

No. 614,090.

Patented Nov. 15, 1898.

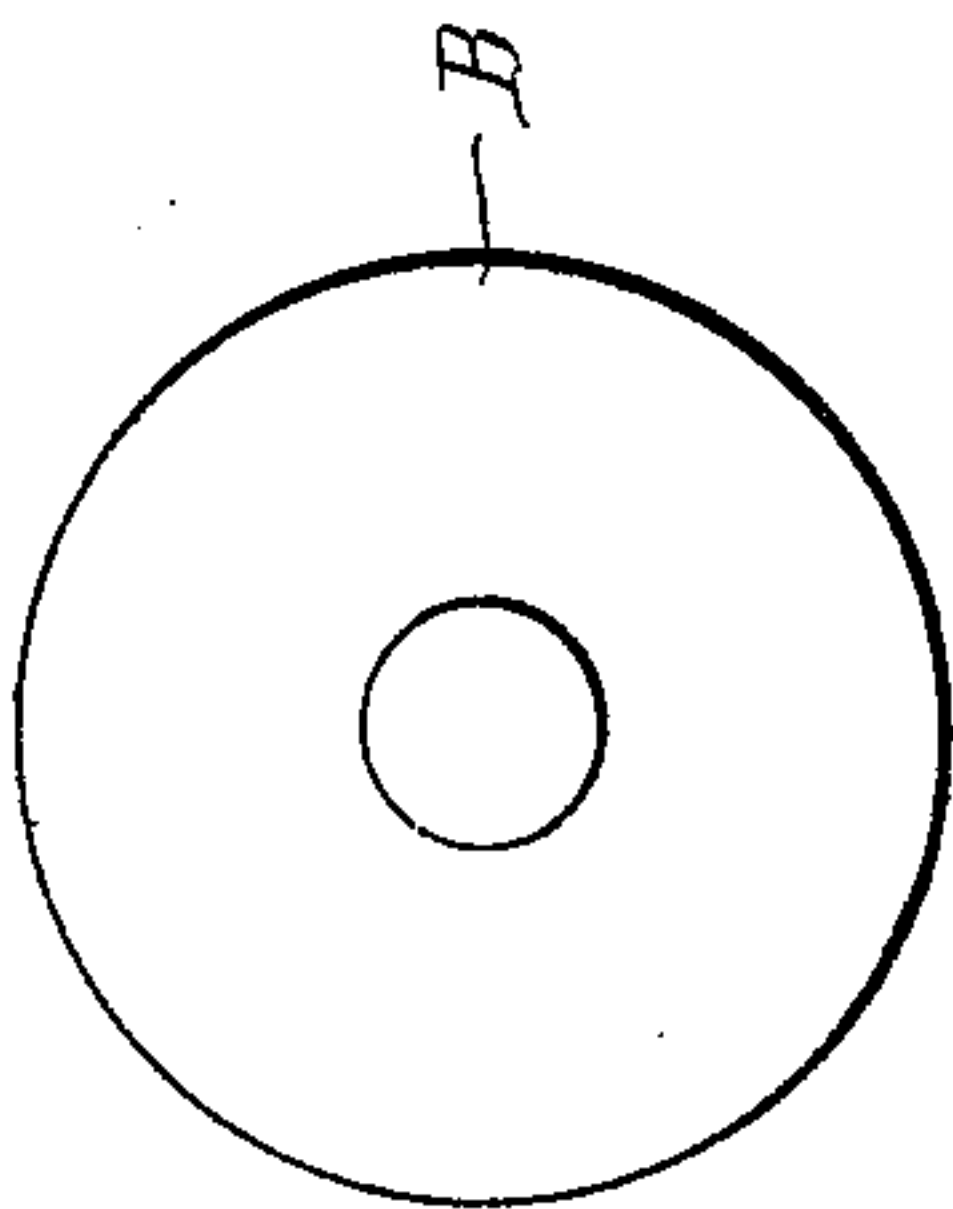
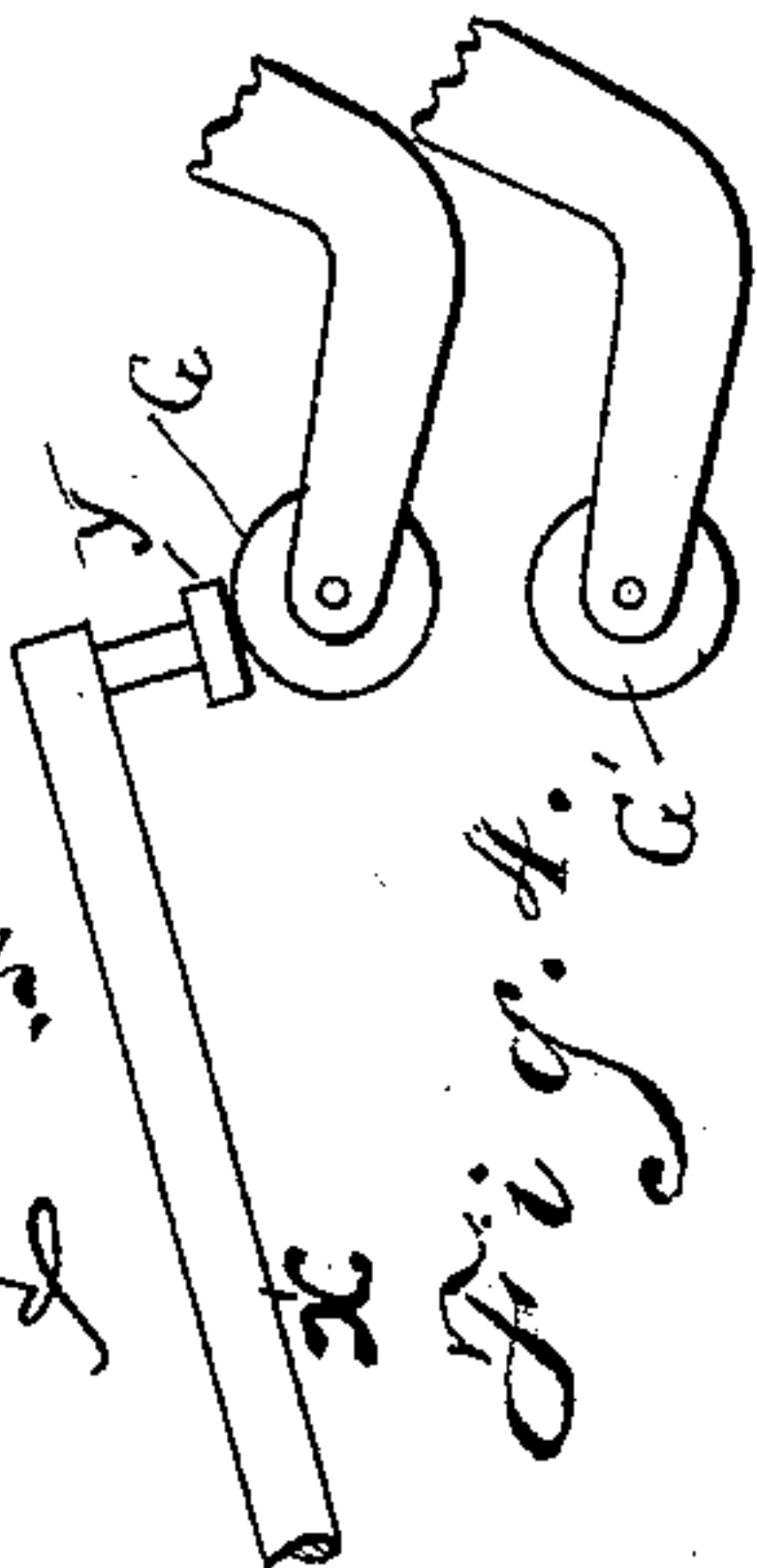
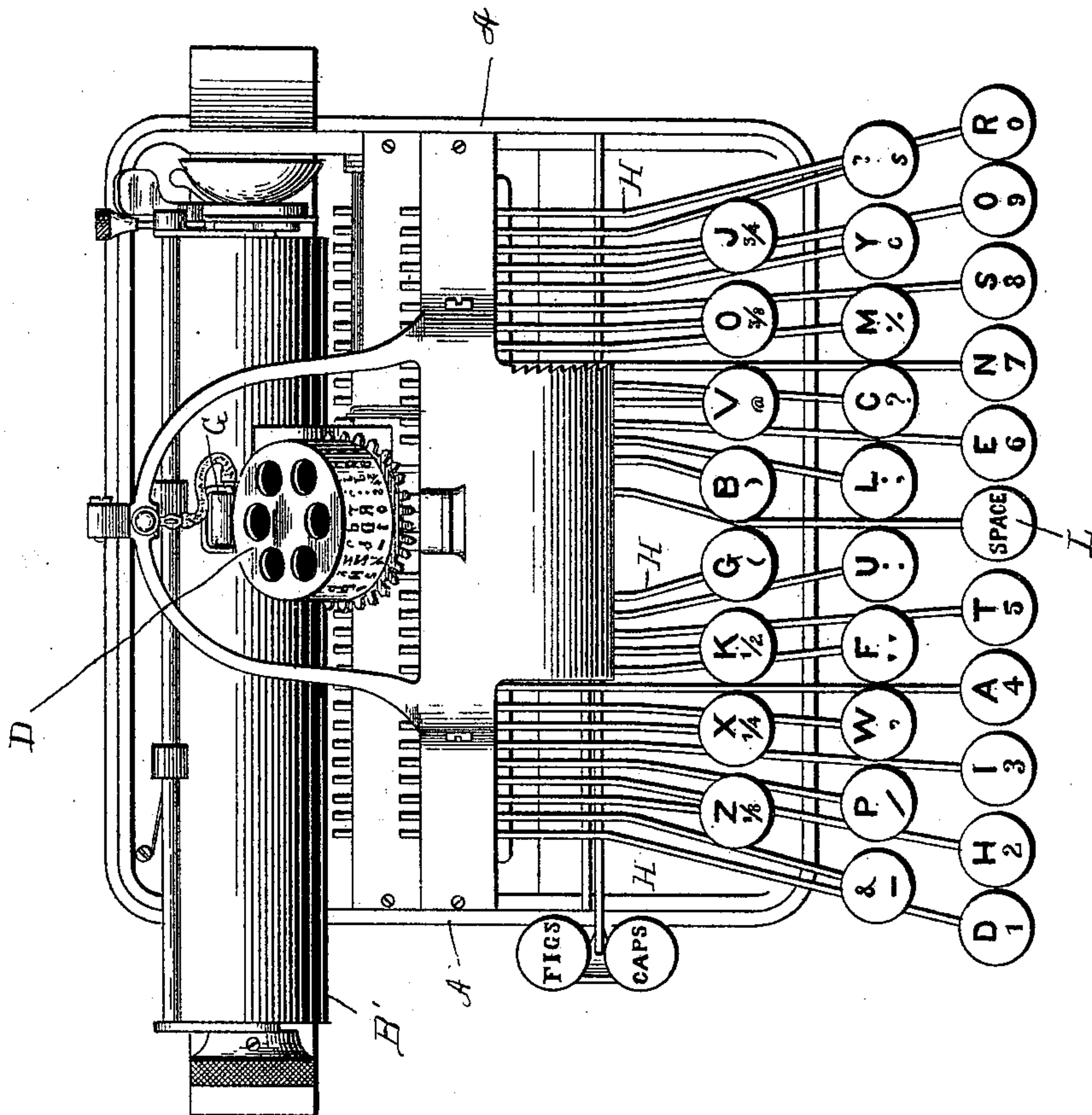
G. R. CORNWALL.
PRINTING MACHINE.

(Application filed Mar. 10, 1897.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.



WITNESSES:

Geo. H. Knight Jr.
Chas. V. Bidgood

INVENTOR

George R. Cornwall
BY
Harry E. Knight.
ATTORNEY

No. 614,090.

Patented Nov. 15, 1898.

G. R. CORNWALL.
PRINTING MACHINE.

(Application filed Mar. 10, 1897.)

(No Model.)

3 Sheets—Sheet 2.

Fig. 2.

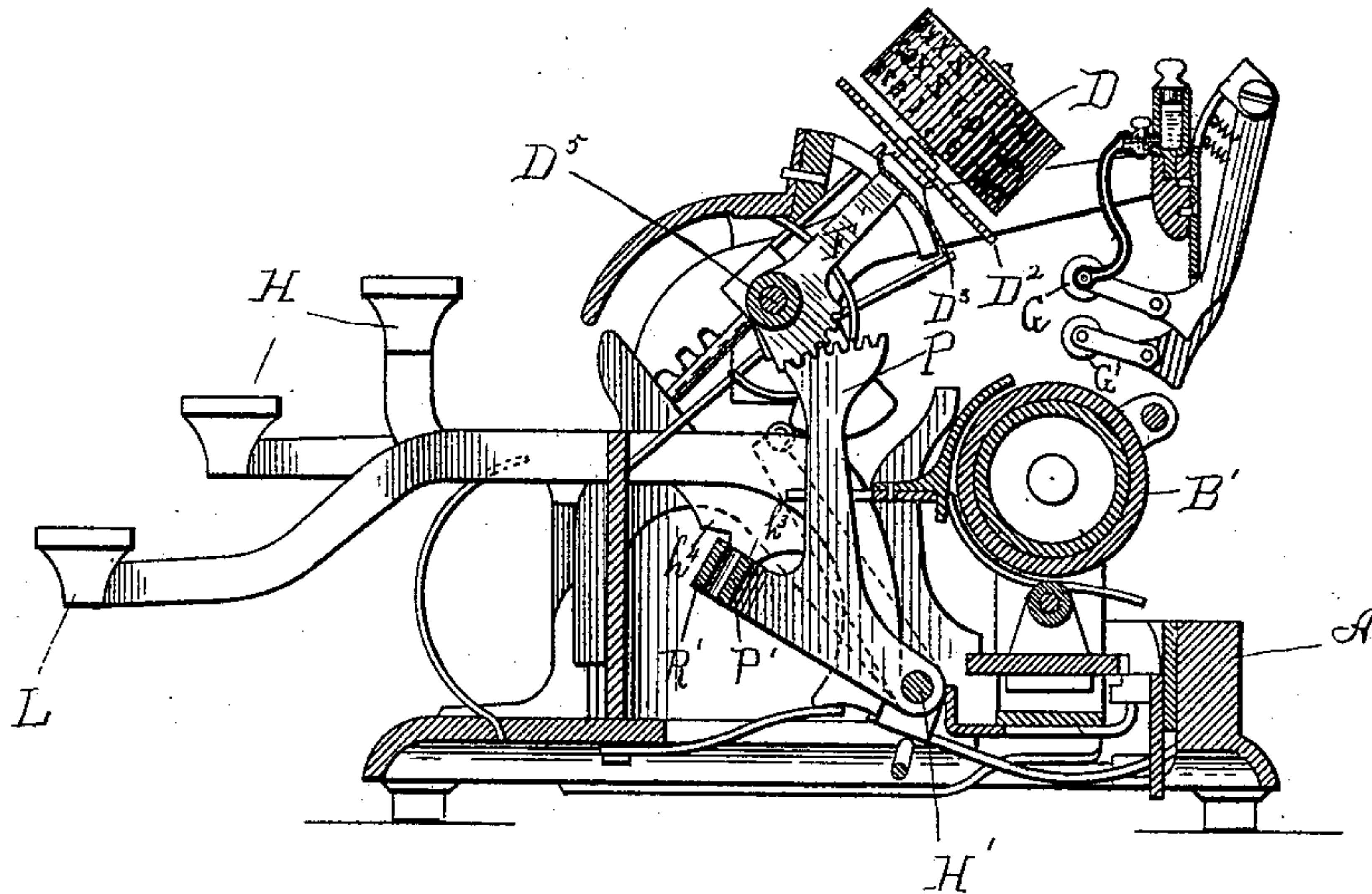
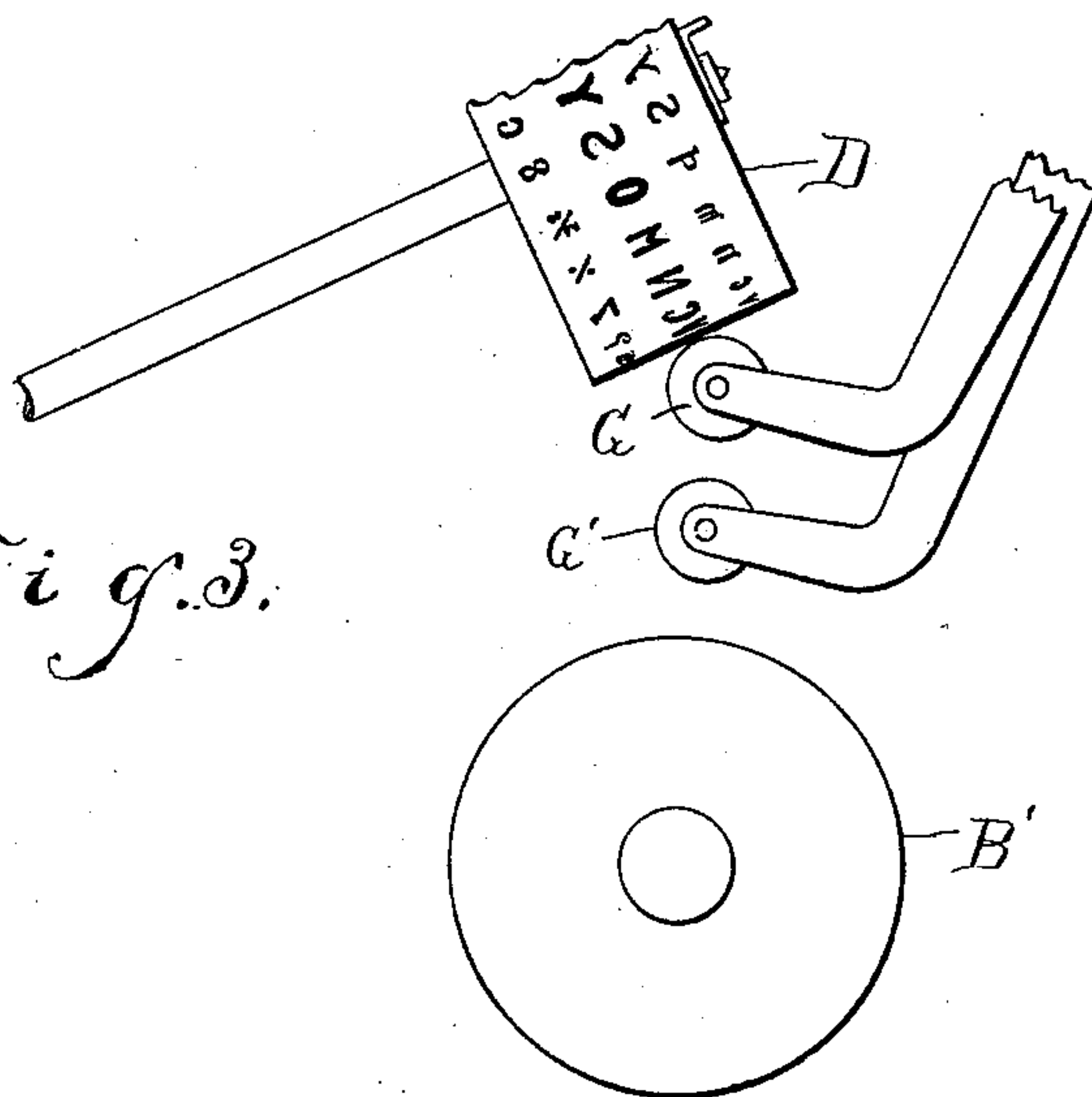


Fig. 3.



WITNESSES:

Geo. H. Knight, Jr.
W. V. Bidgood

INVENTOR

George R. Cornwall
BY *Harry E. Knight,*
ATTORNEY

No. 614,090.

Patented Nov. 15, 1898.

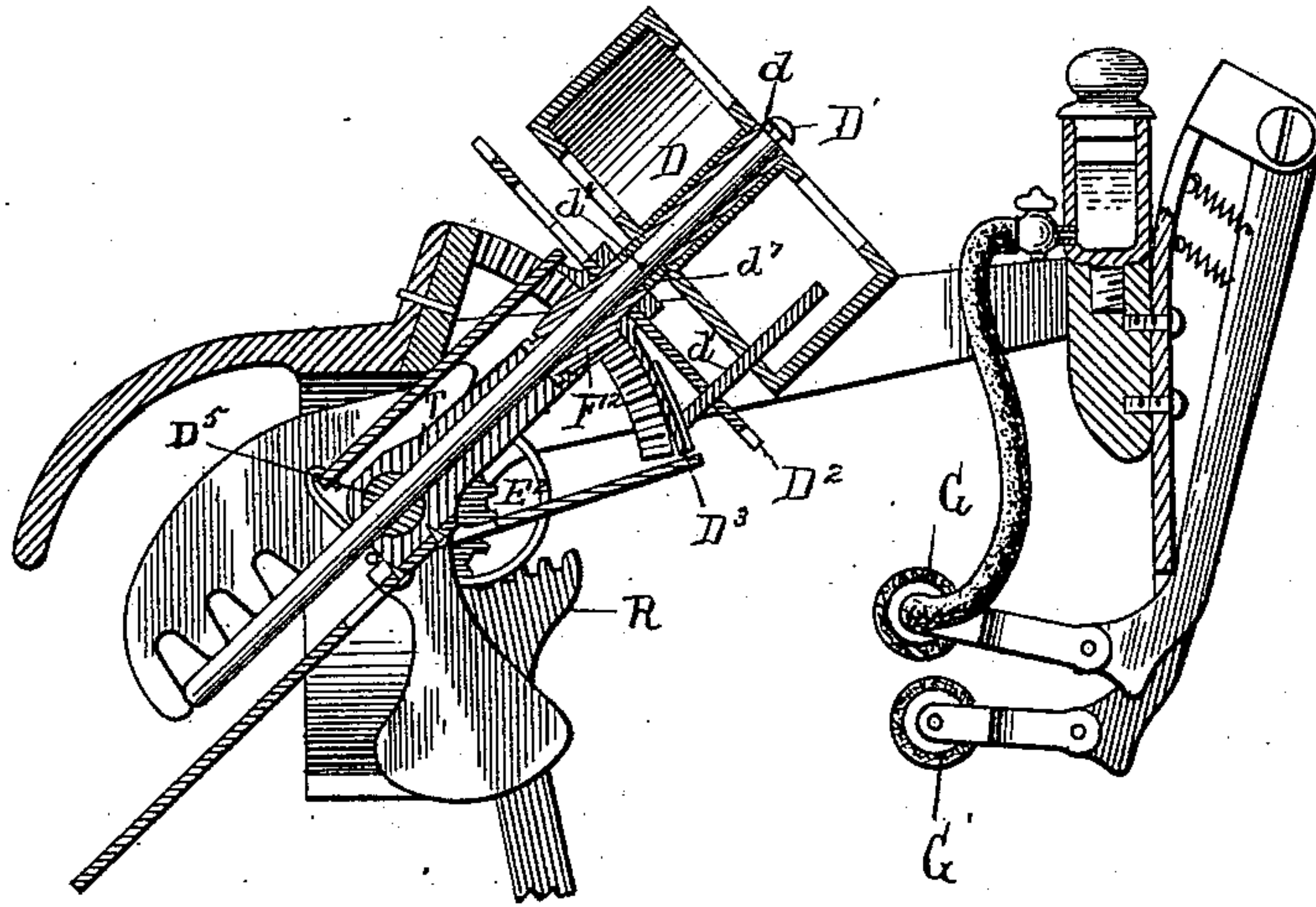
G. R. CORNWALL.
PRINTING MACHINE.

(Application filed Mar. 10, 1897.)

(No Model.)

3 Sheets—Sheet 3.

Fig. 5.



WITNESSES:

Geo. H. Knight Jr.
Dr. V. B. L. good

INVENTOR

George R. Cornwall

BY

Harry E. Knight
ATTORNEY

UNITED STATES PATENT OFFICE.

GEORGE R. CORNWALL, OF PORT CHESTER, NEW YORK.

PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 614,090, dated November 15, 1898.

Application filed March 10, 1897. Serial No. 626,881. (No model.)

To all whom it may concern:

Be it known that I, GEORGE R. CORNWALL, a citizen of the United States, residing at Port Chester, county of Westchester, State of New York, have invented certain new and useful Improvements in Printing-Machines, of which the following is a specification.

The object of my invention is to provide a machine for printing or impressing a succession of designs or characters upon any suitable impression-receiving surface which will produce sharper and better work than machines now in use—such, for instance, as the type-writer of commerce—and thereby widen the application of machines of this character.

My improvements may be employed for the perfection of type-writing machines, but they are primarily useful for preparing designs or forms to be reproduced in surface-printing presses. Such a machine is of peculiar importance at this time in view of the recent great advancement in the art of surface-printing due to the discovery of the availability of aluminium as a substitute for stone. With my machine I propose to imprint designs upon a previously-prepared surface of lithographic stone, zinc, or other metal, or preferably upon the surface of a prepared aluminium plate, or I may print upon any suitable material, such as the transfer-paper used by lithographic printers, by which the impressions of the designs may be transferred to the design-carrying surface of a plate, stone, or other suitable material which is to be printed from in a surface-printing press.

With these objects in view my invention consists, broadly, of a machine provided with a series of printing designs or characters in either surface or intaglio form, prepared to receive and hold a printing-ink and outlined or surrounded by surfaces which are so prepared as to reject the printing-ink, means for operating the designs or characters individually and independently, an impression-receiving surface, a dampening device for moistening the ink-rejecting surfaces, and an inking device for inking the designs. The printing designs or characters are arranged either upon separate blocks or supports or upon a common support, such as a wheel or a rigid or flexible plate, and however arranged they are capable of being brought into printing

position under the control of some suitably-connected mechanism, such as a bank of keys, in a manner similar to the ordinary type-writer of commerce or an automatic operating mechanism under the control of a suitable selecting device. An impression-receiving bed or cylinder or other suitable device is arranged to support a prepared surface—printing plate or stone, such as above referred to, or a sheet of transfer or other paper, and arranged in proper relation to the series of printing designs or characters is an inking device adapted to supply ink to the designs and a dampening device adapted to dampen the surfaces surrounding or outlining the designs to render them ink-rejecting.

In carrying my invention into practice I propose to form the letter designs or characters either in intaglio, similar to the engraved characters of an engraved plate or engraved stone, or in surface characters, such as are employed in lithographic or true surface printing. When surface characters are employed, I prefer to form the characters upon chemically-prepared aluminium plates or blocks in a manner which is well understood in the art. In either case I propose to have the letter characters or designs surrounded or outlined by ink-rejecting surfaces, which may be dampened by the dampening devices prior to the inking of the designs or characters in order that the ink will adhere to the designs or characters only. This operation and action is well understood in the art of lithographic or surface printing.

I have represented in the accompanying drawings for the purpose of explanation my improvements applied to a Blickensderfer type-writer, such as covered by Patent No. 472,692, of April 12, 1892, and I have also represented my improvements diagrammatically.

I do not claim any novelty in details of construction, and it will be a simple matter for those skilled in the art to embody my improvements, as hereinafter described, in a machine such as described or in some other suitable machine controlled by a bank of keys or selecting device.

In said drawings, Figure 1 is a plan view of a machine embodying my improvements. Fig. 2 is a transverse vertical section of Fig. 1. Fig. 3 is a diagrammatic representation

of the printing-wheel, impression-platen, and dampening and inking devices. Fig. 4 is a similar view representing individual type-supports. Fig. 5 is a central transverse sectional view of Fig. 1.

A is the machine-frame, and H II, &c., are the key-levers forming the bank of keys, and L is the spacing-lever, all of which are pivoted upon the shaft H'. On the shaft H' are also pivoted three swinging frames, two of which, P' and R', are shown. The two frames P' contact with the bearing-faces h^3 of the two groups of key-levers, respectively, and the frame R' contacts with all the faces h^4 of all the key-levers of both groups. The spacer-key L is located between the two groups of key-levers and escapes the frames P' and R'.

The frames P' carry rocking arms P, and these arms have gear-teeth at their upper ends, meshing with like teeth on the arms F', which are journaled on the shaft D⁵. Hence when the frames P' are rocked the arms F' are also rocked. The frame R' carries arm R, which has gear-teeth at its upper end, meshing with like teeth on the pawl-arm E², journaled on the shaft D⁵. Hence when the frame R' is moved the pawl-arm E E² is moved. The gear-teeth on the pawl E E² and the part R, which engages said pawl, are arranged in an arc having the same radius as the arcs of teeth on the segment-carrying arms F'. Hence when the pawl is moved by the part R it will move in exact consonance with the arm F'.

On the shaft D⁵ is a T-formed sleeve T, and in this sleeve is held the printing-wheel spindle D'. The printing-wheel D is held on the spindle D' between a collar d^7 , fastened by a pin d^8 , and a catch d , which engages a groove at the upper end of the spindle. Between the collar d^7 and the upper end of the sleeve T on the spindle D' is journaled loosely the pinion F², and it is held against longitudinal movement thereon. On the upper part of the hub of the pinion F² is fastened a ratchet-wheel D² and an eccentric or heart-shaped ratchet D³, so that they will move with the pinion. A crank post or pin d' is attached to the ratchet D³, passes through the ratchet D², and engages the wheel D. As the shaft or spindle D' has no rotary movement, the wheel D is propelled rotatively by the pin d' . By means to be explained farther on the spindle D' is moved longitudinally, and it carries the wheel D with it, so as to bring the different fields of letter designs or characters on the wheel into position, and in thus moving the wheel slides on the pin d' , which is of proper length to permit of that movement. Axial motion is imparted to the pinion F² by segmental racks F, carried on the arms F', which, as before explained, are rocked by the arms P and frames P' through the action of the key-levers H. The printing-wheel has imparted to it by the depression of any of the key-levers H a simultaneous axial and vibratory movement; but the axial movement must be stopped as soon as the desired letter is brought

into proper position for impression and the vibratory movement must be continued until the type is impressed. The means for effecting this result are the frame R', the arm R, the pawl-lever E² E, and the key-lever H. It will be remembered that the key-levers H have bearing-faces h^4 , which act upon the frame R', and that these faces in each group of keys are graded as to their distance from the frames.

The printing-wheel D, of any suitable construction, has arranged upon its periphery the letter designs or characters, which may be of intaglio or surface form, produced upon a suitably-prepared surface. The intaglio or surface designs or characters receive the printing-ink and are surrounded or outlined by ink-rejecting surfaces.

By a "surface" design I mean one which is formed on or in the surface of the plate, so as to project above the rest of the plate to an extent sufficient not to interfere with the use of the dampening principle. Thus in the ordinary lithographic process the design is sometimes formed by the merest film of greasy material placed on and absorbed in the plate, so that when the plate is wiped clean of ink the design is not seen to project at all above the plate. In other cases the design is brought out into very slight relief by the usual etching process; but the relief is so slight that the dampening-rolls can still make contact with the ink-registering portions of the plate, and the dampening principle is therefore used. Either of these kinds of design would come within my invention, inasmuch as they permit of the use of the dampening principle.

The designs are formed on the printing-wheel D by any of the methods in vogue in the printing art for making surface or intaglio designs. Thus if surface characters or designs are to be formed they may be simply impressed on the surface of the wheel by a stamp inked with greasy ink, or they may be drawn on the wheel-surface, using a greasy "crayon," and in either case the remainder or blank portion of the wheel may then be treated to render it ink-rejecting, as by applying a film of gum-arabic or similar material thereto, or the characters may be brought out into very slight relief by an etching process, such as is commonly practiced in the lithographic art. In case the designs are desired in intaglio they may be stamped into the wheel by suitably-formed punches or dies and then treated with suitable greasy material to render them ink-receptive, the surrounding parts of the surface being treated so as to be ink-rejecting. These matters are well known in the lithographic art and need no further elucidation.

Supported in a frame or carriage B' is an impression-platen B, which is arranged in the machine-frame in suitable relation to the printing-wheel D, which is pressed against it for inking impressions.

Any suitable ratchet feed mechanism may be employed under the control of the spacer-

lever L, which may be connected therewith in any suitable manner, not specifically shown.

G represents the dampening device, shown in the form of a small felt-covered roll journaled in a yielding arm and communicating through a flexible tube with a small water-reservoir. G' is an inking-roll similarly supported beneath the moistening-roll. The moistening and inking rolls are so arranged with relation to the printing-wheel that they will come into engagement with the surface of the printing-wheel in succession on its way to the printing position for imparting moisture and ink successively to the surface of the printing-wheel for accomplishing the novel printing effect.

All of the details of construction of the parts described will be arranged according to the judgment of the mechanic and have nothing to do with my present invention.

In lieu of the printing-wheel shown in the drawings I may arrange the individual designs or characters upon a rigid or flexible plate or upon individual supports in the same manner as in the type-writing machine of commerce, such as shown in Fig. 4 of the drawings, in which forms, however, the characters or designs will not differ in their above-described characteristics.

In Fig. 4, B represents the impression-platen, G and G' the moistening and inking devices, respectively, and X one of a set of individual supports carrying an individual intaglio or surface printing character Y.

I propose to employ some suitable form of automatic operating mechanism under the control of a bank of keys, such as used in the ordinary type-writing machine above referred to, or under the control of an automatic selecting device, which automatic mechanism or keys or selecting device will be suitably connected with the printing-wheel or other support carrying the printing designs and adapted to shift the position of the support to bring the designs or characters into printing position with relation to the impression-receiving surface on the bed or platen.

In operation the individual keys or other mechanism controlling the designs will be adapted to select and move into printing position the individual characters, and at the same time impress the character upon the impression-receiving surface, which is supported upon the bed or platen, said characters being automatically supplied with the film of moisture and the ink before reaching printing position.

It is my intention to print directly upon a prepared aluminium plate, which is adapted to be afterward employed to be printed from in a surface-printing press. I may also print upon transfer-paper, from which the design may be transferred to a surface-printing medium, such as a lithographic stone or metal plate. In any case it will of course be understood that the ink employed will be any suit-

able greasy ink which is adapted for the purpose.

In case a thin aluminium or other metal plate or a sheet of paper is used it can be bent around the cylindrical platen B in obvious manner, and after the letters or characters have been imprinted or impressed thereon by the operation of the type-writer the plate or sheet can be removed from the machine and then used in any desirable way. If, however, a thick metal plate or a lithographic stone plate is being used, it will require the use of type-writing mechanisms such as are adapted to printing on flat surfaces. Such mechanisms are well known, and the application thereto of the dampening principle in accordance with this invention will be an obvious matter in view of the above description.

Of course where the expression "letter design" is herein used it includes as an obvious equivalent any character—such as figures, &c.—such as are usually associated together in printing.

For a more detailed explanation of the details of construction of the machine illustrated in the drawings reference is made to the above-named patent, No. 472,692.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. The combination of a series of ink-receptive designs or characters surrounded or outlined by ink-rejecting surfaces, a dampening device, an inking device, an impression-receiving surface, and means for impressing said designs or characters individually and independently against the impression-receiving surface, substantially as set forth.

2. In a printing-machine, the combination of a font of ink-receptive letter designs or characters surrounded or outlined by ink-rejecting surfaces, an impression-receiving surface, a dampening device, an inking device, and means for impressing the individual characters or designs independently against the impression-receiving surface, substantially as set forth.

3. In a printing-machine, the combination of a font of ink-receptive letter designs or characters surrounded or outlined by ink-rejecting surfaces, an impression-receiving surface, a dampening device, an inking device, means for impressing the individual characters or designs independently against the impression-receiving surface, and a selecting device controlling the impression mechanism, substantially as set forth.

4. In a printing-machine, the combination of a series of ink-receptive letter designs or characters surrounded or outlined by ink-rejecting surfaces, an impression bed or platen adapted to support the impression-receiving sheet or plate, means for successively bringing the letter designs into printing position at will and means for impressing said designs against the sheet or plate, a dampening de-

vice adapted to dampen the ink-rejecting surfaces, and an inking device adapted to supply ink to the designs or characters, substantially as set forth.

- 5 5. In a writing or printing machine, the combination of a series of ink-receiving letter designs or characters each design or character of which is surrounded or outlined by an ink-rejecting surface, an impression bed
10 or platen, a bank of keys for selecting and operating the individual characters or designs, a dampening device adapted to dampen the ink-rejecting surfaces, and an inking device adapted to supply ink to characters or
15 designs, substantially as set forth.

6. In a printing-machine, the combination of a printing-wheel having a series of ink-receiving letter designs or characters on its periphery and ink-rejecting surfaces surrounding or outlining said designs or characters, means for bringing the individual designs or characters into printing position independently and impressing them against an impression-receiving surface, an impression bed or platen, a dampening device, and an
20 inking device, substantially as set forth. 25

GEO. R. CORNWALL.

Witnesses:

WM. E. KNIGHT,
M. V. BIDGOOD.