

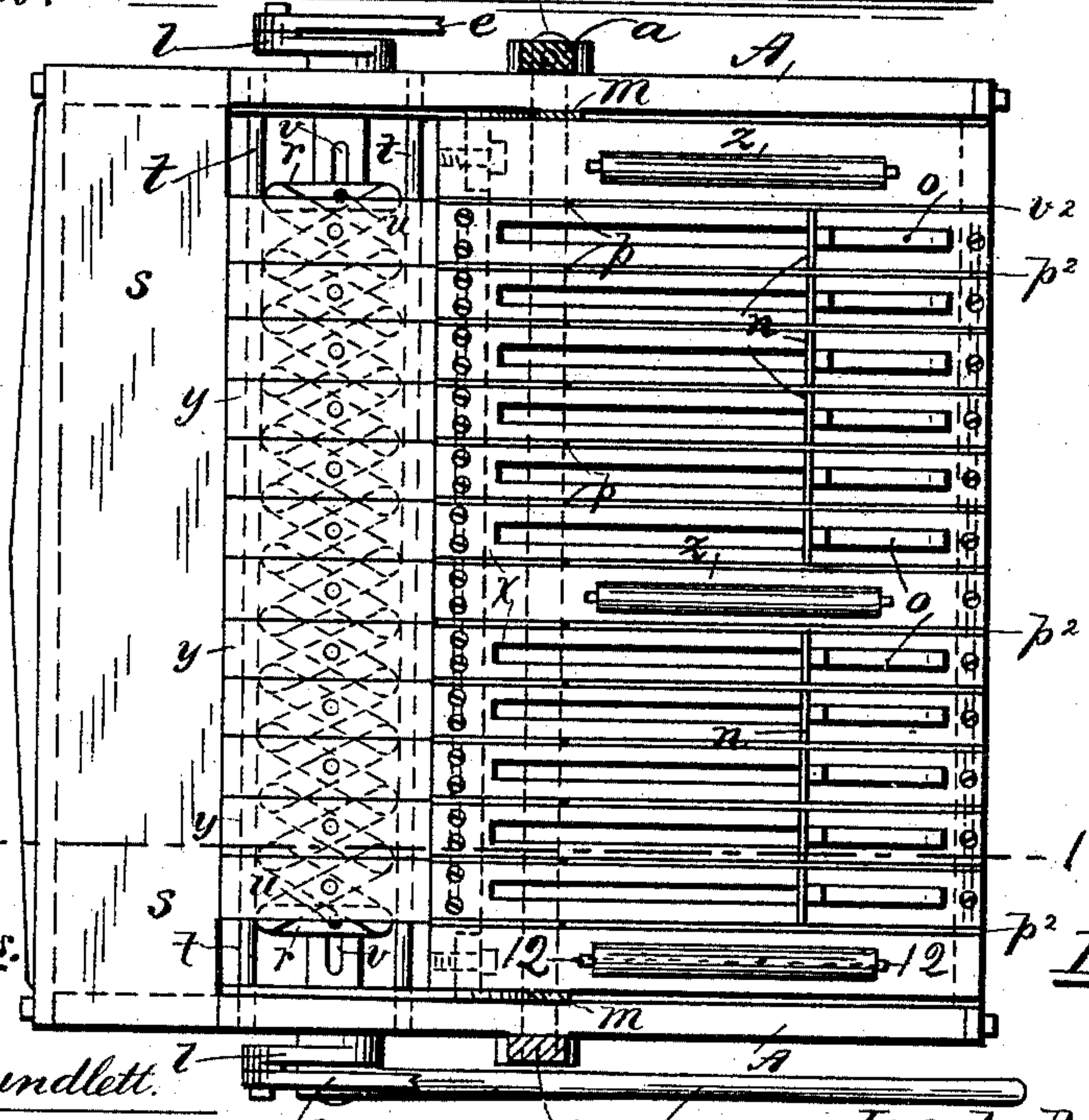
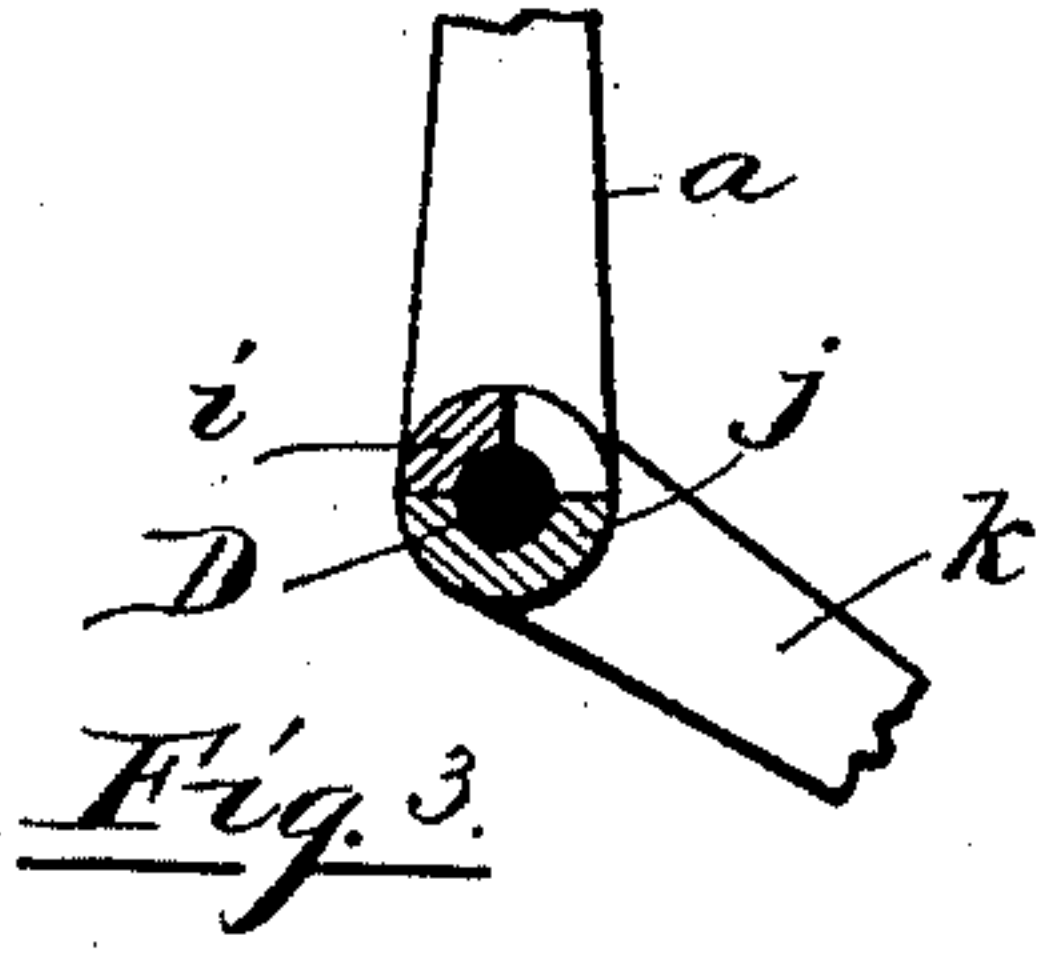
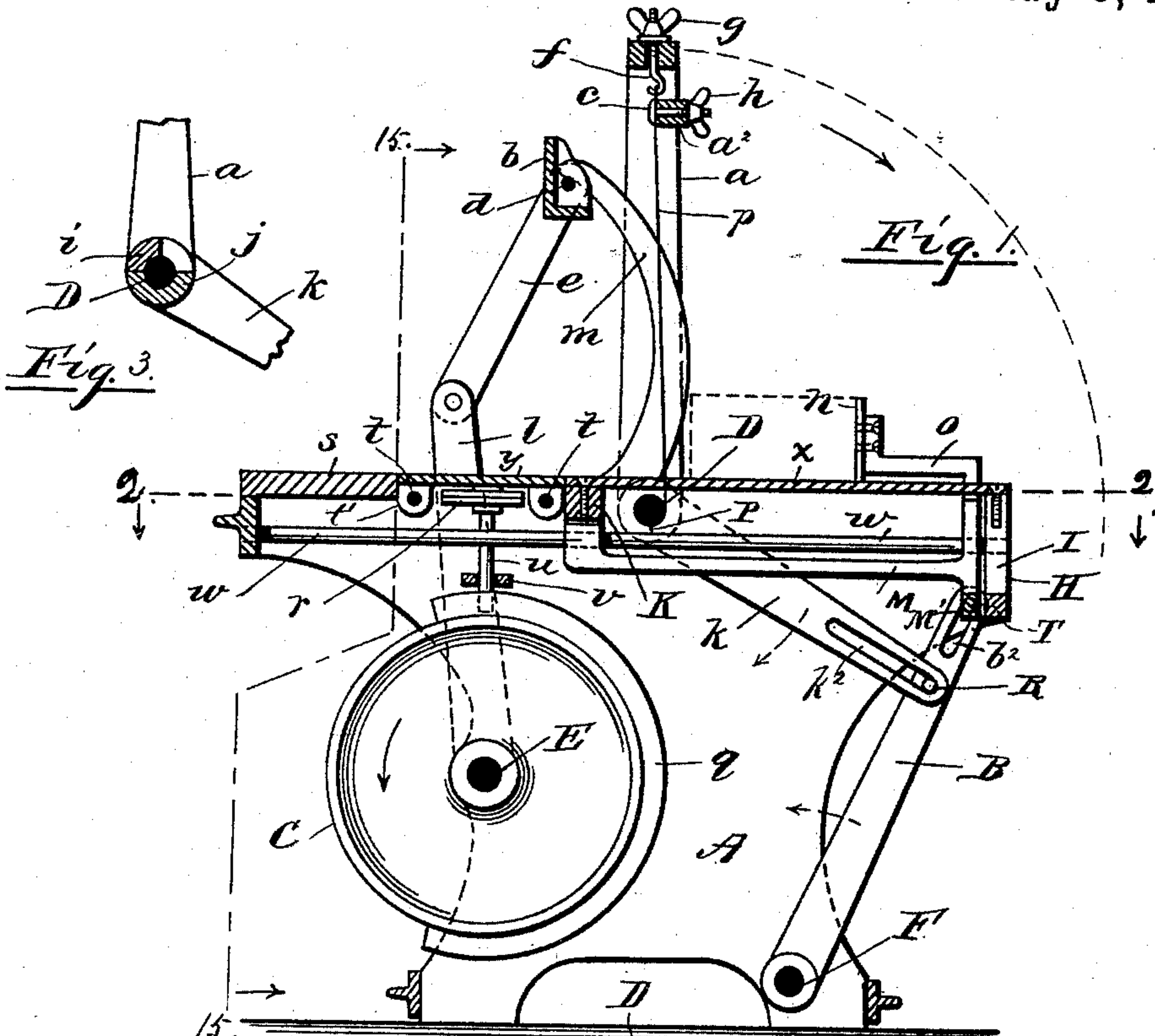
(No Model.)

5 Sheets—Sheet 1.

J. A. SNELL.
BRICK CUTTING MACHINE.

No. 496,982.

Patented May 9, 1893.



Witnesses.

William D. Rundlett.
Ida M. Warren.

Inventor.

Jacob A. Snell.
by Remington & Henshaw Attys.

(No Model.)

5 Sheets—Sheet 2.

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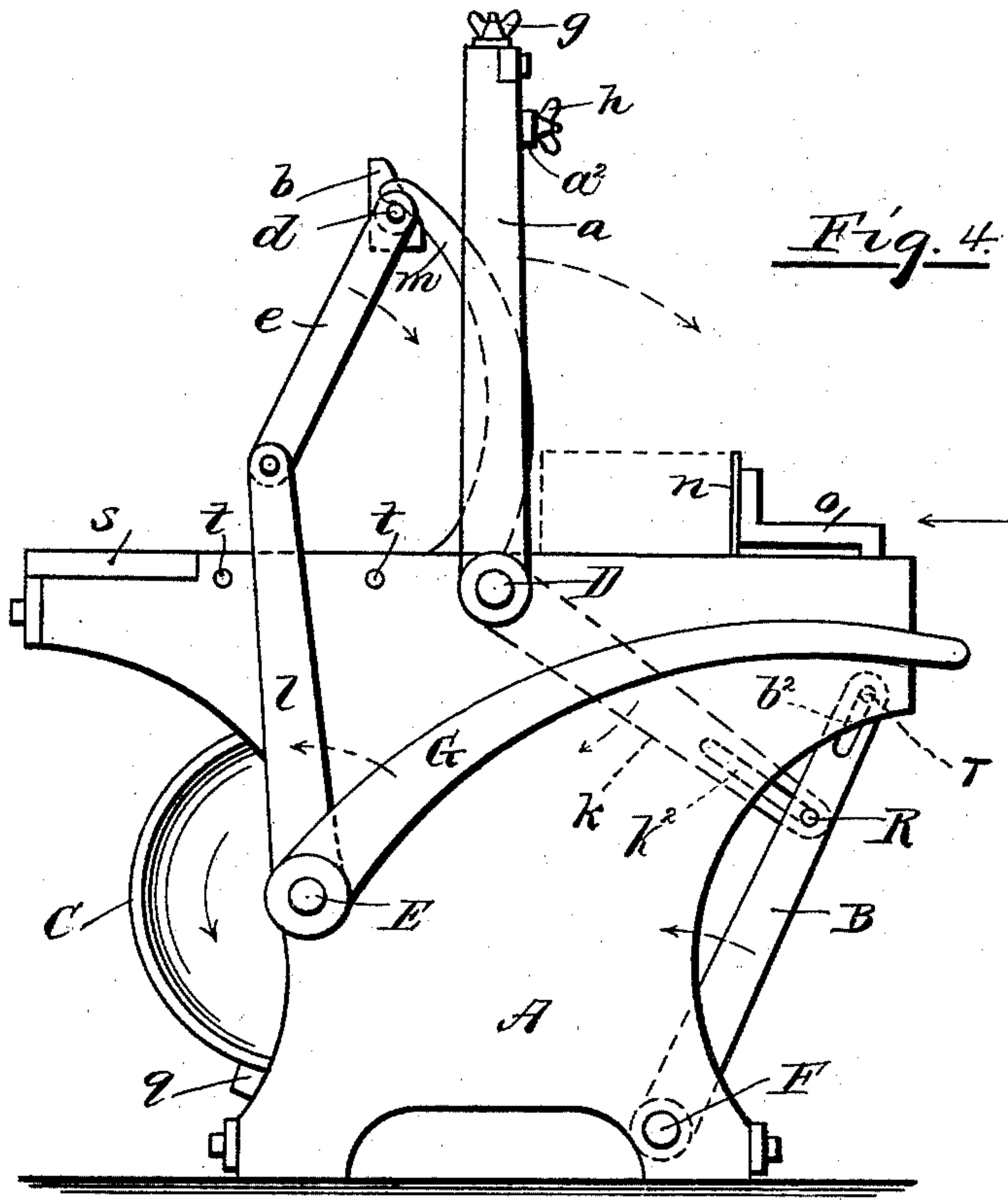


Fig. 4.

Fig. 6.

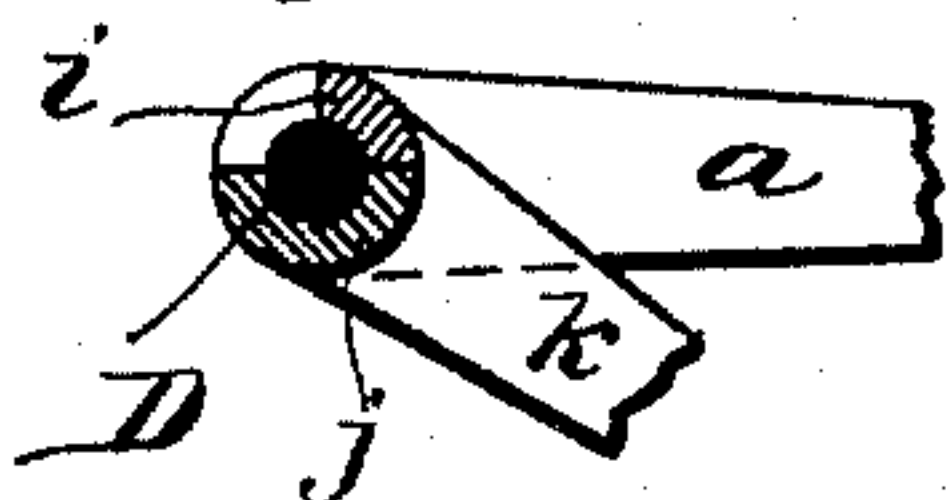
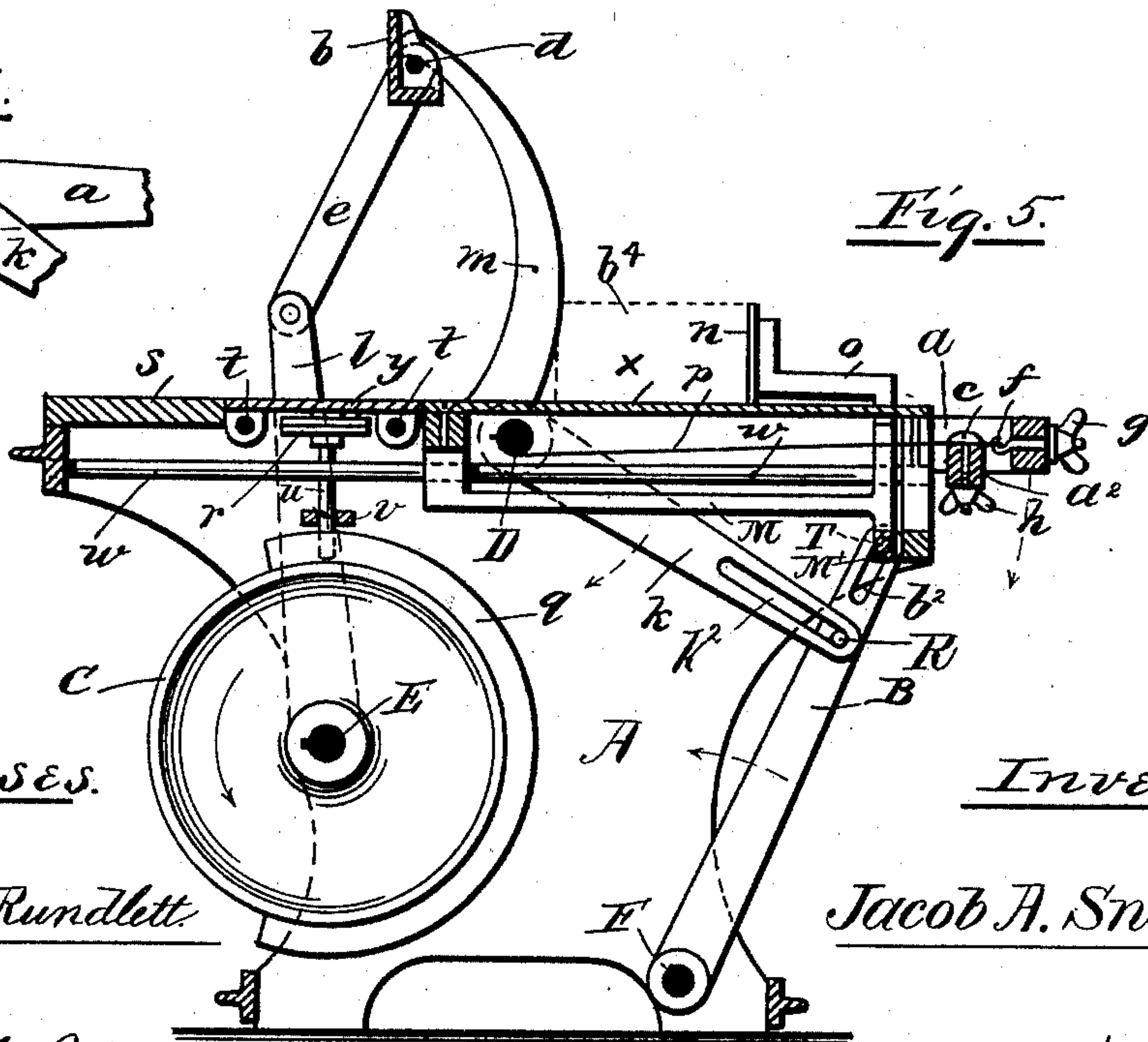


Fig. 5.



Witnesses.

William D. Rundlett.

Ida M. Warren.

Inventor.

Jacob A. Snell.

by Spring & Henthorn
Attys.

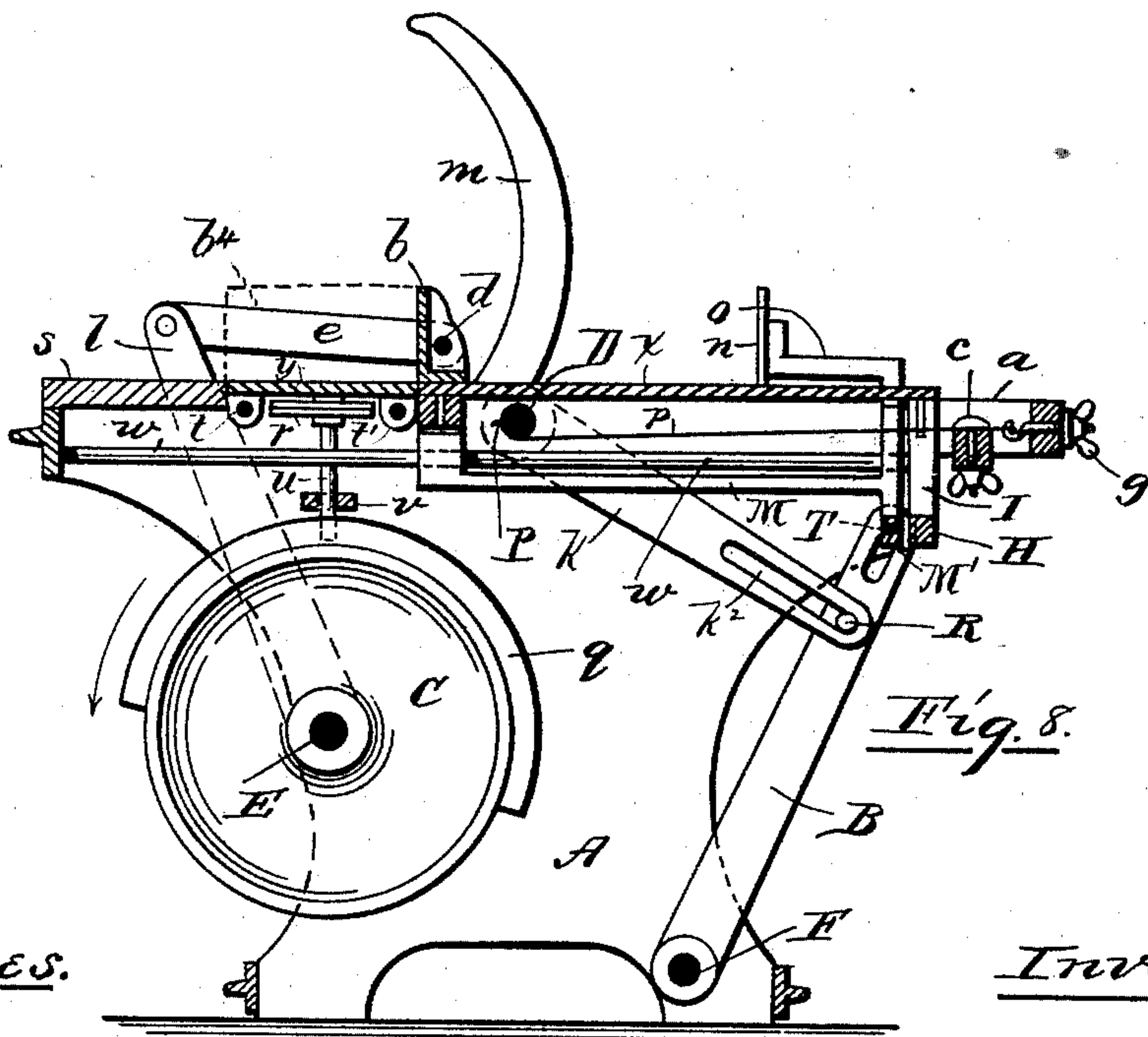
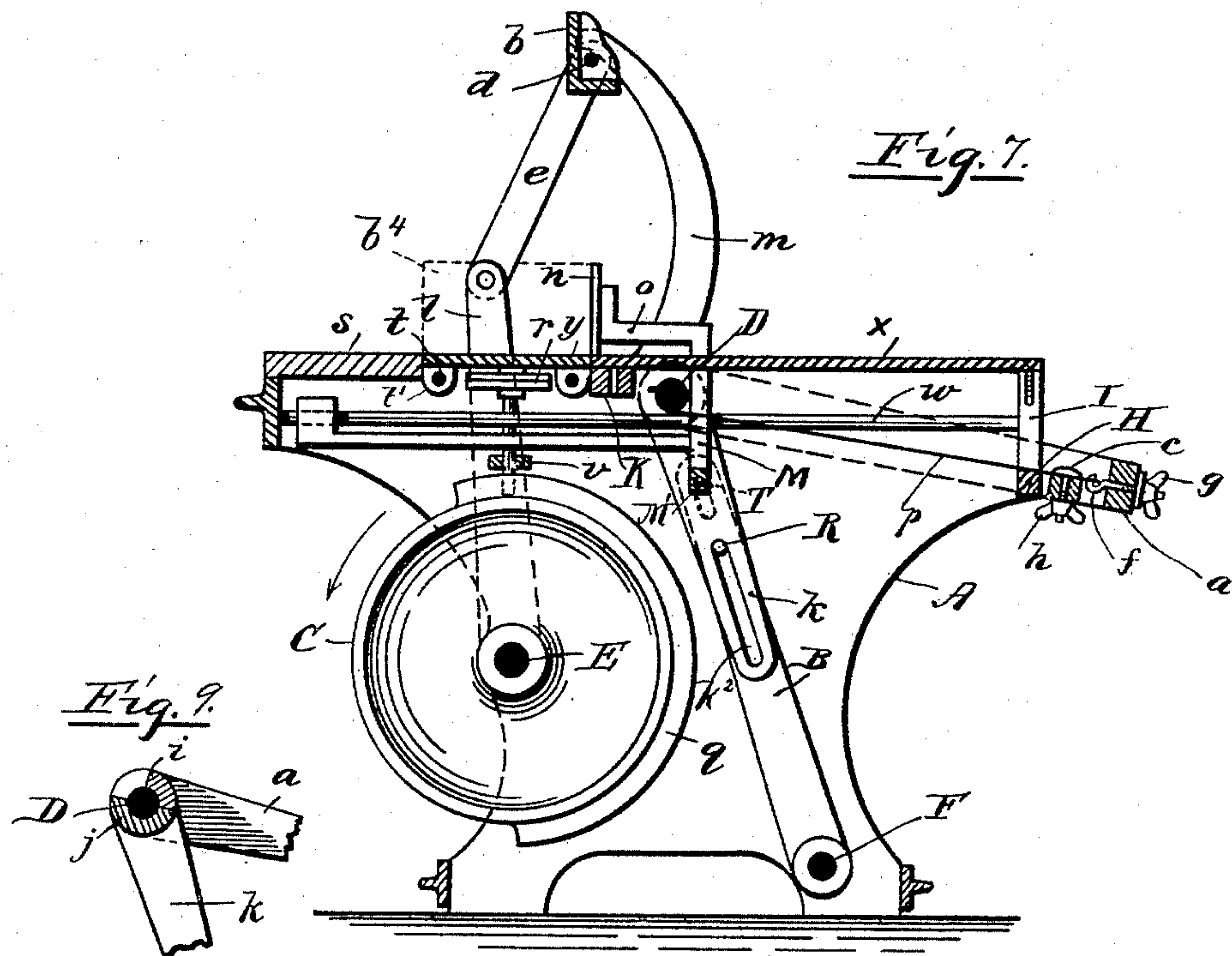
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Witnesses.

Inventor

William D. Rundlett.

Jacob A. Snell.

Ida M. Warren.

by Remington & Kenyon Attys

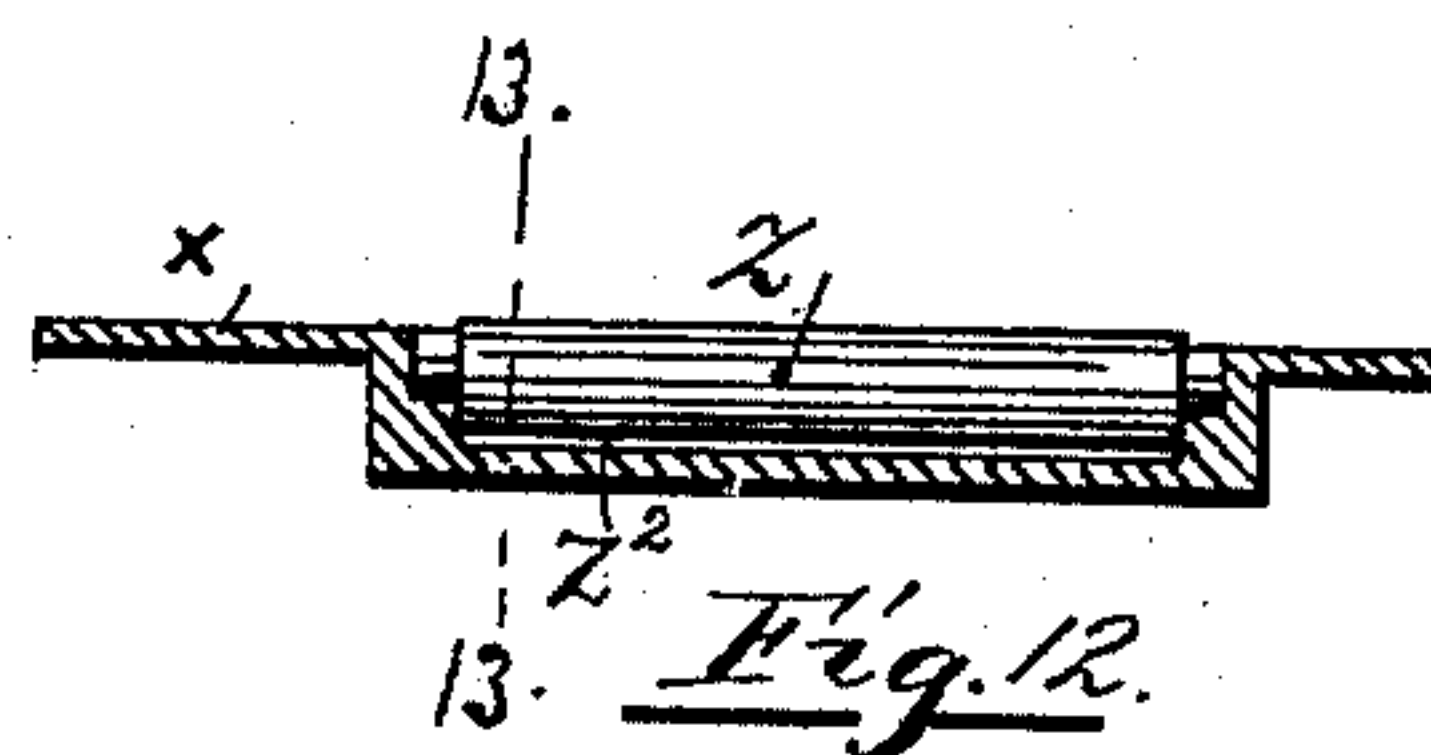
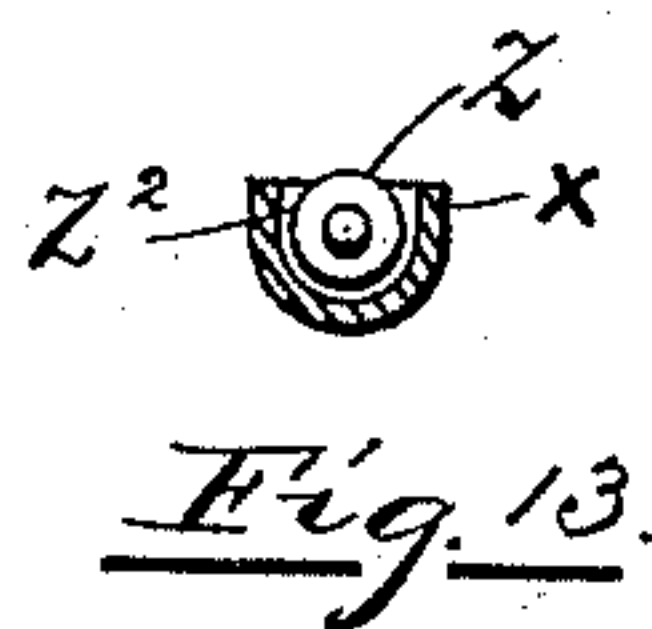
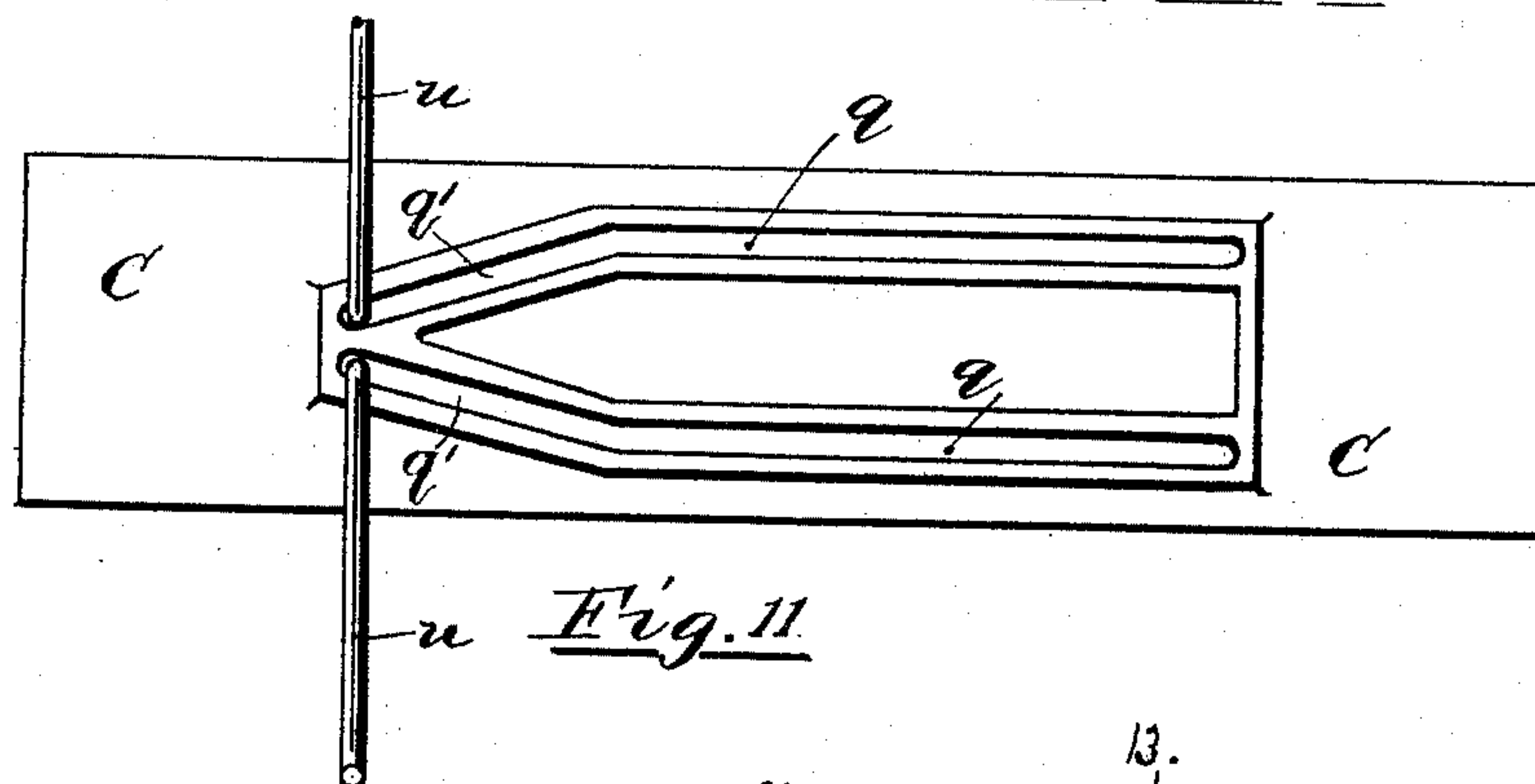
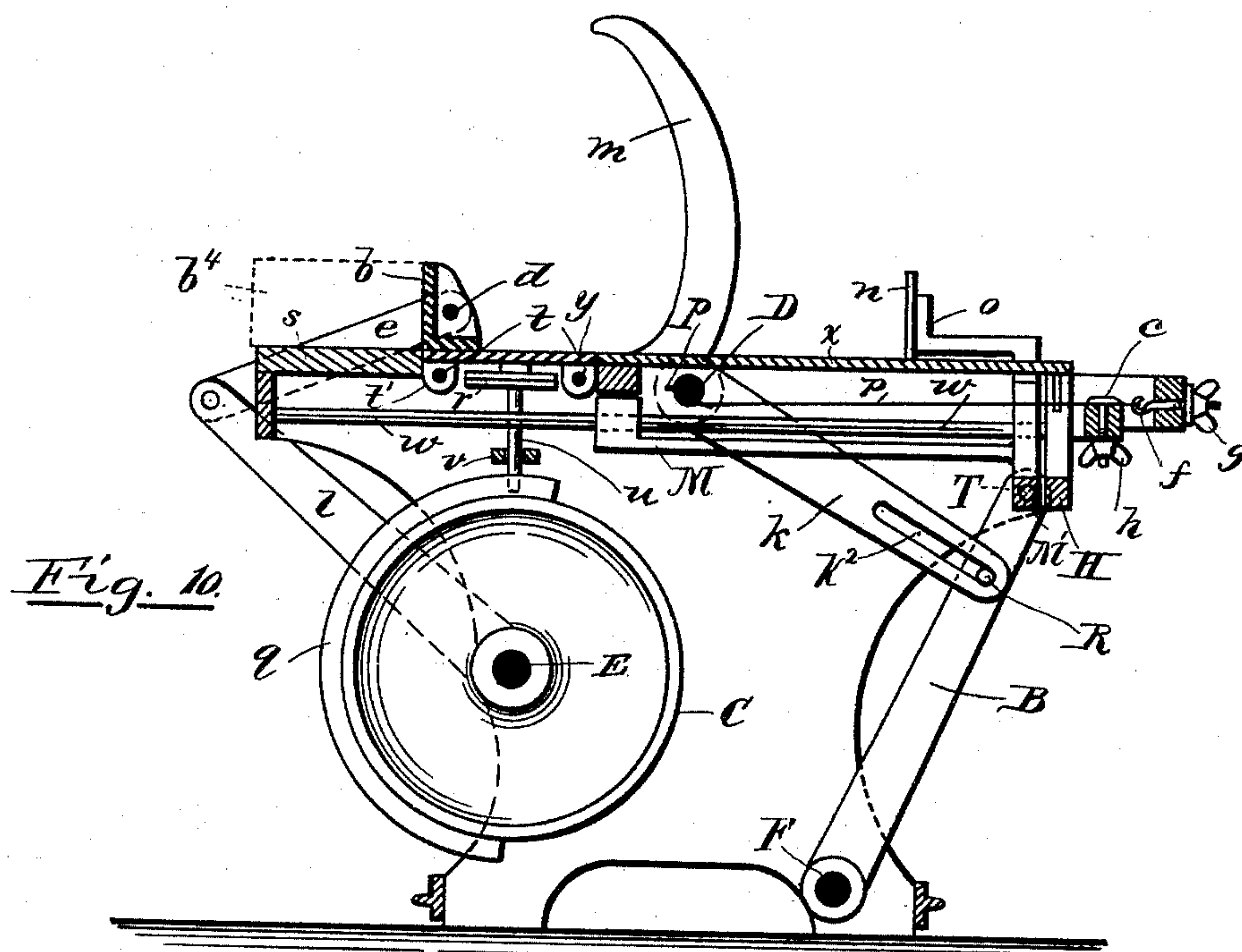
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Witnesses.

William D. Rundlett.

Iida M. Warren.

Inventor.

Jacob A. Snell.

by Remington & Henthorn
Attys.

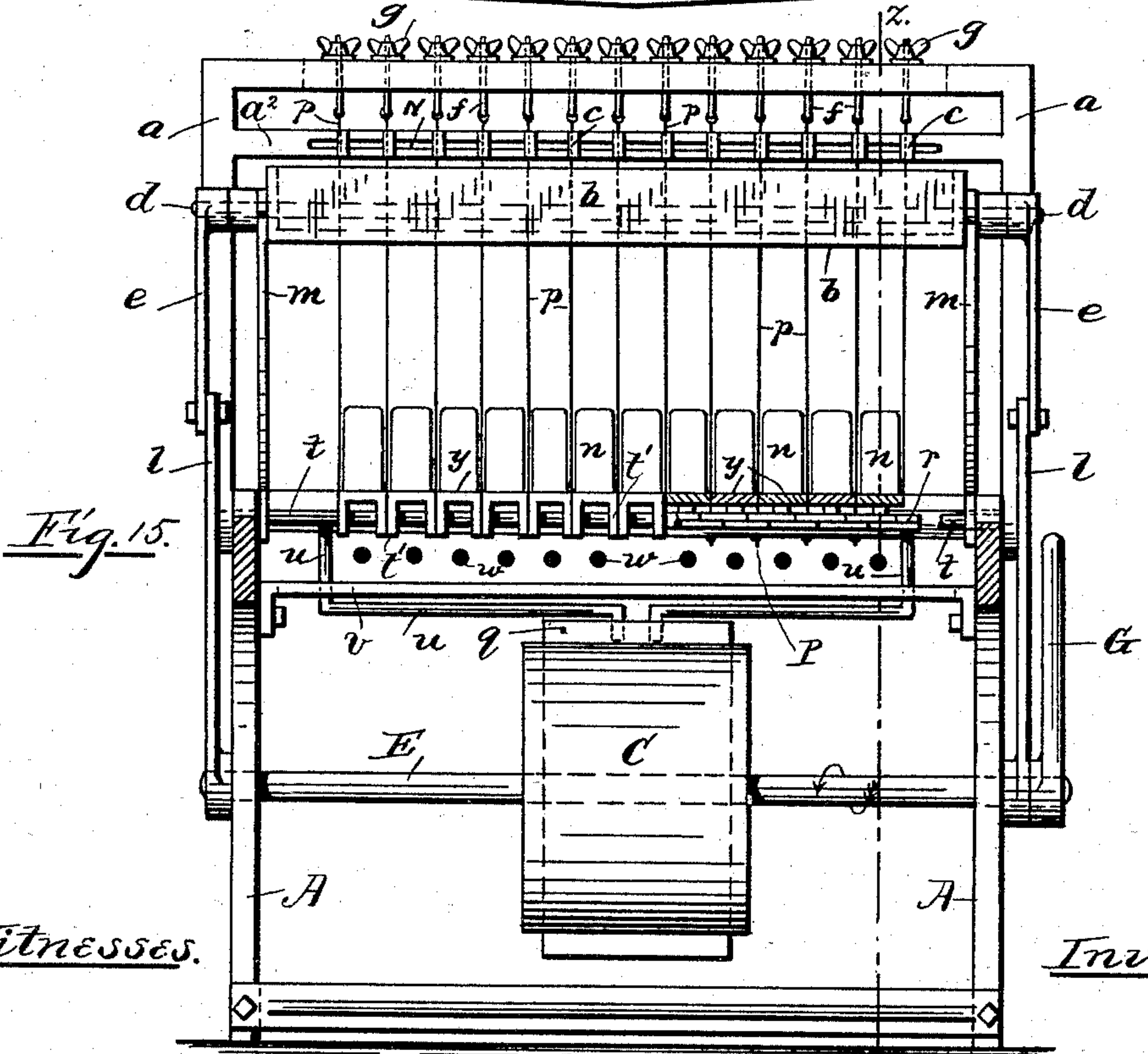
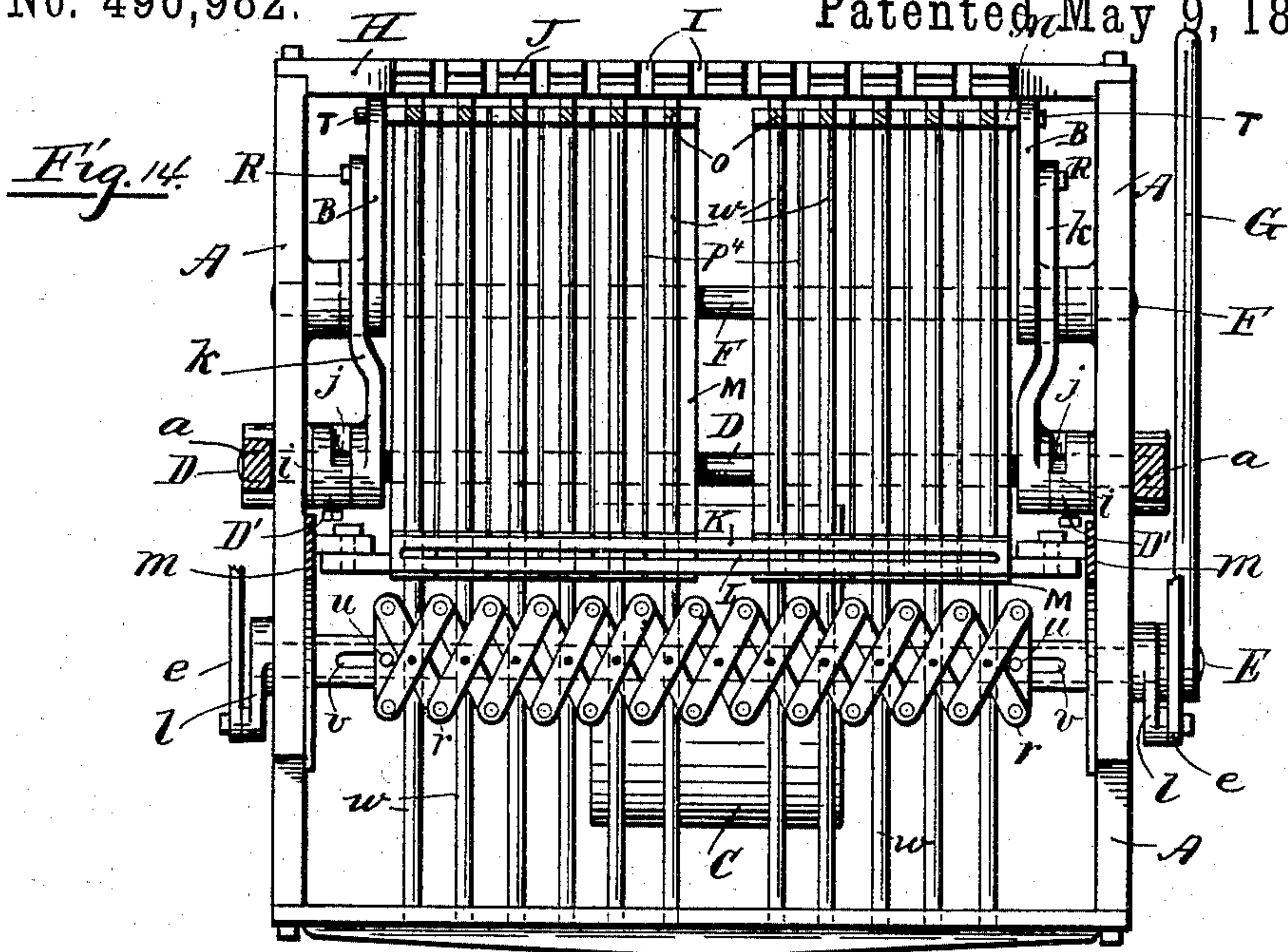
(No Model.)

5 Sheets—Sheet 5.

J. A. SNELL.
BRICK CUTTING MACHINE.

No. 496,982.

Patented May 9, 1893.



Witnesses.

Inventor.

William D. Rundlett.

Jacob A. Snell.

Eola M. Warren.

by Lemington A. Anthony
Attys.

UNITED STATES PATENT OFFICE.

JACOB A. SNELL, OF BARRINGTON, RHODE ISLAND.

BRICK-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 496,982, dated May 9, 1893.

Application filed May 28, 1892. Serial No. 434,708. (No model.)

To all whom it may concern:

Be it known that I, JACOB A. SNELL, a citizen of the United States, residing at Barrington, in the county of Bristol and State of Rhode Island, have invented certain new and useful Improvements in Brick-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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention relates to brick-cutting machines, but more particularly to machines such as are adapted to transversely sever a continuous length of suitably tempered and molded clay, and it consists essentially in the combination of a stationary bed, a cutter-carrying frame adapted to axial movement pivoted below the face of said bed and means for conveying the brick-blanks or unburned-brick from the bed.

It also consists in the combination of a laterally separable table or platen, a follower arranged to place the series of brick-blanks thereupon, mechanism for simultaneously opening or separating said table, and means for discharging the blanks from the table and returning it to its normal or closed position, all as will be more fully hereinafter set forth and claimed. It is well known that the molded clay after being severed transversely into shorter lengths, each corresponding say to the thickness of the brick, is so soft and yielding that great care must be exercised in handling the blanks to preserve their integrity and symmetry. In the case of machine-made bricks wherein a series of blanks are simultaneously severed by a movable frame carrying say a series of fine wires or cutters formed of pieces of thin flat metal placed edgewise, it becomes necessary to still farther separate the blanks in order to allow a free circulation between and around them during the drying and baking operations.

One of the objects of my present invention is to provide a brick-cutting machine with means whereby the series of blanks, say one dozen, more or less, may after being cut be mechanically separated from each other in a

lateral direction with great rapidity and accuracy, thereby reducing the percentage of waste and the labor of handling to a minimum. At the same time the production or capacity of the machine is greatly increased.

Another advantage resulting from my invention is that the arrangement and action of the cutters in severing the blanks leave the edges of one end and a contiguous side smooth, thereby materially increasing the quality of the product. Hitherto it has been usual to sever the blanks by cutters arranged and operating in such manner as to produce ragged or scarf-like edges entirely around them. Obviously such bricks are of much less value than bricks having clear-cut and sharp corners or edges.

In the accompanying five sheets of drawings illustrating my invention,—Figure 1, Sheet 1, is a transverse sectional view of a brick-cutting machine embodying my improvements, taken on line 1—1 of Fig. 2, the several parts being in the normal position. Fig. 2 is a horizontal sectional view, taken on line 2—2 of Fig. 1, being substantially flush with the face of the table, &c. Fig. 3 is a partial sectional view, showing the position and relation of the cutter and follower-operating arms, corresponding to Fig. 1. Fig. 4, Sheet 2, is an end elevation. Fig. 5 is a vertical sectional view, similar to Fig. 1, except that the cutter-frame has been swung downwardly to sever the molded clay into brick-blanks, the latter being indicated by broken lines and resting edgewise upon the stationary bed. Fig. 6 is a partial sectional view, showing the corresponding position of the cutter and follower operating arms or levers. Fig. 7, Sheet 3, is a transverse sectional view similar to Fig. 5, showing the cutter-frame depressed to its limit, the action of which forces the initial follower rearwardly and places the blanks upon the separable table. Fig. 8 is a sectional view, showing the follower returned to its normal position, as in Fig. 5, but having the auxiliary or secondary follower in position against the rear ends of the blanks, the separable table meanwhile having been extended to still farther separate the blanks. Fig. 9 is a sectional view showing the position of the levers, corresponding to Fig. 7. Fig. 10, Sheet 4, is a sectional view similar to Fig. 8, but show-

ing the auxiliary follower in its extreme position, it having forced the severed blanks onto the removable drying board, placed in position to receive them. Fig. 11 is a plan view showing the developed surface of the cam-wheel which operates to open and close the separable table. Fig. 12 is a partial sectional view, taken on line 12—12 of Fig. 2. Fig. 13 is a transverse sectional view, taken on line 13—13 of Fig. 12. Fig. 14, Sheet 5, is a horizontal sectional plan view, with the stationary and movable tables removed; the relation of the parts being substantially as represented in Figs. 1 and 2, and Fig. 15 is a rear side elevation, in partial section, taken on line 15—15 of Fig. 1.

The machine, again referring to the drawings, is provided with the two vertical end frames A, A, suitably tied together and arranged to receive and support the various parts and mechanisms about to be described. The front side of the machine is provided with a stationary top bed x consisting of a series of longitudinally slotted plates through which extends downwardly a corresponding series of knees or arms o secured to a movable frame M, the latter being mounted to slide on fixed guide rods w extending from the front to the rear of the machine. The slotted plates are separated from each other transversely a short distance p^2 to permit the cutters p to work freely therein. To each knee o is secured a short vertical plate or follower n ; the series of followers are in alignment and are arranged to work in unison. The movement of the followers is effected by means of a pin or roll T, mounted at each end of the frame M, working in slots b^2 formed in the upper end of the two levers B, pivoted at F; the levers B being actuated by suitable mechanism hereinafter described.

Near the rear end of the plates x , and contiguous to the under side thereof, is mounted a rock-shaft or rod D, the same extending longitudinally of the machine and projecting through the end frames A. To these projecting portions is secured the cutter-carrying frame a (see Figs. 1, 15, &c). This frame is provided with two slotted top ties, the lower one, a^2 , being adapted to receive the series of clamp-bolts c , the other tie having a series of screw hooks f passing through it. As drawn, the cutters p are simply a series of uniformly spaced fine steel wires, the lower ends being wound around the shaft D and secured to pins P. The upper portions of the cutters are adjustably clamped to the tie a^2 by means of the bolts c and thumb-nuts h , thereby firmly holding the cutters in place. The ends of the wires p are in engagement with the hooks f ; the nuts g being employed to regulate the tension. Now upon vibrating the frame a in the arrow-direction, Fig. 1, to the position shown in Fig. 5, the several cutters p will be forced downwardly through the molded clay or material resting upon the bed x thereby completely

separating the clay into brick-blanks, b^4 , each having a thickness equal to the distance between two adjacent cutters. The small amount of waste material produced is carried through the bed by the cutters and falls beneath. After the clay has been severed into blanks, as just described, the latter are simultaneously forced ahead from the bed x , *i. e.* toward the rear side of the machine, by the action of the followers n until the blanks rest upon the separable table y . See Fig. 7.

The mechanism for effecting the movement of the blanks is as follows:—Referring to Fig. 14, it will be seen that a clutch-collar D' is secured to each end of the shaft or axle D, contiguous to the frames A. Each collar is provided with a lug i arranged to engage a corresponding lug j of the lever k . These two levers k are loosely mounted upon the shaft D and each is further provided at its front or free end with a slot k^2 in which a pin or roll R works; the latter being fixed to the side of the adjacent lever B, before referred to. The relative arrangement of the levers, &c., is clearly shown in Figs. 1 and 3. When in the position indicated by said figures the clay is resting upon the bed x preparatory to being severed into blanks by the action of the cutters p . Now, upon swinging the cutter-frame downwardly ninety degrees or to the position shown in Fig. 5, thereby at the same time forcing the series of cutters through the clay, the lugs i will be correspondingly vibrated and brought into engagement with the lugs j , see Fig. 6. The act of depressing the cutter-frame to its limit from a horizontal position will cause the collar-lugs i to force the loosely mounted levers k rearwardly, thereby carrying with them the levers B and the connected follower-table M; the result being to force the several brick-blanks from the bed onto the expansible table y , preparatory to being further separated; the relation of the parts then being as represented in Figs. 7 and 9.

To the left side of the machine is located an operating lever G, the same being fixed to the outer end of the shaft E. This shaft extends across the lower portion of the machine and is mounted in and projects beyond the side frames A, see Figs. 4, 15, &c. To the shaft are also secured outer arms l , l , each having a link e jointed thereto at its upper end through which in turn is journaled a rod d carrying a loosely mounted pusher-plate b . The said rod extends across the machine and is in immediate contact with the inner or concave face of the two upwardly extending fixed bent arms m , the plate b filling the space between them upon the shaft.

Located upon and about midway of the shaft E is secured a wheel or drum C having right and left cam-shaped grooves q formed in its periphery, see Fig. 11, &c. This figure represents the developed surface of the cam-wheel. It will be seen that the grooves ex-

tend about half-way around the wheel. The cam proper, q' , that is the divergent portion, forms about one-third of the grooves' length from which point they continue parallel with each other.

u, u , indicate two oppositely arranged bent rods or connections having their adjacent ends adapted to work in the said cam-grooves; these rods are guided in and extend upwardly through a fixed bar v and are secured to the outer ends of a "lazy-tongs" connection r , see Figs. 2, 14, and 15. To each central joint of said connection is attached a plate y of the extensible table; these connected plates are adapted to receive the series of brick-blanks as they are forced thereon by the action of the pusher-plates n . The end portions of the plates y are provided on the under side with ears t' through which the combined supporting and guide rods t extend. These rods are parallel and are secured to the frames A. From this it is obvious that upon rotating the cam-wheel in the arrow-direction the two guided connections $u u$ will become separated thereby at the same time expanding or elongating the table y and separating the plates forming it, the latter freely sliding upon the rods t .

While the operating lever G is being vibrated rearwardly from its normal position, the first part of its movement (say one-third of its maximum travel) will impart a corresponding movement to the cam-wheel thereby expanding the table y to its limit and at the same time depressing the pusher b , through the medium of the parts l, e and m , from its normal position (Fig. 7) until it rests upon the bed x , its position then being at the rear of the series of blanks b^4 , (Fig. 8.) I would state that the followers n must be returned to their normal position before the pusher can be used, or as indicated in said Fig. 8. At this point in the operation the lazy-tongs connection will be extended to its limit by reason of the rotation of the cam, the lower ends of the connections u then being at the terminals of the divergent grooves q' , and resulting in the lateral separation of the blanks, the spaces between them being say one-half an inch. The further and completed movement of the lever G and its connections will operate to advance the pusher across the table y thereby carrying with it the several brick-blanks and depositing them upon the removable drying-board s placed in position to receive them, as clearly shown in Fig. 10. During the movement last described the several plates y remain practically immovable in a lateral direction by reason of the connections u working in the parallel portions of the cam-groove q . A reverse movement of the lever G quickly returns the several connected parts to the normal position shown in Figs. 4 and 5.

The series of slotted plates forming the bed x are removably secured to the front tie H of

the machine and to a slotted lower tie or brace K located at the rear of the shaft D. Said brace is secured to the ends A; its underside forming a guide for the upper rear end of the movable follower-carrying frame M. As drawn this frame is composed of a series of pieces, each loosely mounted on a guide-rod w ; the pieces when thus arranged form narrow openings p^4 between them, see Fig. 14. At the front end they are each secured to a bottom strip M' carrying end pins T adapted to work in the lever-slots b^2 before described. The front tie H, above referred to, is provided with a series of deep transverse grooves or notches I arranged to freely receive the cutters p (Fig. 14). It also serves as a stop for the latter when the cutter-frame a is in its lowest position, see Fig. 7. These grooves are coincident with the spaces p^2, p^4 , before described. The face of the bed x may be provided with rolls z , the same extending but slightly above its surface. These are to assist in conducting a suitable length of molded clay into position upon the bed. They are further employed to lubricate the clay to prevent it from sticking to the bed, &c. For this purpose the rolls run in small pans or chambers z^2 formed in the bed which are kept filled with oil, see Figs. 12, 13.

From the foregoing detailed description of the several parts of my improved brick-cutting machine it is clearly evident that upon feeding a length of suitably molded unburned clay endwise from the right of the machine into position upon the bed x (Fig. 1), assisted by the lubricating rolls z , and swinging the cutter-frame a downwardly (about ninety degrees) from its normal position to that indicated in Fig. 5, the several wires or cutters will be forced through the clay and into the corresponding spaces p^2 formed in the bed and follower, thereby completely dividing the clay into a series of brick-blanks b^4 ; the action of the cutters at the same time producing a smooth cut along the edges of one side and end of each blank; the corresponding relation of the clutch-lugs being shown in Fig. 6. The operator continues the downward movement of the cutter-frame until it is arrested by the front tie H, see Fig. 7. The result of the latter movement is to cause the lugs i to engage those (j) of the levers k thereby carrying the latter in the arrow-direction (Fig. 5), and thus causing the levers B to advance correspondingly. The last-named levers, through the medium of the slots b^2 and pins T working therein, operate to quickly force the follower-carrying frame M toward the rear side of the machine to its limit, thereby sliding the several blanks b^4 from the bed x onto the expansible table y , see Fig. 7. A reversal of the movements returns the follower, cutters, &c., to their normal position. Now, the operator next seizes the lever G located at the left side of the machine and swings it rearwardly, say about sixty degrees more or

less, thus causing the cam-wheel C to simultaneously separate the blank-carrying plates forming the table *y* to their limit; said lever movement at the same time, through the medium of the levers *l*, *e*, &c., depresses the auxiliary follower or pusher-plate *b* until it rests upon the bed *x* and just at the rear of the blanks; the corresponding relation of the parts being represented in Fig. 8. The operating lever G is next further rotated, thereby advancing the pusher into engagement with the series of blanks and forcing them from the expanded table onto a removable drying-board *s* previously placed in position at the rear or delivering side of the machine to receive them, see Fig. 10. A reversal of the lever's (G) movement returns the pusher-plate to the bed *x* and thence upwardly along the guide-arms *m* to its normal position; the action of the cam-grooves *q'* operating at the same time to contract the table *y*.

The subsequent operations of handling the loaded boards *s* and drying the blanks, as well as the final operation of burning or baking the bricks in suitable ovens or furnaces, are all substantially as common to the process of brick-making.

My improved brick-cutting machine can be readily adapted to cut the molded clay into forms other than the usual rectangular brick, by first changing the position and arrangement of the cutters *p*, the bed *x* and the table *y*. In some cases it may be employed to form a single large brick, in lieu of a series of smaller ones, by the action of the cutter-frame, &c., in which event the connections *u*, *u*, should be disconnected from the cam, thereby rendering the table *y* immovable.

Owing to the manner of mounting and operating the cutters *p* the blanks are kept in substantially one and the same horizontal plane throughout the operations of severing the clay and placing them upon the drying boards, thereby saving handling and the resulting percentage of waste. Moreover, the bricks produced upon my improved machine have each at least two sides or faces whose edges are smooth, thereby well adapting them to be used as front or face bricks.

My machine is distinguished from others of its class from the fact that the column of clay is not, as hitherto, fed continuously nor do the cutters sever it into blanks, one by one, which latter are automatically conveyed and discharged in the same plane and in the same direction as that of the advancing bar of clay. In my present brick-making machine the tempered and molded column of clay is first deposited upon the bed at the front side of the machine; the clay is next severed or divided simultaneously into a series of blanks; the latter are then forced endwise (or at right angles to the direction of the length of clay) from the bed rearwardly onto an expansible table; while resting thereon the table is elongated, thereby farther separating the blanks

and increasing the space between them, after which through the medium of an operating pusher-plate they are discharged simultaneously from the table onto a removable drying board located at the rear side of the machine.

I claim as new and desire to secure by United States Letters Patent—

1. In a brick-cutting machine, the combination with the slotted stationary cutting bed and a series of mounted cutters arranged to pass into said slots, of an extensible table composed of a series of connected sections onto which a number of brick blanks are simultaneously delivered, means for opening and closing said table, and a pusher or discharging plate arranged to force the series of blanks from the table, substantially as described.

2. In a brick-cutting machine, the combination with a slotted bed and a series of cutters mounted in an axially movable frame pivoted below said bed, of a guided transversely separated follower, as *n*, and means for operating the same, a table adapted to receive the blanks from said bed and a vertically movable pusher or secondary follower arranged to engage the rear end of the blanks and force them onto a removable board or conveyor, substantially as described.

3. In a brick-cutting machine, the combination with a stationary bed, a pivotally mounted frame carrying a series of cutters adapted for cutting or severing the molded clay into bricks and a follower arranged to force them from said bed, in the same plane with but at substantially right angles to the direction of the length of clay, of an extensible table adapted to receive the bricks from the bed, mechanism for elongating said table, for the purpose of still farther separating the bricks from each other, and means for removing them from the machine.

4. In a brick-cutting machine, the combination with a stationary bed and a suitably mounted extensible table adapted to receive a series of brick-blanks, of mechanism arranged to first open or separate the table and a movable pusher-plate adapted to force the blanks from the table after the latter has ceased moving.

5. In a brick-cutting machine, a slotted stationary bed, as *x*, an expansible table and a removable drying-board, having their upper or working faces level or in a common plane, in combination with an axially movable frame carrying a series of adjustably mounted cutting-wires for severing a length of molded clay into blanks and forcing them onto said drying-board, substantially as described.

6. In a brick-cutting machine, provided with an axially movable cutter-carrying frame, a follower mounted and arranged to reciprocate back and forth by means of levers, &c, actuated and controlled by the movement of the said cutter-carrying frame, substantially as described.

7. The combination, in a brick-cutting ma-

chine, with the series of connected plates arranged to form an expansible table and means for actuating the same, of a movable frame carrying a series of cutting-wires arranged to
5 divide the prepared clay into blanks, an initial follower adapted to force the blanks onto said table before the latter is expanded and a secondary follower arranged to discharge the

blanks from the table after its expansion has been effected, substantially as set forth. 10

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

JACOB A. SNELL.

Witnesses:

GEO. H. REMINGTON,

IDA M. WARREN.