

W. P. KIDDER.
Chromatic Printing Machine.
No. 224,440. Patented Feb. 10, 1880.

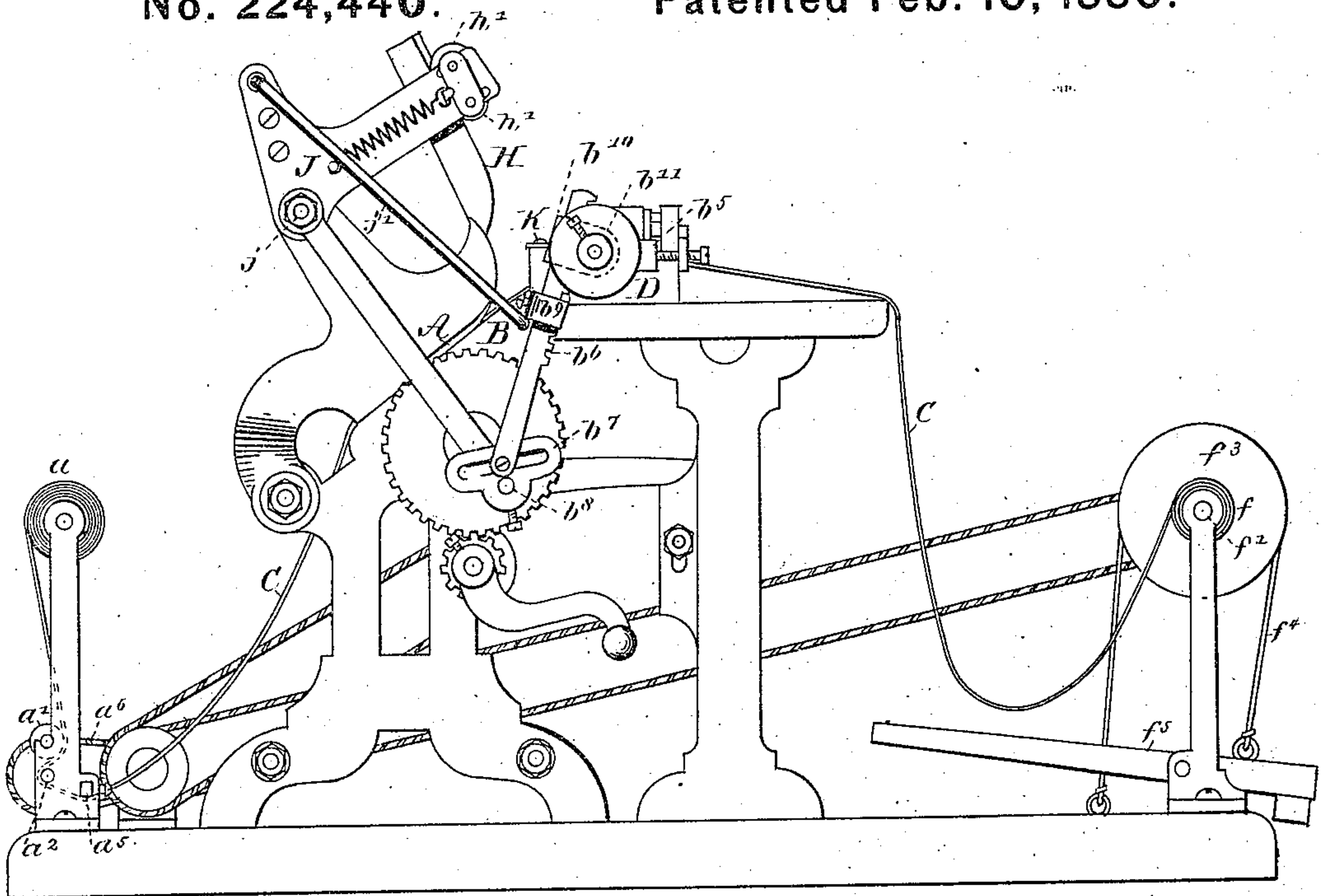


Fig. 1

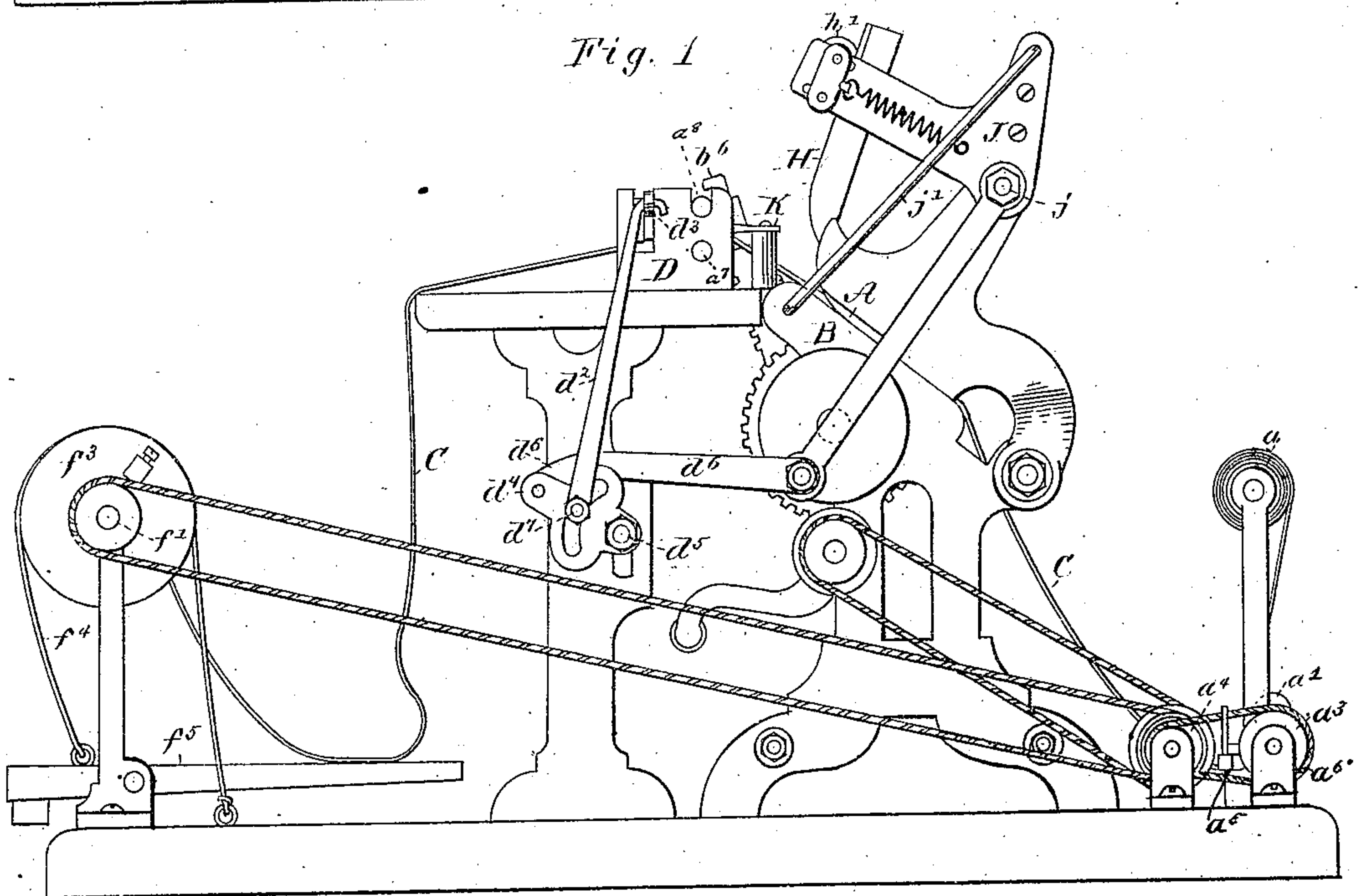


Fig. 2.

Witnesses:
Frank G. Parker
George O. G. Boal

Inventor:
Wellington P. Kidder

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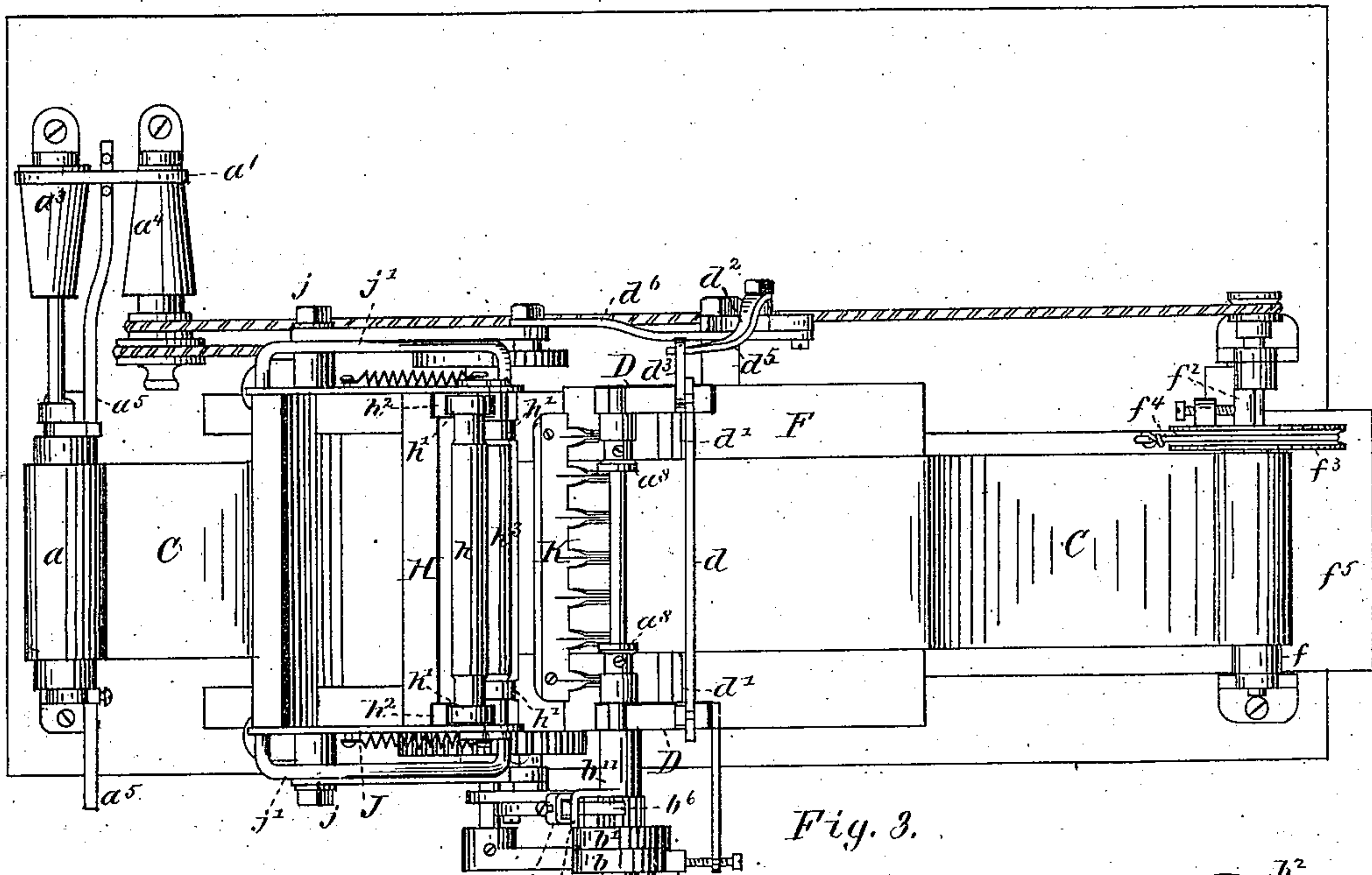


Fig. 3.

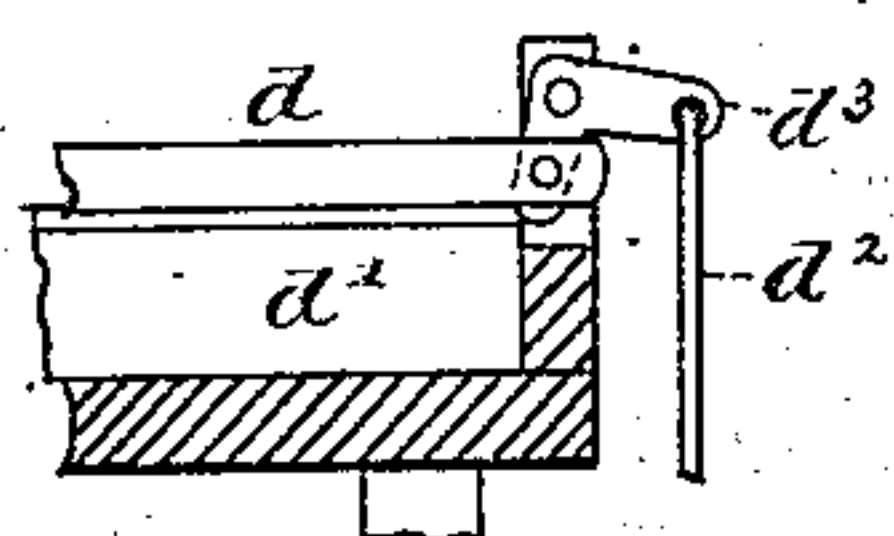


Fig. 4.

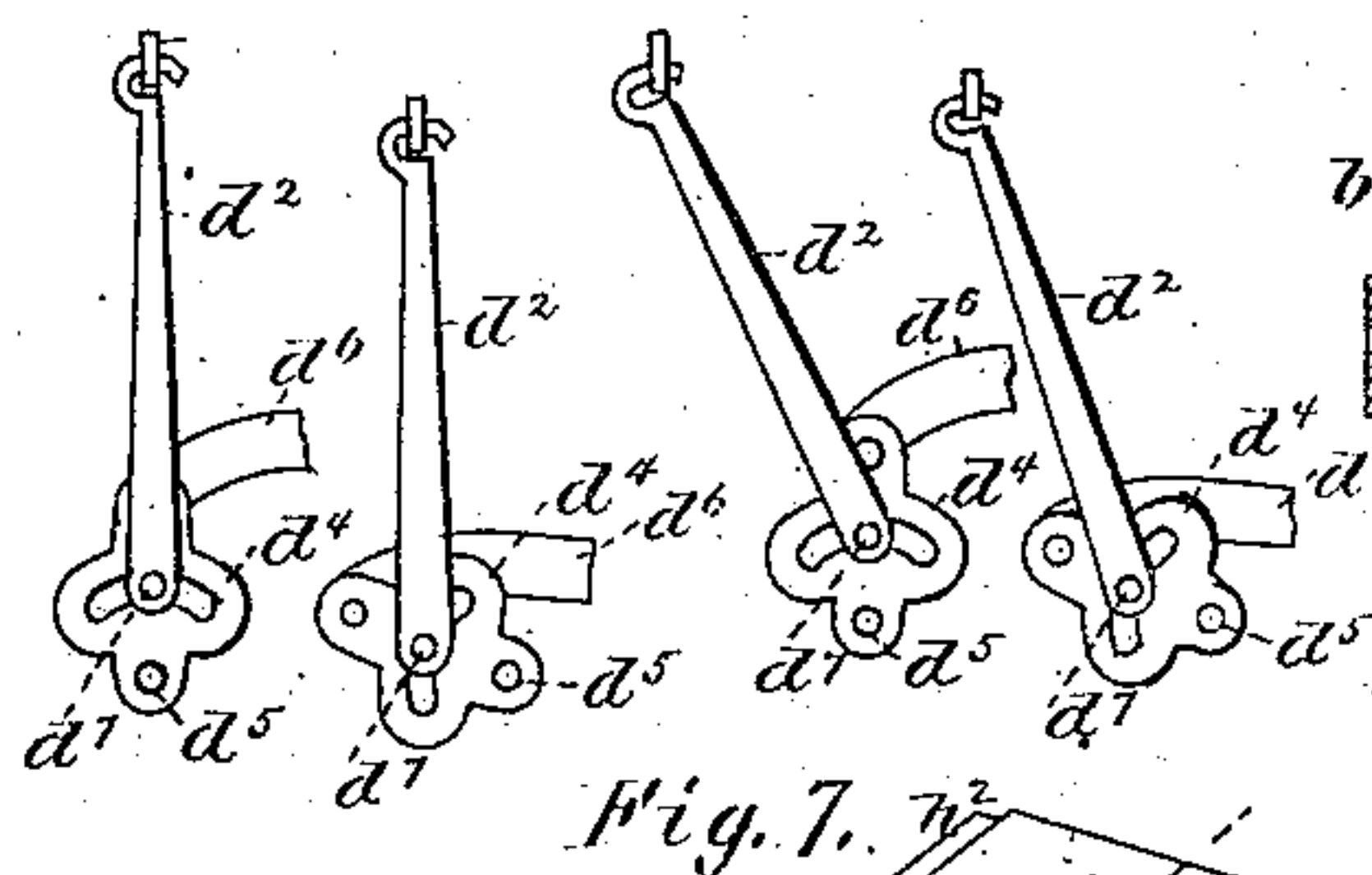


Fig. 5.

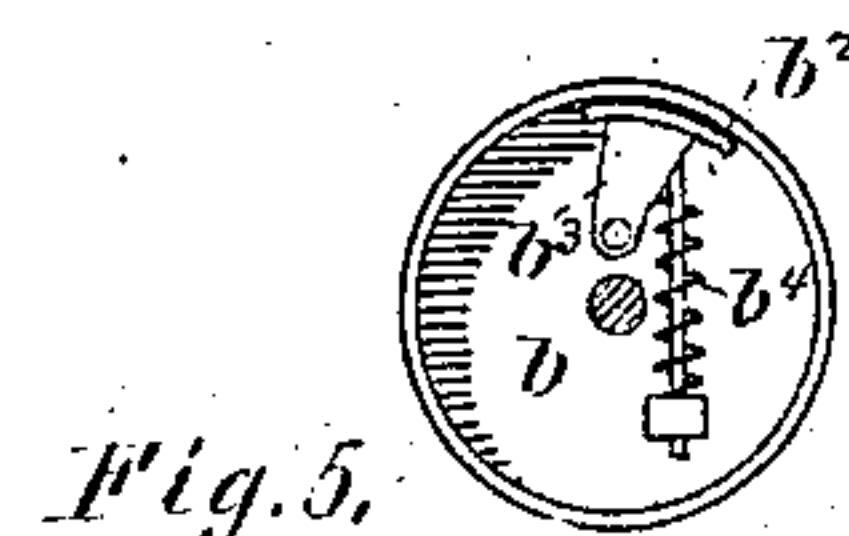
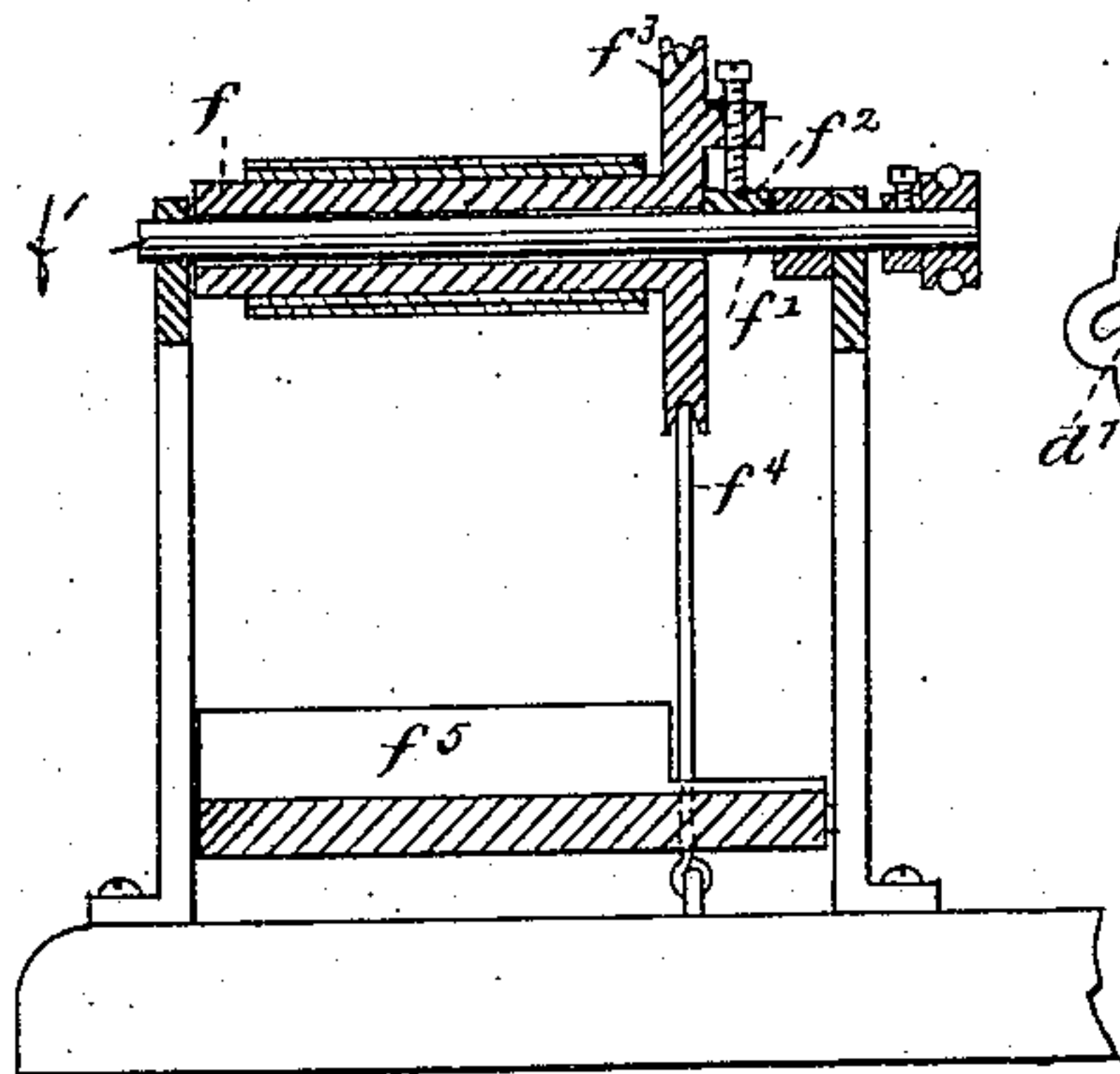


Fig. 6.



Witnesses:
Frank C. Parker.

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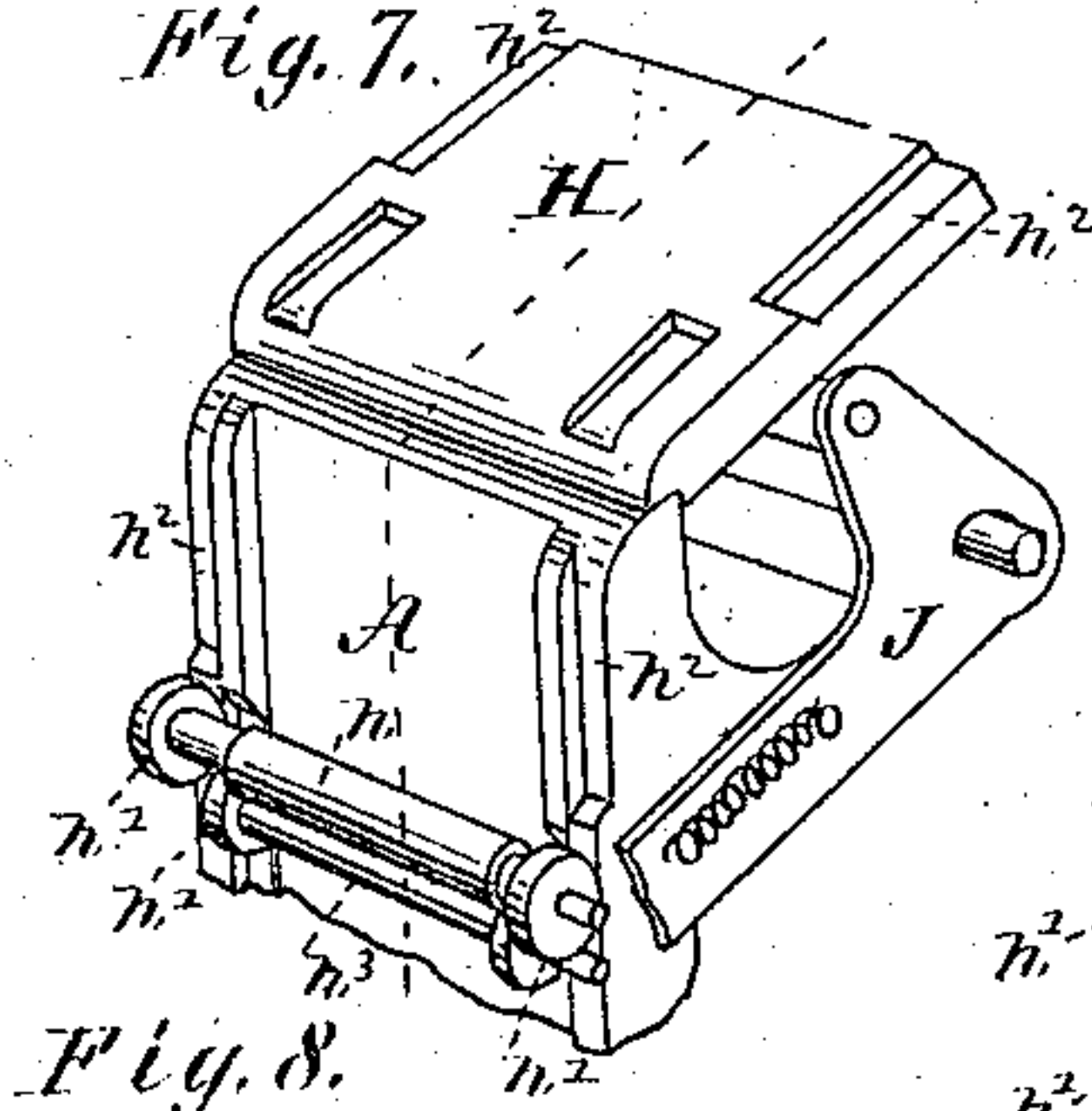


Fig. 8.

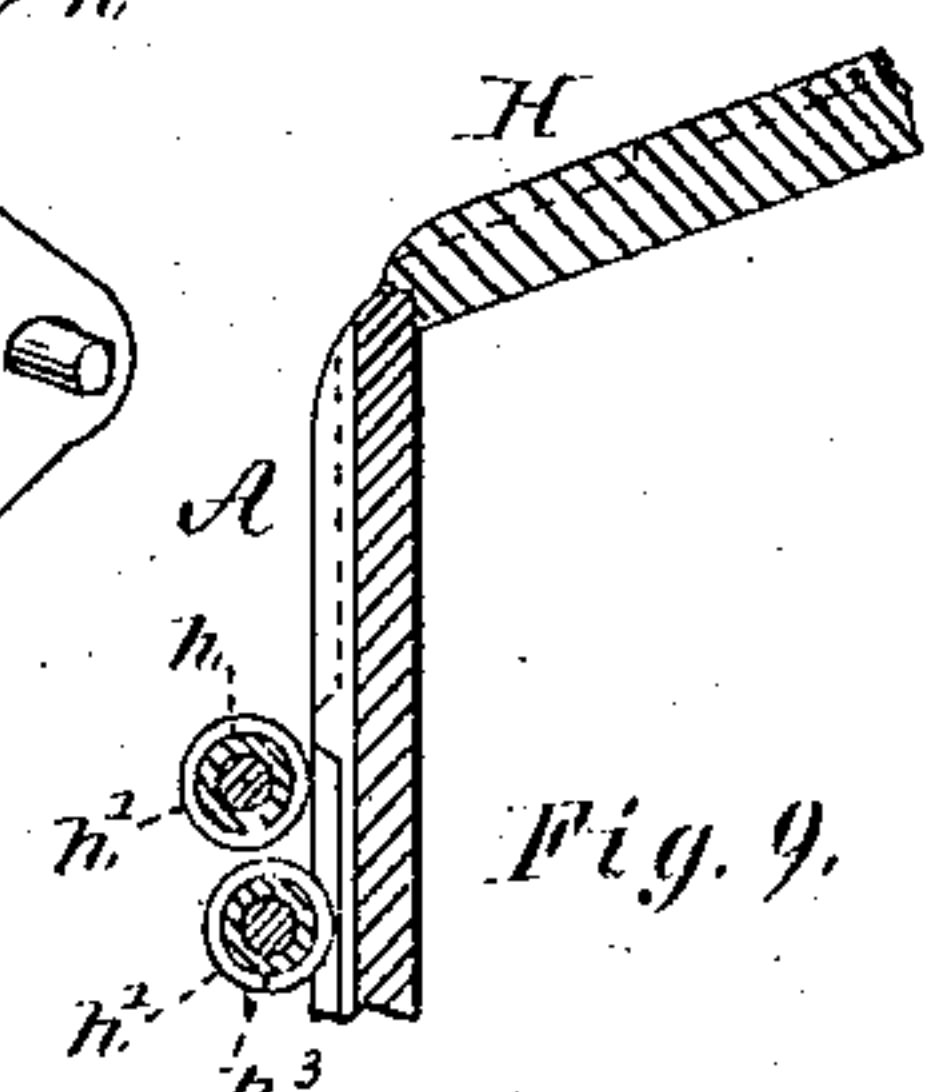


Fig. 9.

Inventor:
Wellington P. Kidder

UNITED STATES PATENT OFFICE.

WELLINGTON P. KIDDER, OF BOSTON, MASSACHUSETTS.

CHROMATIC-PRINTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 224,440, dated February 10, 1880.

Application filed March 14, 1879.

To all whom it may concern:

Be it known that I, WELLINGTON P. KIDDER, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Printing-Presses, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, making a part hereof.

10 In the drawings, Figures 1 and 2 are side elevations; Fig. 3, a plan.

The other figures show details, and are referred to below.

15 A is the bed, and B the platen, of a printing-press, properly connected together to make the impression, and C is the strip to be printed. The strip C is wound upon a drum, a , suitably supported in convenient proximity to the press.

20 Heretofore in all presses known to me adapted to print a long strip of paper or other material the paper was unwound from the drum or reel by the action of the feed, the drum or reel being one side of the platen and the feed the other side. The effect of this is to throw
25 more strain upon the printed paper than is desirable, especially when the paper is of a poor quality; and one feature of my present invention is designed to remedy this difficulty, this
30 feature of my invention consisting in the use of two feeds, one serving to draw the paper from the drum or reel or other supply, so as to have the paper slack between the first feed and the form, while the other feeds the paper
35 to the action of the type by simply taking up the slack furnished by the first feed.

The auxiliary feed in the drawings consists of the rollers $a' a^2$, between which the strip of paper C is passed. The under roller, a^2 , is revolved positively, while the upper one, a' , may be revolved by friction only. To regulate the speed of this feed I use a conical pulley, a^3 , fast to the shaft of roller a^2 and belted to a conical pulley, a^4 . The belt-shipper a^5 controls the position of the belt a^6 , and thereby
45 determines the quantity of paper fed by this auxiliary feed $a' a^2$ in a given time. The object is to keep the paper slack between the auxiliary feed $a' a^2$ and the main feed $a^7 a^8$, in
50 order to relieve the latter feed of the duty of

drawing the paper from the reel or other supply.

The auxiliary feed may be intermittent and be driven by mechanism like that used on the main feed; but with the conical pulleys $a^3 a^4$, belt a^6 , and belt-shipper a^5 , by a slight change in the position of the belt-shipper a^5 , the speed of the auxiliary feed can be regulated, and thus the paper be kept slack below the platen.

This combination of the conical pulleys $a^3 a^4$, belt a^6 , and belt-shipper a^5 with the feed $a' a^2$ also constitutes a part of my invention.

The strip of paper C extends from the feed $a' a^2$ through suitable guides and between the bed and platen through the main feed $a^7 a^8$, being a roll actuated positively, while a^8 may be actuated by friction only. In a bed-and-platen press this roll a^7 must be actuated intermittently, and in order to effect this I have combined with this feed $a^7 a^8$ the clutch device shown in detail in Figs. 5 and 6.

The two wheels b and b' are arranged as shown, b being fast to the shaft of roll a^7 , while b' and the pinion formed on its hub are free to revolve on that shaft except when b and b' are connected together by the clutch mounted on b . This clutch consists of the shoe b^2 , wide enough to engage with the flange of wheel b' , this shoe b^2 being mounted on the cam b^3 , and the cam b^3 being pressed in one direction by the spring b^4 . When the motion of b' is such that the friction of its flange on the shoe b^2 tends to move the shoe and its cam b^3 against the spring b^4 , that spring yields, and thus the flange of b' slips over the shoe b^2 without moving wheel b . For greater certainty, and also in order to prevent the wheel b moving by its own momentum at the end of the feed, I use a brake, b^5 , on wheel b . (See Fig. 1.) But when the motion of wheel b' is such that the friction of its flange tends to move the shoe b^2 and its cam b^3 in the opposite direction—that is, in the same direction as that in which they would be moved by the spring b^4 —the cam causes the shoe b^2 , which is loosely supported upon its cam, to bind tightly upon the flange of the wheel b' , and thus clutches them together, so that they move as one wheel.

In practice the shoe b^2 is connected with cam b^3 by a dowel-pin fitting loosely, but may,

of course, be otherwise connected, provision being always made for a slight tip of the cam sufficient to bind the shoe against the flange of wheel b' .

5 Motion is imparted to wheel b' by means of its pinion and the rack b^6 . That rack is connected to the piece b^7 , which is secured to the wrist-pin b^8 . The motion of the rack is made more or less by connecting it to the piece b^7 farther from or nearer to the axis around which
10 wrist-pin b^8 revolves.

This combination of feed a^7 a^8 with clutch b b' and reciprocating rack b^6 also constitutes one feature of my invention.

15 In some cases it is important to adjust the motion of the feed within very exact limits, and the use of this rack b^6 with a slide, b^{10} , nicely fitted to the rack and secured to a sleeve, b^{11} , nicely fitted to its stud, enables me to use
20 adjustable stops (one of which is shown marked b^9) on the rack on each side of slide b^{10} . These stops are capable of very accurate adjustment, and they serve to prevent any variations in the feed arising from backlash or loose bearings.

25 The cutters d d' are mounted in a frame which is rigidly connected to or made in one piece with the frame of the feed a^7 a^8 . The purpose of this is to allow the adjustment of the cutters without changing their relation to
30 the feed.

It is necessary, in order to adapt the press to various sizes of sheets, that not only the feed be adjustable, but also the position of the cutters in relation to the form of type.

35 In the press shown the cutter-frame and feed-frame are in one piece, and in practice this double frame D is held to the table F by clamps, so that the frame D may be readily adjusted toward or from the press.

40 The movable cutter d is actuated through the connecting-rod d^2 , which connects the two bell-crank levers d^3 d^4 . The stud d^5 , which supports the bell-crank d^4 , is secured adjustably to the frame of the machine (by entering
45 a vertical slot in the frame in a well-known way) in order that it may be raised or lowered to suit the position of the cutter. The bell-crank d^4 is actuated by the connecting-rod d^2 .

50 When the axis of d^4 , the axis of wrist-pin d^5 , and the end of cutter d are in line, the cutter d is at its highest position, and the motion imparted to the cutter is very slight while the axis d^5 moves across the line, the motion increasing rapidly as the motion of axis d^5 gets
55 lengthwise of that line.

Either the stud d^5 or the connecting-rod d^2 must be adjustable, as will be clear from the diagram, Fig. 7.

60 When it is desired to roll up the printed strip (for example, in order to print upon both sides) the shears will not, of course, be operated, but this strip will extend from the feed a^7 a^8 to the drum f . The paper must be so wound upon this drum that it will always be
65 slack between the feed a^7 a^8 and the drum f ; and to effect this I have devised the contrivance now to be described.

The drum f is mounted upon a shaft, f' , so that the motion of the shaft f' will be imparted to drum f through the friction-shoe f^2 . This
70 friction-shoe is fast upon the friction-pulley f^3 , which pulley is fast to drum f , f^3 being an enlargement of drum f , simply that the friction belt or brake f^4 may act with greater power. This brake f^4 is fast at one end to the floor
75 or bed of the machine and at the other end to the lever f^5 , which is sufficiently heavy at its outer end to produce a friction between the brake f^4 and pulley f^3 sufficient to prevent
80 the drum f from revolving with its shaft f' , and thus prevent the winding up of the strip C on drum f . This causes the slack to accumulate on the inner end of the lever f^5 (which is made wide for this purpose) until the weight
85 of the accumulated slack is sufficient to depress the inner end of the lever f^5 , thus raising its outer end, and thereby relieving the pulley f^3 from its brake f^4 to such an extent that the friction of shoe f^2 is greater than the
90 friction between pulley f^3 and its brake f^4 when the drum f is revolved by its shaft f' , and winds up the strip C until the weight of that part of it resting on the inner end of lever f^5 is too small to counterbalance the lever—that is, until the outer end of lever f^5
95 descends far enough to tighten the brake f^4 on pulley f^3 and stop the revolution of drum f .

This combination of drum f and shaft f' with the two sets of friction devices, one acting to make the drum and its shaft revolve together,
100 and the other controlled automatically by the weight of the slack acting to prevent the drum from revolving with its shaft until a given quantity of the strip is slack, also constitutes
105 one feature of my invention.

Another feature of my invention relates to the use of two or more inking-rollers, each supplying ink to a different part of the form; and this part of my invention consists in the
110 combination, with the inking-rollers, of guides so arranged that each roller shall be held away from the inking-table and from the form during a portion of its travel over the table and form. Thus in the drawings the roller h is
115 prevented by its guides h' from coming into contact with the lower part of the inking-table H and the lower part of the form, but is allowed, the guides h entering grooves h^2 along the edge of the table H and of the form, to come into contact with the upper part of the
120 table and form. In like manner the inking-roller h^3 is prevented by its guides h' from coming into contact with the upper part of the table and form, but comes into contact with only the lower part of the table and form.
125

In printing with two colors one will be distributed to and applied by one of the rollers and the other by the other, and in this way all kinds of two-colored printing can be done, the feed being so regulated that that portion
130 of the strip which receives an impression from the lower portion of the form shall receive a second impression from the upper portion of the form. Thus, after that part of the form

which prints red, for example, has made its impression, the feed is such that that impression is carried under the other part of the form, which prints black, for example, two impressions being necessary to make one complete impression.

In the drawings, J is the roller-frame, journaled at *j* to the bed A. One part of this frame carries the inking-rollers, as shown. 10 The connecting-rod *j'*, extending from platen B to the frame J, causes the frame to rock on its journal. As the bed vibrates toward and from the platen this rocking of frame J carries the rollers over the inking-table and the 15 form.

Another important feature of my invention consists in the combination of a bed-and-platen printing-press and a ruling apparatus, so arranged together that the intermittent 20 feed of the press shall also act as the feed of the ruling apparatus, the purpose of this part of my invention being to rule letter and note sheets, bill-heads, &c., at the same time that they are printed.

25 In the drawings, K indicates a ruling apparatus, too well-known to need description. This apparatus is best applied so that the points of the ruling-pins shall rest on or near the feed-roll, as shown in the drawings.

30 This combination gives a new capacity to my press, and enables a very large class of work to be done upon it which before my invention required two separate machines, one for printing, the other for ruling.

By means of the printing-press, ruling apparatus, feed, and cutters, a long strip of paper can be printed, ruled, and cut into sheets at the same operation; and this combination also constitutes an important part of my invention. 40

What I claim as my invention is—

1. The combination of the two feeds *a'* *a''* and *a'* *a''*, in the manner described, and mechanism, substantially as described, for driving the two feeds at different speeds, the first 45 feed drawing the paper from the drum or other supply and slacking it between the first feed and the form, the other feed drawing the paper thus slacked over the form, all substantially as described. 50

2. In combination, reciprocating rack *b'*, slide *b''*, and adjustable stop *b'''*, substantially as described.

3. In combination, drum *f*, shaft *f'*, friction-brakes *f''* *f'''*, and lever *f''''*, all substantially as 55 described.

4. In combination, feed-rolls *a'* *a''* and winding-up device *f* by means of automatic mechanism operated by the weight of the slack, substantially such as is above described, the 60 weight of the slack, when in excess of the desired amount, acting to permit drum *f* to revolve.

WELLINGTON P. KIDDER.

• Witnesses:

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GEORGE O. G. COALE.