comprising radially-movable members provided with end rollers engaged by and traveling along the vertical edges of said cheek-pieces to rotate the reel
25 and longitudinal cutting-wires carried by said members, substantially as described.

8. The rotary brick-cutting reel comprising end hubs having shaft-stubs, the inner faces of said hubs provided with intersecting diametrical slideways, the crossed independent
30 diametrically-arranged frames confined in said ways to slide diametrically of the reel, guide-rollers loosely mounted at the ends of the frames, and the cutting-wires between
35 the ends of the frames, substantially as described.

9. In a brick-cutter, a rotary cutting-reel provided with freely diametrically movable members, and the cutting-wires carried by
40 said members, substantially as described.

10. In a brick-cutter, a rotary cutting-reel having a diametrical frame freely movable diametrically and provided at both ends with the cutting devices, and stops limiting the
45 diametrical movement of the frame in opposite directions, substantially as described.

11. A brick-cutting reel comprising radial bars having transverse openings in their outer ends, hollow journal-bolts passed through

said openings and secured therein, guide-rollers loosely confined on said bolts, tension-bolts passed loosely and longitudinally through said journal-bolts and having adjustable stops at their outer ends, and the cutting-wire between the inner ends of said tension-bolts, substantially as described.
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12. In a brick-cutting device, in combination, a frame, end sprockets, an endless carrier passing over the sprockets and comprising flat plates having inner bearing-blocks
60 hinged together, a track beneath the top ply of the carrier on which said blocks travel, and a track for upholding the return ply of the carrier, substantially as described.

13. In a brick-cutting apparatus, an endless carrier comprising loosely-united plates provided with projecting cheek-pieces, in combination with a rotary cutting-reel comprising radially-reciprocating members provided with cutting-wires and guide-rollers
70 engaged by and cooperating with the cheek-pieces to rotate the reel substantially as described.

14. In a brick-cutting apparatus, a frame having a top longitudinal track, and separated bottom tracks, end sprockets, and the endless traveling carrier mounted on said sprockets and comprising loosely-connected plates traveling on and upheld by said top track and having lateral rods traveling on
80 said bottom tracks, substantially as described.

15. A brick-cutting apparatus comprising a frame, an endless traveling carrier, supports for said carrier and mounted in the frame, longitudinal bars beneath the top ply of the carrier, flanged rollers carried by said bars, said carrier comprising plates at their under faces provided with bearing-blocks moving on said rollers and between the
90 flanges thereof, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

BYRON E. BECHTEL.

Witnesses:

L. W. SHUH,

CHAS. O'DONNELL.