

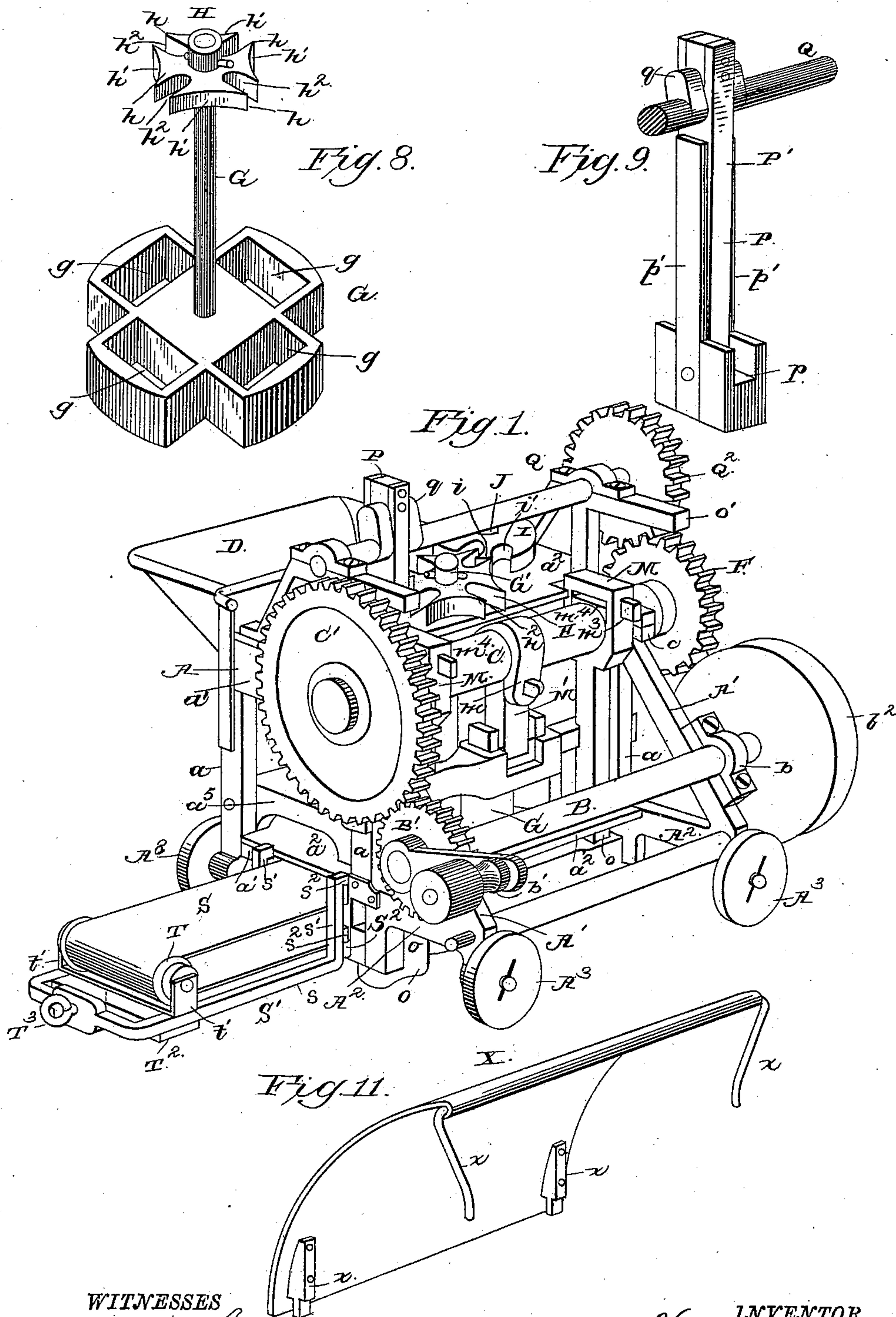
(No Model.)

4 Sheets—Sheet 1.

V. DORIOT.
BRICK MACHINE.

No. 333,288.

Patented Dec. 29, 1885.



WITNESSES

M. E. Fowler
A. Burkhard

INVENTOR

Victor Doriot
by C. A. Snow & Co.
Attorneys

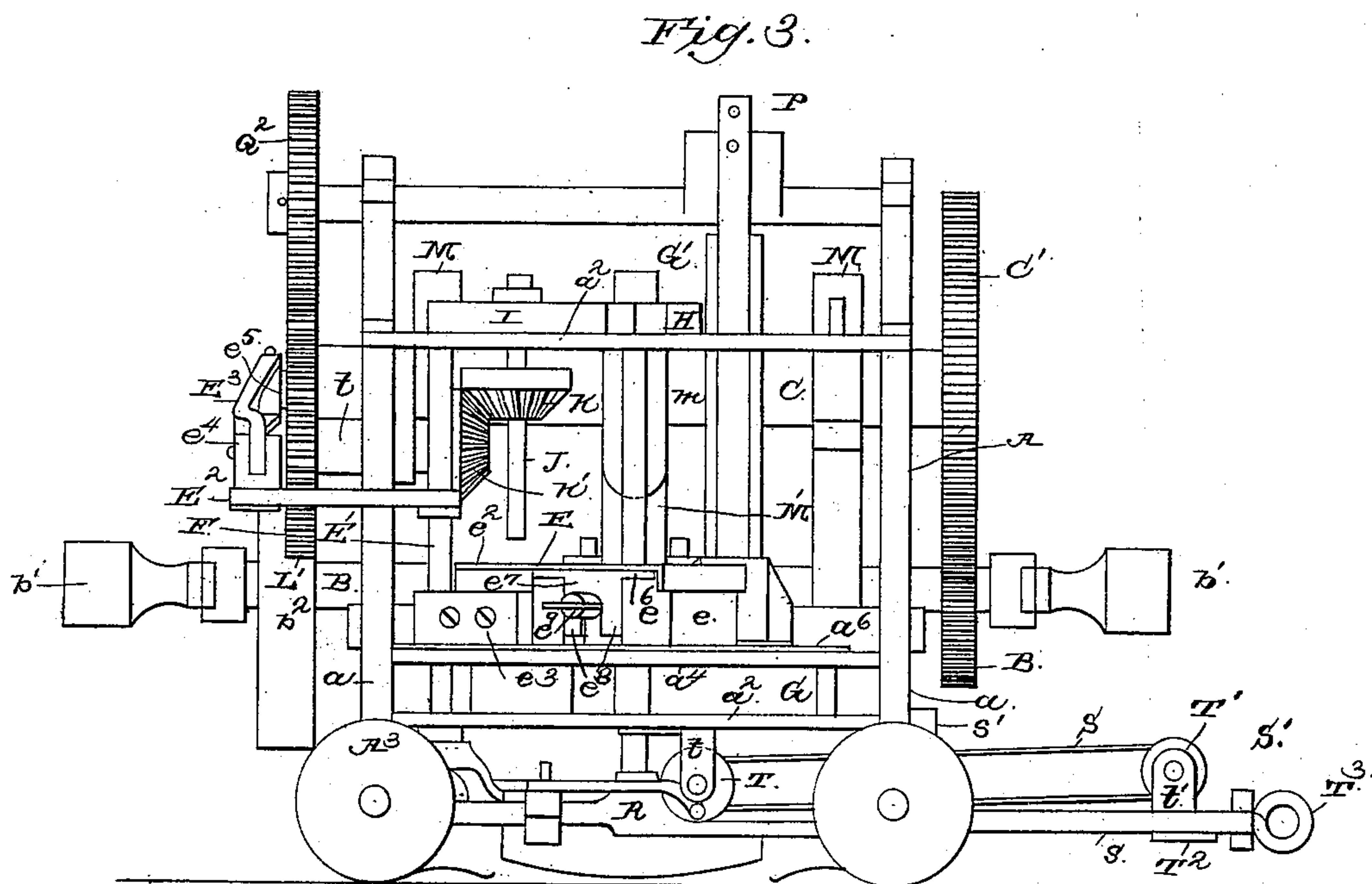
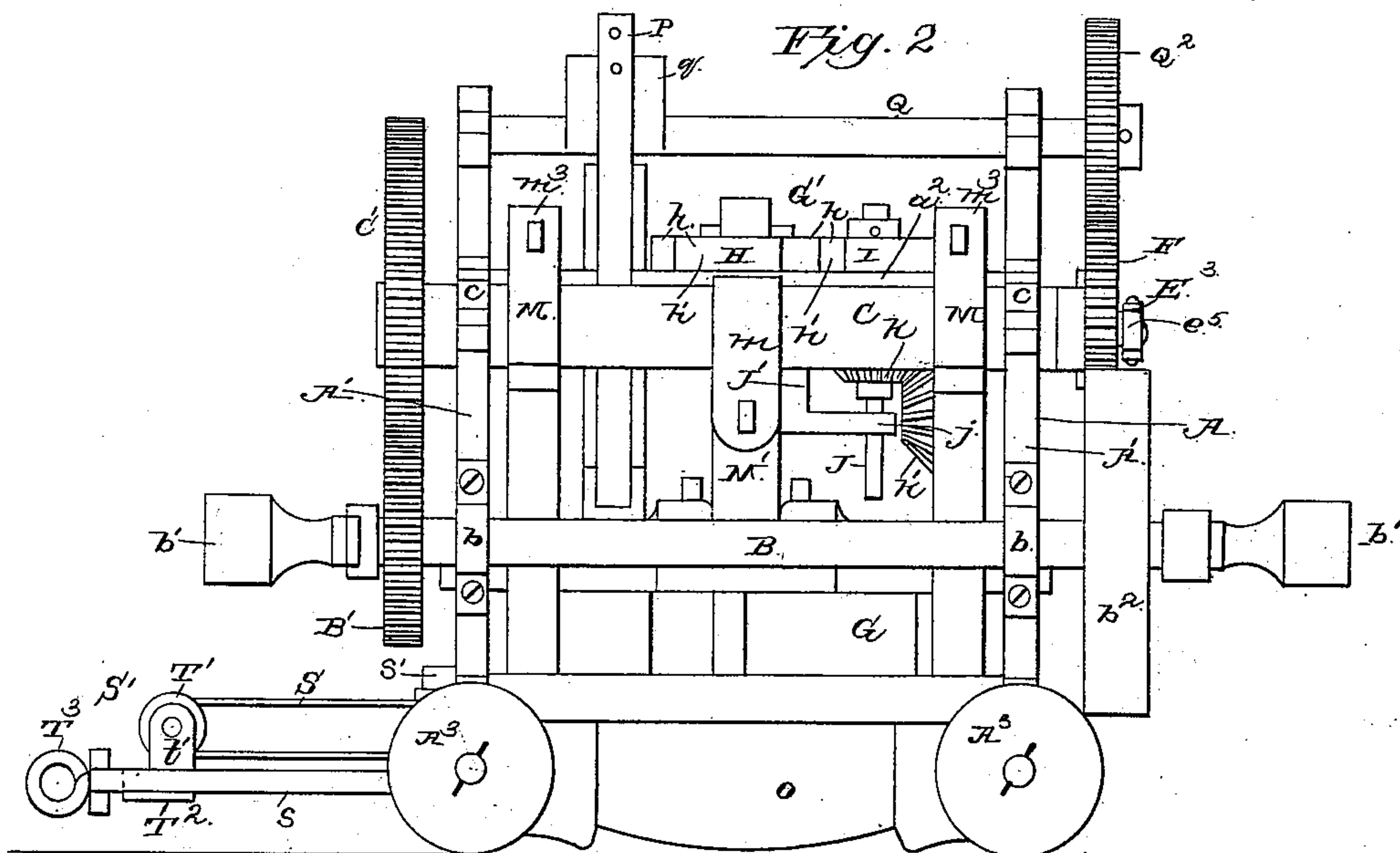
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4 Sheets—Sheet 2.

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H. J. Bernhard

INVENTOR

Victor Doriot

by C. A. Snow & Co.
Attorneys

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Fig. 4.

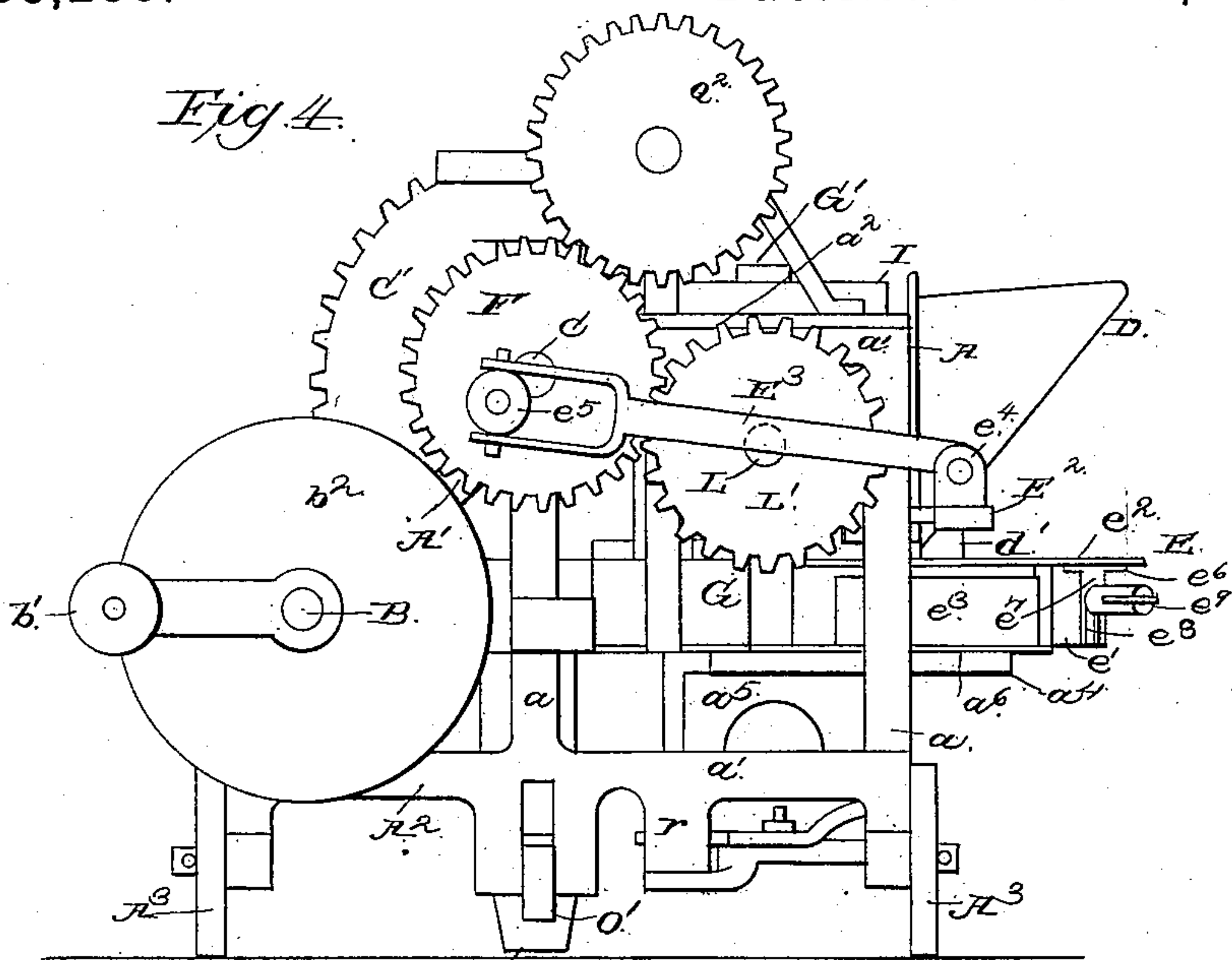


Fig. 12.

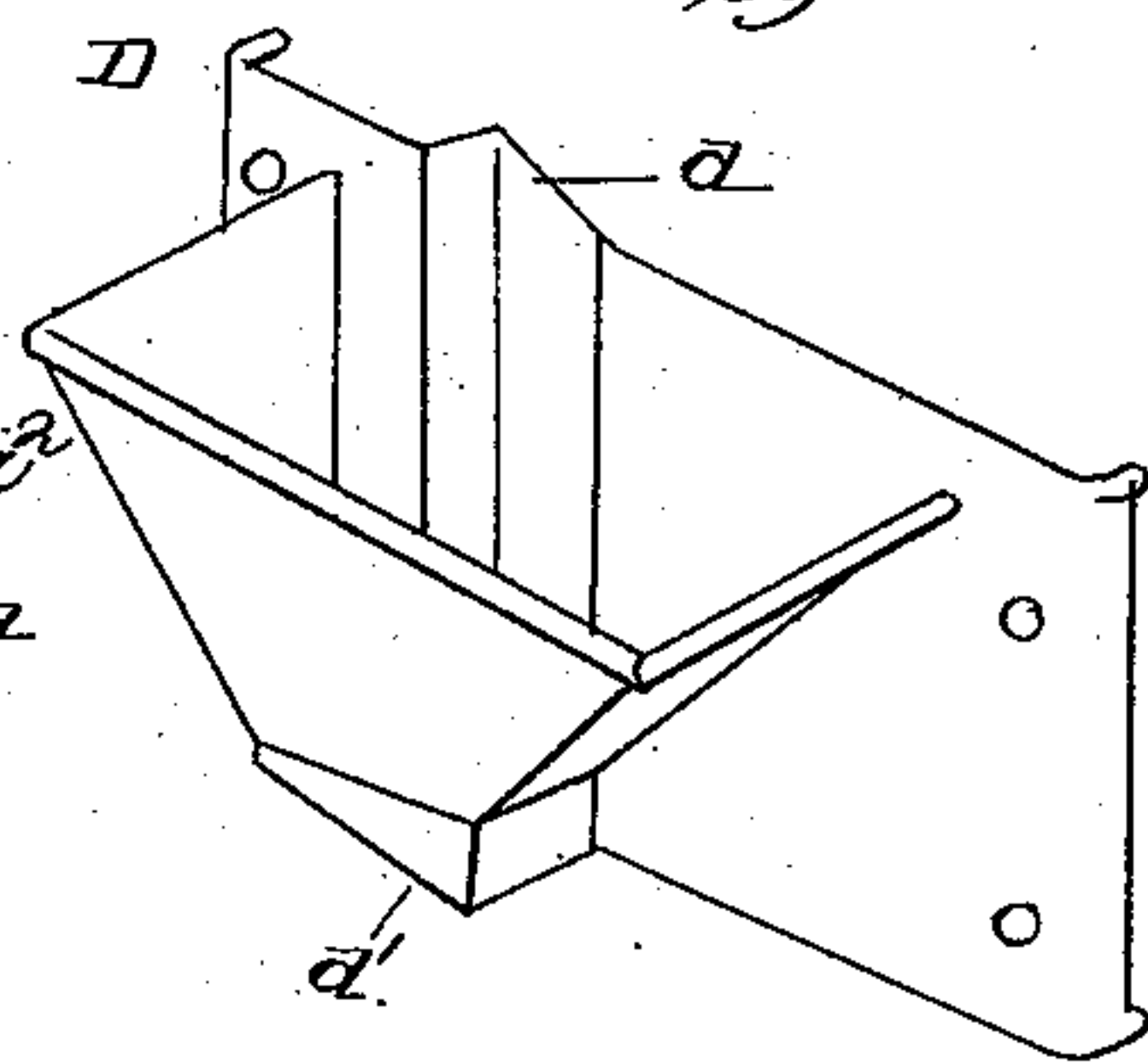


Fig. 5.

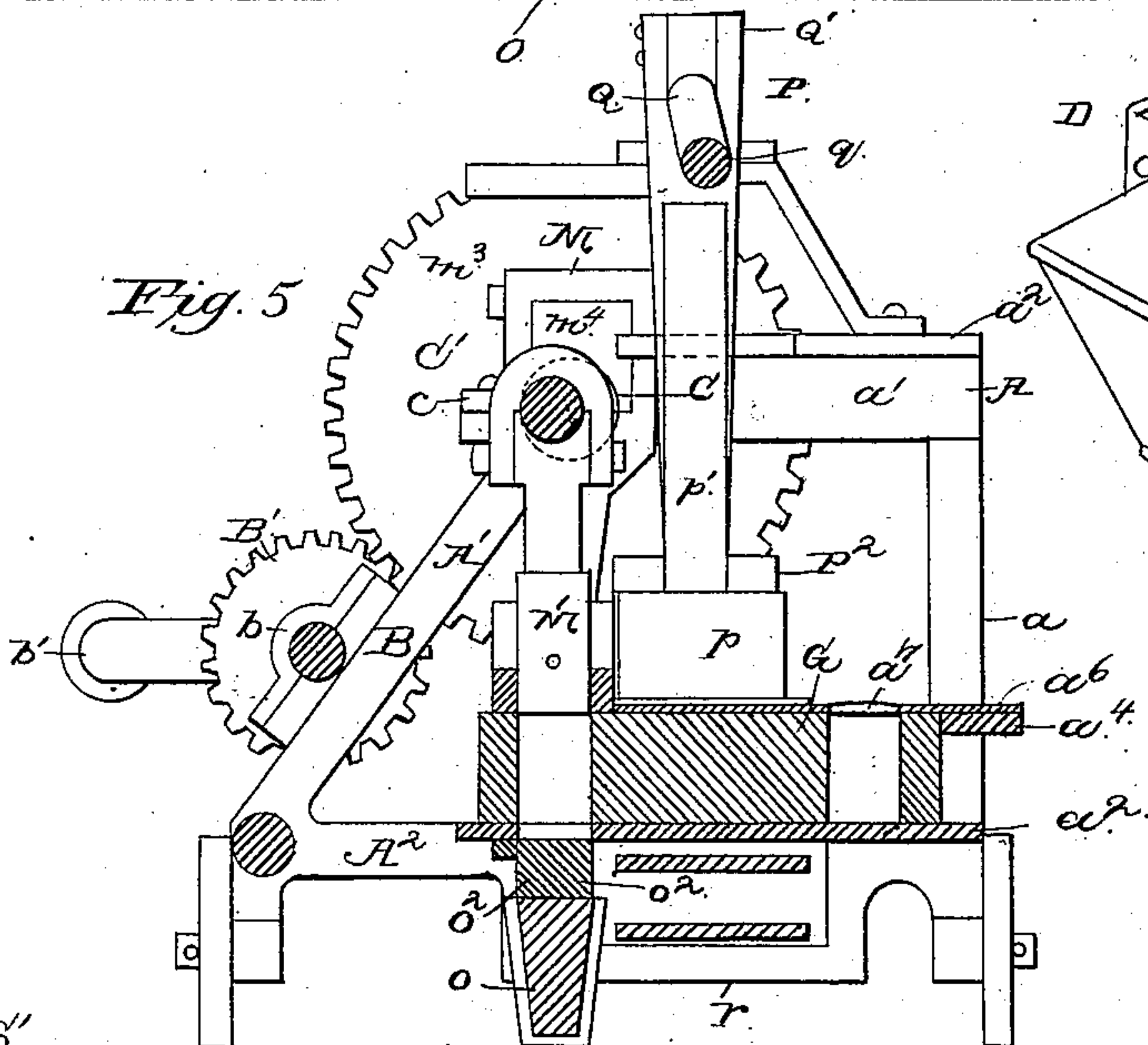
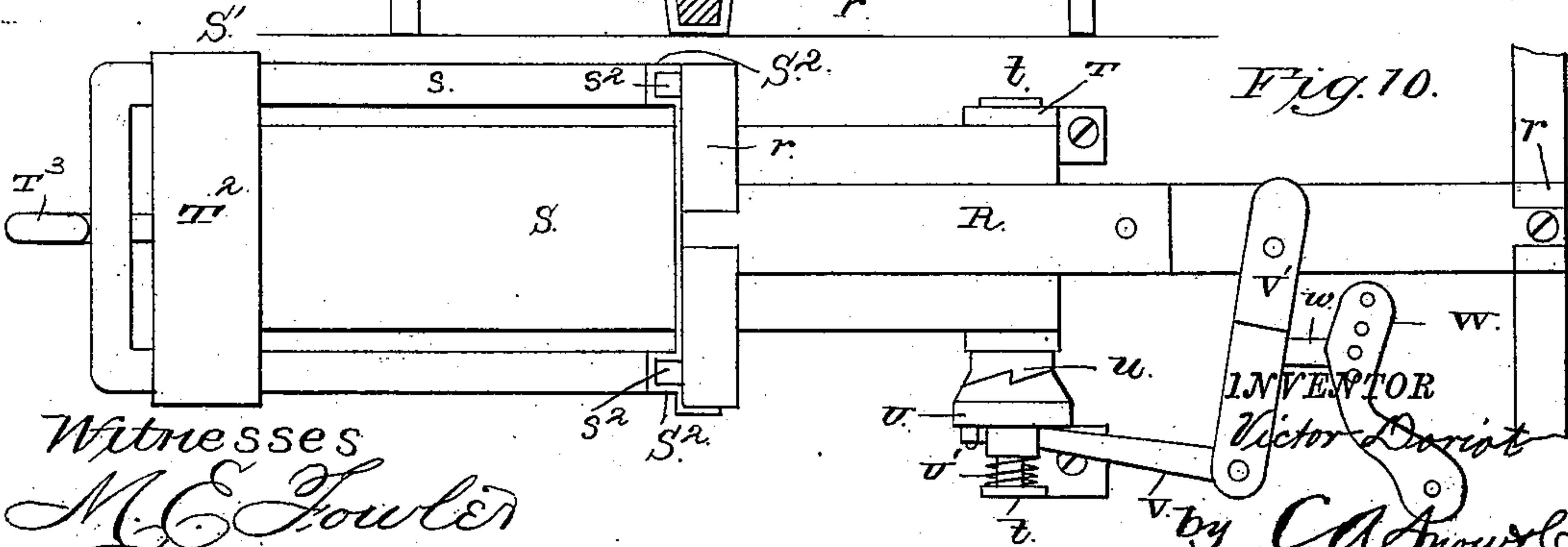


Fig. 10.



Witnesses
M. E. Fowler
H. Berchard.

INVENTOR
Victor Doriot
by C. A. Snow & Co.
Attorneys

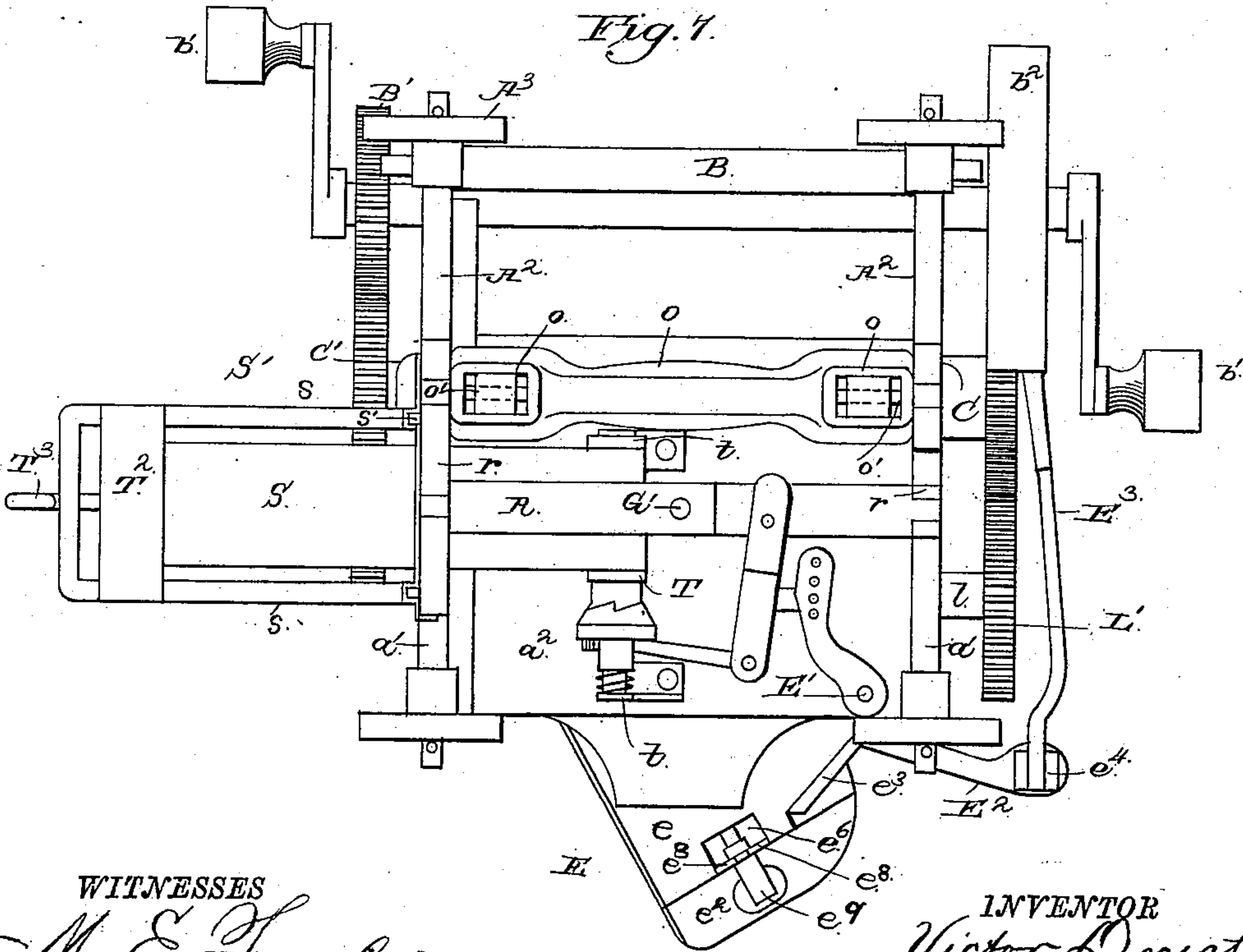
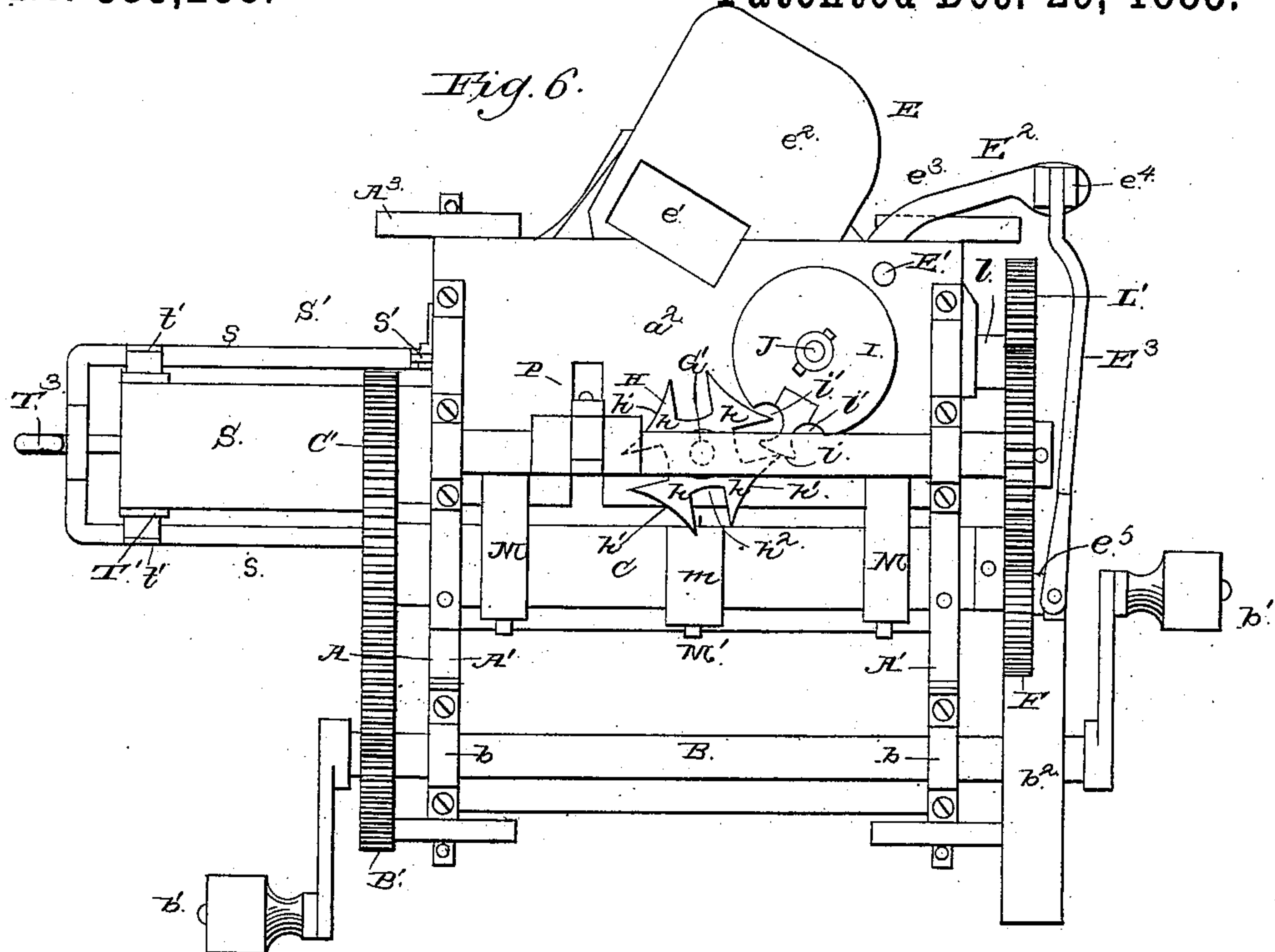
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WITNESSES

M. E. Fowler
A. Bernhart

INVENTOR

Victor Doriot
by *C. A. Snow & Co.*
Attorneys

UNITED STATES PATENT OFFICE.

VICTOR DORIOT, OF BRISTOL, TENNESSEE, ASSIGNOR OF ONE-THIRD TO
WILLIAM WEBB, OF SAME PLACE.

BRICK-MACHINE.

SPECIFICATION forming part of Letters Patent No. 333,288, dated December 29, 1885.

Application filed July 22, 1885. Serial No. 172,318. (No model.)

To all whom it may concern:

Be it known that I, VICTOR DORIOT, a citizen of the United States, residing at Bristol, in the county of Sullivan and State of Tennessee, have invented new and useful Improvements in Brick-Machines, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to improvements in machinery for forming and compressing earth or clay into bricks of proper shape and size; and the novelty consists in the peculiar constructions, combinations, and arrangements of the sundry parts for service, substantially as hereinafter fully set forth and claimed.

The object of my invention is to provide a machine of the class named which shall be comparatively simple in construction, efficient in operation, and durable in use, require a minimum expenditure of power for its successful operation, and be capable of transportation from place to place.

In the drawings hereto annexed, and which form a part of this specification, Figure 1 is a perspective view of a brick forming and compressing machine constructed in accordance with my invention. Fig. 2 is a front elevation thereof, and Fig. 3 is a rear view with the hopper removed, to show the feeding and measuring mechanism. Fig. 4 is an end elevation, and Fig. 5 is a vertical cross-section on the line *x x* of Fig. 2. Fig. 6 is a top plan view, and Fig. 7 is a bottom plan. Fig. 8 is a detail view of the molds, together with a portion of their operating mechanism. Fig. 9 is a detail of the extracting mechanism with its guides, and Fig. 10 is a detail view of the off-bearing belt with its operating mechanism. Fig. 11 is a detail view of a removable shield or cover. Fig. 12 is a detail of the hopper.

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

Referring to the drawings, A designates the main supporting-frame, comprising upright posts *a a*, connected at their upper and lower ends by horizontal cross-bars *a' a'*, said frame having platforms or tables *a² a²*, secured at its upper and lower ends, and extending across from one upright to the other. A supplemental frame, composed of inclined uprights

A' A' and horizontal beams *A²*, connected to said uprights *a*, is arranged at one side of the frame A, as shown. These frames are mounted upon rollers *A³ A³*, secured to the lower ends of the uprights *a a* and extensions of the inclined uprights *A'*, for conveniently moving the machine from place to place; but the rollers may be omitted, if desired.

B designates the power-shaft, mounted in boxes *b*, secured to the uprights *A'* of the supplemental frame, and having cranks *b' b'* at each end for operation by hand, and a belt-pulley, *b²*, on one end for applying power from a steam-engine or other motor to run the machine.

At one end of the shaft B is a spur gear-wheel, *B'*, adapted to mesh with a larger gear-wheel, *C'*, secured upon the outer end of a shaft, C, mounted in boxes *c c*, secured upon the uprights *A'* of the supplemental frame at their upper ends, as clearly shown. The shaft C is provided with three grooves, formed eccentrically therein to its axis, the grooves being arranged equidistant from each other, the middle eccentric groove being formed in the shaft at a different angle or position to the eccentric grooves at the ends thereof.

D designates the hopper, arranged at the rear of the machine at its upper end, extending from side to side thereof and bolted to the rear uprights *a* of the frame, said hopper having a bent portion, *d*, adapted to fit in a cut-way portion of the upper platform *a²*, and inwardly-converging side and rear walls to form a narrow contracted feed-orifice, *d'*, at the bottom thereof.

E designates the measuring and mold wheel feeding device, arranged immediately beneath the feed-orifice of the hopper, and comprising a body portion, *e*, of the shape shown, having a clay-receiving chamber, *e'*, at its front end, an upper protecting plate, *e²*, secured to the body *e*, and adapted to fit snugly against the under surface of the hopper-orifice, and a bracket, *e³*, secured by bolts or otherwise to one end of the body *e*, and secured or keyed upon a vertical shaft, *E'*, arranged in one corner of the frame and journaled in the upper and lower platforms thereof. The shaft has a vibrating motion communicated thereto by

means of an arm, E^2 , secured thereon and provided with lugs e^4 , by means of which and a pivot-pin it is connected to a pitman, E^3 , bifurcated at its front end and connected to a wrist-pin, e^5 , secured upon the outer face of a gear-wheel, F , mounted upon the outer end of the eccentric shaft C . The size or area of the receiving-chamber e' can be varied to contain a larger or smaller quantity of material, and accordingly increase or decrease the size of the brick, said chamber having a movable platen, e^6 , fitted therein and formed with a plate, e^7 , having a downwardly-projecting bifurcated lug, e^8 , adapted to engage and be operated by a thumb-nut, e^9 , working in a bearing secured in the body portion e .

G designates the mold-wheel, having a series of molds, g , arranged at an angle to each other, the wheel in the present instance comprising four molds arranged at right angles to each other. The wheel is adapted to be rotated and is arranged between the lower platform, a^2 , of the frame A and another platform, a^4 , of like character arranged a distance above the lower platform equal to the depth of the mold-wheel, said platform a^4 being supported upon feet or projections a^5 , affixed to the platform a^2 . The platform a^4 is protected by a plate, a^6 , and is provided with a rectangular opening, a^7 , with which the opening or orifice of the feeding-chamber e' is adapted to register, said feeding device being reciprocated back and forth over the platform a^4 , and at its extreme forward movement the receiving-chamber e' , which is bottomless, registers with the opening a^6 and discharges the clay or material into the same and one of the molds g of the mold-wheel, each mold of which is adapted to register successively with the opening a^6 during the rotation of the wheel, thus accomplishing the charging or filling of the mold in which the brick is to be formed and pressed. The mold-wheel G is mounted or supported upon a vertical shaft, G' , passing between the platforms of the frame at or near the middle thereof, and stepped at its lower end in a bearing formed therefor in a bridge-tree, R , extending across from side to side of the frame, and secured in lugs r , depending from the lower surfaces of the horizontal cross-bars a' of the main frame. The upper end of the shaft G' extends through the upper platform or table a^2 of the frame A , and is provided with a stop-wheel, H , intermittently rotated by a revolving drive-wheel, I , mounted on the upper end of a short vertical shaft, J . The shaft J passes through the upper table a^2 , and at its upper end it is supported therein, while at its lower end it is mounted in a bracket, J' , depending from the under surface of the table a^2 and having an arm, j , which receives the shaft J . The shaft J is provided below the platform or table a^2 with a beveled gear-wheel, K , by means of which said shaft is rotated through motion transmitted from a similar beveled gear-wheel, K' , with which the wheel K meshes, said gear-wheel K'

being mounted upon a shaft, L , arranged at right angles to the shaft J , and mounted in a box or journal, l , secured to the under surface of one of the cross-beams a' of the main frame. The short shaft L is rotated by motion transmitted to a spur-gear wheel, L' , secured on said shaft at its outer end, from the gear-wheel F on the eccentric shaft C , with which the gear-wheel L' meshes, as clearly shown.

The stop-wheel H comprises four projecting teeth or spurs, h , arranged at right angles to each other, and having each a rounded outer face, h' , said teeth being separated from each other by intervening spaces or slots h^2 of square form, with a slightly-rounded inner face, the slots being cut into the body of the wheel at the corners thereof, and adapted to successively receive a tooth or projection, i , of the drive-wheel I . The tooth i has a rounded outer face, and on each side it has a curved or rounded recess, i' , the projection being adapted to fit in the recess h^2 of the stop-wheel H presented to it, and impinge against the side walls thereof, rotating said wheel a quarter of a revolution, the remainder of the rounded face of the wheel I registering or fitting in the rounded outer face of one of the teeth h' of the wheel H during the remainder of the revolution of the wheel I until the projection i thereof enters the succeeding notch of the wheel H presented to it, and so on. Each of the wheels H I bears upon the upper face of the upper table a^2 , and is removably keyed to its supporting-shaft.

I will now proceed to describe the mechanism for forming and pressing the clay or material into the proper shape in the molds.

M M M' designate the pressing-pistons, the two former of which are arranged to bear in the grooves formed at each end of the shaft C , while the latter, M' , is arranged in the eccentric groove formed in the shaft midway between the end grooves and at a different angle to said end grooves. The upper end of the shaft M' has a concave face formed therein adapted to fit the curvature of the eccentric face of the groove, a removable strap or band, m , passing over and embracing the groove snugly, and secured at its lower ends by a cross-pin, serving to keep the follower or piston proper in position while allowing the shaft to rotate. The lower end of the piston-follower M' is provided with an enlarged head, m' , having side lugs or flanges, m^2 , adapted to slide in grooves n , formed in a guide-bar, N , extending across from one to the other of the uprights a , to which they are secured, said guide-bar having an enlargement, n' , at its middle and arranged above the plane of the mold-wheel G , the molds of which are adapted to fit under and register with the opening formed in the enlargement of the guide-bar, thus bringing the mold in proper position to be acted upon by the position-head of the follower M' , which is adapted to form and compress the earth or clay into the proper shape for brick from the upper surface thereof, while the pressure-fol-

lowers M M operate a pressure-bar adapted to compress the earth or clay in the molds from beneath the same.

The followers M M are each provided with an enlarged head, m^3 , which carries a journal or bearing, m^4 , adapted to snugly fit in one of the eccentric-shaped grooves of the shaft C. Each follower passes through openings or apertures formed in the lower table a^2 , and at its lower end said follower fits in a socket, o , provided therefor in the end of a pressure-bar, O, located beneath the lower platform or table a^2 , and provided with ears or guides o' at each end, which fit between grooves formed in the lower surface of the supporting-frame uprights, or in guides provided therefor, to maintain or keep the bar in its proper position during the vertical movements thereof. The pressure-bar O is provided with a platen, o^2 , secured to its upper surface at the middle thereof and adapted to pass through an opening in the lower table into the lower end of one of the molds g , acting conjointly with the upper piston to compress and form the earth or clay into the proper shape for the brick.

P designates the ejector for forcing the brick from the mold after having been formed and pressed into shape by the pistons and bar, said ejector being arranged at one side of the frame and comprising a bar, P' , having an enlarged base, p , adapted to move vertically through an opening formed in the platforms or tables, and to force or expel the brick from the molds which are brought to register therewith. The bar is pivotally connected at its lower end to the base p , which moves between a guide, P^2 , secured to the table a^4 , said base having parallel uprights $p' p'$, between which the bar P' lies, which project through the upper table a^2 and reciprocate in slots formed therein. The bar P' is pivotally connected to and reciprocated up and down by a crank, q , formed with a shaft, Q, mounted in standards Q' , arranged at each side of and secured upon the upper table a^2 , said shaft Q being revolved by motion transmitted thereto by a pinion or gear-wheel, Q^2 , secured upon the outer end of the said shaft Q, and adapted to mesh with the gear-wheel F on the eccentric shaft C, said shaft and gear-wheel Q Q^2 being arranged above the gear-wheel F. The bricks in their green state, after being forced from the molds by the ejector P, are deposited on and carried off by an endless traveling apron S, the means for operating and supporting which I will now describe. At one side of the main frame is arranged a belt-supporting frame, S' , which comprises parallel horizontal arms $s s$, connected to or formed at their inner ends with vertical parallel arms $s' s'$, each of which is provided with pins s^2 , two or more in number, adapted to fit in sockets S^2 , secured upon the uprights a of the main frame, thus permitting the belt-frame to be easily and quickly connected to and removed therefrom.

T T designate the belt supporting and shifting rollers, the former of which, T, is ar-

ranged beneath the lower platform or table a^2 , and suspended therefrom by hangers $t t$, bolted to said platform near the opening therein through which the brick passes after being expelled from the mold by the ejector. The roller T' is supported at its ends in brackets $t' t'$, secured at their lower ends to a movable sliding plate, T^2 , having notches cut in its edges to adapt it to fit between the parallel arms of the frame S' , a thumb-screw, T^3 , passing through the rear cross-bar of the said frame S into the plate T^2 and adapted to adjust the same backward or forward to increase or decrease the tension of the belt as occasion may require. One end of the roller T has a notched or clutch face, u , which is engaged by a clutch-faced hub, U, normally held in contact with the face of the roller by pressure exerted by a coiled spring, U' , wound or coiled upon the supporting pin of the hub. One end of a link, V, is connected or pivoted to the outer face of the hub U, while the opposite end of said link is pivoted to an arm, V' , bifurcated at one end and pivoted to the tree R. The arm V' is vibrated back and forth, and the hub-clutch U and roller T' revolved by motion communicated to said arm V' from the shaft E' through the medium of an arm, W, rigidly secured on the lower end of said shaft, and a short link, w , pivoted to said arms W and U, as shown. The outer end of the arm W is bifurcated and provided with a series of apertures, and between the bifurcated portions of said arm one end of the link w is pivoted by a pin, said link being capable of adjustment to either of said apertures to vary the stroke of the arm W.

X is a removable shield or cover adapted to be fitted over the upper portion of the machine, said plate being bent or curved, as shown, and provided with securing pins or bolts $x x$, one arranged at each corner, those at the front end of the shield fitting in apertures formed in the front ends of the standards Q^2 , while those at the rear abut against the upper projecting edges of the hopper D.

The operation of my invention is as follows: Earth, clay, or other material in a dry state is placed in the hopper, and power by hand or otherwise is applied to the shaft B, which rotates the shaft C through the intermeshing gearing B' C' and causes the feeding carrier or plate to be reciprocated away from beneath the bottom of the hopper through the medium of the gearing F, pitman E^3 , link E^2 , and shaft E', the chamber e' of said carrier being forced forward to register with the opening in the table a^4 and deposit its charge of earth, clay, or the like into one of the mold-receptacles g of the wheel G. The mold-wheel G is then shifted around in position between the pressure-plungers by motion transmitted from the shaft C through the gear-wheels F L', shaft L, bevel gear-wheels K K', shaft J, drive and stop wheels I H, and to its supporting-shaft G'. As soon as the mold is in position between the platens of the pressure-plunger M' and the platen of the pressure-bar

O, the platens are forced into the mold toward each other, the one from above and the other from below, moving in opposite directions toward and from each other by the motion of the eccentric shaft C and the pressure-plunger. The platens, after pressing the brick into proper shape, are drawn away from each other and the brick, and a further rotation of the mold-wheel occasioned by the same mechanism and power from the same shaft brings the mold containing the brick thus formed beneath the expelling-plunger P', operated by the crank-shaft Q and gear-wheel Q', meshing with the gear-wheel F of the eccentric shaft C. The brick is forced from the mold by the downward stroke of the plunger P', and is deposited upon the endless traveling apron S, by which it is carried from beneath the machine and removed by hand for burning in a kiln, &c.

The operation just described illustrates the manner of forming one brick only; but it will be understood that the forming of a number of brick is only a repetition thereof, the operations of filling and pressing the molds, ejecting and carrying off the formed compressed brick being successively and automatically performed by a machine constructed in accordance with my invention, without any attention whatever, except the feeding of the material in the hopper and removal of the formed brick from the apron.

The parts of the several mechanisms are so proportioned and arranged with relation to each other that at the end of every eighth revolution of the power-shaft a mold has been filled and compressed, and a formed brick ejected and carried off. At the first half of the first revolution of the power-shaft, when the machine has been started, the feeding-carrier has been moved forward in position for charging the mold, and at the end of the first revolution of the shaft the carrier has been moved back to be charged from the hopper. Simultaneously with the forward and rearward movement of the carrier the stop-wheel I is rotated, and at the beginning of the second stroke it begins to rotate the stop-wheel H, on the shaft of which the mold-wheel G is mounted, and thus at the end of the second revolution the charged mold is carried away from beneath the charging or feeding carrier, and its place supplied by another mold for filling. At the end of the third revolution the second mold has been filled and the stop-wheel moved half-way round, and at the termination of the fourth revolution the mold first charged has been shifted between the platens of the pressure-plunger. During the first half of the fifth revolution the pressure-plungers are forced against the earth or clay to form the brick, and at the termination thereof they have been drawn away from the mold. At the first half of the sixth stroke the mold containing the pressed brick is shifted beneath the expelling-plunger, and at the end of said revolution the brick has been expelled from the mold by the downward pressure exerted by the ejector P',

and deposited upon the endless carrying-apron S, the remaining two revolutions of the shaft moving the apron with the formed brick a sufficient distance to clear the machine, from whence they may be removed by hand.

A machine constructed in accordance with my invention is simple and durable in construction, efficient and automatic in operation, can be readily transported or moved from place to place, requires a minimum expenditure of power, is compactly constructed and works by positive motion, and is consequently not liable to get out of order.

It will be observed that the plate e' of the vibrating carrier E projects beyond the edge of the body thereof and that the same covers the orifice of the hopper D, thus preventing the escape or waste of the clay or material when the carrier is at its forward stroke.

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

1. In a brick-machine, the combination of a frame, a power-shaft journaled therein, a shaft, J, carrying a mold-wheel at its lower end, and having a stop-wheel provided with a single tooth, a shaft, G', having a drive-wheel, I, and a gear-wheel, K, and a shaft, L, geared to the power-shaft, and having a gear-wheel, K', substantially as described.

2. In a brick-machine, the combination of a frame, a rotating mold-wheel mounted therein, an eccentric shaft geared to a power-shaft, also mounted in the frame, an upper pressure-plunger mounted on the eccentric shaft, a pressure-bar carrying a platen arranged to reciprocate in the lower end of the molds, guides secured to the frame for the pressure-bar, and connections M, mounted on the eccentric shaft and secured to the pressure-bar, whereby when the eccentric shaft is rotated the plunger and pressure-bar will reciprocate in the upper and lower half of the molds, substantially as described.

3. In a brick-machine, the combination of a frame, a mold-wheel, a power-shaft, a crank-shaft, Q', geared thereto, an expelling-plunger mounted on the crank-shaft to operate in the molds, guides p' , pivoted on the plunger, and a guide for the plunger secured on the table a' of the frame, substantially as described.

4. In a brick-machine, the combination of a frame, a rotating mold-wheel, an expelling-plunger, an intermittently traveling belt, supporting-rollers over which the belt moves and is supported, a clutch for rotating one of the rollers, a pivoted arm, V', connected to the clutch, and an arm secured on a shaft, E', and connected to the arm V', substantially as described.

5. In a brick-machine, the combination of a frame, a traveling belt, rollers for supporting the belt, a clutch for driving one of said rollers, a shaft, E', an arm or arms secured to the hub, and an arm rigidly secured on the shaft E', and having a series of apertures at its free end, to which is connected the arm of the

clutch, whereby the stroke of the clutch-arm can be varied, substantially as described.

6. In a brick-machine, and in combination with a reciprocating plunger, a traveling belt, 5 supporting-rollers therefor, one of said rollers having a clutch-face, and a spring-pressed hub having a clutch-face normally in contact with the roller and adapted to rotate the same to feed the belt forward, substantially as de- 10 scribed.

7. In a brick-machine, and in combination with the reciprocating plunger thereof, a traveling belt arranged below the plunger, a frame arranged to one side of the machine and car-

rying a roller mounted on a movable plate, a 15 roller suspended from the bottom of the machine in hangers and carrying a spring-pressed clutch, an arm secured upon a vibrating shaft, a lever pivoted to a cross-bar, and pivoted links connecting said arm, lever, and clutch, 20 substantially as and for the purpose described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

VICTOR DORIOT.

Witnesses:

EDW. G. SIGGERS,
JOHN H. SIGGERS.