

(No Model.)

2 Sheets—Sheet 1.

J. BENSING.  
BRICK OR TILE CUTTING MACHINE.

No. 563,252.

Patented July 7, 1896.

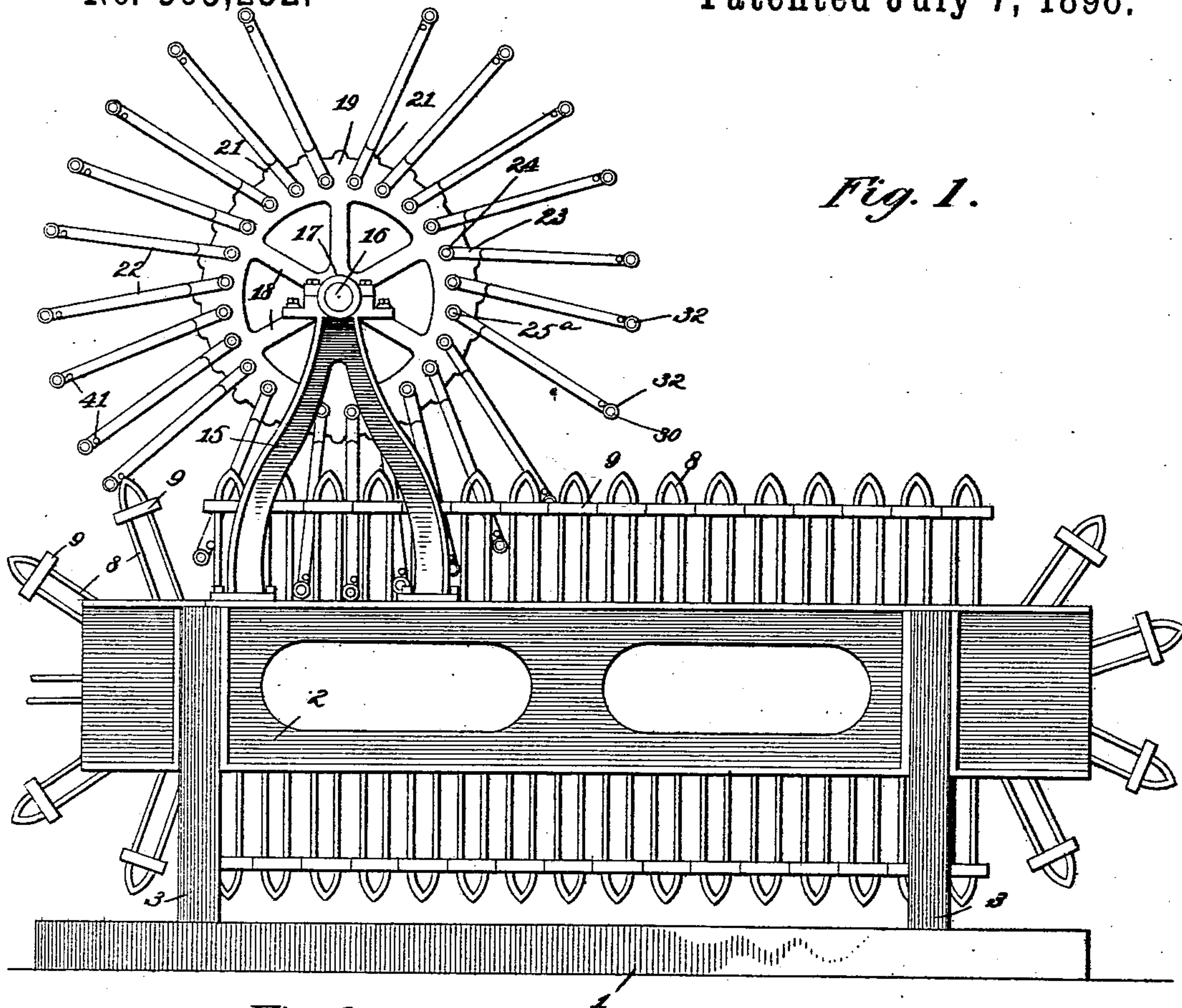


Fig. 1.

Fig. 3.

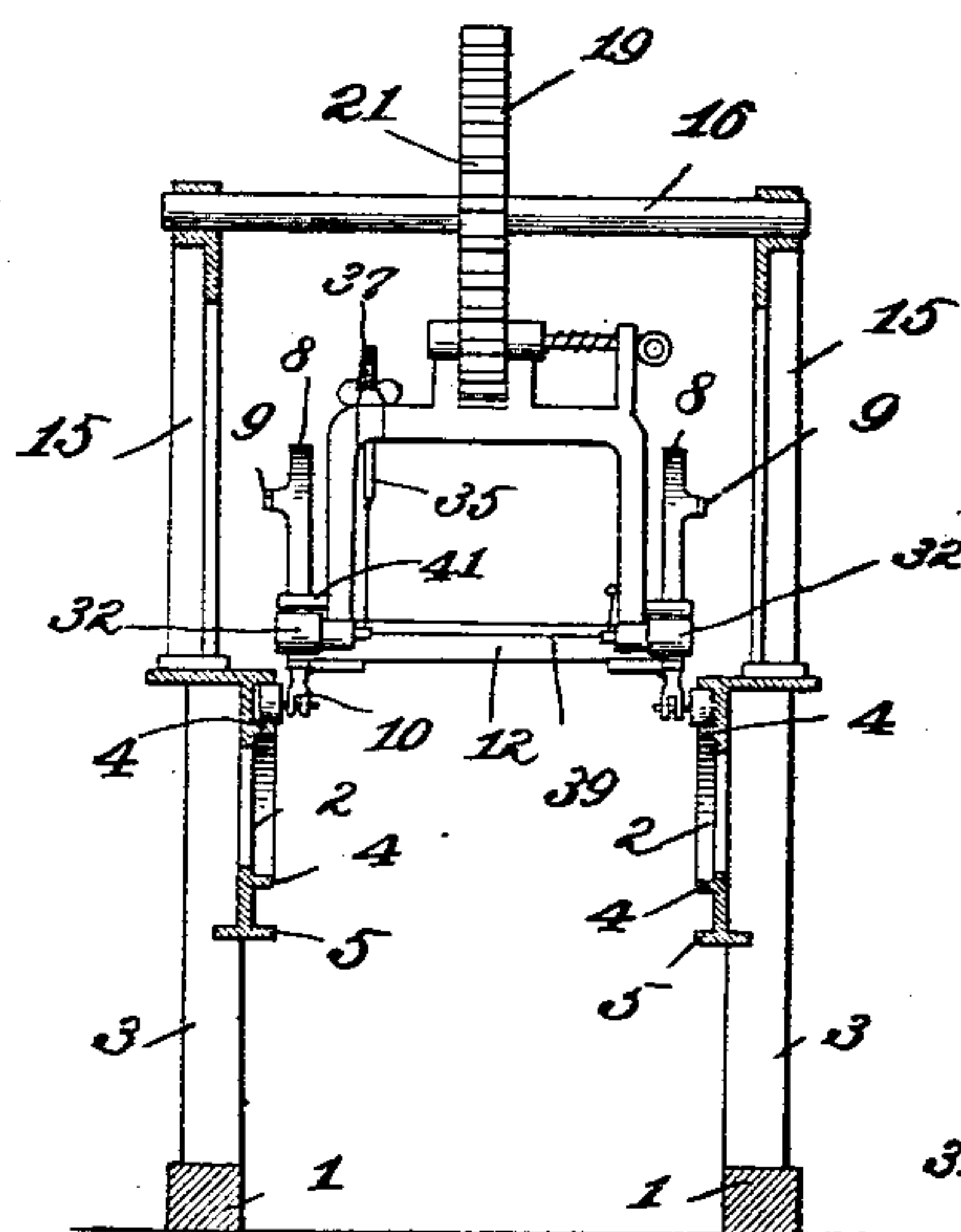
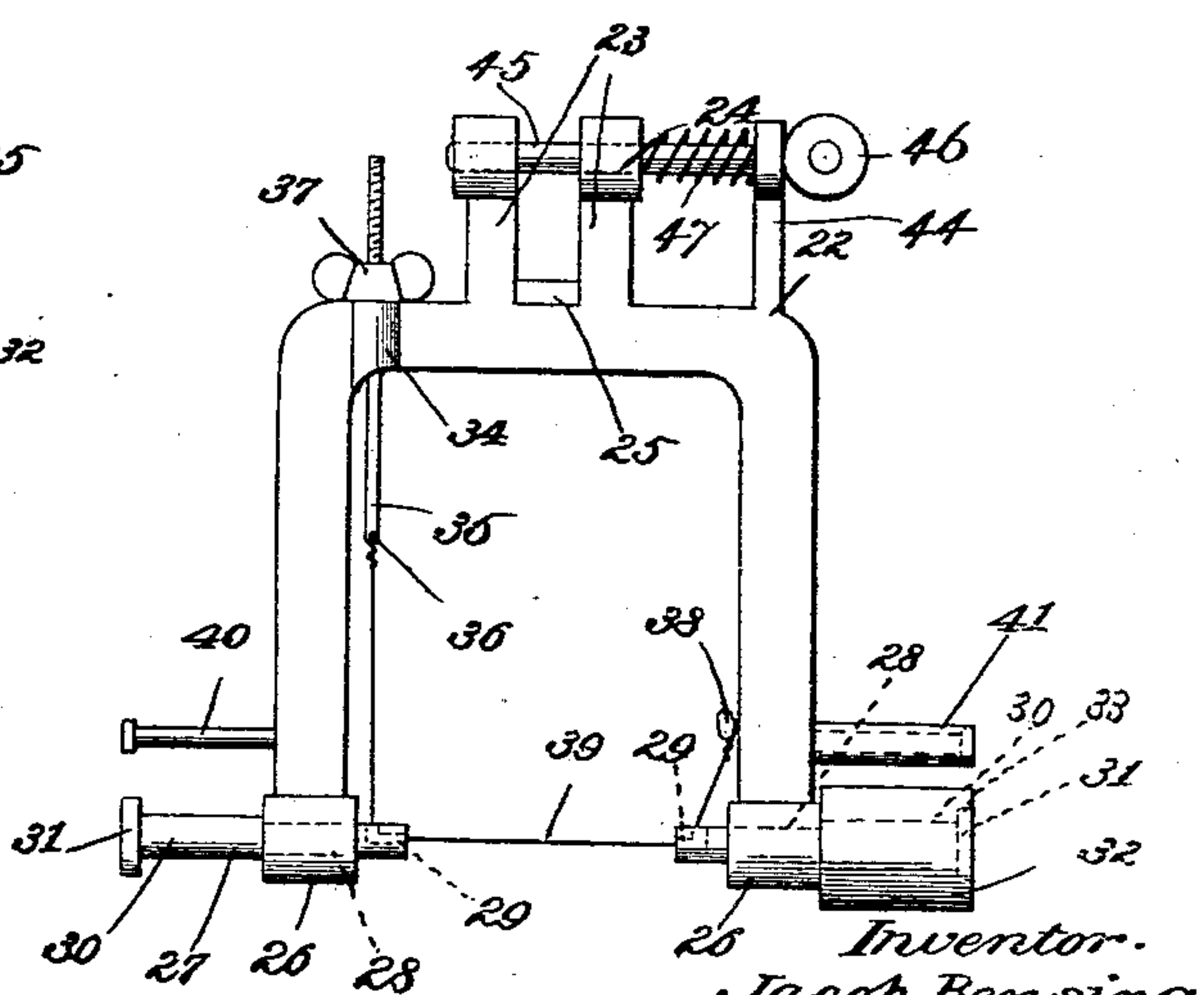


Fig. 4.



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Jacob Bensing.

By M. J. Duwall Atty.

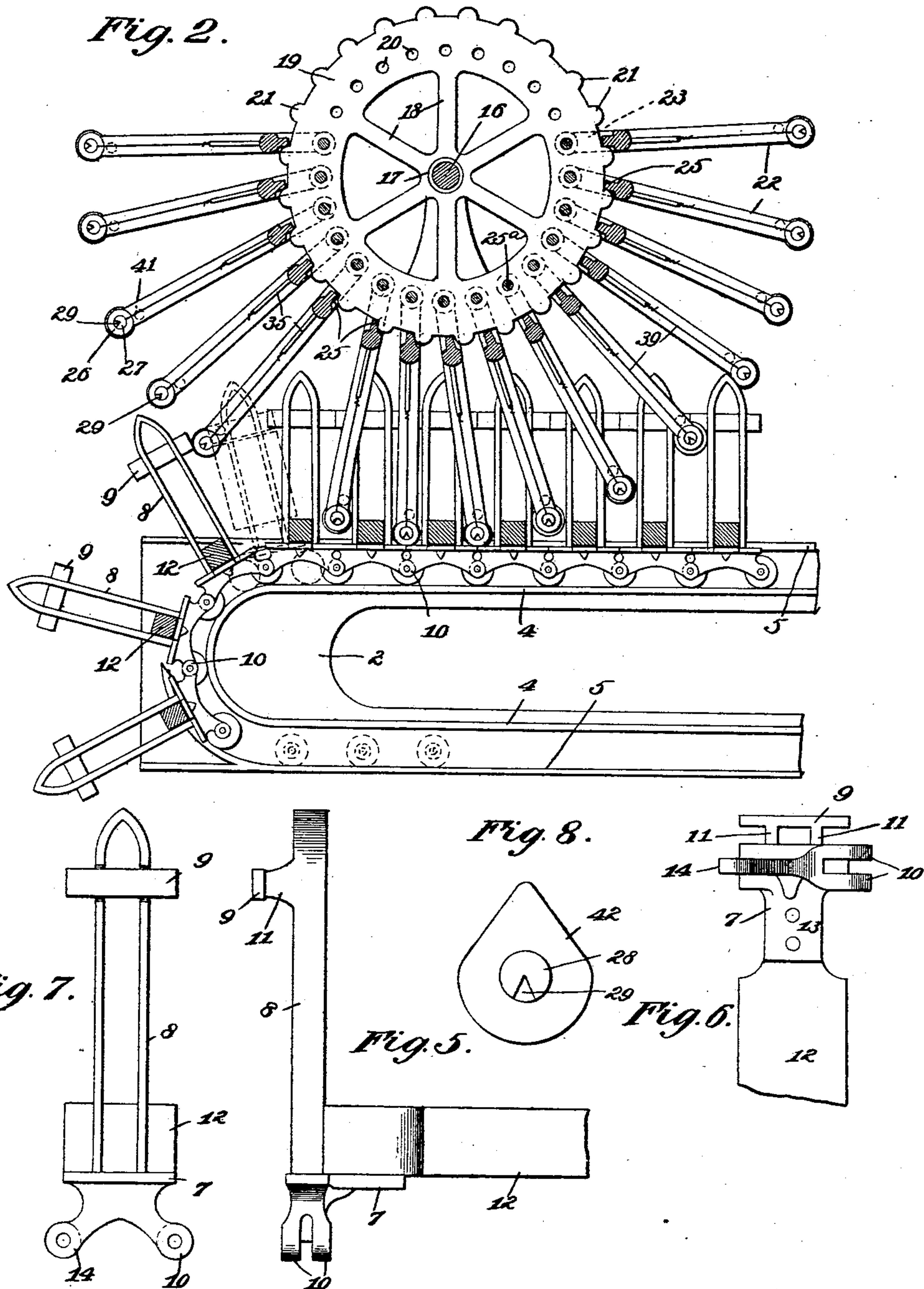
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2 Sheets—Sheet 2.

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Edw. J. Duval Jr.  
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Inventor.  
Jacob Bensing.  
By M. J. Duval  
Atty.



# UNITED STATES PATENT OFFICE.

JACOB BENSING, OF MALINTA, OHIO.

## BRICK OR TILE CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 563,252, dated July 7, 1896.

Application filed August 22, 1895. Serial No. 560,113. (No model.)

*To all whom it may concern:*

Be it known that I, JACOB BENSING, a citizen of the United States, residing at Malinta, in the county of Henry and State of Ohio, have invented certain new and useful Improvements in Brick or Tile Cutting 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.

This invention relates to brick and tile cutting machines, and has for its object certain new and useful improvements upon the details of construction shown and described in United States Patents Nos. 411,638 and 524,302, granted me, respectively, September 24, 1889, and August 14, 1894, such improvements being illustrated in the accompanying drawings, described in the following specification, and more particularly pointed out in the appended claims.

Referring to the drawings, Figure 1 is a side elevation of a brick and tile cutting machine embodying my improvements. Fig. 2 is a vertical longitudinal sectional view of the delivery end of the machine, together with the revolving cutters. Fig. 3 is a transverse vertical sectional view of the machine, the revolving cutter being shown in elevation. Fig. 4 is a detail of one of the cutter-arms; Fig. 5, a detail of one of the carrier links or members in side elevation. Fig. 6 is a bottom plan view of the same. Fig. 7 is an end elevation of the same. Fig. 8 is a detail of a modified form of shifting device.

Like numerals of reference indicate like parts in all figures of the drawings.

Mounted upon suitable longitudinal sills 1 is the table of the machine, and the same as constructed comprises the opposite longitudinal sides 2, formed of angle-iron properly braced and bolted and supported upon the sills by the legs or standards 3. The inner faces of the sides 2 are provided with flanges forming the inner tracks 4, and these tracks 4 are partially surrounded, that is, at their front and upper and lower sides, by the outer tracks 5, which are parallel therewith, except at the receiving end of the machine. The tracks 4 and 5 are at the delivery end of the

machine formed upon the segment of a circle, struck from the center of the frame.

Arranged upon the track 4 and inclosed by the track 5 is the endless carrier, which consists of a series of links or members, in pairs, at each side of the machine. Each pair of links comprises a cast-metal base 7, from which rises and is formed integral therewith the vertical guide-arm 8, terminating at its upper end in an apex. Each guide-arm 8 is provided upon its outer side and at a suitable point above its base 7 with a transversely-disposed bar 9. Each base 7 has formed on its under side and projecting downwardly and outwardly therefrom a pair of perforated bearing-lugs 10. These bearing-lugs have the centers of their perforations in vertical alinement with the corresponding ends of the base 7 and cross-bar 9, so that a line drawn through said centers will also meet the ends of the base 7 and bar 9. The bars 9, it will be seen, are not arranged directly against the faces of the standards 8, but at the outer ends of short lugs 11, formed upon said faces of the standards, so that the bars 9 may be said to be "offset" upon the standards.

The base-plates 7 at their inner ends correspond to the standards, and are connected in pairs by the transverse pallets 12. These pallets 12 have their inner ends reduced, and are bolted to the base-plates 7, all as indicated at 13. This constitutes a link or member of the endless carrier, and the same are connected in series to constitute the carrier by means of pivotal bolts which pass through the pairs of lugs 10 at one side of a base-plate, and through the single corresponding lug 14 at the adjacent side of the next succeeding link or member. The carrier, it will be understood, is intended to be operated from the receiving to the delivery end of the table, either by the column of clay as it issues from the mill and takes frictional contact with the carrier, or by other means, as may be preferred.

It will be obvious that when the links or members of the carrier are upon the flat or upperside of the track 4 the ends of the cross-bars 9 and the ends of the base-plates 7 will all be in contact, so that a rigid carrier will



result, and no independent motion of any one or more links can take place, but the carrier will move as a whole from the time the column of clay is received until after the cuts are made, by which time the cut portions of the clay and the pallets or members supporting the same will have reached the curved delivery portion of the track, and then an immediate separation of the members of the carrier will take place and continue around the curved delivery end of the track, so as to facilitate in a manner hereinafter described the withdrawal of the cutting-wires from a point below the column of clay and from between the links or members. I am aware that in the patents referred to a track having a sudden decline at this point is illustrated, but I find that it is desirable that the separation should continue for a longer period of time than is possible with such a form of track, and that the cut bricks or tile should diverge toward their upper ends. This result I produce by forming the track upon the segment or arc of a circle in the manner described.

Difficulty has also been experienced by the occasional tilting or independent movement of one or more of the links or members of the carrier as the same advanced with the column of clay to the cutter, and it will be obvious that by constructing the links or members in the manner described—that is, by providing the bars 9 and having their ends in line with the ends of the base-plates 7, so that when in series they abut—I avoid this objection and produce in the carrier or that portion thereof upon the upper side of the track a rigidity not heretofore obtainable.

Rising from and bolted to the upper edges of the sides 2 are the vertical standards 15, the same having bearings at their upper ends for the accommodation of the transverse shaft 16, upon which is mounted the revolving cutter. This cutter comprises the hub 17, from which radiate the spokes or arms 18, that carry the annular rim 19. At intervals the rim 19 is provided with bolt-holes 20, and alternating radially with such bolt-holes the periphery of the rim has formed thereon lugs or spurs 21, which act as stops for limiting the movements of the cutter-arms in a manner hereinafter apparent.

22 designates a U-shaped cutter-arm, at whose center or closed end is formed a pair of bearing-arms 23, having eyes 24 at their ends. These arms 23 are connected near their inner ends with a web 25. A series of these arms 22 are arranged around the rim 19 between the spurs or lugs 21, the arms 23 embracing the opposite sides of the rim and pivotally and loosely connected to the rim by means of bolts 25<sup>a</sup>, passed through the bearing-eyes 24 at the inner ends of the arms 23 and through the holes 20 of the rim. When in position upon the rim, it will be obvious that the pivotal movement of each arm will be limited by reason of the web 25 coming in

contact with one or the other of the adjacent spurs or lugs 21 of the rim.

Each of the terminals of each cutter-arm 22 terminates in a bearing-eye 26, and in each eye there is seated a bearing bolt or spindle 27. These bolts or spindles exceed in length the width of the eyes 26 and are reduced at their inner ends, as indicated at 28, their extremities being notched, as at 29. The outer or larger portions of the bolts (indicated at 30) are provided with heads 31. Upon each of these bolts, upon the enlarged portions 30, antifriction-rollers 32 are mounted for free revolution, and the ends of the rollers are countersunk, as at 33, to receive the heads 31 of the spindles or bolts. An eye 34 is formed in the upper portion of each of the cutter-arms 22 at one side of its arms 23, and arranged therein for adjustment is a rod 35, having an eye 36 at its lower end, which is within the arm 22, and having its outer end threaded and provided with an adjusting thumb-nut 37. Diagonally opposite the rod 35 there is formed on one of the terminals of the cutter-arm 22 a lug 38. To this lug 38 is attached the cutting-wire 39, after which the wire is passed into engagement with the two inner notched ends of the spindles or bolts 27 and subsequently connected to the eye 36 of the rod 35. From this it will be seen that, by a proper manipulation of the nut 37, the tension of the cutting-wire may be fixed.

The above is the ordinary construction of cutter-arm, and I have found that the same is subject to some criticism, namely: As heretofore constructed, the cutting-wire, when the arm is being elevated subsequent to a cut, is apt to cut or slice or otherwise mar the adjacent end of a receding or approaching brick or tile blank. To obviate this, I find it necessary to provide some means other than the antifriction-rollers 32 for throwing the cutting-wires away from the cut blanks as the cutting-wires are withdrawn subsequent to a cut. For this purpose I extend, parallel to the bolts 27 and above the same from the outer side of each terminal of each arm 22, a lug 40, and prefer to locate thereon a loose antifriction sleeve or roller 41. It will be seen that the same is eccentric to the antifriction-roller 32 and its bolt, and consequently is so located as to contact with the sides or edges of the guide-standards 8 when the cutter-arms are being withdrawn subsequent to a cut. In this manner the cutting-wires are supported so far beyond the blank which it passes as to obviate any possibility of its contact therewith and its marring thereof.

As it sometimes happens, stones are embedded in the clay, and the cutting-wires in making a cut will spring around the same, and thus the stone be left as a projection. In the old construction of arm the cutting-wire, as it was withdrawn, was apt to engage this projection, and in fact has been known to actually lift the cut blank from the carrier.



By the construction of arm described, however, such possible accidents are avoided. Other means may be provided for accomplishing this object, and I have herein shown one  
 5 simple substitute for that described. The same consists simply in substituting for the antifriction-roller 32 an eccentric cam 42, (see Fig. 8,) the cam being so adjusted upon its bolt as to cause its longer side to contact with  
 10 the guide-standards 8 as the cutting-arm is withdrawn subsequent to a cut.

This completes the construction of the invention, and the operation of the machine as improved is as follows: The column of clay  
 15 issuing from the die arrives in contact with the carrier and forces the latter over its track. This movement upon the part of the carrier causes the revolving cutter to operate, by reason of the fact that its rollers 32 are en-  
 20 gaged by the guide-standards 8, in the same manner as a rack-bar engages the teeth of a spur-gear. As the column of clay advances, the wires of the cutter-arms are carried down through the same, so that the tiles or bricks  
 25 are cut. In the downward movement of the cutter-arms the rollers 32 move over the adjacent edges of the guide-standards, and when the cutter-wires have passed entirely through the clay the said rollers occupy the recesses  
 30 13 in the pallets. As each cutter-arm passes the perpendicular and moves upward, the rollers 40 come in contact with the reverse sides of the guide-standards, so that they, acting as eccentrics, serve to hold the cutting-  
 35 wires away from the moving end of the clay and renders impossible any contact whatever between a cutting-wire and the clay after the said wire has made a cut and is in the act of returning to its first position. As before ex-  
 40 plained, the cams 42 would in a like manner produce the desired result, though I prefer to employ the independent means shown.

From the foregoing description, in connection with the accompanying drawings, it will  
 45 be seen that I have improved the enumerated details of the machine in the manner specified, and have greatly improved the working of the machine as a whole. I also located the stops for the cutter-arms at the rim of the  
 50 disk instead of at its side, whereby the disk wheel or rim can be more easily made and the weight of the arm is directly on the spur or lug, the cutter thereby operating with considerably less jar.

At one side of the bearing-arms 23 of each  
 55 cutter-arm 22 I locate a short bearing-standard 44, the same being perforated in line with the bearing-arms, and together with said arms receiving a transverse bearing-bolt 45. The  
 60 bolt 45 is adapted to reciprocate sufficiently to one side to permit of the arms 22 being mounted in position or dismounted therefrom, as desired, and is provided at its outer end with a ring or eye 46, which may be readily  
 65 grasped by the operator. The bolt is held

normally in its closed position by means of a coiled spring 47, located thereon and between the said bearing-standard and the adjacent bearing-arm. By this arrangement, it will  
 70 be seen that the operator can readily withdraw the bolt and remove an arm for the purpose of replacing a broken cutter-wire without the necessity of stopping the machine for this purpose, and after such repair can re-  
 75 place the arm, this by reason of the absence of any nuts on the bolts which would have to be unscrewed.

Having described my invention, what I claim is—

1. In a brick and tile cutting machine the  
 80 combination with a revolving cutter and a subjacent frame having an endless track, of a carrier arranged for movement on the track, said carrier consisting of flexibly-connected  
 85 sections, each comprising a base-plate and a guide-standard and a transverse bar secured between the ends of the standards and projecting beyond such standards, a plurality  
 90 of which bars are adapted to aline and abut when one or more carrier-sections occupy a straight portion of the track, substantially as specified.

2. In a brick and tile cutting machine, the combination with a frame having a track and a superimposed, revolving cutter, of an end-  
 95 less carrier consisting of a series of loosely-connected sections, each section comprising a pair of opposite base-plates, vertical guide-standards narrower than the same, and cross-bars arranged upon and offset from the stand-  
 100 ards and terminating in vertical alinement with the edges of the base-plate, the base-plates and cross-bars, of a plurality of said sections abutting when the same are arranged  
 105 upon a straight portion of the track so as to render that portion of the carrier rigid and prevent any of its sections in that portion from having any independent movement, substantially as specified.

3. In a brick and tile cutting machine, the  
 110 combination with the frame having a track, the endless carrier arranged for movement thereon and consisting of a series of flexibly-connected sections having guides at their op-  
 115 posite ends, of a rim supported revolubly above the carrier, U-shaped arms pivoted thereto and carrying cutting-wires, bolts extending from the terminals of the arms, anti-  
 120 friction-rollers arranged loosely on the bolts, pins extending from the arms above the rollers and provided with antifriction-rollers adapted to contact with the guides of the sections when the arms are moving upward, substantially as specified.

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

JACOB BENSING.

Witnesses:

J. A. SMITH,

H. P. BENSING.