No. 889,684. PATENTED JUNE 2, 1908.

H. HEUSS.

BRICK CUTTING MACHINE.

APPLICATION FILED OCT. 28, 1907.

4 SHEETS—SHEET 1.

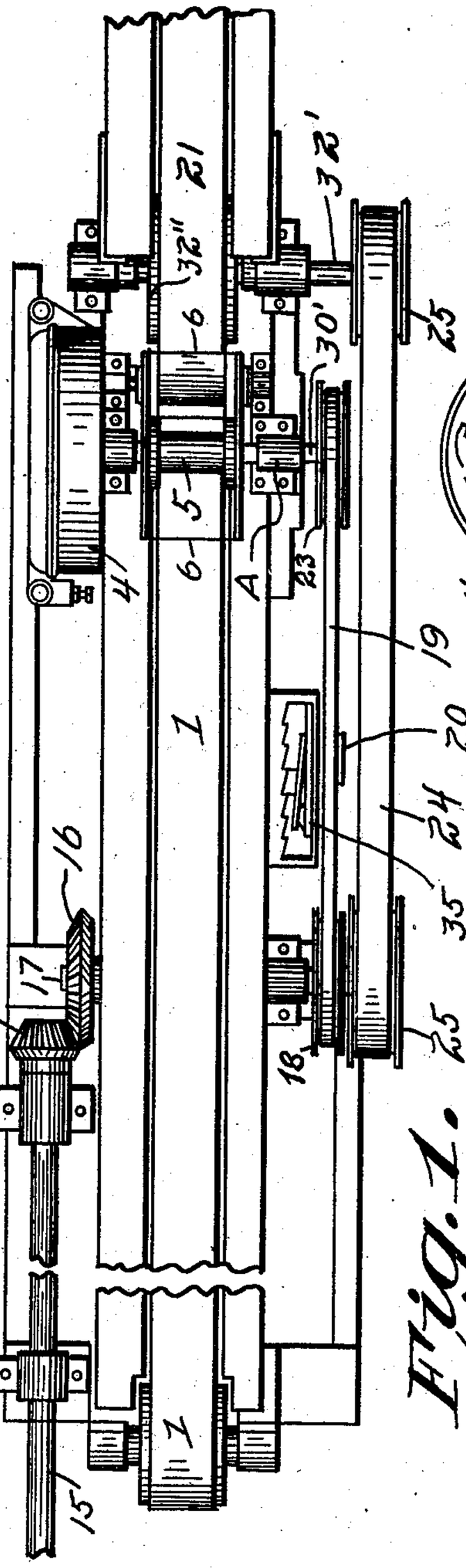

Fig. 1.

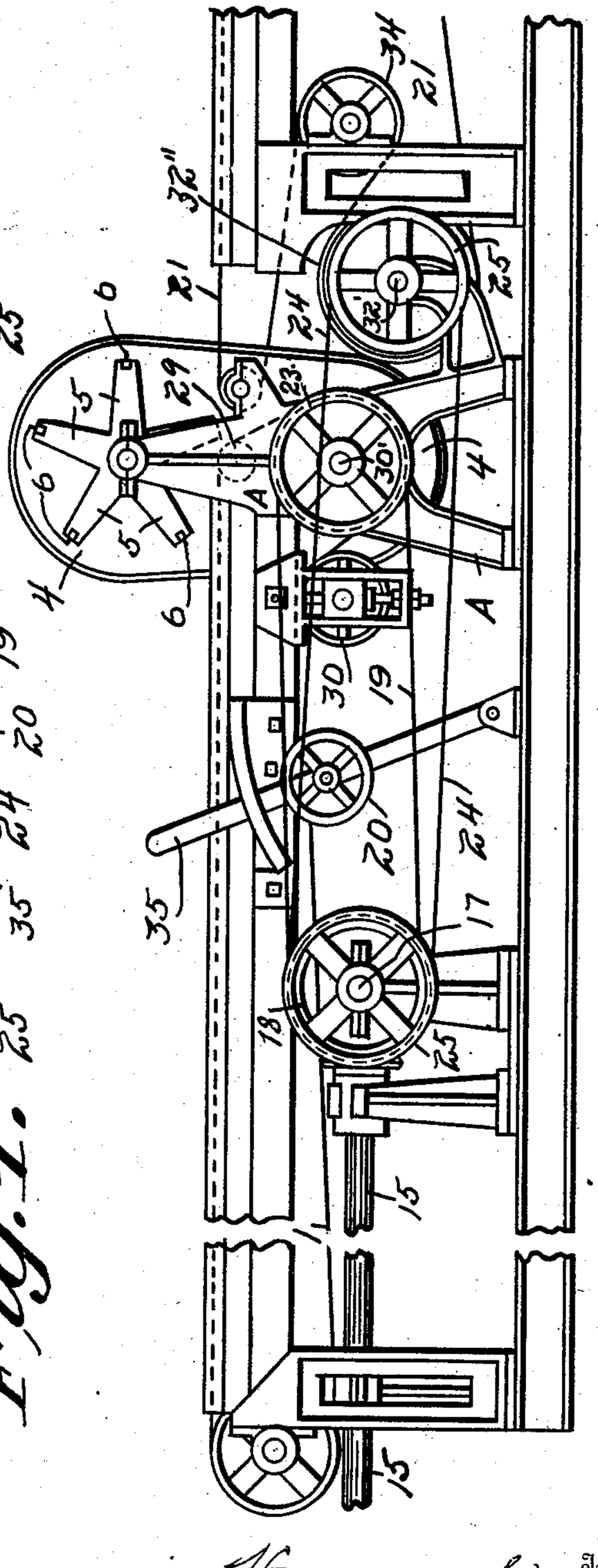

Fig. 2.

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4 SHEETS—SHEET 2.

Fig. 6.

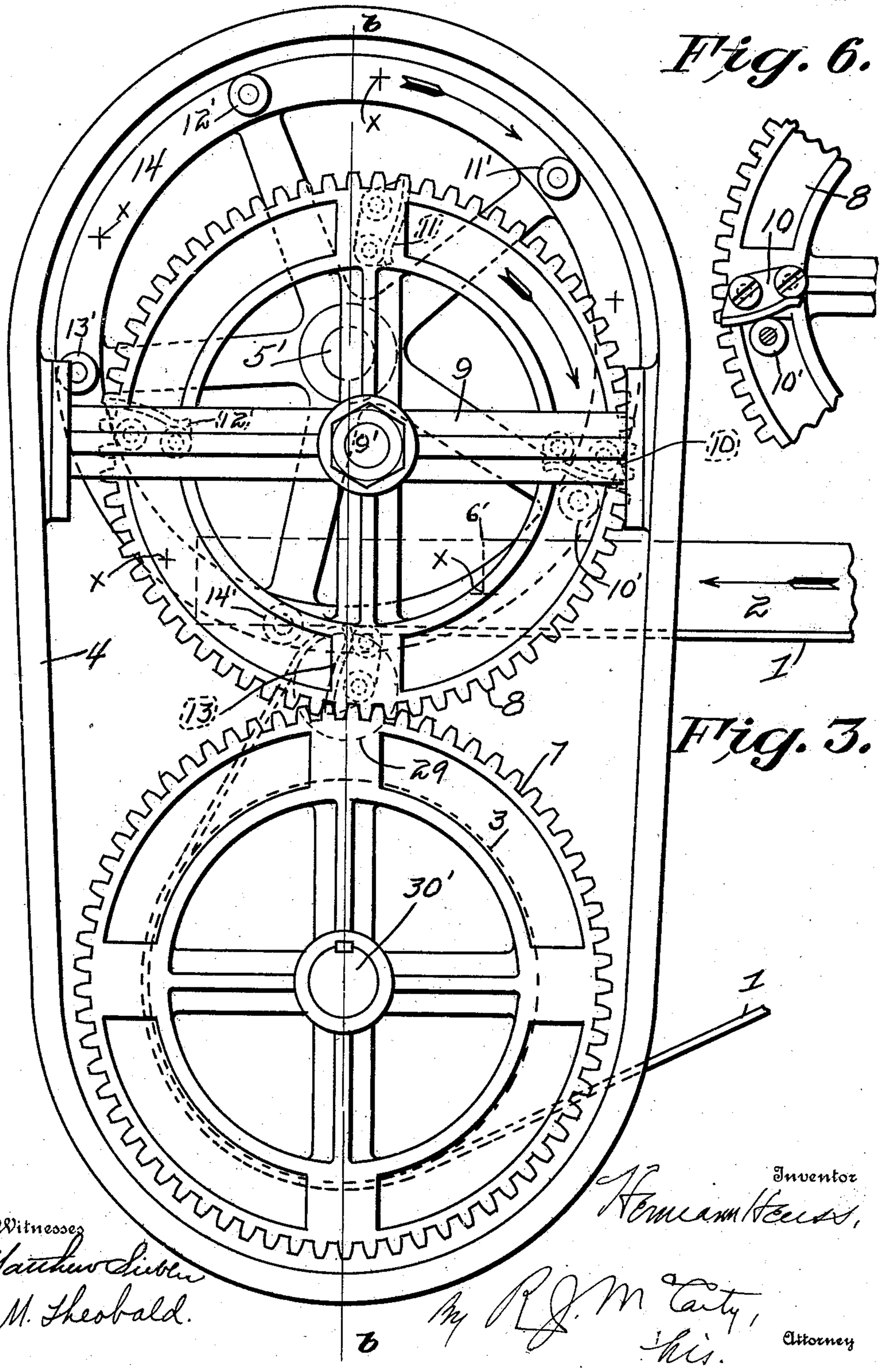

Fig. 3.

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4 SHEETS—SHEET 3.

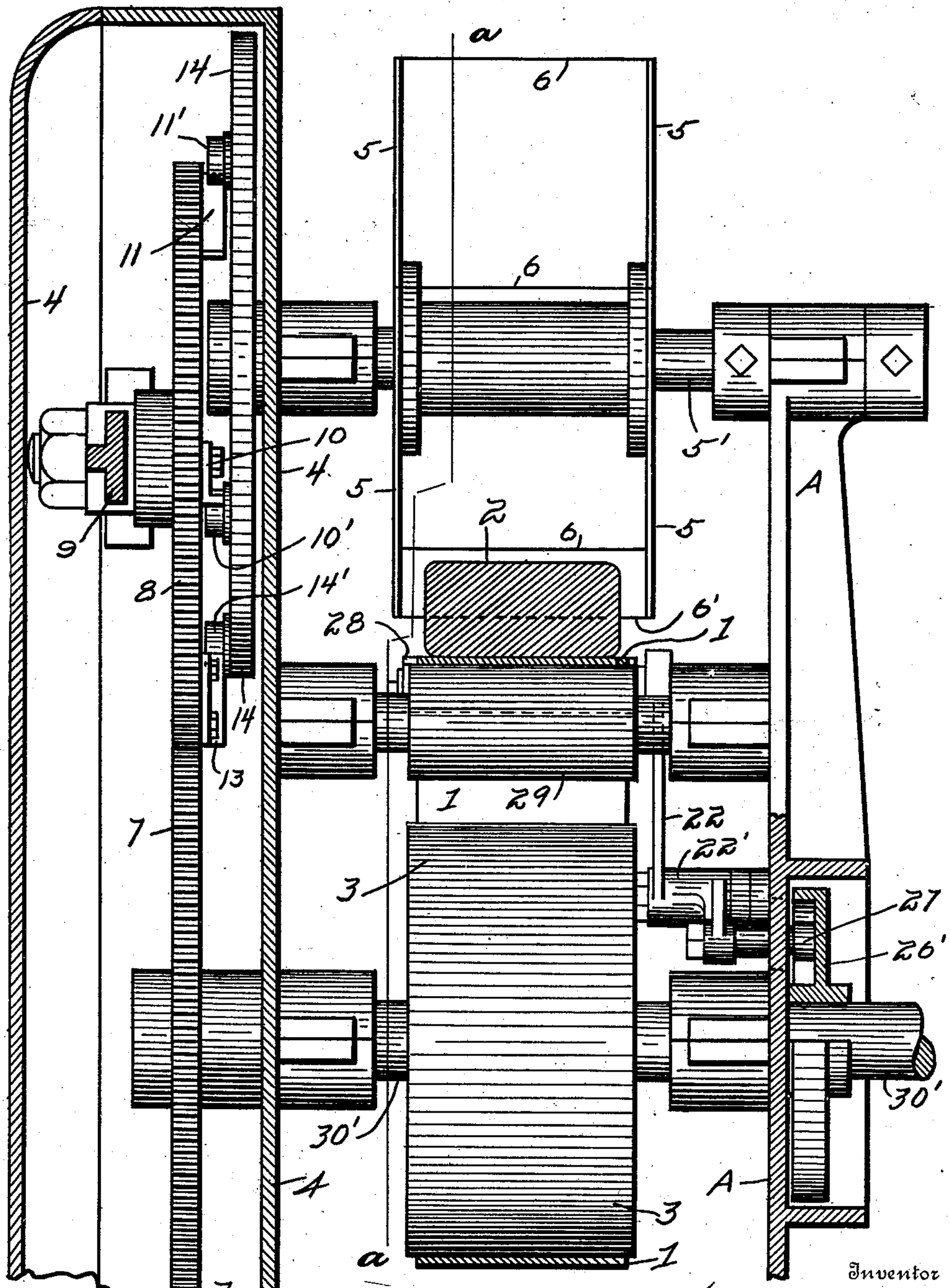

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Fig. 4.

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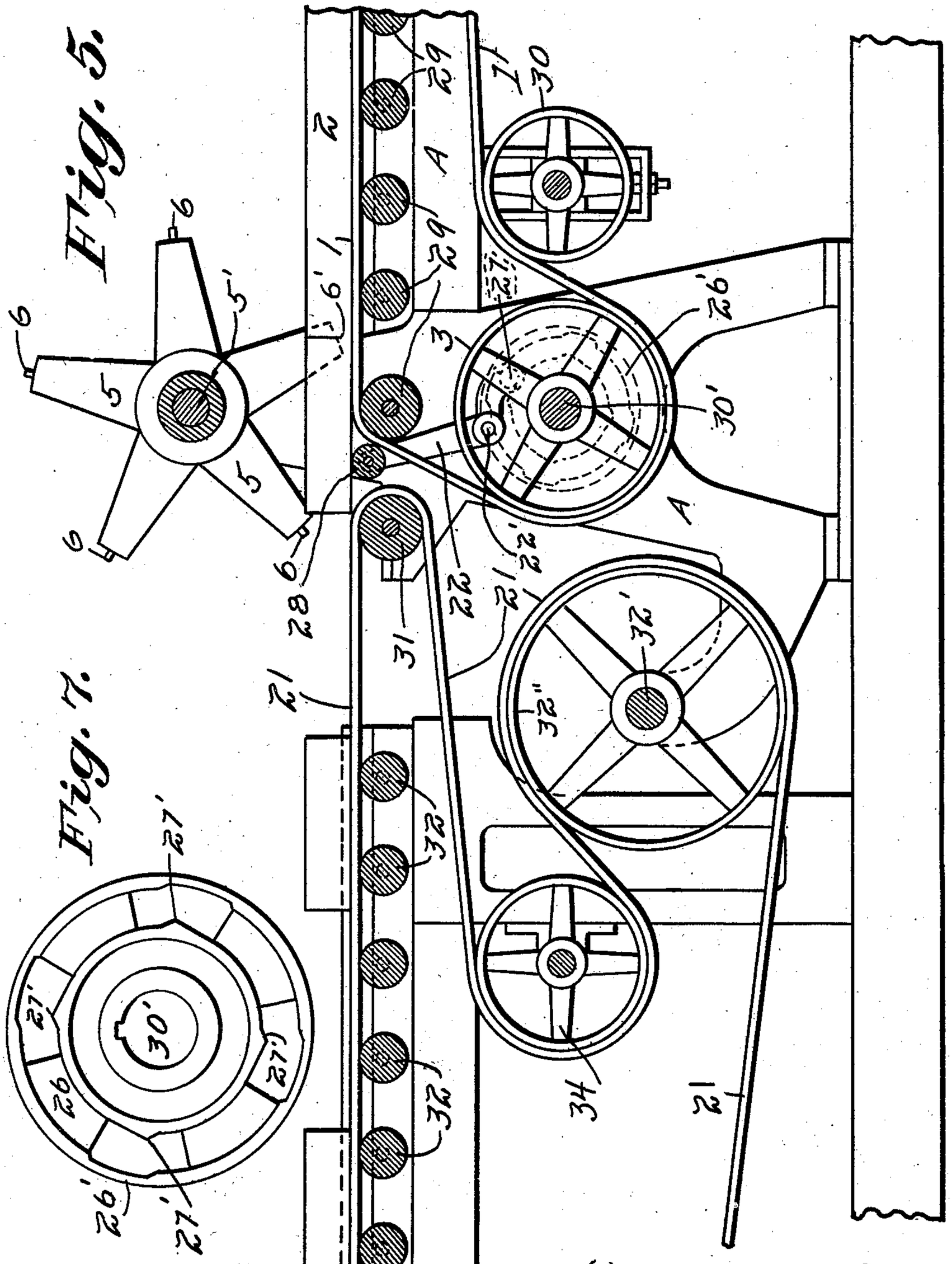
4 SHEETS—SHEET 4.

Fig. 5.



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UNITED STATES PATENT OFFICE.

HERMANN HEUSS, OF DAYTON, OHIO, ASSIGNOR TO THE C. W. RAYMOND CO., OF DAYTON, OHIO, A CORPORATION OF OHIO.

BRICK-CUTTING MACHINE.

No. 889,684. Specification of Letters Patent. Patented June 2, 1908.

Application filed October 28, 1907. Serial No. 399,404.

To all whom it may concern:

Be it known that I, HERMANN HEUSS, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Brick-Cutting Machines; and I do 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 the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to improvements in brick-cutting machines in which bricks of uniform lengths are cut from a moving bar of clay. The bar of clay is forced from the well-known brick machine at a variable speed, and while said bar is thus moving, a series of wires or cutters carried upon a rotating reel are caused to cut the advancing clay bar into oblong rectangular pieces or bricks which are removed by a conveyer. The pieces of clay are severed in straight vertical cuts at right angles to the moving clay bar, and in order to effect such cuts, the rotating reel or the cutters must have a retarding movement. This is obtained through the means hereinafter described and claimed.

Preceding a detail description of the invention, reference is made to the accompanying drawing, of which—

Figure 1, is a top plan view of a portion of a brick-cutting machine sufficient to illustrate my improved cutting mechanism. Fig. 2, is a side elevation of the same. Fig. 3, is a side elevation of the cutter-driving mechanism. Fig. 4, is a section on the line *b*—*b* of Fig. 3. Fig. 5, is a section on the line *a a* of Fig. 4. Fig. 6, is a detail of one of the cams of the cutter mechanism. Fig. 7, is a detail view of the mechanism which supports the end of the clay bar prior to a severance of each brick after which the conveyer removes the same.

In a detail description of the invention, similar reference characters indicate corresponding parts.

The several mechanical divisions of the machine may be described under three distinct heads, towit—the measuring devices; the cutting devices; and the off-carrying devices, by which the finished product is taken care of during the continuous operation of the machine. This orderly arrangement will be observed in describing the invention in detail.

The measuring devices.—These consist of an endless belt 1 which passes over a measuring pulley 3 and is supported upon a suitable number of rollers 29 journaled in the sides of the main supporting frame A. An adjustable pulley 30 engages the lower side of said belt 1 adjacent to the measuring pulley and by means thereof said belt is maintained in suitable condition. The clay bar 2 is delivered to the endless belt 1 from a clay machine which is a well-known means for forming a continuous column of clay or plastic material. Owing to the well-known construction and operation of such machine, it has been omitted from the drawings and will not be further described. The measuring pulley 3 measures to the machine proper, a definite length of the clay bar 2 for the cutters, such lengths being proportional to the circumference of said measuring pulley and likewise proportional to the diameter of said pulley. By changing the diameter of the measuring pulley 3, the several lengths of the clay bar may be either increased or decreased. The measuring pulley is attached to the shaft 30′ journaled in the lower portion of the main frame, more clearly illustrated in Fig. 5 of the drawings.

The power for driving the machine is partly furnished by the continuously moving clay bar, owing to its frictional engagement with the belt 1, and auxiliary power devices driven from the brick machine which produces the clay bar or any other source of power. From the brick machine a shaft 15 is extended parallel with the cutting machine as shown in Fig. 1. This shaft 15 is continuously driven and in turn, drives a cross shaft 17 through bevel gears 16, one of which is on the shaft 15, and the other of which is on the cross shaft 17. With the cross shaft 17 the shaft 30′ of the measuring pulley is connected by a small belt 19 which runs over pulleys 18 and 23 and an idler pulley 20. The position of the last-named pulley may be adjusted in a way that the tension of the belt may be increased or decreased so that the desired amount of auxiliary power can be transmitted to the cutting mechanism. The speed of the machine, however, is governed by the friction exerted by the moving clay bar 2 on belt 1.

The cutting devices.—These consist of the mechanism within the housing 4 as seen in Fig. 3, and the rotating cutter reel 5 on which are secured wire cutters 6. The object of this cutting mechanism is to obtain straight vertical cuts at right angles to the plane of the moving clay bar, so that the bricks will have perfectly straight and rectangular edges. This is accomplished by driving the cutting wires through the moving clay bar at a retarding speed. On the same shaft of the measuring pulley 3 there is fastened a spur gear 7 which is driven from the power transmitted to the measuring pulley by the moving clay bar and the auxiliary power devices. The spur gear 7 drives an upper spur gear 8 of the same diameter which runs loosely on a pin 9′ fastened to a cross arm 9 extending between the housing 4. On the rear side of this spur gear 8 are fastened a series of four cams 10 11 12 and 13, each of which has a working surface substantially of the shape shown in Fig. 6. These cams are equally spaced and are alike in shape and size. In the rear of the spur gear 8, but arranged eccentrically to the axis thereof, is a wheel 14 which is fastened on shaft 5′ on which the reel with its cutting wires is mounted. This wheel 14 carries a number of rolls 10′ 11′ 12′ 13′ and 14′ engaged by said cams, the number of said rolls being equal to the number of cutters or wires on the reel. The cams on the back of the gear 8 and the rolls on the wheel 14 work together as follows: One cam engages one of said rollers at a time and thus turns the wheel 14 and the cutter reel in unison. To obtain the desired straight vertical cut through the moving clay bar, it is essential that the cutters shall move forward with the clay bar in exactly the same speed. The movement of the clay bar is in a straight line, while the movement of each cutter is in an arc of a circle, it is therefore obvious that the speed of the cutter must change constantly while the cut is being made through the clay bar. In other words, the angular speed of the cutting wires must change in such a way that the horizontal distance through which each cutter travels during a definite period, must be equal to the distance the clay bar progresses or travels in the same time. This requires that the angular speed of the cutting wires must be a retarding speed. This is obtained by means of the eccentric arrangement of the spur gear 8 and the cam wheel 14 is relation to each other, and by the curvatures of the several cams.

Referring to Fig. 3, the reference marks X on the wheel 14 indicate the positions of the cutting wires 6. Cam 10 is in action, transmitting motion through roller 10′, to the wheel 14 and the cutter reel 5. The cutter 6′ is in action, having cut through somewhat more than half the thickness of the clay bar as indicated by reference characters 6′. The cut is completed when said cutter 6′ passes through its lowest position directly below the center of the roller wheel 14. Some time elapses before the next cut into the clay bar begins, and during this time cam 11 begins its action upon roll 11′ performing the next cut. In the same manner cam 12 cooperates with roll 12′; cam 13 coöperates with roll 13′; cam 10 with roll 14′, and cam 11 with roll 10′, etc. There being four cams secured to the spur gear 8, four cuts will be made through the clay bar during one revolution of said gear, or during one revolution of the measuring pulley 3. If the diameter of the measuring pulley 3, for example is 11″, and the circumference therefore is 34.5″, the length of each brick will be $8\frac{5}{8}$″.

Off-carrying devices.—These devices take care of the product or bricks, and consist of an off-carrier belt 21 to which each brick is delivered when cut from the clay bar. This belt passes over a terminal roller 31 adjacent to the cutting mechanism and is supported upon a suitable number of rollers 32. Movement is imparted to said off-carrier belt from the cross shaft 17 before referred to through means of pulleys 25 and belt 24, one of the pulleys 25 being on a cross shaft 32′. On shaft 32′ is a pulley 32″ around which the carrier belt 21 passes and thence over an idler pulley 34 to the terminal roller 31. It is essential that the end of the clay bar shall not engage the off-carrier belt 21 before the severance of each brick. To accomplish this, a device is provided consisting of an angular lever 22 which is pivoted at 22′ to a side of the main frame A; this lever supports upon its upper end a roller 28 beneath the advancing end of the clay bar and upon which said end normally rests until it is severed by the rotating cutters. The lower end of said lever 22 carries a roller 27 which lies within a cam groove 26 in the face of a disk 26′. The disk 26′ is fixed to the shaft 30′ of the measuring pulley and is set in such position that at the moment each cut of the clay bar is completed, the lever 22 is rocked to lower the roller 28 to permit the brick to engage the off-carrier belt. The lever 22 is rocked by the roller 27 riding on the higher points 27′ of the cam groove 26 during the periods in which the roller 28 is lowered—see Figs. 4 and 7.

The normal position of the supporting roller 28 is shown in Fig. 5, and from this position said roller is lowered in an arc when each cut of the clay bar is completed so that the severed portion of the clay bar may come in contact with the off-carrier belt 21 and be taken away thereby. As before stated, the off-carrier belt 21 is driven from the cross shaft 17 through which the auxiliary power for the cutting mechanism is taken. Owing to the difference between the speed of the moving clay bar and the auxiliary power, it

is essential that the auxiliary power belt 19 shall run loosely upon its pulleys, but in order that the auxiliary power may be regulated or controlled to properly assist the power transmitted to the measuring and cutting devices through the moving clay bar, means are provided for regulating the tension of the belt 19 to properly coöperate with the power transmitted from the moving bar clay; a tension pulley 20 is thus provided on a hand-operative lever 35, through the movement of which the tension of the belt 19 is regulated.

I claim:

1. In a brick-cutting machine, the combination with means for advancing a clay bar, of a rotatable reel carrying a series of cutters to cut said bar into bricks, a member carrying a series of rollers and rotatable on the axis of the reel, a spur wheel rotatable upon an axis eccentric to that of the reel, a series of individual cams fixed to said spur wheel and adapted to engage the rollers on said roller-carrying member, a spur wheel engaging the spur wheel carrying the cams, a measuring pulley on the shaft of said first-named spur-wheel, and a belt passing around said measuring pulley and supporting the clay bar and movable thereby.

2. In a brick-cutting machine, means for moving a bar of plastic material in a horizontal plane, a carrier upon which said plastic bar is delivered and which is actuated by said bar, a measuring pulley, auxiliary power devices comprising an auxiliary pulley on the shaft of the measuring pulley, a pulley driven from independent driving means, a belt inclosing said pulleys, an adjustable idler pulley adapted to engage said belt to tighten the same, or to release it, an operating handle carrying said idler pulley, a rotatable reel carrying a series of cutters, a wheel on the axle of said reel and carrying a series of rollers, a spur gear, a series of individual cams mounted on said spur gear and adapted to engage the rollers to impart movement to the cutting reel, and a spur wheel on the shaft of the measuring pulley and engaging the spur wheel carrying the cams.

3. In a machine of the class specified, a carrier supporting and actuated by a moving bar of plastic material, a measuring pulley driven by said carrier, a spur wheel on the shaft of the measuring pulley, a spur wheel driven by the spur wheel on the shaft of the measuring pulley, a series of individual cams attached to said driven spur wheel, a wheel supporting a series of rollers engaged by the cams on said spur wheel, a cutting reel driven by the roller wheel, an off-carrier to receive the severed pieces of plastic material, a roller interposed between the carrier and the off-carrier to support the severed pieces of the plastic material while being advanced to the off-carrier, a lever supporting said roller, and a disk having a cam groove engaging said lever to raise and lower the same, substantially as specified.

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

HERMANN HEUSS.

Witnesses:
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R. J. MCCARTY.