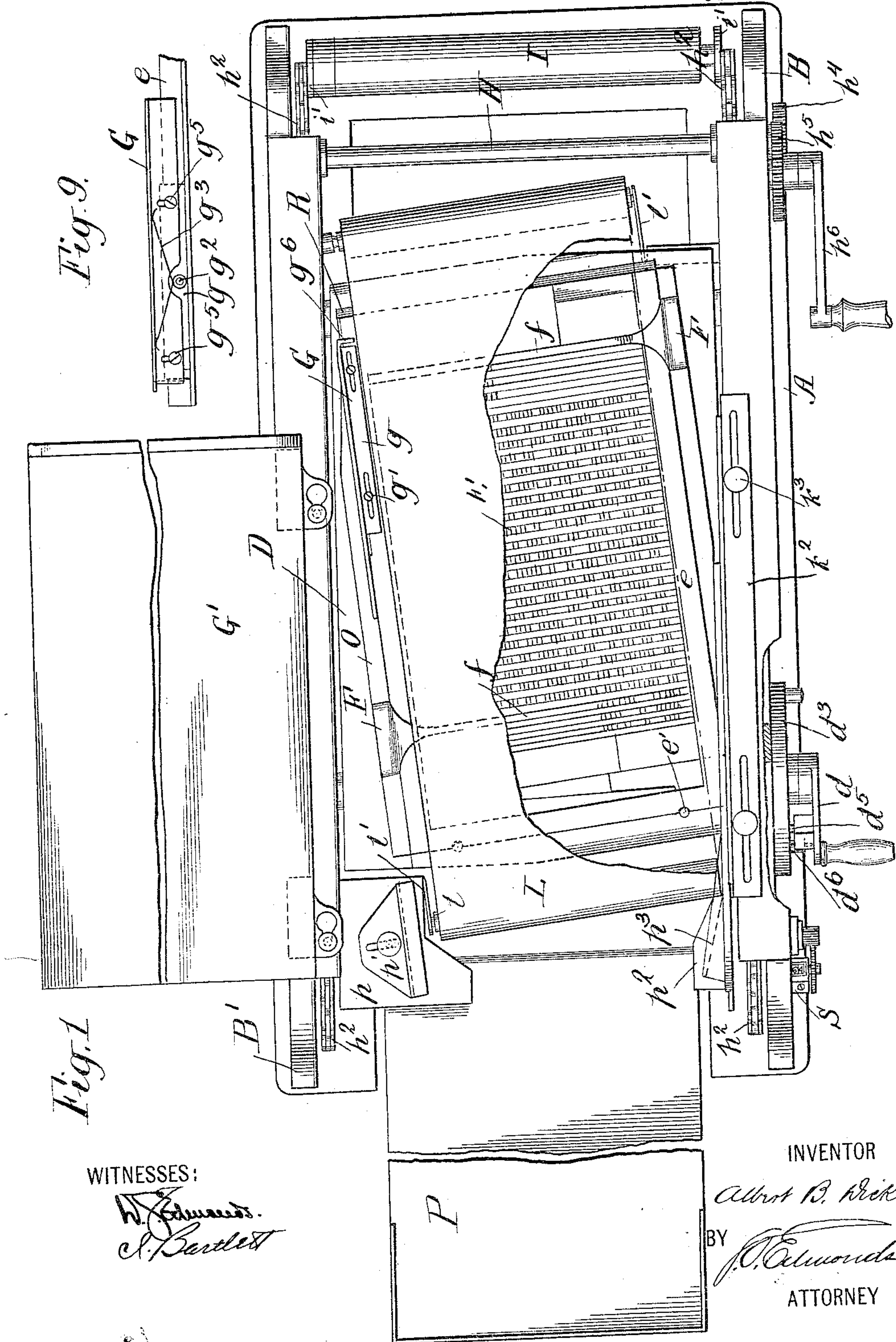


917,022.

A. B. DICK.
PRINTING MACHINE.
APPLICATION FILED MAY 26, 1908.

Patented Apr. 6, 1909.

3 SHEETS—SHEET 1.



WITNESSES:

W. Edwards.
S. Bartlett

INVENTOR

Albott B. Dick

BY

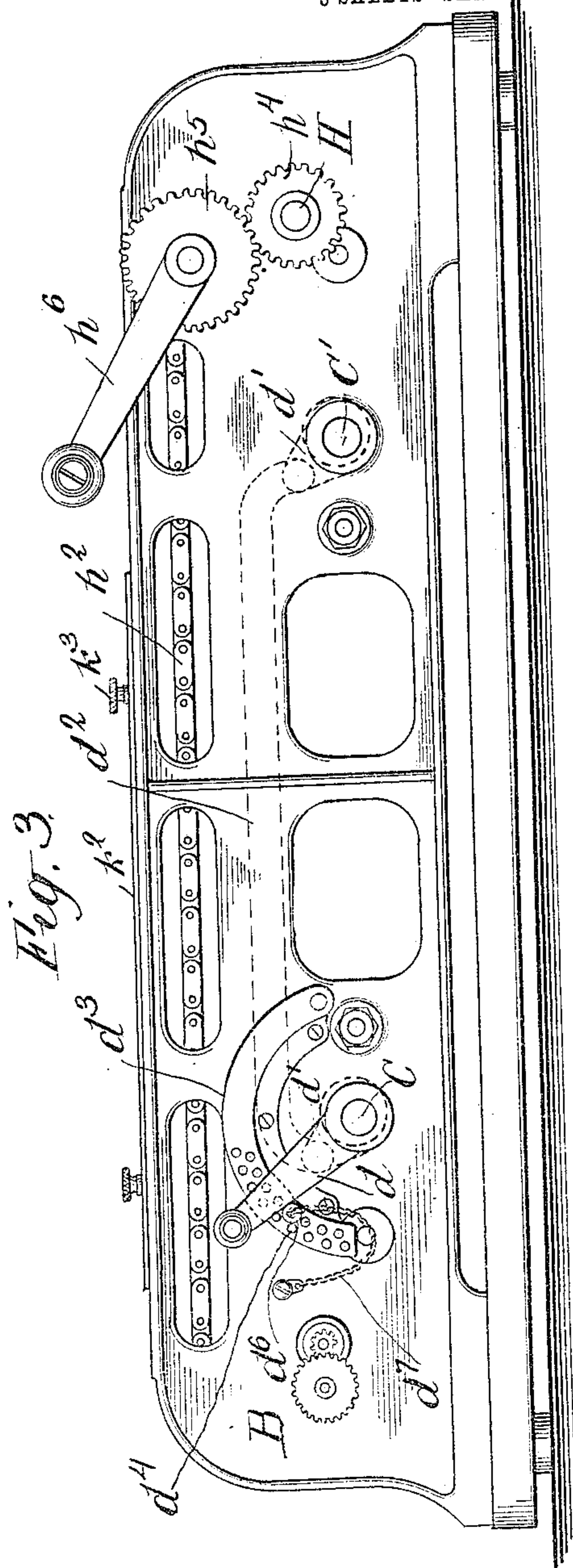
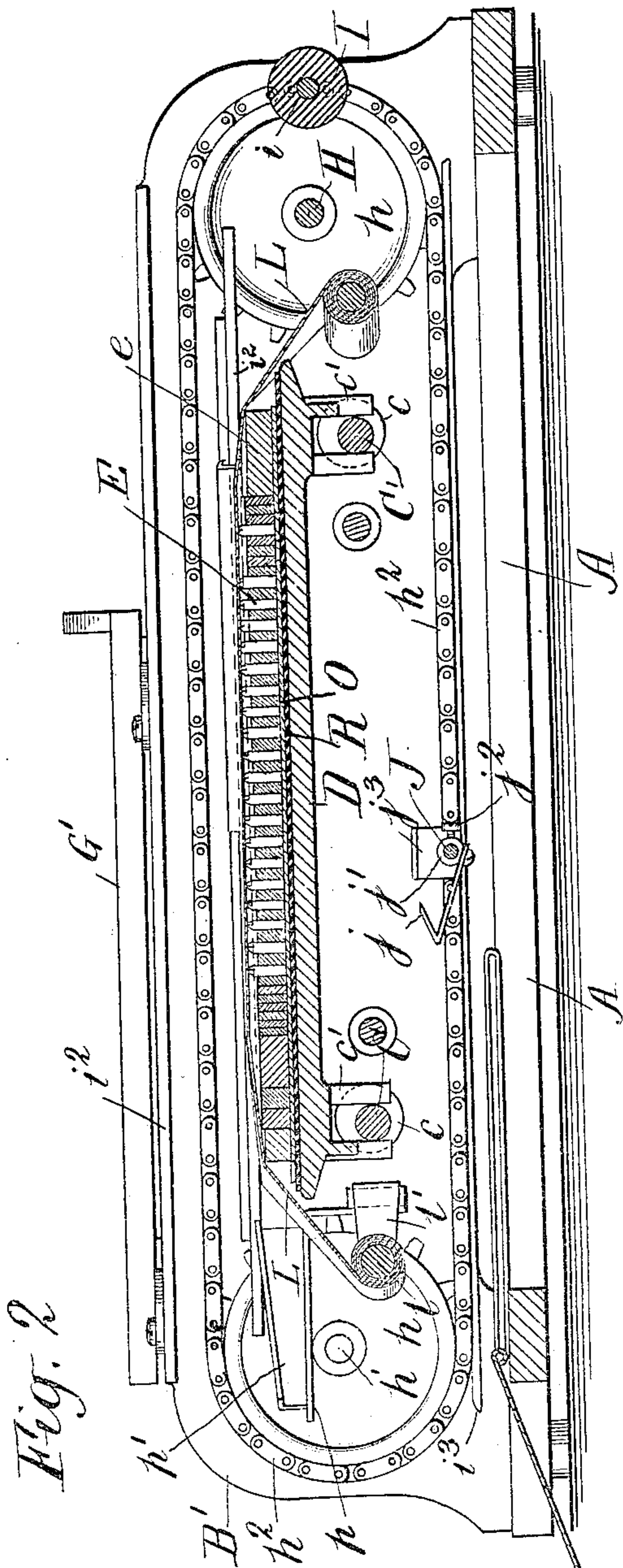
W. Edwards

ATTORNEY

917,022.

A. B. DICK.
PRINTING MACHINE.
APPLICATION FILED MAY 26, 1908.

Patented Apr. 6, 1909.
3 SHEETS—SHEET 2.



WITNESSES:

J. Edwards
A. Bartlett

INVENTOR

Albert B. Dick

BY

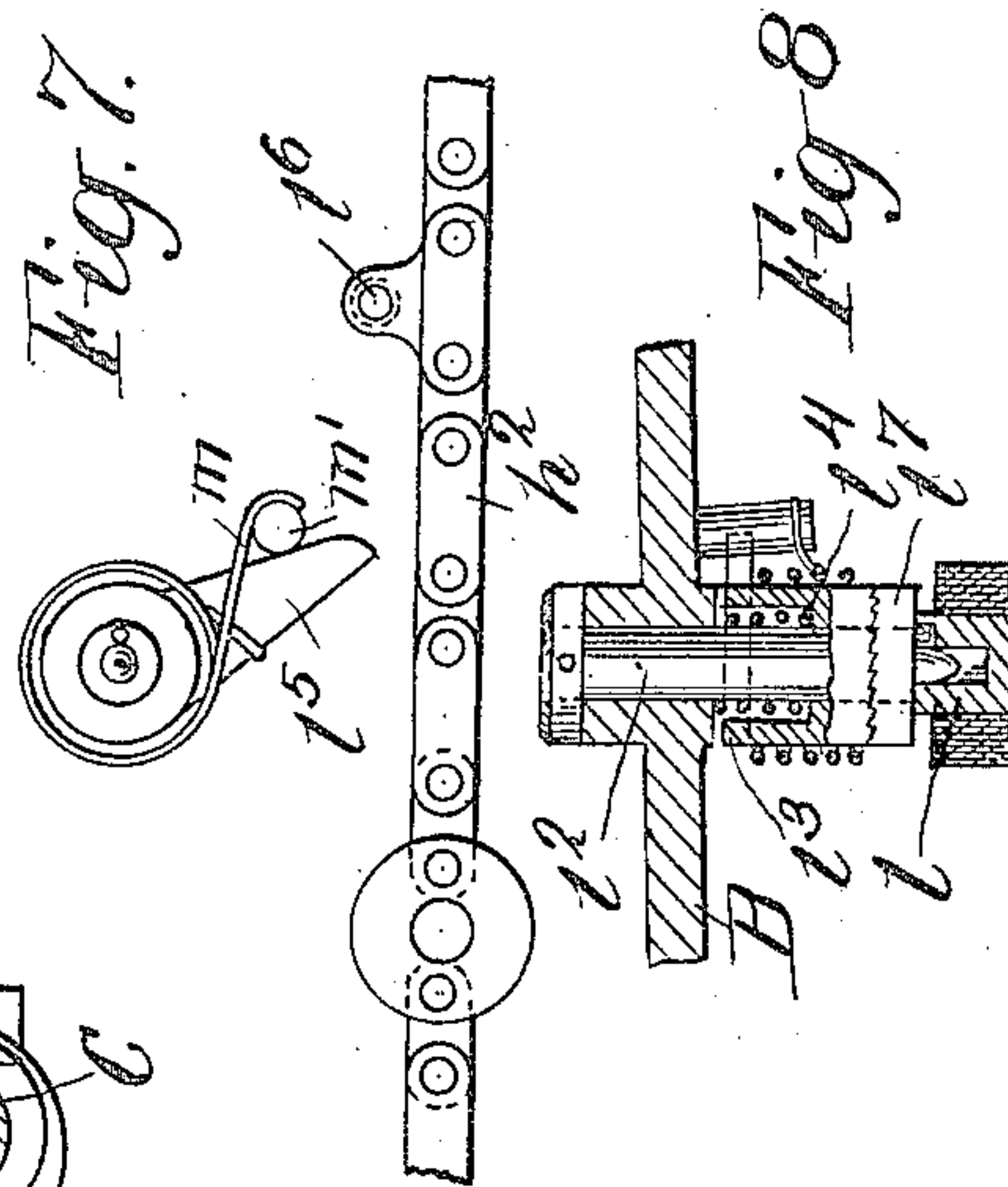
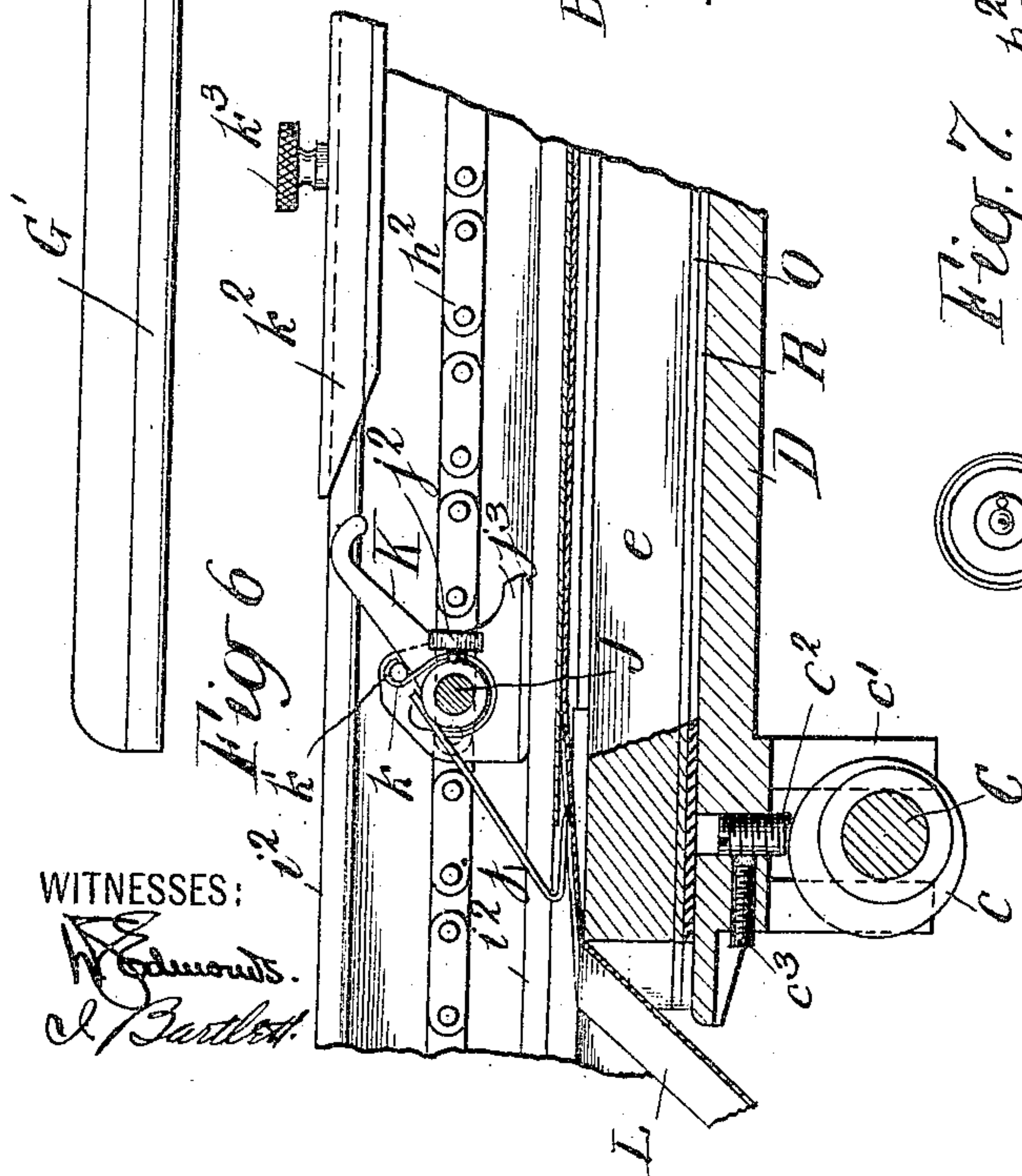
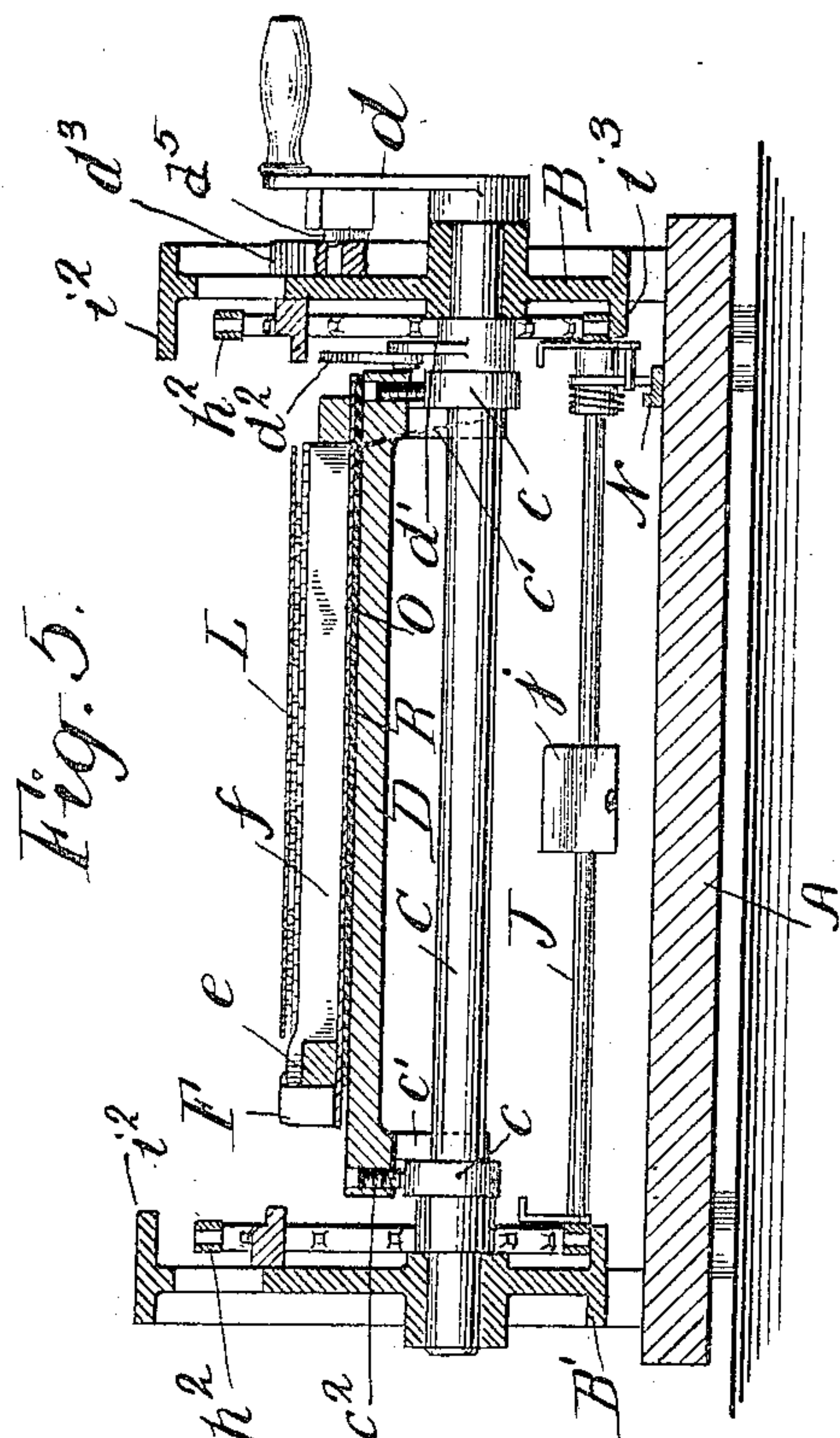
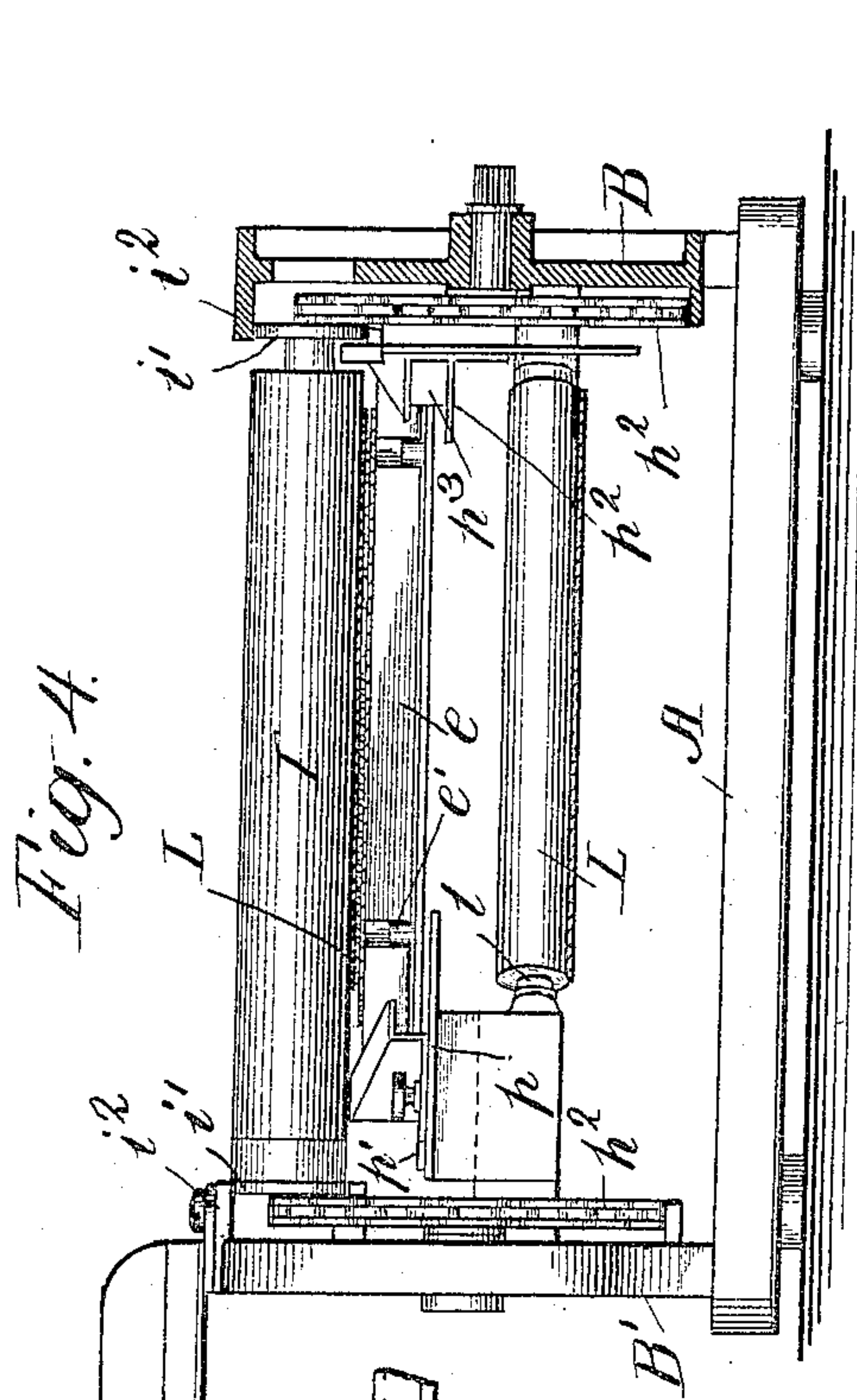
J. Edwards

ATTORNEY

917,022.

A. B. DICK.
PRINTING MACHINE.
APPLICATION FILED MAY 26, 1908.

Patented Apr. 6, 1909.
3 SHEETS—SHEET 3.



WITNESSES:
J. Edwards.
A. Bartlett.

INVENTOR
Albert B. Dick
BY *J. Edwards*
ATTORNEY

UNITED STATES PATENT OFFICE.

ALBERT B. DICK, OF LAKE FOREST, ILLINOIS, ASSIGNOR TO A. B. DICK COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

PRINTING-MACHINE.

No. 917,022.

Specification of Letters Patent.

Patented April 6, 1909.

Application filed May 26, 1908. Serial No. 435,155.

To all whom it may concern:

Be it known that I, ALBERT B. DICK, a citizen of the United States, residing at Lake Forest, in the county of Lake and State of Illinois, have invented a certain new and useful Improvement in Printing - Machines, of which the following is a specification.

This invention relates to printing - machines and is directed to the provision of a printing - machine adapted for office use, which can be run at comparatively high speed by an unskilled operator, and with which prints may be produced in close imitation of typewritten work.

In accordance with the invention, there is employed a bed on which the type are supported, an ink-ribbon adapted to overlie the printing faces of the type, an impression-roller and means for moving the type and roller relatively to effect the printing of an impression.

One feature of the invention resides in the arrangement of the lines of type with reference to the impression-roller. I have found that by so supporting the type-bed that the lines of type are disposed at a slight incline to the axis of the impression-roller, much superior results are obtained, in that the impressions are more uniformly printed and are free from blurring, particularly at the edge where the initial coaction of the roller and type takes place. A page-form of type may be set up in a chase in the usual way, and this chase may be mounted upon the bed of the machine in such a manner that the lines of type extend in a direction inclined slightly to the direction of the axis of the impression-roller, preferably at an angle of about fifteen degrees. This feature of my invention is applicable to printing-machines varying widely with respect to the construction and arrangement of the parts thereof. In order that the machine may be of comparatively small size and the parts thereof compactly arranged, I prefer to move the impression-roller rather than the type, and to give to this roller a continuous movement carrying it in one direction in coaction with the printing faces of the type and then returning it to initial position upon the other side of the type-form and preferably below the same. For this purpose, the impression roller may be carried by chains which pass over suitable sprockets arranged at opposite edges of the bed, and if desired, in order to

increase the capacity of the machine, two or more such rollers may be mounted upon a single pair of chains. With the machine so constructed, I employ a bed provided with means for accurately leveling it and means for raising and lowering it in order to secure a heavier or lighter coaction of the impression - roller with the type. Also, paper-guides of a peculiar construction are provided for facilitating the placing of the sheets in position for printing, and improved delivery mechanism for removing the printed sheets.

The preferred embodiment of my invention is illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of the machine broken away and sectioned in part; Fig. 2 is a longitudinal section of the machine; Fig. 3 is a side elevation, certain parts being omitted; Fig. 4 is an end view broken away and sectioned in part; Fig. 5 is a transverse section; and Figs. 6, 7, 8 and 9 are detail views hereinafter referred to.

Referring to these drawings, the machine consists of a base A, on which are mounted side-frames B, B', disposed parallel to each other. Extending between the side-frames and mounted for rotation in bearings formed therein, are two shafts C, C', on each of which are mounted two eccentrics c. The bed D is supported upon the shafts C, C', and for this purpose is provided with pairs of downwardly - extending integral guides c', the guides of each pair extending on opposite sides of the shaft C or C'. A pair of guides c' is provided at each corner of the bed D, and lie adjacent to one of the eccentrics c. In each corner of the bed, is a threaded opening to receive a screw c², the lower end of which bears upon the periphery of one of the eccentrics c. Another threaded opening is provided in the bed D extending into the opening for the screw c², and this opening is adapted to receive a screw c³, the end of which engages the screw c² and locks it in any position to which it is adjusted. It will be seen that by turning any one of the screws c², the corner of the bed in which that screw is located will be raised or lowered, so that the bed may be accurately leveled. When this is done, the screws c³ may be tightened up, so that the correct adjustment which has been found will be retained throughout the operation of the machine. The shaft C

is extended through the side-frame B and carries an operating handle d . Secured on each of the shafts C, C', just inside the side-frame B, is a crank d' and the ends of these 5 cranks are connected by a connecting rod d^2 . Secured to the outer side of the frame B is an arc-shaped piece d^3 , in which are two lines of openings d^4 . On the inner side of the operating handle d (Fig. 5), is a block in 10 which are two pins d^5 pressed toward the arc-shaped piece d^3 by suitable springs. The ends of these pins are rounded and are adapted to enter a slight distance within the openings d^4 in the piece d^3 , so as to hold the handle 15 d in any position to which it is moved. These pins, however, do not enter into the openings d^4 a sufficient distance to permanently lock the handle d , so that by applying a little force to the handle it may be readily 20 turned. A stop-pin d^6 , suspended by a chain d^7 from a pin on the side-frame B, may be inserted in any one of the openings d^4 to arrest the movement of the handle d . Thus, by turning the handle d the shafts C, C' may 25 be rotated and the eccentrics c will raise or lower the bed D. When the correct position of the bed has been found, the pin d^6 may be inserted in the opening at the side of the handle d so that if the handle is moved to 30 the right in Fig. 3 to lower the bed, it may be moved back again to the position which was found to give the desired height of the bed D, its movement being arrested by pin d^6 .

The type E are set up in lines and locked 35 in a chase e , in the usual manner. This chase, with the type therein, is positioned upon the bed D so that the lines of type will be disposed at a slight incline to the impression-roller which extends between the side-frames B, B'. This position of the lines of 40 type is best shown in Fig. 1. To facilitate arranging the type in this manner, the chase e is provided with notches in the forward edge thereof, and pins e' are provided extending 45 upwardly a short distance from the bed D, so that when the chase is placed upon the bed it may be moved forward thereon until the pins e' lie in these notches; when this has been done, the proper angular disposition of 50 the lines of type will have been secured. When the lines of type are thus arranged and the impression-roller is moved into coaction with the type, the roller will engage a line of type at one end thereof, and this 55 might result in a slight tilting of the roller if means were not provided for guarding against it. I therefore provide blocks or supports for holding one end of the impression-roller in the proper relation while the 60 other end only is bearing upon the printing faces of the type. These blocks are shown at F in Figs. 1 and 5. As thus shown, they are formed integral with bars f which may be inserted in the chase and locked therein 65 as an ordinary piece of furniture. At one

end, the bar f has an extension adapted to 70 overlie the side-member of the chase e and which connects the bar f with the block F. The block F is of such size that its upper face lies in the same plane as the printing faces of 75 the type, and in setting up the type the block is so positioned that when the roller is moved into position for printing it will engage the block F at one end before or simultaneously with its engagement with the type 80 E at the other, so that the roller will be held against movement out of the horizontal position. A block F with its bar f is arranged at each end of a page-form of type within the chase e , so that movement of the pres- 85 sure-roller into and out of coaction with the type will be effected without such a tilting movement of the roller as would cause blurring of the impression, and such other blocks F may be employed at other points as may 90 be necessary, as when a date line is set up, spaced apart from the body of the page-form of type, or when the matter set up consists of tabulations.

Secured to the chase e at one edge thereof 95 is a paper-guide G shown in Figs. 1 and 9. This guide consists of a strip g slotted as shown in Fig. 1, so that it may be secured by screws g' to the chase e at various positions along the side of the chase. The edge of this 100 strip g extends down along the outer side of the side-member of the chase and has a stud g^2 fixed thereto. Secured to this stud and extending upwardly therefrom, is a spring g^3 , the upper ends of which engage the under 105 side of a flange on the upper edge of the guide G, which is provided with vertically disposed slots through which screws g^5 extend into the strip g . At its end, the guide G is bent to provide a portion g^6 which extends at a right 110 angle to the main portion of the guide. The sheets are fed into position from a feed-board G' mounted upon the side-frame B', and are positioned by moving one side edge of a sheet into engagement with the guide G and the 115 end of the sheet at the corner thereof into engagement with the end-piece g^6 .

Mounted for rotation in bearings formed in the side-frames, is a shaft H, on which are 120 mounted two sprocket-wheels h . At the opposite end of the machine, a stub-shaft h' is provided extending inwardly from each of the side-frames and each carrying a sprocket-wheel h . Sprocket-chains h^2 run on the sprocket-wheels h , one adjacent to each of 125 the side-frames of the machine. The pressure-roller I is carried by these chains h^2 , it being arranged to rotate loosely upon a shaft i , the ends of which are received in bearings formed in links of the chains. Adjacent to 130 each end, the shaft i is provided with a disk i' . When the pressure-roller is in coaction with the type, the disks i' lie between guides i^2 extending inwardly from the side-frames, so that these guides cause the roller I to

move in a horizontal plane. A second shaft J extends between the chains h^2 , its ends being carried by links of the chains and arranged for rotation in bearings formed in those links. A hook-shaped member j is carried by a sleeve j' , which is secured by means of a set-screw j^2 upon the shaft J. The links of the chains in which the bearings for the shaft J are formed are extended as shown at j^3 in Figs. 2 and 6, and their edges are provided with flanges. These flanges are adapted to coact with the lower guides i^2 , in order to insure movement of the shaft J in a horizontal plane when that shaft is moving above the page-form of type. Secured to shaft J at one end thereof, is an arm K, and a spring k is fixed at one end to this arm and at the other to a stud k' upon the member j^3 , so that the spring tends to turn arm K and shaft J upon the axis of the shaft until the arm engages the stud k' . The arm K is adapted to coact with a cam k^2 secured upon the side-frame B, as shown in Figs. 1 and 6. This cam has slots formed therein, to receive screws k^3 , whereby the cam may be secured to the frame B in various positions of adjustment along the length of the frame.

An ink-ribbon L is arranged to overlies the printing faces of the type, and its ends are carried by spools l . These spools are mounted for rotation in bearings l' secured upon the inner faces of the side-frames in any suitable manner. The bearing for one end of the left spool (Fig. 1) is shown in detail in Figs. 7 and 8. A stub-shaft l^2 extends inwardly from the side-frame B, and has a sleeve l^3 loosely mounted thereon and pressed inwardly of the machine by a spring l^4 . Depending from this sleeve, is an arm l^5 , the end of which normally lies in the path of a pin l^6 carried by one of the chains h^2 . A spring m , fixed at one end to the finger l^5 and at the other to a pin m' on the side-frame B, normally holds the finger l^5 against the pin m' , as shown in Fig. 7. On the end of the sleeve l^3 ratchet-teeth l^7 are formed, adapted to coact with similar teeth on the end of the spool l . Thus, as the chains are moved, the pin l^6 engages the end of the finger l^5 and rotates the sleeve l^3 against the tension of the spring m , and in rotating thus the sleeve carries with it the spool l . When pin l^6 disengages and passes beyond the finger l^5 , the latter is retracted by its spring m to the position in which it is shown in Fig. 7, and sleeve l^3 turns back independently of the spool l , since the sleeve is caused to move away from the spool l by the ratchet-teeth l^7 against the tension of spring l^4 .

After the sheets are imprinted upon, they are delivered into a tray P. As the sheets lie at somewhat of an angle to the length of the machine, I provide guides for guiding them so that they will move substantially in the direction of the length of the machine and

fall into the tray P. The guide p at one side of the machine is secured to the frame B' as shown in Fig. 1, and when the sheet is moved by the hooked member j it passes over the upper surface of this guide p . Adjustably mounted upon the guide p , is a member p' (Fig. 4) adapted to coact with the edge and upper surface of the sheet. The guide p^2 for the other edge of the sheet is preferably secured to the bed D and extends forwardly therefrom, as shown in Fig. 1. This guide is provided with parallel walls between which the sheet passes and a wall p^3 (Figs. 4 and 1) extending between these parallel walls and arranged at an incline so as to guide the sheet into the tray P.

Preferably the chase e is closed at the bottom thereof, as by securing the rectangular frame constituting the chase upon a thin sheet of metal, as shown at O in Fig. 2. In order to give the page-form of type a slight amount of resiliency, a pad of rubber R is laid over the upper face of the bed D and between the bed and the bottom plate O of the chase.

If desired, a cam-strip N may be secured to the base A of the machine (Fig. 5), in position to coact with the arm K as the latter and the shaft J are moving back below the page-form of type to initial position. This cam-strip acts on the arm K to turn the shaft J and hold it in such a position that the hooked member j is disposed in a substantially horizontal plane, as in this way the path of movement of the shaft J may be closer to the shafts C, C', and the parts of the machine more compactly arranged.

A cyclometer S may be secured upon the side-frame B and operated by a pinion on the end of the stub-shaft for one of the sprockets h at the left end of the machine.

The machine may be operated either manually or by means of a suitable motor. In the drawings, I have shown the shaft H extended through its bearing in the frame B and provided with a pinion h^4 which meshes with a gear h^5 carried by a suitable stub-shaft on which an operating handle h^6 is mounted.

In running the machine, the operator turns the handle h^6 with the right hand and feeds the sheets from the tray G' to the printing position with the left hand. The sheet is properly positioned by moving it into engagement with the body and end portions of the side-guide G. The rotation of the shaft H and the movement of the chains h^2 brings the roller I upward at the right end of the machine, so that the disks i on the shaft of the roller enter between the guide-flanges i^2 , and from then on the roller I moves in a horizontal plane in coaction with the type to the left end of the machine. Just before coming into coaction with the type, the roller engages the guide G and depresses it

against the tension of the spring g^3 until its upper edge lies in the plane of the printing faces of the type. As the roller comes into engagement with the type adjacent to one side of the page-form, it engages at its other end one of the blocks F, so that there is no tendency to tilt the roller I, such as would cause blurring or uneven printing of the impression. After the roller has passed beyond the type, the hook j is brought by the chains h^2 to the position in which it is shown in Fig. 6. At this time, the members j^3 are bearing upon the lower guide-flange i^2 , so that the shaft J must also move in a horizontal plane. When the arm K is in engagement with the stud k' , as shown in Fig. 6, the end of the hook j extends a slight distance below the plane of the sheet which has been imprinted upon, so that the end of the hook is carried between the sheet and the ribbon L. Just as the end of the hook passes under the sheet, the end of the arm K engages the cam k^2 and is depressed thereby against the tension of spring k , thus raising the end of hook j and the rear edge of the impression-sheet which overlies the hook. Then, as the movement of the shaft J and the hook j continues, the sheet is moved along by the hook from the printing position. In this movement, the sheet is guided by the guides p and p^2 , so that it falls into the tray P.

It will be seen that the adjustment provided for the cam k^2 permits of so positioning this cam that the hook j will be raised immediately after its end passes under the edge of the sheet, in order to lift the end of the hook above the plane of the printing faces of the type.

As thus constructed, the machine may be run at comparatively high speed by an unskilled operator and the copies produced thereby are evenly and uniformly printed and may be in close imitation of typewritten work. If the impression is a little heavier or lighter than is desired, it is only necessary to turn the handle d in one direction or the other, so as to rotate the shafts C, C', and the eccentrics c carried thereby, and thus raise or lower the bed D the slight amount necessary to give the desired impression. Also, if it is desired to operate the machine without imprinting upon a sheet, the handle d may be turned to the right a considerable distance, so as to lower the bed D so much that the roller I will not effect the printing of an impression. The positioning of the pin d^6 in the proper hole d^4 in the member d^3 permits of returning the handle d to the exact position it had before the bed D was so lowered.

Arranging the type as herein disclosed, so that the lines thereof extend at a slight angle to the axis of the roller I, offers a number of important advantages. In this way a sharper definition of the characters printed is

obtained and the impressions are more free from blurring. Also, less pressure need be exerted upon the pressure-roller and for this reason the machine can be operated more rapidly, with less effort and without jarring when the roller engages the type. It will be seen that because of the angular arrangement of the lines of type with respect to the axis of the pressure-roller, the latter contacts at one time with type in several lines, preferably three or four when wide spacing of the lines of type is employed; therefore, the roller is in contact and is printing from a much smaller number of type at any one time than would be the case if the lines of type extended in the direction of the length of the machine or in the direction of the length of the pressure-roller, and as a consequence less pressure need be exerted by the roller upon the type through the sheet and ribbon.

Having now described my invention, what I claim as new therein and desire to secure by Letters Patent is as follows:—

1. In a printing-machine, the combination of a support, a form of type thereon, an ink-ribbon coacting with the printing faces of the type, a pressure-roller and means for moving the form of type and the pressure-roller relatively to effect the printing, said form of type being so disposed that the lines of type are inclined with relation to the axis of the pressure-roller, substantially as set forth.

2. In a printing-machine, the combination of a support, a form of type thereon, an ink-ribbon coacting with the printing faces of the type, a rotatable pressure-roller and means for moving the pressure-roller bodily in coaction with the printing faces of said type through the ink-ribbon to effect the printing, said form of type being so disposed that the lines of type are inclined with relation to the axis of the pressure-roller, substantially as set forth.

3. In a printing-machine, the combination of a support, a form of type thereon, means for inking the printing faces of the type, a pressure-roller and means for moving the form of type and the pressure-roller relatively to effect the printing, said form of type being so disposed that the lines of type are inclined with relation to the axis of the pressure-roller, substantially as set forth.

4. In a printing-machine, the combination of a support, a form of type thereon, means for inking the printing faces of the type, a rotatable pressure-roller and means for moving the pressure-roller bodily in coaction with the printing faces of said type to effect the printing, said form of type being so disposed that the lines of type are inclined with relation to the axis of the pressure-roller, substantially as set forth.

5. In a printing machine, the combination

of a bed, a form of type mounted thereon, means for inking the printing faces of the type, a pressure-roller, and means including a pair of endless flexible carriers on which said roller is mounted for moving the roller on one side of the type and in coaction therewith and returning it to initial position on the other side of the type and bed, said form of type being so disposed that the lines thereof are inclined with relation to the axis of the pressure-roller, substantially as set forth.

6. In a printing machine, the combination of a support, a form of type mounted thereon, an ink-ribbon coacting with the printing faces of the type, a small, light, rotatable pressure-roller, and means for moving the pressure-roller and the form of type relatively to effect the printing, said form of type being so disposed that the lines of type are inclined with relation to the axis of the pressure-roller so that the pressure-roller will coact with but a portion of each of a small number of lines of type at a time, substantially as set forth.

7. In a printing machine, the combination of a bed, a form of type mounted thereon, an ink-ribbon coacting with the printing faces of the type, a pressure-roller, a pair of endless flexible carriers on which said roller is mounted, means for actuating said carriers to move the roller on one side of the type and in coaction with the printing faces thereof and returning it to initial position on the other side of the type, said form of type being so disposed that the lines thereof are inclined with relation to the axis of the pressure-roller, and means for automatically removing the printed sheets from printing position, substantially as set forth.

8. In a printing-machine, the combination of a bed, a form of type mounted thereon, an ink-ribbon coacting with the printing faces of the type, a pressure-roller, and means including a pair of endless flexible carriers on which said roller is mounted for moving the roller on one side of the type and in coaction therewith and returning it to initial position on the other side of the type and bed, said form of type being so disposed that the lines thereof are inclined with relation to the axis of the pressure-roller, substantially as set forth.

9. In a printing machine, the combination of a bed, a form of type mounted thereon, an ink-ribbon coacting with the printing faces of the type, a pressure-roller, a pair of flexible carriers on which said roller is mounted, means for actuating the carriers to move the roller on one side of the type in coaction with the printing faces thereof and return it to initial position on the other side of the type, said form of type being so disposed that the lines thereof are inclined with relation to the axis of the pressure-roller, and means mount-

ed on said carriers and moving therewith for automatically removing the printed sheets from printing position, substantially as set forth.

10. In a printing machine, the combination of a bed, a form of type mounted thereon, an ink-ribbon coacting with the printing faces of the type, a pressure-roller, flexible carriers on which the roller is mounted, means for actuating the carriers to move the roller on one side of the type and in coaction with the printing faces thereof and returning it to initial position on the other side of the type, said form of type being so disposed that the lines thereof are inclined with relation to the axis of the pressure-roller, and a paper-stop for positioning a sheet in a predetermined relation to the form of type, substantially as set forth.

11. In a printing machine, the combination of a bed, a form of type mounted thereon, an ink-ribbon coacting with the printing faces of the type, means for automatically feeding said ribbon in the direction of its length, a pressure-roller, a pair of flexible carriers on which the roller is mounted, and means for actuating the carriers to move the roller on one side of the type in coaction with the printing faces thereof and returning it to initial position on the other side of the type, said form of type being so disposed that the lines thereof are inclined with relation to the axis of the pressure-roller, substantially as set forth.

12. In a printing machine, the combination of a bed, a form of type mounted thereon, an ink-ribbon coacting with the printing faces of the type, a pressure-roller, a pair of flexible carriers on which the roller is mounted, means for actuating the carriers to move the roller on one side of the type and in coaction with the printing faces thereof and returning it to initial position on the other side of the type, and means mounted on one of said carriers for automatically feeding said ribbon in the direction of its length, said form of type being so disposed that the lines thereof are inclined with relation to the axis of the pressure-roller, substantially as set forth.

13. In a printing-machine, the combination of a support, a chase mounted thereon, a form of type locked in the chase, a pressure-roller, means for moving the roller and type relatively to effect the printing, and a member held in the chase by the means for locking the type therein and having an upwardly-extending portion for supporting the roller, substantially as set forth.

14. In a printing-machine, the combination of a support, a chase mounted thereon, a form of type locked in the chase, an ink-ribbon coacting with the printing faces of the type, a pressure-roller, means for moving the pressure-roller in coaction with the type to

effect the printing and returning it to initial position, and a bar extending across the chase locked therein with the type, said bar having an upwardly extending portion at one
5 end for supporting the roller, substantially as set forth.

15. In a printing-machine, the combination of a support, a form of type mounted thereon, an ink-ribbon overlying the printing faces of the type, a small, light, rotatable pressure-roller, means for moving the pressure-roller and the form of type relatively to effect the printing, said form of type being
10 so disposed that the lines of type are inclined with relation to the axis of the pressure-roller so that the pressure-roller will coact with but a portion of each of a small number of lines of type at a time, and a member of short length relatively to the length of
20 the form of type, mounted in fixed relation to the type and adapted to support one end of said roller when the other end only is in coaction with the type, substantially as set forth.

25 16. In a printing-machine, the combination of a support, a chase having a form of type locked therein mounted on said support, a pressure-roller, means for moving the roller and type relatively to effect the printing, said form of type being so disposed that
30 the lines of type are inclined with relation to the axis of the roller, and a member locked in the chase by the means for locking the type therein and having a portion projecting upwardly in position to support one end of said roller when the other end only is in
35 coaction with the type, substantially as set forth.

17. In a printing-machine, the combination of a bed, a chase thereon, a form of type in the chase, an ink-ribbon coacting with the printing faces of the type, a pressure-roller, means for moving the pressure-roller in coaction with the type to effect the printing
40 and then returning it to initial position out of coaction with the type, said form of type being so disposed that the lines of type are inclined with relation to the axis of the pressure-roller, and a member in the chase with the
45 type and extending upwardly into position for supporting one end of said roller when the other end only is in coaction with the type, substantially as set forth.

18. In a printing-machine, the combination of a bed, a sheet of yielding material overlying the same, a chase upon said sheet consisting of a rectangular frame secured to a bottom-piece of sheet-metal, a form of type in the chase, an ink-ribbon overlying the
50 printing faces of the type, a pressure-roller, flexible carriers on which said roller is mounted and means for operating said carriers to move said roller in one direction on one side of the type and in coaction with the printing
60 faces thereof and in the other direction on

the other side of the form of type to return to initial position, substantially as set forth.

19. In a printing-machine, the combination of a bed, a sheet of yielding material overlying the same, a chase upon said sheet consisting of a rectangular frame secured to a bottom-piece of sheet-metal, a form of type in the chase, an ink-ribbon overlying the printing faces of the type, a pressure-roller, and means for moving the pressure-roller in
70 coaction with the type to effect the printing and returning it to initial position out of coaction with the type, said form of type being so disposed that the lines of type are inclined relatively to the axis of the pressure-roller, substantially as set forth. 80

20. In a printing-machine, the combination of a frame, a bed supported thereby, means for raising and lowering the corners of the bed one independently of another to position the same, a form of type upon the bed, an ink-ribbon coacting with the printing faces of the type, a pressure-roller, flexible carriers on which the roller is mounted, and means for moving the carriers to carry said
90 roller in one direction on one side of the type and in coaction therewith and in the other direction on the other side of the type to return to initial position, substantially as set forth. 95

21. In a printing-machine, the combination of a frame, a bed supported thereon, means for effecting a vertical adjustment of the bed without altering the angular disposition thereof, means for holding the bed in any one of a plurality of predetermined positions of said vertical adjustment, a form of type upon the bed, an ink-ribbon coacting with the printing faces of the type, a pressure-roller and means for moving the pressure-roller relatively to the type and in coaction therewith through the ink-ribbon, substantially as set forth. 105

22. In a printing-machine, the combination of a frame, a bed supported thereby, means for raising and lowering the bed bodily without altering the angular disposition thereof, a form of type upon the bed, an ink-ribbon coacting with the printing faces of the type, a pressure-roller, flexible carriers on which the roller is mounted, and means for moving the carriers to carry said roller in one direction on one side of the type and in coaction therewith and in the other direction on the other side of the type to return to initial position, substantially as set forth. 110 115 120

23. In a printing-machine, the combination of a frame, a bed supported thereon, a form of type on said bed, a pressure-roller, means for moving the pressure-roller bodily in one direction in coaction with the printing faces of the type, means for returning the pressure-roller to initial position over a different path so as to be out of coaction with the type, means for raising and lowering the 125 130

bed bodily without altering the angular disposition thereof, an operating device for said last-named means, and an adjustable stop for arresting the movement of said operating
5 device to limit the raising movement of the bed, substantially as set forth.

24. In a printing-machine, the combination of a frame, a bed supported thereon, means for raising and lowering the bed bodily,
10 an operating device for said means, an adjustable stop for arresting the movement of said operating device in raising the bed, a form of type upon the bed, an ink-ribbon co-acting with the printing faces of the type, a
15 pressure-roller, flexible carriers on which the roller is mounted, and means for moving the carriers to carry said roller in one direction on one side of the type and in coaction therewith and in the other direction on the other
20 side of the type to return to initial position, substantially as set forth.

25. In a printing-machine, the combination of a bed, a form of type mounted thereon, an ink-ribbon coacting with the printing
25 faces of the type, spools carrying the ends of the ribbon, a pressure-roller, a pair of flexible carriers on which said roller is mounted, means for moving said carriers to carry said roller in one direction on one side of the type
30 and in coaction therewith to effect the printing and in the other direction on the other side of the type to return to initial position, an abutment carried by one of said carriers, and means actuated by said abutment for
35 operating one of said spools to feed the ribbon when said roller is out of coaction with the type, substantially as set forth.

26. In a printing-machine, the combination of a bed, a form of type thereon, an ink-
40 ribbon overlying the printing faces of the type, a roller, means for moving the roller and type relatively to effect the printing, a paper-guide bent intermediate its ends to coact with both the side and end edges of a
45 sheet, a spring for holding said guide in the raised or operative position, said guide being adapted to be depressed by said roller, and means for adjusting the position of said guide, substantially as set forth.

50 27. In a printing-machine, the combination of a bed, a chase thereon, type in said chase, a ribbon overlying the printing faces of the type, a roller adapted to coact with the type, a paper-guide mounted upon the chase
55 and bent intermediate its ends to coact with one side and one end edge of a sheet, means for adjusting the guide to various positions upon the chase, and a spring for holding the guide in the raised or operative position, said
60 guide being adapted to be depressed by said roller, substantially as set forth.

28. In a printing-machine, the combination of a bed, a form of type thereon, an ink-
65 ribbon overlying the printing faces of the type, a roller movable relatively to the type

and in coaction therewith to effect the printing, a delivery device movable relatively to the type and adapted to engage the edge of a sheet and move the sheet from printing position, and means for raising said device above
70 the plane of the type faces immediately after it engages the edge of the sheet, substantially as set forth.

29. In a printing-machine, the combination of a bed, a form of type thereon, an ink-
75 ribbon overlying the printing faces of the type, a roller movable relatively to the type and in coaction therewith to effect the printing, a delivery device movable relatively to the type and adapted to engage the edge of a
80 sheet and move the sheet from printing position, a cam for raising said device above the plane of the type faces immediately after it engages the edge of the sheet, and means for adjusting the position of said cam, substan-
85 tially as set forth.

30. In a printing-machine, the combination of a bed, a form of type thereon, an ink-
ribbon coacting with the printing faces of the type, a pair of flexible carriers, a roller
90 mounted thereon, means for operating said carriers to carry said roller in one direction on one side of the type and in coaction therewith and in the other direction on the other side of the type, a delivery device carried by
95 the carriers and adapted to coact with the edge of a sheet to remove the sheet from printing position, and means coacting with said carriers at the points of support of said device thereon for insuring movement of said
10 device in a plane while passing over said type, substantially as set forth.

31. In a printing-machine, the combination of a bed, a form of type thereon, an ink-
10 ribbon overlying the printing faces of the type, a pair of chains, a roller mounted thereon, means for operating said chains to carry said roller in one direction on one side of the type and in coaction therewith and in the
11 other direction on the other side of the type, a delivery device carried by the chains and adapted to coact with the edge of a sheet to remove the sheet from printing position, guide-flanges, and members on said chains
11 at the points of support of said device thereon adapted to ride on said flanges to insure movement of said device in a plane, substantially as set forth.

32. In a printing-machine, the combination of a bed, a form of type thereon, an ink-
12 ribbon overlying the printing faces of the type, a pair of chains, a roller mounted thereon, means for operating said chains to carry said roller in one direction on one side of the type and in coaction therewith and in the
12 other direction on the other side of the type, a delivery device carried by the chains and adapted to coact with the edge of a sheet to remove the sheet from printing position, means coacting with said chains at the points
13

of support of said device thereon for insuring movement of said device in a plane while passing over said type, and means for rocking said device immediately after it engages the edge of a sheet, substantially as set forth.

33. In a printing-machine, the combination of a bed, a form of type thereon, an ink-ribbon overlying the printing faces of the type, a pair of chains, a roller mounted thereon, means for operating said chains to carry said roller in one direction on one side of the type and in coaction therewith and in the other direction on the other side of the type, a delivery device carried by the chains and adapted to coact with the edge of a sheet to remove the sheet from printing position, means coacting with said chains at the points of support of said device thereon for insuring movement of said device in a plane while passing over said type, a cam for rocking said device immediately after it engages the edge of a sheet, and means for adjusting said cam, substantially as set forth.

34. In a printing-machine, the combination of a bed, a form of type thereon, an ink-ribbon overlying the printing faces of the type, a pair of chains, a roller mounted thereon, means for operating said chains to carry said roller in one direction on one side of the type and in coaction therewith and in the other direction on the other side of the type, a shaft extending between and mounted for rotation upon said chains, a member carried by said shaft and adapted to engage the edge of a sheet to remove the sheet from printing position, a spring and stop for positioning said shaft and member, an arm secured to the shaft, and a cam adapted to be engaged by said arm to rock said shaft and member, substantially as set forth.

35. In a printing-machine, the combination of a support, a form of type mounted thereon, an ink-ribbon coacting with the printing faces of the type, a pressure-roller,

means for moving the pressure-roller and the form of type relatively to effect the printing, said form of type being so disposed that the lines of type are inclined with relation to the axis of the pressure-roller, devices for holding said roller in coaction with the type during the printing operation, and means for effecting an adjustment of the relative positions of said devices and said support for the type to vary the pressure exerted between the type and roller during the printing operation.

36. In a printing-machine, the combination of a support, a form of type thereon, a platen-member, said support and platen-member forming a printing couple one member of which is adapted to rotate on an axis, an ink-ribbon coacting with the printing faces of the type, and means for moving the form of type and platen-member relatively to effect the printing, said form of type being so disposed that the lines of type are inclined with relation to the axis of said rotary member of the printing couple, substantially as set forth.

37. In a printing-machine, the combination of a support, a form of type thereon, a platen-member, said support and platen-member forming a printing couple one member of which is adapted to rotate on an axis, means for inking the printing faces of the type, and means for moving the support and pressure-roller relatively to effect the printing, said form of type being so disposed that the lines of type are inclined with relation to the axis of rotation of said rotary member of the printing couple, substantially as set forth.

This specification signed and witnessed this 22nd day of May, 1908.

ALBERT B. DICK.

Witnesses:

M. H. BURKART,
R. R. HARRINGTON.