

No. 690,857.

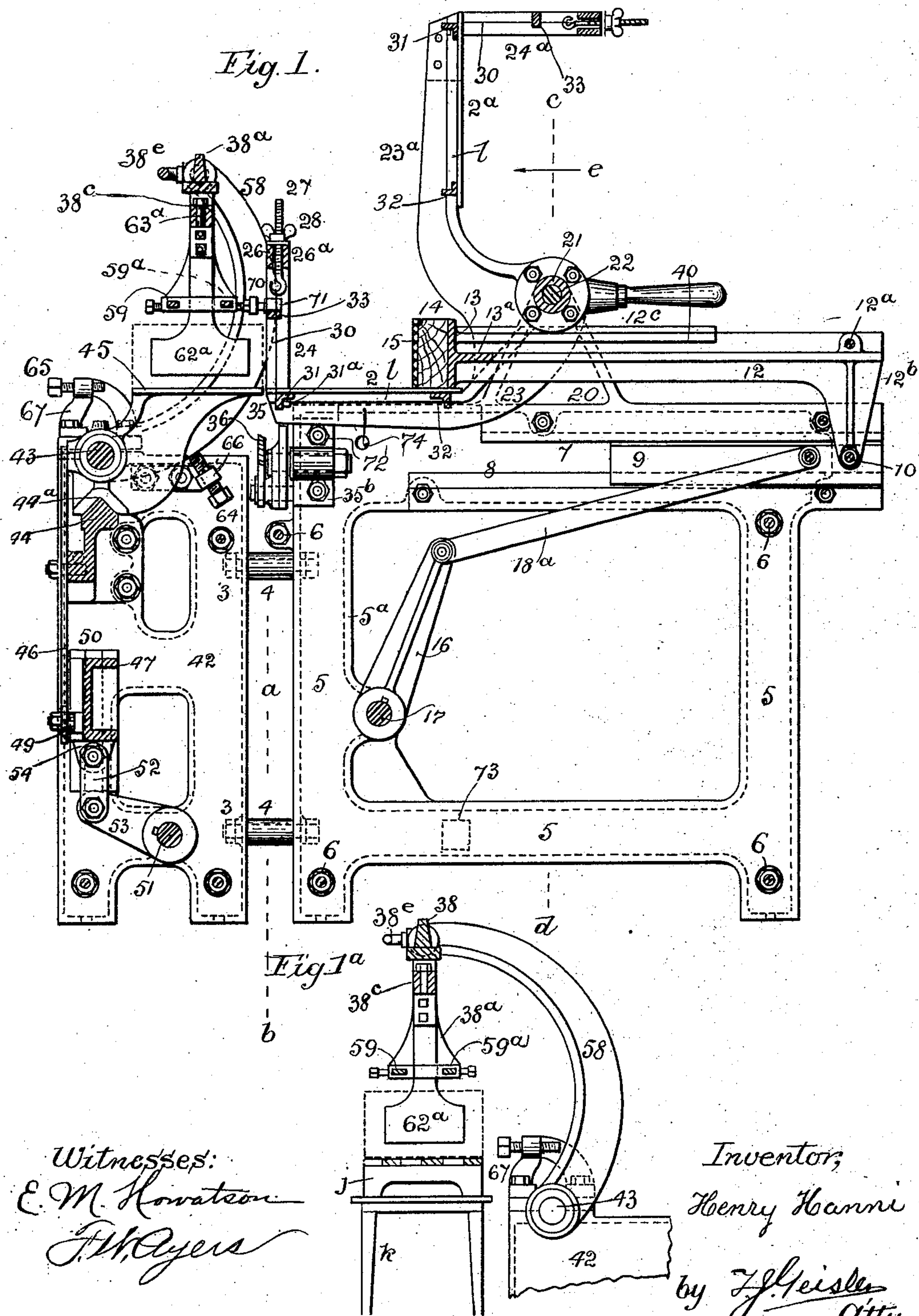
Patented Jan. 7, 1902.

H. HANNI.  
BRICK MAKING MACHINERY.

(Application filed May 9, 1901.)

(No Model.)

5 Sheets—Sheet 1.



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5 Sheets—Sheet 2.

Fig. 2.

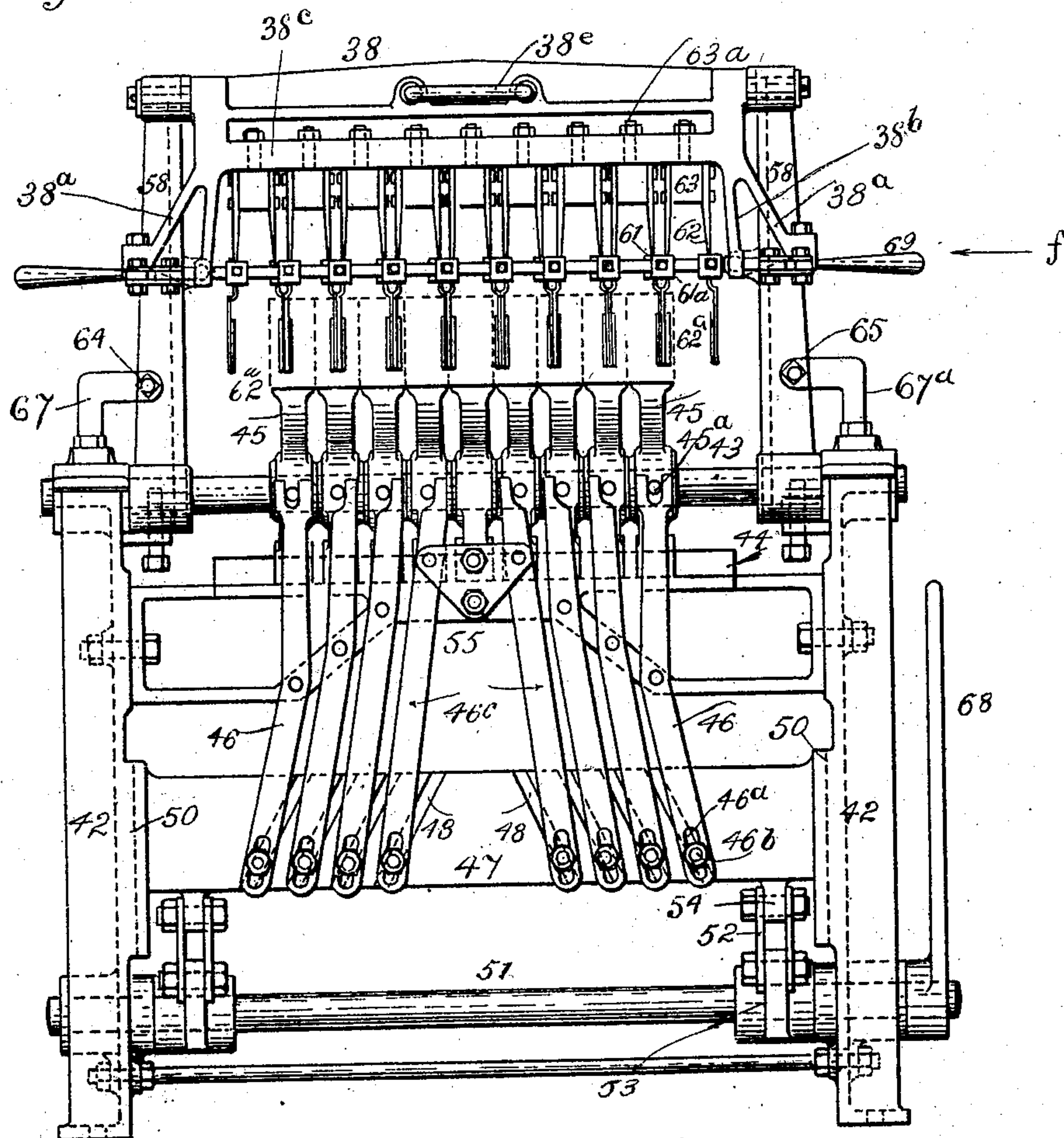
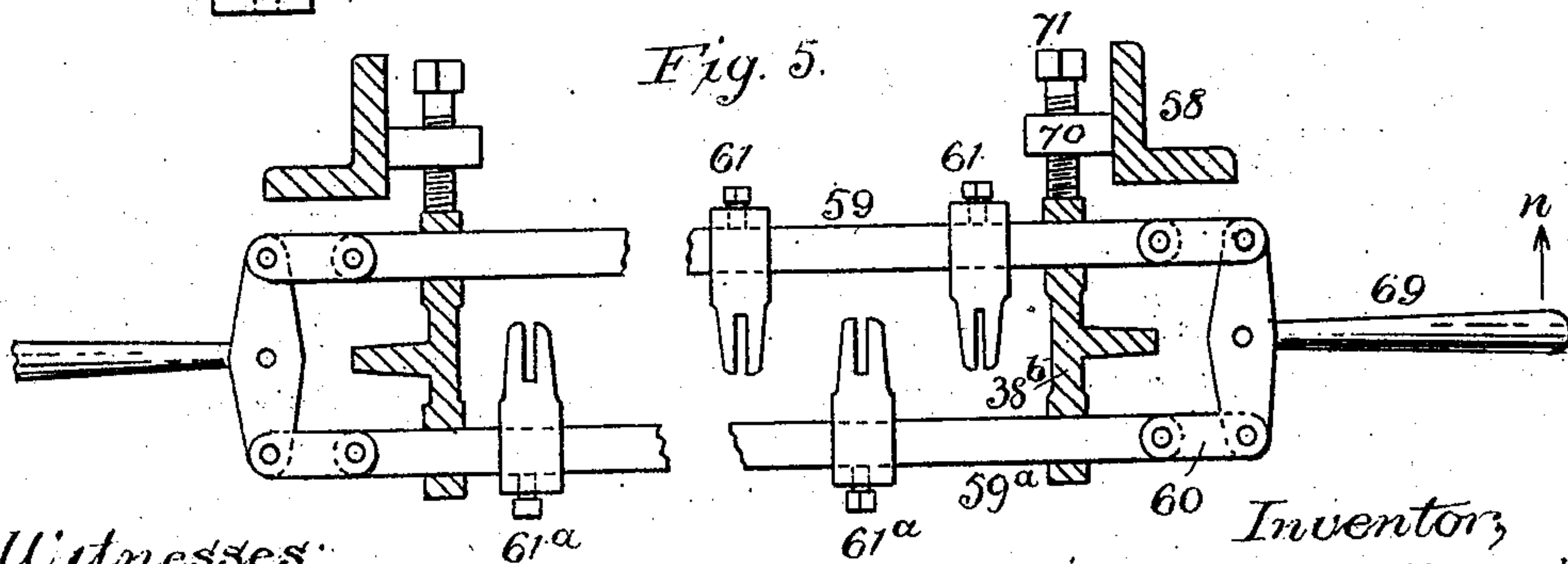


Fig. 5.



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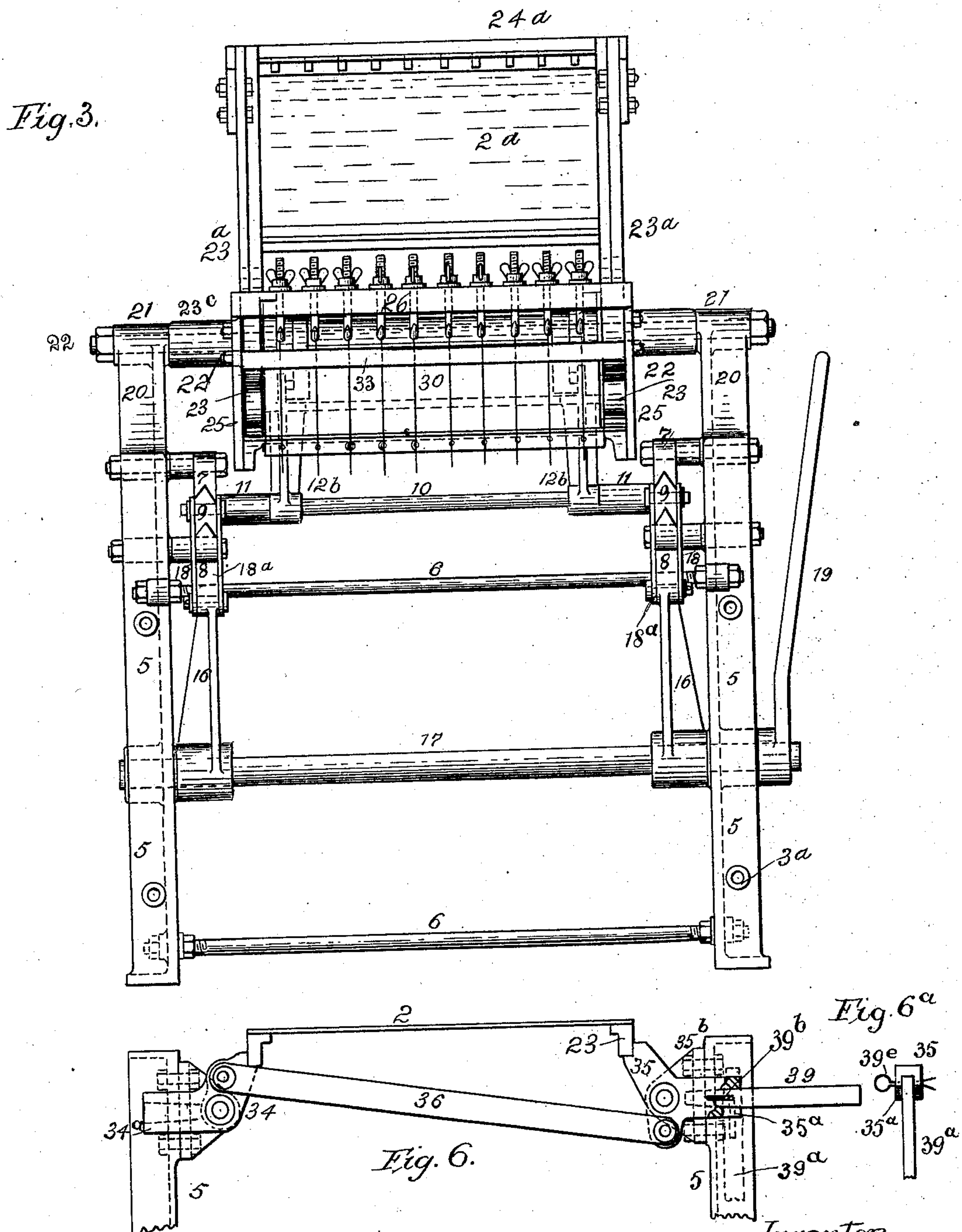
**Patented Jan. 7, 1902.**

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(Application filed May 9, 1901.)

**5 Sheets—Sheet 3.**

(No Model.)



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Emma Howatson  
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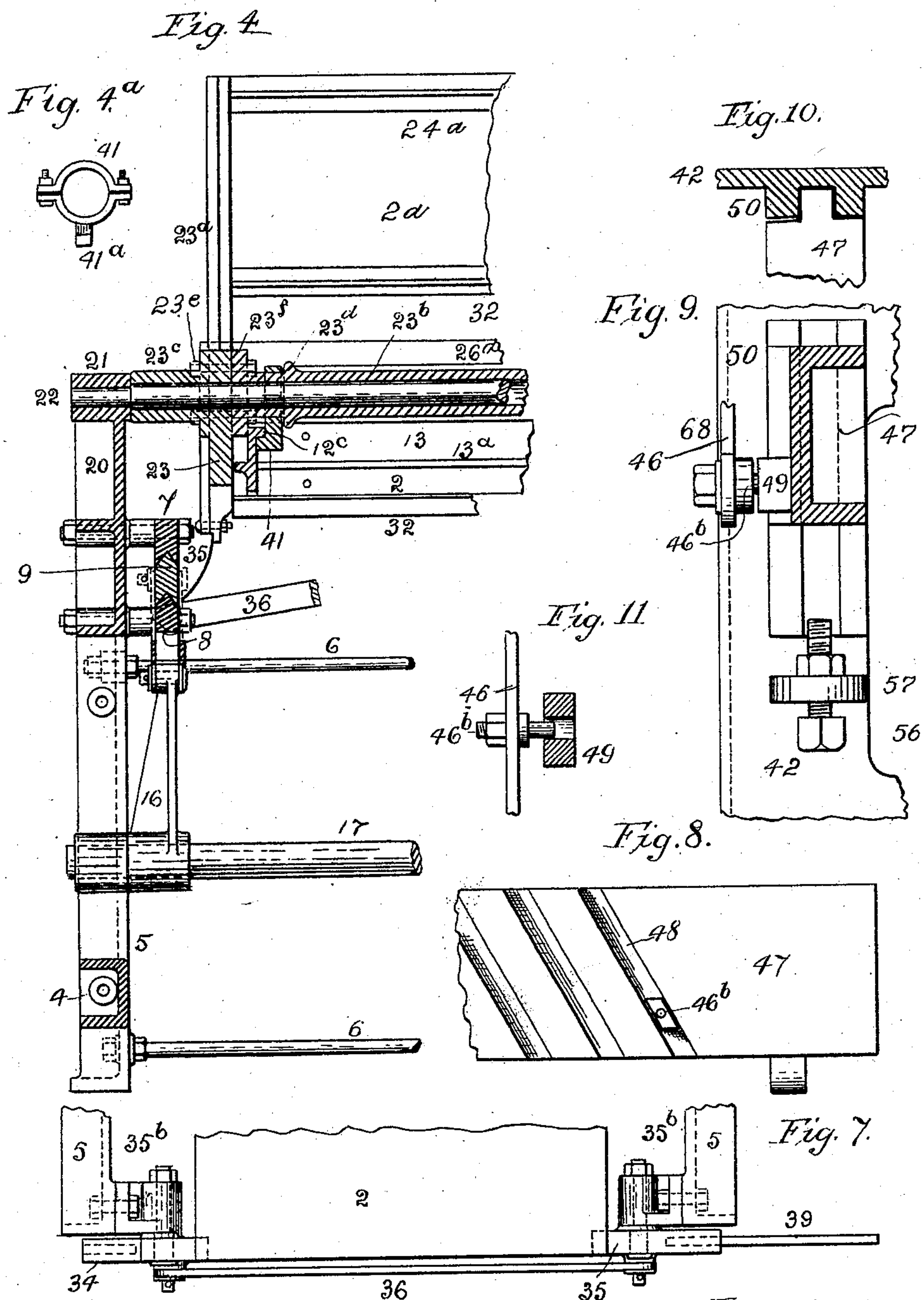
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BRICK MAKING MACHINERY.

(Application filed May 9, 1901.)

(No Model.)

5 Sheets—Sheet 4.



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No. 690,857.

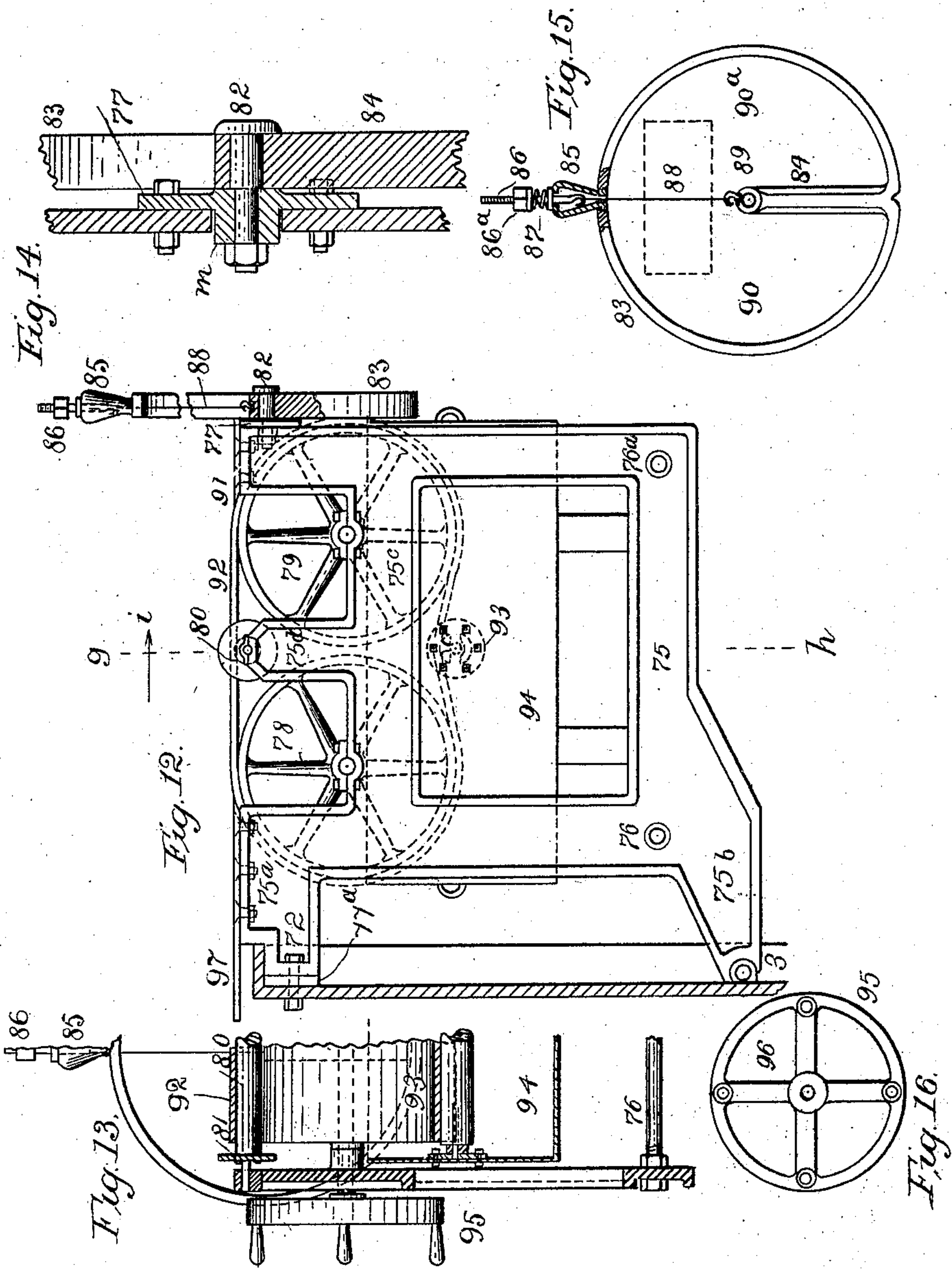
Patented Jan. 7, 1902.

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(Application filed May 9, 1901.)

(No Model.)

5 Sheets—Sheet 5.



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# UNITED STATES PATENT OFFICE.

HENRY HANNI, OF PORTLAND, OREGON.

## BRICK-MAKING MACHINERY.

**SPECIFICATION** forming part of Letters Patent No. 690,857, dated January 7, 1902.

Application filed May 9, 1901. Serial No. 59,531. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY HANNI, a citizen of the Swiss Republic, (but having declared my intention of becoming a citizen of the United States,) and a resident of Portland, in the county of Multnomah and State of Oregon, have invented a new and useful Improvement in Brick-Making Machinery, of which the following is a specification, reference being had to the accompanying drawings as constituting a part thereof.

My invention relates to improvements in brick-making machinery operating to cut and separate into blocks of brick sizes the stream of stiff clay expressed from the pug-mill; and the objects of my invention are to obtain a machine of inexpensive construction performing the following operations: first, cutting off a slab from the stream of clay exuded by the pug-mill and conveying such slab to the mechanism performing the second step below described, such slab-conveyer also being adapted to present a constantly-wetted carrying-surface to facilitate moving the slab onto the cutting-table; second, cutting the slab into brick sizes; third, separating the freshly-cut blocks of clay, and, fourth, picking up such blocks from the cutting-table and placing the same on a portable pallet for carrying to the hack.

To accomplish my objects, my invention comprises three mechanical contrivances, each performing a complete step in the entire operation, such contrivances, however, being inseparably related to each other in order to produce and place the blocks of clay or bricks ready for the hack, as will be seen.

The construction and operation of my brick-making machinery will be readily understood from the drawings above referred to and the description thereof hereinafter given.

In such drawings, Figure 1 is a longitudinal section centrally taken of my improved brick-making machine, including both the brick-cutting and the brick-separating mechanisms and appurtenances for picking up the separated bricks and placing them on a pallet on which to be carried to the hack. Fig. 1<sup>a</sup> shows the swinging frame 38, supported from arms 58, thrown forward, as it would be after having been operated to seize the newly-cut

brick and convey them from in front of the cutting-table to the pallet for carrying to the hack. Fig. 2 is a front elevation of the brick-separating mechanism. Fig. 3 is a front elevation of the brick-cutting mechanism, the brick-separating mechanism—that is to say, all devices to the left of the line indicated by *a b*, Fig. 1—having been removed. Fig. 4 is a partial transverse vertical section taken on a line pointed by the arrows *c d* looking in the direction pointed by the arrow *e* in Fig. 1. Fig. 4<sup>a</sup> is a detail showing in elevation the clamp-collar. Fig. 5 is a partial plan section taken on a line pointed by the arrow *f* of Fig. 2, but on a larger scale, and shows the mechanism for operating the brick-clutching devices, whereby the brick after having been separated are seized and carried to the pallet. Fig. 6 is a detail of the contrivances for movably supporting one of the duplicate cutting-tables and appurtenances in operative position. Fig. 6<sup>a</sup> is a detail showing an end view of the socket of the arm 35 and illustrated means for so supporting the bar 39 as to allow the same to hang down when not in use. Fig. 7 is a plan of the contrivances shown in Fig. 6. Fig. 8 is a detail of the reciprocating grooved plate 47. Fig. 9 is a partial longitudinal section illustrating the means for limiting the downward travel of such plate 47 and also shows the operative connection between the lower ends of the arms 46 and said plate 47. Fig. 10 is a partial plan section showing a portion of one of the sides 42 on which are cast guides 50 for the reciprocating plate 47 to operate in. Fig. 11 is a detail showing the operative connection between the arms 46 and 46<sup>c</sup> with the reciprocating plate 47. Fig. 12 is an elevation of the conveyer or mechanism for conveying the separated slab of clay to the cutting-table. Fig. 13 is a partial transverse section taken on the line *g h* of Fig. 12 looking in the direction pointed by the arrow *i*. Fig. 14 is a longitudinal section illustrating journal-bearings for cutting-wheel 83 on frame 75. Fig. 15 is a detail showing in elevation the cutter 83 for separating a slab of clay from the stream expressed by the pug-mill; and Fig. 16 is an elevation of the wheel 95, affixed on the end of the journal of one of the rolls 78 79 for rotating the same.



The letters and numerals designate the parts referred to in the description of my invention.

The conveyer, the cutting mechanism, and the dividing mechanism have each independent frames. The frames of the latter two are rigidly united by bolts and nuts 3, inserted through perforations, as 3<sup>a</sup>, in the flanges of the opposed portions of the two frames 5 and 42, sleeves 4 being inserted on the bolts 3 between the two frames.

My cutting mechanism consists of a frame comprising sides 5, rigidly united by tie-bolts 6. In the upper portion of the frame are bolted upper and lower horizontal rails 7 8, having V-shaped bearing-faces. Between such rails travels the carrier 9, constructed of two sliding shoes, their bearing-faces being V-shaped like the rails 7 8, and such shoes being connected by a rod 10, extending through the arms of the pusher 12. To hold the pusher in place on the rod 10, sleeves 11 are inserted on both ends of the latter. The head 14 of the pusher rests and slides on the cutting-table. The pusher operates to push the slab of clay delivered on the cutting-table from the pug-mill against the cutting-wires 30. Such pusher comprises a pair of arms joined at the head ends by webs 13 13<sup>a</sup>. Below such rod 30 the arms have dependent portions 12<sup>b</sup>, perforated to receive the rod 10. To the head 13 is secured a block of hard wood 14, faced with a piece of thick felt 15 or other suitable elastic material, having a series of vertical incisions to receive the cutting-wires 30. The pusher is reciprocated by arms 16, fast on the shaft 17 and respectively connected by links 18 18<sup>a</sup> with the carrier 9, the shaft 17 having a lever 19 for operating the pusher 12, as mentioned, during the brick-cutting operation. Projecting upwardly from the frame of the cutting mechanism are pedestals 20, provided with boxes 21, furnishing the bearing for the axle 22, supporting a pair of two-membered arms 23 23<sup>a</sup>, carrying duplicate cutting-tables 2 2<sup>a</sup>, and cutters 24 24<sup>a</sup>, the cutters 24 being in operative position and the cutters 24<sup>a</sup> standing in inactive or reserve position.

My object in providing duplicate cutters was to be prepared for a case of the wires in one set of cutters being broken and avoid the interruption which such would necessitate. As my cutting devices are arranged in my machine a simple turn of the lever or handle 40 would swing the broken set of cutters out of operative position and put in their place the second or auxiliary set of cutters and allow the brick-making operation to be proceeded with again within a very little while after the break had occurred, and while one of the duplicate cutters is in use the one which is out of repair can be fixed up, so as to be ready for use. The tables of the cutting mechanism are supported in operative position by the pair of notched arms 34 35, a detail of which is shown in Figs. 6 and 7, such arms being pivotally supported from brackets

35<sup>b</sup>, bolted to the frame 5 and operatively connected by a bar 36. Each of the arms 34 35 is provided with a socket 34<sup>a</sup> 35<sup>a</sup>, adapted to receive a bar 39, with which to turn the arms 34 35 under or from under the cutting-table, either supporting one of such cutting-tables in operative position or clearing the same to allow the duplicate tables to be rotated to replace one for the other. In order that the bar 39 will not be in the way when not in use, it may be adapted to be dropped, as shown in Fig. 6 by the dotted outline thereof 39<sup>a</sup>. To allow the bar 39 to be dropped, as mentioned, it is provided at its inner end with a slot 39<sup>b</sup>, and the socket of the arm 35 has horizontally-registering perforations to receive a pin 39<sup>c</sup>, and a portion of 35<sup>a</sup> of the mouth end of said socket is omitted. Thus the bar 39 may be drawn forward and allowed to hang down from the pin 39<sup>c</sup>, as shown in Fig. 6<sup>a</sup>. Each individual set of the duplicate cutters 24 24<sup>a</sup> in construction resembles like devices of that character now in use. The arms 23 23<sup>a</sup> are castings journaled between the pedestals 20. The shaft or axle 22 thereof is supported in the boxes 21. To make the arms and frames of the duplicate cutting mechanism and tables of sufficiently rigid construction, the duplicate arms have projecting hubs 23<sup>c</sup>, in which to receive the ends of the shaft 22, and intermediately between the duplicate arms there is inserted on the shaft 22 a sleeve 23<sup>b</sup>, having perforated flanges 23<sup>f</sup> at both ends to receive bolts 23<sup>e</sup>, which extend through registering perforations in the said hubs. The frames 24 24<sup>a</sup>, holding the cutting-wires, are bolted to the free ends of the arms 23 23<sup>a</sup>, such frames consisting of two standards or vertical plates, between which are secured a pair of cross-plates 26 26<sup>a</sup>. (See Figs. 1 and 3.) The cross-plates 26 26<sup>a</sup> have a sufficient space between them for the insertion of the shanks of the hooks 27, having threaded ends to receive a winged nut 28, providing the means for vertically adjusting the hooks, and thereby stretching the cutting-wires 30, attached thereto. The arms 23 23<sup>a</sup> have interior laterally-projecting flanges 1. On these flanges are bolted the cutting-tables 2 2<sup>a</sup>, consisting of steel plates, and such plates or tables are stiffened on the under side by angle-irons 31 32. A bar 33 is horizontally secured between the standards 25 of the cutting-frame and provided with a series of vertical slots in which to receive the cutting-wires 30. The function of such bar is to hold the cutting-wires against lateral displacement. On the inner side of the angle-iron 31 is a series of pins 31<sup>a</sup> to which to fasten the lower ends of the cutting-wires, the upper ends of which are secured to the hooks 27, as mentioned. As both the bars 33 and the angle-irons 31 are merely secured by bolts and therefore removable, when desiring to change the size of the brick such angle-irons and bars may be replaced by others adapted to hold the cutting-wires the desired



distances apart, the hooks 27 being adjusted to correspond under such circumstances. When desiring to change from one set of cutters to another, the pusher 12 by operating the lever 19 is moved sufficiently back to clear the cutting-tables. While in this position, the pusher is supported by the clamp-collar 41, inserted over the ends of the sleeve 23<sup>b</sup> and held in place by the flange 23<sup>d</sup>, cast on such sleeve, said clamp-collar having a projecting lug 41<sup>a</sup> engaging ribs 12<sup>c</sup>, cast on the inner side of the arms of the pusher, as shown in Fig. 4. To one side of the frame of the brick-cutting mechanism is attached the mechanism shown in elevation in Fig. 12, operating to cut off a slab of clay and convey the same to the cutting-table. The frame of such conveyer comprises two sides 75, united by tie-bolts 76 76<sup>a</sup> and the cross-plates 77 77<sup>a</sup> at both ends. For rigidly attaching the frame of the conveyer to the frame of the cutting mechanism the plate 77<sup>a</sup> has a perforation centrally located to receive a bolt inserted through a perforation 74 in the upper portion of the frame 5, and the projecting two foot parts 75<sup>b</sup> are adapted to rest against the base of the frame 5, one of such parts 75<sup>b</sup> setting on a lug 73, cast on the frame 5 and the other setting on the sleeve 4 in line with said lug 73. The portions 75<sup>c</sup> 75<sup>d</sup> of the frame sides 75 provide journaled bearings for the pair of rolls 78 79 and for the smaller intermediate roll 80, having flanges 81 at both ends. The cross-plate 77 has a perforated box *m* or bearing for the headed bolt 82, rotatably holding the cutter 83. The construction of the latter is shown in Fig. 15, comprising a rim with a single arm 84 and a handle 85, recessed to receive an adjustable hook 86, carrying a nut 86<sup>a</sup>, resting on a spring 87 and holding one end of the wire 88, the other end of which is secured to a hook on the hub 89. This construction of the cutter 83 allows a stream of clay emitted from the mouth of the pug-mill to pass through the spaces 90 90<sup>a</sup> after each time the cutter has been operated to cut off a slab of clay of the required size. The slab so separated passes onto the table 91 and then on the endless belt 92 extending around the rolls 78 79 and over the intermediate roll 90 and kept in suitable tension by a roll 93, journaled between the sides of the tank 94, and on leaving the belt 92 said slab passes over the table 97 onto the cutting-table of the brick-cutting mechanism. The tank 94 rests on scantling or blocks of wood supported crosswise on the base of the frame sides 75. The tank is filled with water, so as to wet the surface of the belt 92 as it passes through the tank, the object being to keep the bearing-surface of such belt thoroughly wetted, the film of water carried by the bearing-surface thereof acting as a lubricant for the slab of clay and allowing said slab to be readily moved from the belt across the table 97 and onto the cutting-table in front of the cutting-wires. The axle of one of the rolls 78 or 79 projects and

carries a wheel 95, provided for convenience with four handles 96, a quarter-turn of said rolls being sufficient to start the separated slab toward the cutting-table, and said slab must then be moved in place in front of the cutting-wires by the hand. The delivery end of the pug-mill is placed immediately in front of the slab cutting and conveying mechanism. As a slab of clay is delivered on the cutting-table the pusher 12 is moved forward, presses such slab against and through the cutting-wires 30, and leaves the separated clay portions on the blocks 45 of the mechanism for spreading the freshly-cut bricks and placing them on the pallet ready for carrying to the hack. The mechanism for performing the last two operations consists of a supporting-frame comprising standards or frame sides 42, bolted together in about the same manner as has been described of the standards or frame sides 5 of the frame of the cutting mechanism. In the upper portion of the standards 42 is secured the transversely-extending rod or rail 43 and below the same a rail 44, having a V-shaped bearing-face 44<sup>a</sup>. (See Fig. 1.) The rails 43 44 constitute the supports for the series of sliding blocks 45. In their normal state such sliding blocks 45 are close together, as shown in Fig. 2, and constitute an extension to the cutting-table abutting against the front edge thereof, as seen in Fig. 1, and receiving the blocks of clay as they come from the cutting-wires. The blocks 45 are moved apart and together again by means of a series of fulcrumed arms 46 46<sup>c</sup>, the blocks 45 being provided with pins 45<sup>a</sup>, which the upper extremities of the fulcrumed arms engage. The arms 46 are unequally fulcrumed to enable them when operated to spread the blocks 45 equal distances apart. The outer arms being required to travel a greater distance than the arms nearer the center, the fulcrum-pins of said arms are arranged accordingly. To the inner sides of the standards 42 are secured guides 50. (See cross-section, Figs. 9 and 10.) In the guides 50 is secured the reciprocating plate 47, having a series of diagonal grooves 48 on its face, in which are slidably contained perforated blocks 49, and the arms 46 are provided at their lower extremities with stud-pins 46<sup>b</sup>, which are inserted in the perforated blocks. The stud-pins 46<sup>b</sup> are secured in slots 46<sup>a</sup> in order that they may be properly set when adjusting the arms 46. In the lower portion of the standards 42 is journaled a shaft 51, having a lever 68 for rocking the same. On the shaft 51 are arms 53, and the links 52 connect such arms with the ears 54, projecting from the under side of the plate 47. Thus by rocking the shaft 51 by means of the lever 68 the plate 47 may be moved up and down. As the plate 47 is drawn down the blocks 49 slide in the diagonal grooves 48 and in so doing cause the upper ends of the fulcrumed arms 46 and the blocks 45, therewith connected, to spread apart. As



the required motion of the two inner arms 46<sup>c</sup> is but slight and their fulcrum-pins have necessarily to be placed well up toward their upper ends, a plate 55 is secured to the rail 5 44 and holds the fulcrum-pins for the inner arms 46<sup>c</sup>. As will be observed from Fig. 2, only the outer two of the arms 46 are necessarily bifurcated, for such arms alone are required to move the blocks 45 in both direc- 10 tions. The intermediate arms are required to move the intermediate blocks 45 outwardly only, and the two end arms move the blocks together again. The downward travel of the vertically-reciprocating plate 47 is limited by 15 means of a set-screw 56, seated in the flange 57, projecting from the interior of the frame sides 5, and by the adjustment of such set-screw is regulated the distance which the arms 45 will spread apart on operating the lever 20 68. Since the bricks will be placed on the pallet on which they are carried to the hack in the same position as they were placed by the blocks 45, the operation of the latter must be adjusted according to circumstances, 25 so as to allow a sufficient circulation of air between the bricks while drying. On the rod 43 are also journaled the arms 58, from which is pivotally suspended the swinging frame 38, carrying the devices operating to 30 pick up the freshly-cut bricks and place the same on the pallet after they are properly separated. The dependent arms 38<sup>b</sup> of the frame 38 provide the bearings for the two sliding bars 59 59<sup>a</sup>, connected by the links 35 60 with the levers 69, which are fulcrumed in laterally-projecting portions 38<sup>a</sup> of said frame 38. On such sliding bars are adjustably secured a series of clutches 61 61<sup>a</sup>, the function of which is to grasp the spring-arms 40 62 of the hands 62<sup>a</sup>. The arms 62 are bolted to blocks 63, and the latter are provided with threaded studs and bolts 63<sup>a</sup> for securing them in place, the studs being inserted between the pair of cross-bars 38<sup>c</sup>, being integral por- 45 tions of the swinging frame. The normal position of the hands 62<sup>a</sup> is shown in Fig. 2, the hands of two continuous arms being in contact throughout the intermediate series. By operating the lever 69 in the direction indicated by the arrow *n*, Fig. 5, the sliding 50 bars 59 59<sup>a</sup> will be moved in opposite directions, thereby causing the clutches 61, engaging the arm 62, to spread the hands apart, and as soon as the lever 69 is released the hands will regain their normal state. While 55 a slab of clay on the cutting-table 2 is being pushed through the cutting-wires the frame 38 will be thrown forward in the position in which it is shown in dotted outline in Fig. 1. 60 After the freshly-cut bricks have been pushed onto the heads of the blocks 45 the lever 68 is operated to spread said blocks and the bricks thereon resting, as described. While the bricks are so spread apart, the hands 62<sup>a</sup> 65 can pass between them, the outer of the hands 62<sup>a</sup> passing the outer sides of the end bricks. By now operating the lever 69 to spread the

hands 62<sup>a</sup> apart each brick will be seized between a pair of hands, and then taking hold of the handle 38<sup>e</sup> the arms 58 and the swing- 70 ing frame 38 can be pulled forward, so as to bring the bricks on a pallet *j*, previously placed in suitable table *k*, as indicated in Fig. 1<sup>a</sup>. The lever 69 being now released the hands 62<sup>a</sup> will let go of the bricks, and the pallet 75 may be carried away to the hack. The clutches 61 61<sup>a</sup> are adjustable. They are not shown in relative adjustment in Fig. 5; but such adjustment can readily be ascertained by studying Fig. 2. While the swinging 80 frame 38 is leaning forward, my machine is ready for a new batch of bricks to be cut out of a slab of clay conveyed in front of the cutter-wires, the blocks 45 being first restored to their normal positions. The set-screws 64 85 65 in brackets 67 67<sup>a</sup>, Fig. 2, provide adjustable rests for holding the arms 58 in proper position while thrown forward over the pallet, and when said arms are thrown back they rest against set-screws 64, seated in lugs 90 66 on the interior of the frame sides 42, Fig. 1. To aline the swinging frame 38 when standing upright, the arms 58 are provided with projecting lugs 70, holding set-screws 71, Fig. 1. 95

The means above described for separating the freshly-cut bricks and thereupon conveying the same to the pallet presents a mechanism without which the making of good brick may at times be interfered with. It 100 not infrequently happens that the clay is soft, and in such case the freshly-cut bricks will not stand any handling with the hands without danger of spoiling their shape. With the use of my mechanism such soft condition of 105 the clay is of no moment, the pressure of the hands 62<sup>a</sup> against the sides of the bricks being so uniform that it can be borne with impunity.

Having fully described my invention, now what I claim, and desire to secure by Letters 110 Patent, is—

1. In a brick-making machine, the combination of the supporting-frame, a rotatable duplicate cutting-table journaled in the upper portion of such frame, a support for the 115 free end thereof; a reciprocating pusher for pushing the slab of clay deposited on the cutting-table through the cutting-wires; a series of blocks horizontally movable in front of the cutting-table; means for operating such movable blocks to spread them apart, and bring the same together again; arms journaled in the upper part of said frame; a swinging frame suspended from said arms and provided with laterally-movable hands; and operative connections, adapted to spread said 120 hands apart, for the purpose of grasping the newly-cut brick and lifting the same off said blocks and onto the pallet, substantially as described. 125

2. In a brick-making machine, the combination of the supporting-frame, a rotatable duplicate cutting-table journaled in the upper portion of such frame, a support for the 130



free end thereof; a reciprocating pusher for  
pushing the slab of clay deposited on the  
cutting-table through the cutting-wires; a  
series of blocks horizontally movable in front  
5 of the cutting-table; means for operating such  
movable blocks to spread them apart, and  
bring the same together again; arms jour-  
naled in the upper part of said frame; a  
swinging frame suspended from said arms  
10 and provided with laterally-movable hands;  
and operative connections adapted to spread  
said hands apart, for the purpose of grasping  
the newly-cut brick and lifting the same off

said blocks and onto the pallet; and a device  
for feeding the slab exuding from the pug- 15  
mill to the cutting-table, said device com-  
prising a belt traveling through a trough of  
water for the purpose specified, substantially  
as described.

In testimony whereof I have hereunto af- 20  
fixed my signature, in the presence of two  
witnesses, this 31st day of March, 1901.

HENRY HANNI.

Witnesses:

T. J. GEISLER,  
E. M. HOWATSON.