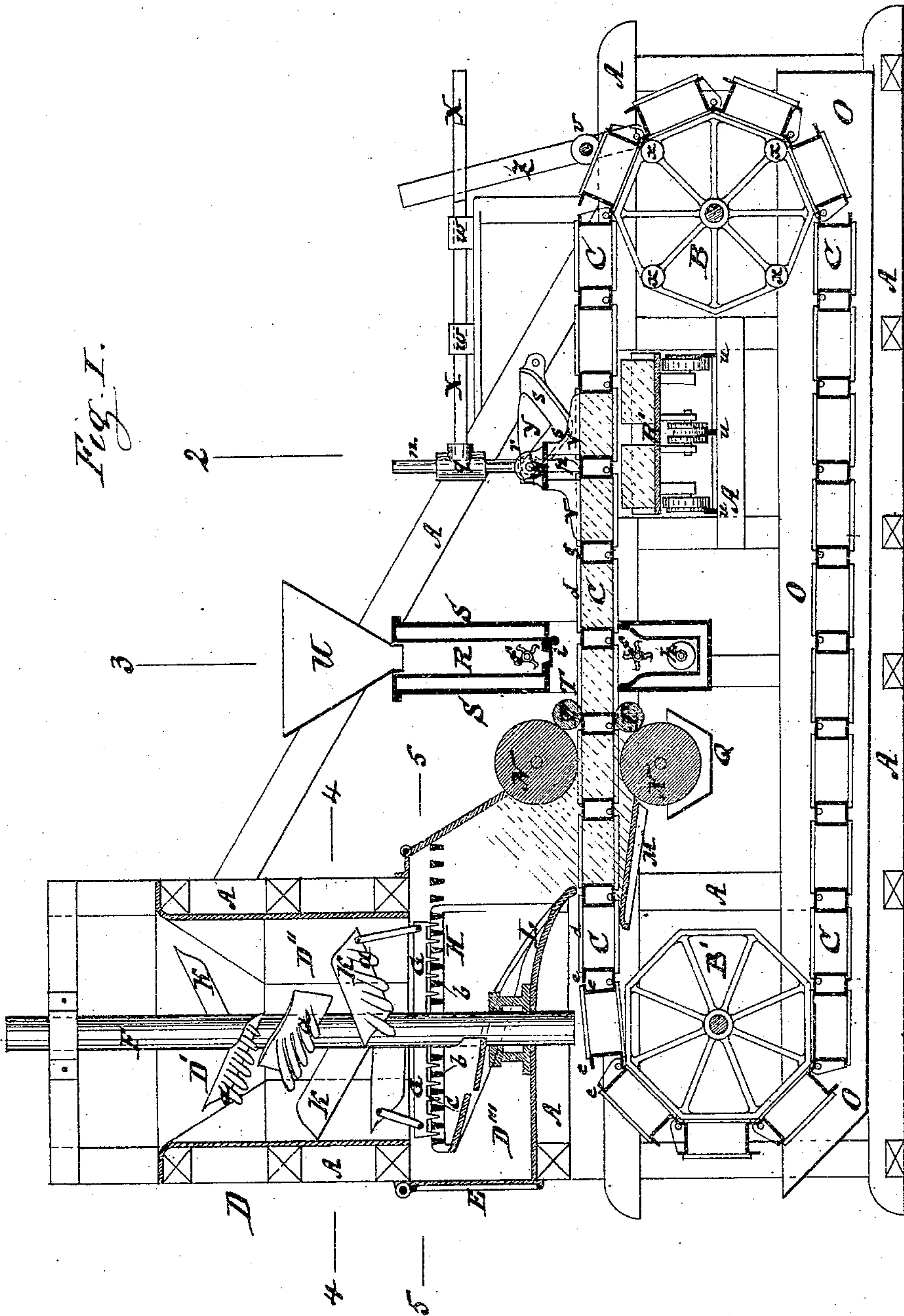


**G. BOUDRIOT.**  
**Brick-Machines.**

No. 153,189.

Patented July 21, 1874.



Witnesses.

*J. B. Bunker*  
*W. H. Hermann*

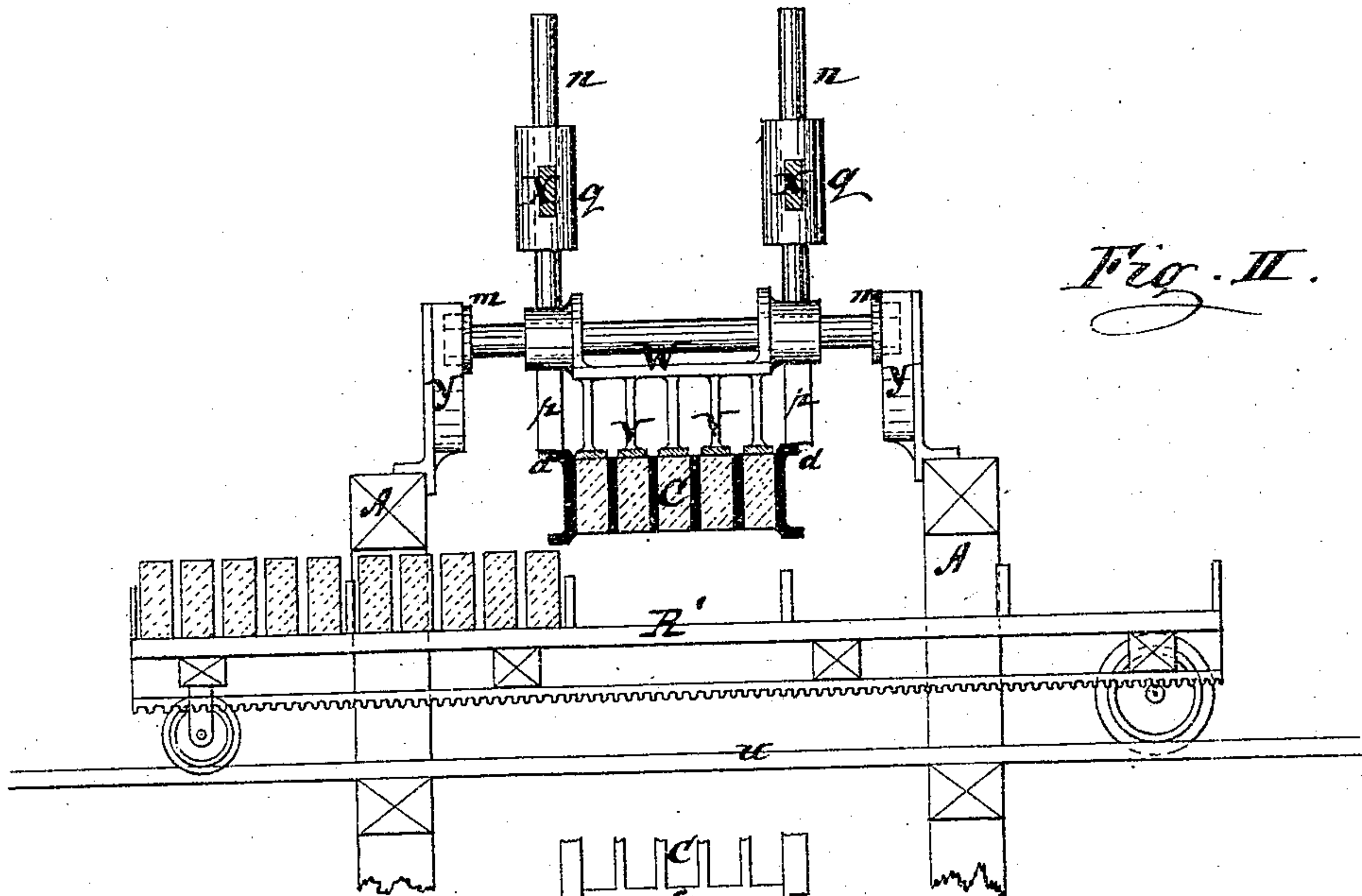
Inventor.

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*Attorney*

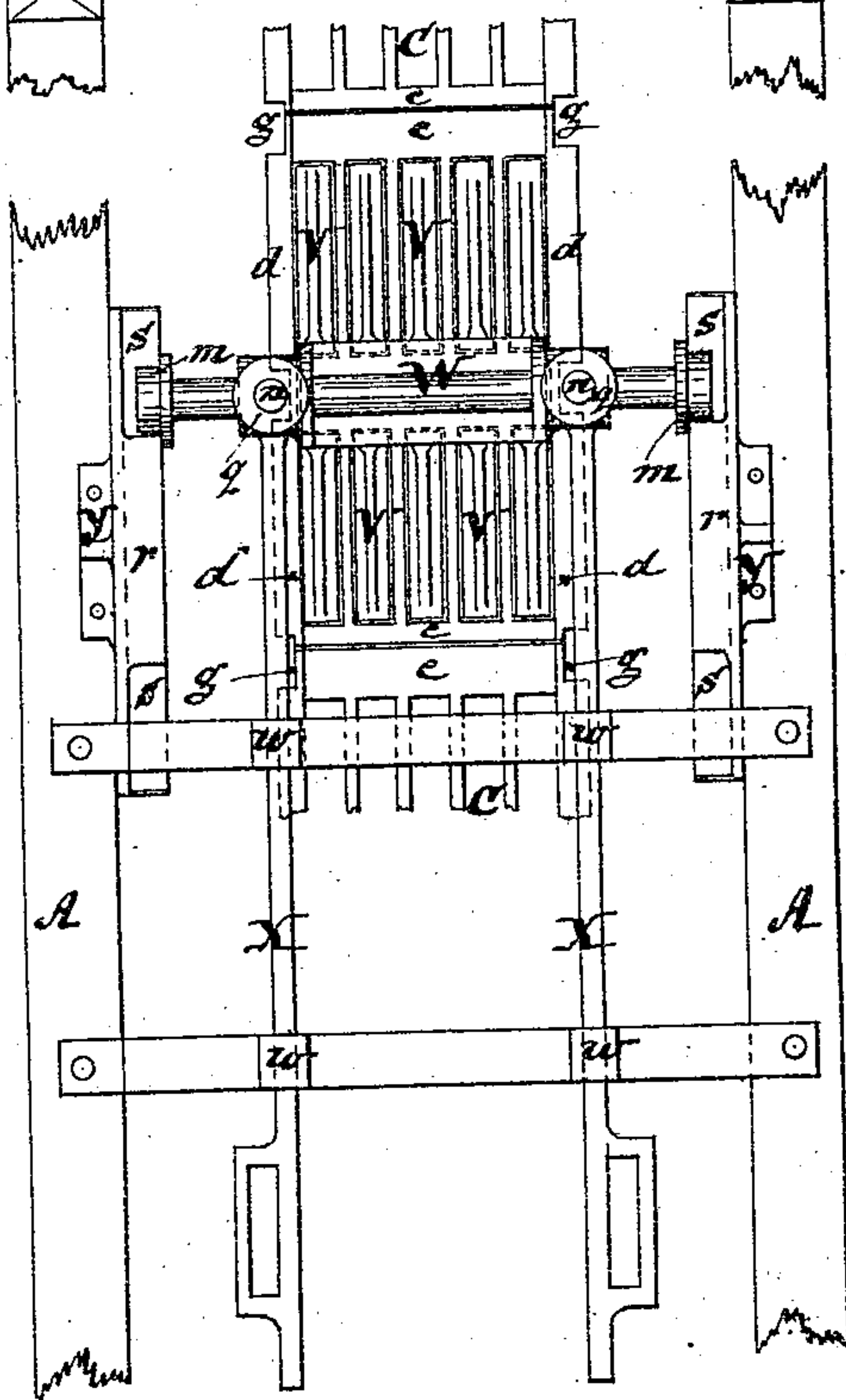
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*Fig. II.*



*Fig. III.*

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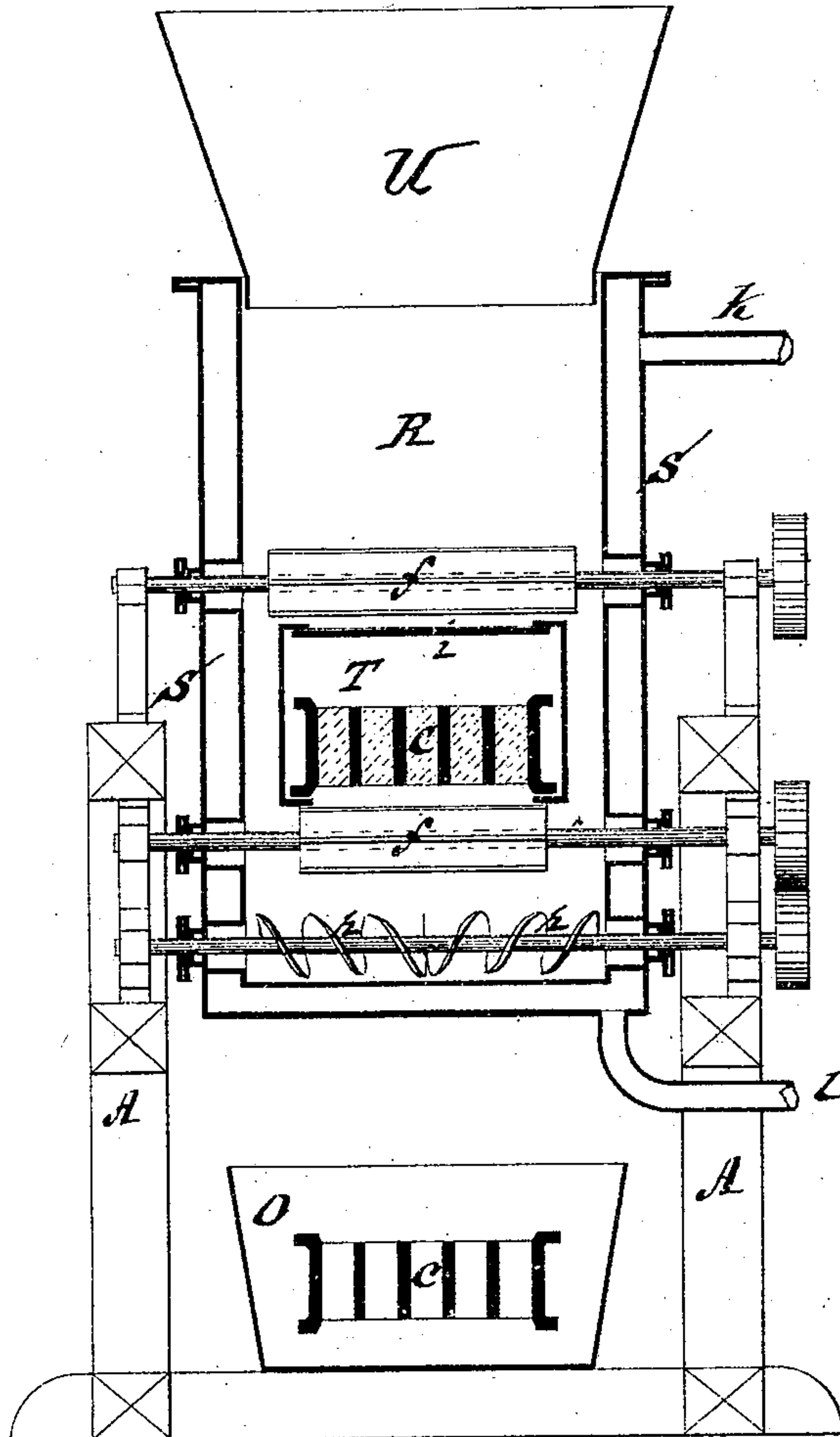


Fig. IV.

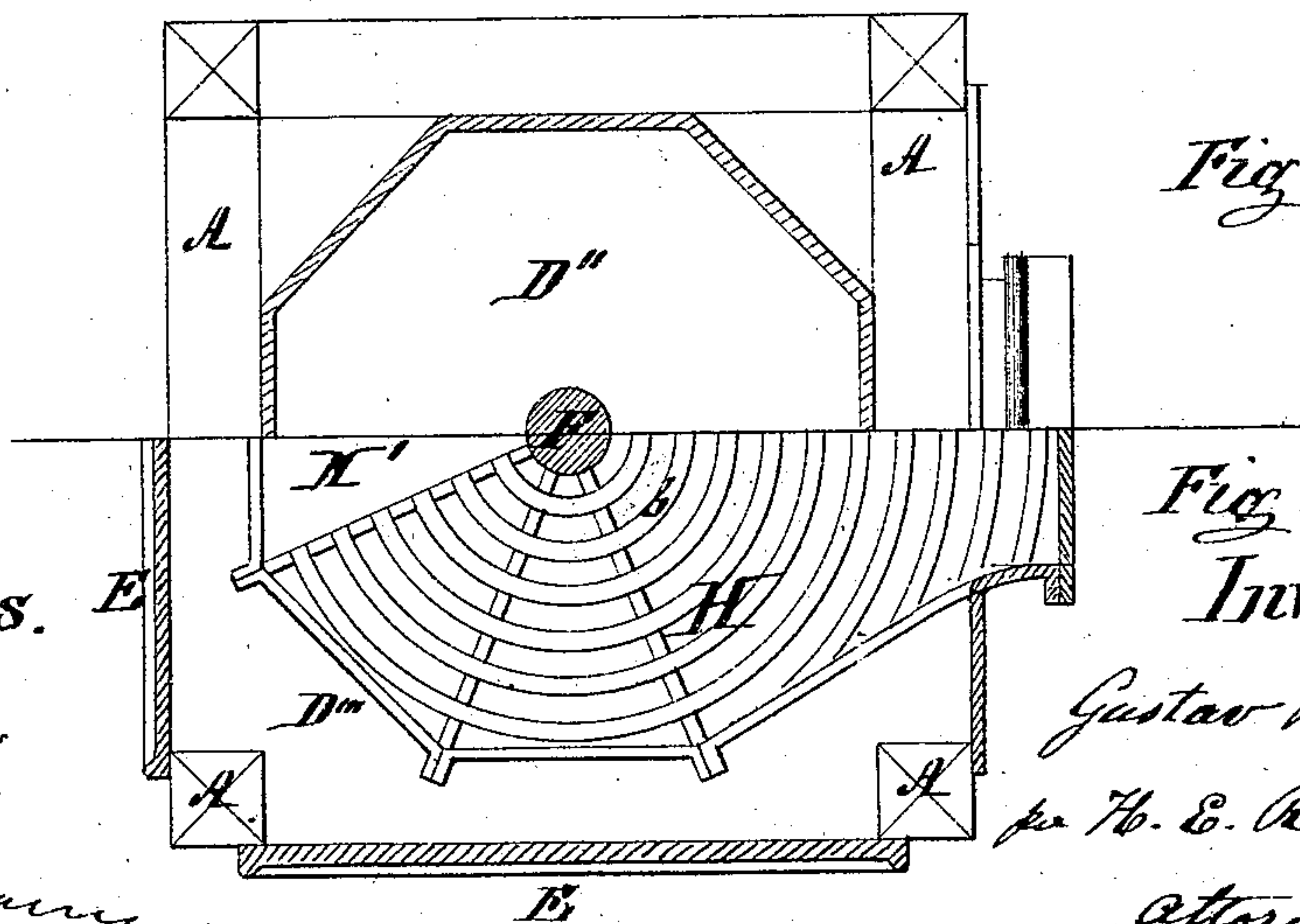


Fig. V.

Fig. VI.

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Witnesses.

J. Boudriot  
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# UNITED STATES PATENT OFFICE.

GUSTAV BOUDRIOT, OF WEHRINGHAUSEN, NEAR HAGEN, GERMANY.

## IMPROVEMENT IN BRICK-MACHINES.

Specification forming part of Letters Patent No. **153,189**, dated July 21, 1874; application filed June 26, 1874.

*To all whom it may concern:*

Be it known that I, GUSTAV BOUDRIOT, of Wehringhausen, Germany, have invented a new and Improved Brick-Machine, of which the following is a specification:

The nature of my invention consists in the arrangement of a machine to manufacture bricks, upon the principle and after the method of hand-working; and it consists, first, in the arrangement of pressing the bricks by means of rollers; secondly, in the arrangement of a bottomless mold or form chain; thirdly, in the arrangement of sprinkling the bricks, from above and from below, with dry warm sand; fourthly, in the peculiar mechanism for pushing the bricks out of the molds or forms, and transporting the same away.

In the accompanying drawings, Figure I represents a longitudinal section of a brick-machine embodying my invention. Fig. II is a cross-section at line 2, Fig. I. Fig. III is a top view of Fig. II, of the pressing-out mechanism. Fig. IV is a cross-section at the line 3, Fig. I. Fig. V is a horizontal half-section at line 4, Fig. I. Fig. VI is a horizontal half-section at line 5, Fig. I.

Similar letters represent corresponding parts in all the figures.

On a suitable frame, A, two drums, B B', are supported, over which an endless mold or form chain, C, is stretched. Above the drum B' the clay-mill D is arranged. The upper part, D', of the inside of this clay-mill, is made funnel-shaped to receive the clay, which may be brought into the same by means of suitable conveyers. The central part, D'', of the clay-mill is made octagonal, while the lower part, D''', is square, and as large as the framing will allow, for the deposition of the stones and other pernicious substances. This lower part D''' is closed by doors E E, (see Figs. I and VI,) to remove the stones and other substances out of the mill. The clay-cutter consists of an upright shaft, F, running in suitable bearings, and has attached to it two rake-knives, G G, passing by a grate, H, situated in the upper part of the square part D''', for the purpose of separating the stones and other substances from the clay. K are a number of driving-knives, securely fastened to the shaft F at angle of about thirty degrees, to which

smaller knives *a* are fastened. These knives will thoroughly mix and cut up the clay while passing through the octagonal part D''. The grate H consists of bars *b*, which are bent in the radius of the mill-spindle, resting on suitable bearings. (See Fig. VI.) One part of this grate H' is left open for the stones and other substances to fall off into the square bottom part D'''. The bars are made conical, to prevent them being stopped up with stones. The rake-knives G are provided with points *c* which pass between the radial bars *b* of the grate, and whereby the clay is cut up fine and forced through the grate H, while stones, &c., are pushed away till they fall through the open part H' of the grate. Under the grate an inclined surface or funnel, L, is arranged, whereby the clay is conducted downward upon the mold or form chain C. This mold or form chain C consists of five, more or less, brick-forms cast together, and a number of them jointed together to form an endless chain. These molds are bottomless, consisting only of side walls with projecting flanges on the outer sides and at front and back. The projecting flanges *c* on front and back, or forward and behind, touch each other (see Figs. I and III) where the chain forms a straight line, to prevent any clay falling between the same. The projecting flanges *d* at the sides (see Figs. II and III) are made with recesses *g*, for the purpose hereafter mentioned. M is a plate attached to the frame A, just below the upper part of the mold-chain C, and below the funnel L, forming a bottom for the clay which it presses into the molds; and to support the mold-chain C in a straight line. Forward of the plate M, two rollers, N N, are fixed in suitable bearings on the frame A, one above and one below the mold-chain C, through which the clay is pressed into the molds. Two smaller rollers, P P, likewise situated above and below the mold-chain C, are arranged forward of and close to the rollers N, and bear hard upon the top and against the bottom of the molds, through which the clay is pressed firmly into the molds, and any surplus clay at the top and bottom of the molds removed.

The forward drum, B, receives a regular motion, and gives thereby a continuous motion



to the mold-chain C. The lower part of the chain C passes through a suitable tank, O, filled with water, whereby the molds are always washed and cleaned before the same pass between the funnel-plate L and the bottom plate M. The lower roller N runs likewise in a tank, Q, containing water, and a stream of water is directed upon the upper roller N. Any surplus water is pressed out by the smaller pressure-rollers P P. Near the middle of the machine, forward of the pressure-rollers N and P, the sand-sprinkling mechanism is arranged. The same consists of an inner box, R, surrounded by an outer shell, S. In the central part an opening, T, closed on the sides, is arranged, through which the upper part of the mold-chain C, with the mold filled with clay, passes. To the top of the inner box a funnel, U, is fitted, to fill the same with sand. In the bottom of this inner sand-box R a roller, *h*, (see Figs. I and IV,) having right-and-left-handed wings on its circumference, is arranged, to keep the sand in motion and move the same toward the middle of the box. In the top and bottom of the central opening T, elongated holes of a length equal to the width of the mold-chain C are made, and close to these holes fan-wheels *f f* are arranged in the inside of the sand-box R, to keep the sand in motion, and the lower wheel being particularly for the purpose of throwing the sand upward against the under side of the clay previously pressed into the molds of the chain C. To the upper hole a slide, *i*, is fitted, to regulate the quantity of sand to be thrown upon the upper side of the mold-chain C, upon the top of the clay which has been pressed into the said molds. The hole in the bottom of the opening T does not require any slide to regulate the amount of sand, as any excess will fall back into the sand-box R. The space between the sand-box R and the outer casing S is supplied with steam through the pipe *k*, (see Fig. IV,) while the pipe *l*, at the bottom, carries off the condensed water. By this arrangement, the sand in the box R will always be kept warm, and heated sand will be sprinkled upon the top and against the under side of the clay in the mold-chain C, which will, at the same time, more readily absorb any excess of water in the clay.

After that part of the mold-chain C which has been filled with clay has passed through the sand-box, and has been sprinkled with warm sand, as above described, the further motion of the mold-chain C brings those molds filled and sprinkled under the pressing-out mechanism. (See Figs. I, II, and III.) The same consists of plates or plungers V, attached to a cross-bar, W, provided with rollers *m m* on its ends, guide-rods *n n* projecting upward, and arms *p p* projecting downward, in a line with the guide-rods *n n*. The guide-rods *n n* move in guides *q*, attached to guide-rods or frames X, moving or sliding freely horizontally, in suitable bearings *w*, fast to the frame A. The rollers *m m*, on the ends of the cross-

bar W, are fitted and move in and upon frames Y, attached to the inside of the framing A. These frames Y are provided with V-shaped grooves S, open at the top. The downward-projecting arms *p p* rest upon the projecting side flanges *d* of the mold-chain C. (See Figs. II and III.) The number of the plungers V corresponds with the number of molds in each link of the mold-chain C, and are made double, so as to fit into the molds of two links at the same time and operation, and, as shown in the drawing, consist consequently of ten plungers attached to the frame or cross-bar W.

The operation of this pressing-out mechanism is as follows: When the mold-chain comes directly under the plungers V, the recesses or notches *g* in the projecting side flanges *d* are directly under the arms *p p*, which, having previously rested upon the flanges *d*, fall into these recesses or notches *g g*, and bring the rollers *m m*, on the ends of the cross-bar W, into the V-shaped grooves S in the frames Y. The further progress of the chain C will cause the plungers V, with their cross-frame W, to move with it, causing the plungers to move at the same time downward, so as to press the clay which had been filled into the forms or molds out of the same, and then to move upward again out of the forms or molds, in consequence of the ends of the cross-frame W being forced through the V-shaped recesses *s* in the frames Y during the forward motion of the mold-chain C, and the plungers V, and cross-bar W.

During this forward, downward, and upward motion of the plungers V these plungers are caused to move perpendicular, downward and upward, on account of their arms *p p* being held fast and guided in the recesses *g g* in the side flanges *d* of the mold-chain C, and their guide-rods *n n* being guided in the guides *q q* on the frames X, which latter are, during this operation, caused to slide horizontally in their fixed bearings *w*. In the end of the frames X levers Z are arranged, turning in suitable bearings *v*, fast to the framing A, and operated at their lower ends by projections *x*, fast on the side surfaces of the chain-drum B. As soon as the plungers V have moved out of the forms in the mold-chain C, as above described, the projections *x* on the drum B will act against the lower ends of the levers Z, causing thereby their upper ends to act upon the frames X so as to move the same, and consequently the cross frame or bar W, together with the plungers V attached, backward again into their original position, ready for the next operation, the rollers *m m* passing during this operation over the curved surfaces *r*, between the openings of the V-shaped recesses *s* on the frames Y, to support the cross-frame W and plungers V. Below the pressing-out mechanism, between the upper and lower part of the mold-chain C, rails *u* are attached to the framing A at right angle to the chain C, upon which suitable carriages R' are placed to receive the bricks or molded clay as soon as the same are pressed



out of the forms or molds. These carriages are moved by suitable gearing driven by a toothed wheel attached to the side of the chain-drum B, and so constructed, by leaving out one or more teeth, as to cause the carriage R' to stop during the time the pressed clay or bricks are delivered out of the molds by the above-mentioned mechanism, and deposited upon said carriage.

Instead of heating the sand in the box R by introducing steam into the space between said box R and the outer casing S, a grate for fire may be arranged in the lower part of the outer box or casing S, and the sand heated by the circulation of the flame and gases around the sand-box R.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The endless mold-chain C, formed of links, each link consisting of a number of bottomless molds or forms cast together and provided with projecting end flanges *e* and side flanges *d*, in the manner substantially as set forth.

2. In combination with the bottomless mold-chain C, the fixed plate M below said chain, and the presser-rollers N N and P P, situated above and below the mold-chain C, constructed and arranged in relation with the clay-mill, substantially in the manner and for the purpose specified.

3. The sand-box R, provided with rollers or fan-wheels *h* and *f f*, and central opening T,

through which the mold-chain C passes, in combination with a surrounding casing, S, supplied with steam or heat, the whole being constructed and arranged in the manner and for the purpose substantially as set forth.

4. The plungers V, attached to a cross bar or frame, W, and provided with arms *p* and guide-rods *n*, in combination with frames Y provided with V-shaped grooves *s* and frames X, moving horizontally in suitable bearings *w*, the whole being constructed, arranged, and operating together in the manner and for the purpose substantially as described and set forth.

5. In combination with the frames X, the levers Z, turning in suitable bearings *v* attached to the frame A, and acted upon by projections *x* fast on the sides of the chain-drum B, substantially in the manner and for the purpose set forth.

6. In combination with a mold-chain, C, and the pressing-out mechanism, arranged and constructed as above described, a carriage, R', running at right angle with said mold-chain C upon suitable rails *u*, attached to the framing A, arranged and constructed substantially in the manner and for the purpose specified.

In testimony that I claim the foregoing I have hereunto set my hand.

GUST. BOUDRIOT.

Witnesses:

FRANZ WIRTH,

FRANZ HASSLACHER.