

(No Model.)

4 Sheets—Sheet 1.

C. H. CAMPBELL.

BED MOTION FOR CYLINDER PRINTING MACHINES.

No. 379,933.

Patented Mar. 27, 1888.

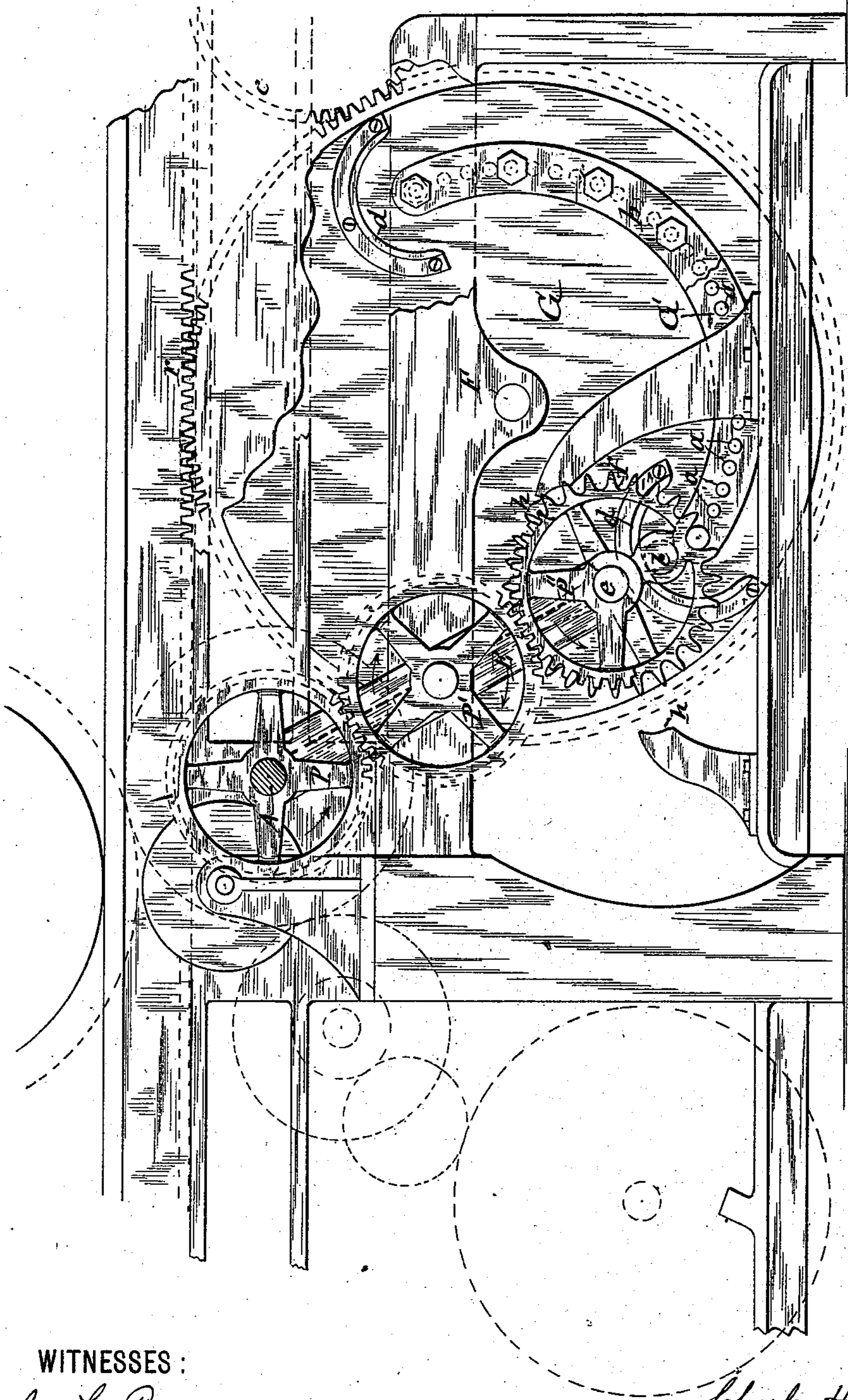


Fig. 1

WITNESSES:

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H. P. Denison

INVENTOR,

Charles H. Campbell
BY
W. L. L. L. L. L.
ATTORNEYS

(No Model.)

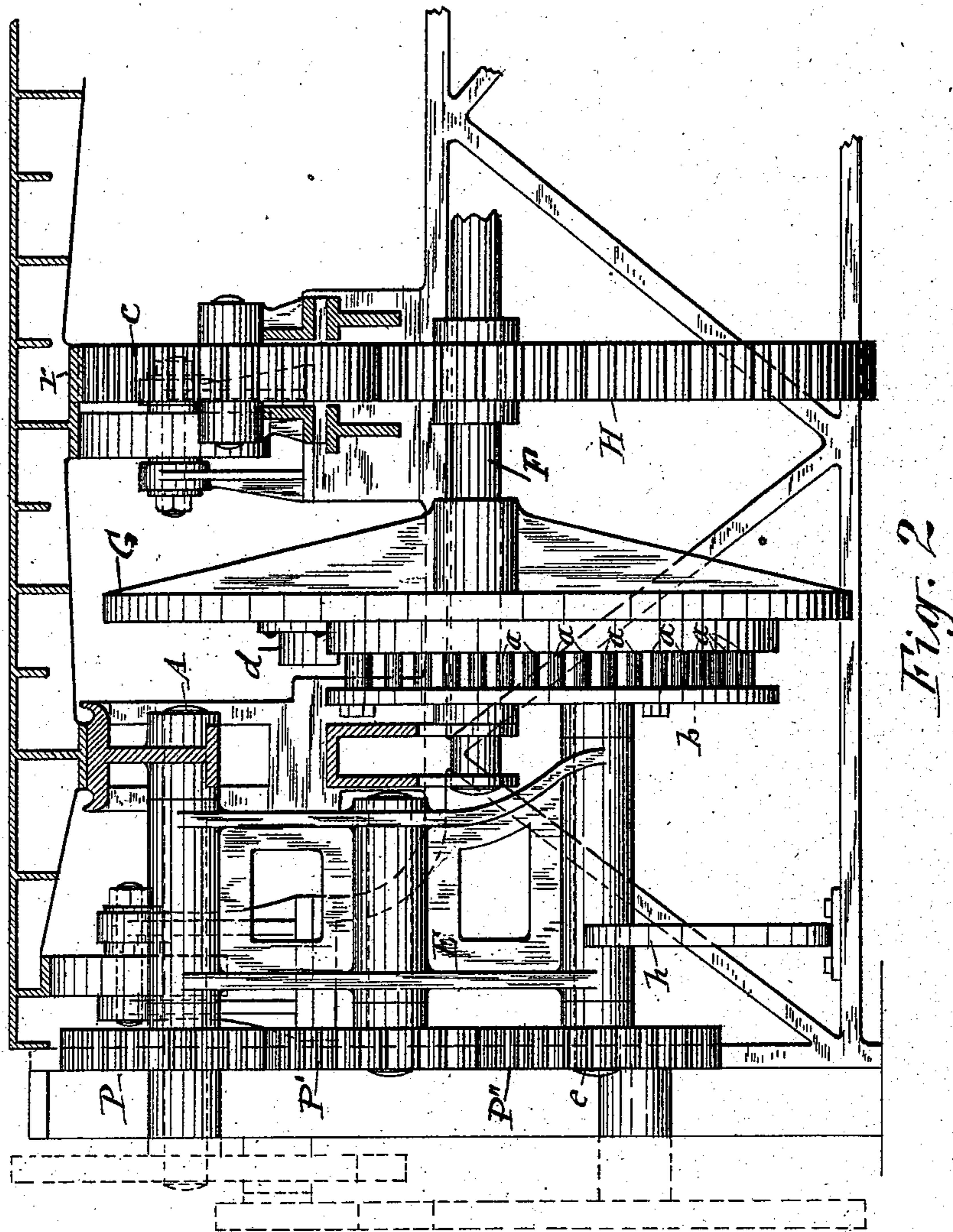
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WITNESSES:

E. L. Bendixon,
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INVENTOR,

Charles H. Campbell.

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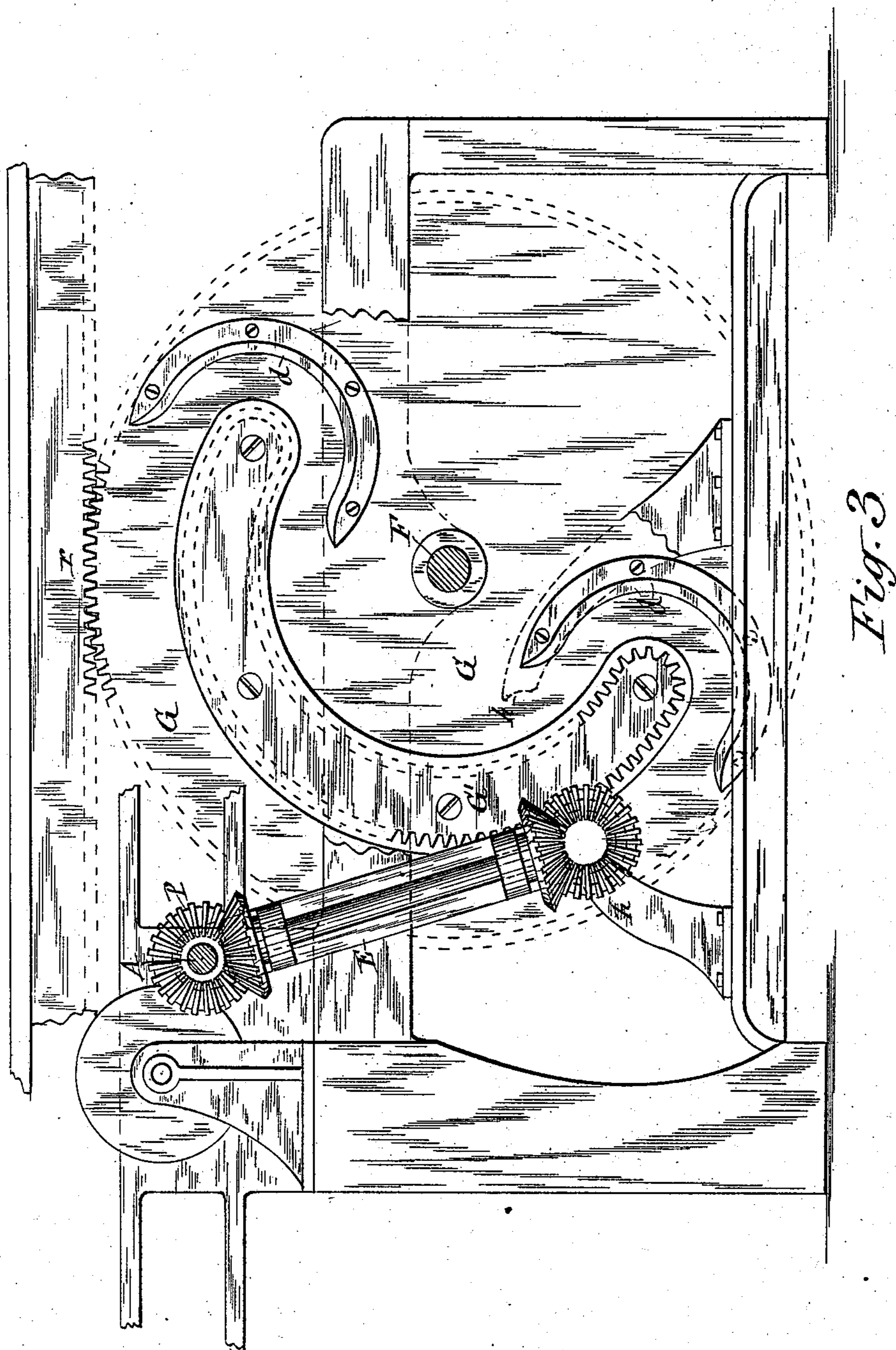
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H. P. Denison.

INVENTOR.

Charles H. Campbell

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Hugh, Luss & Hurd

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(No Model.)

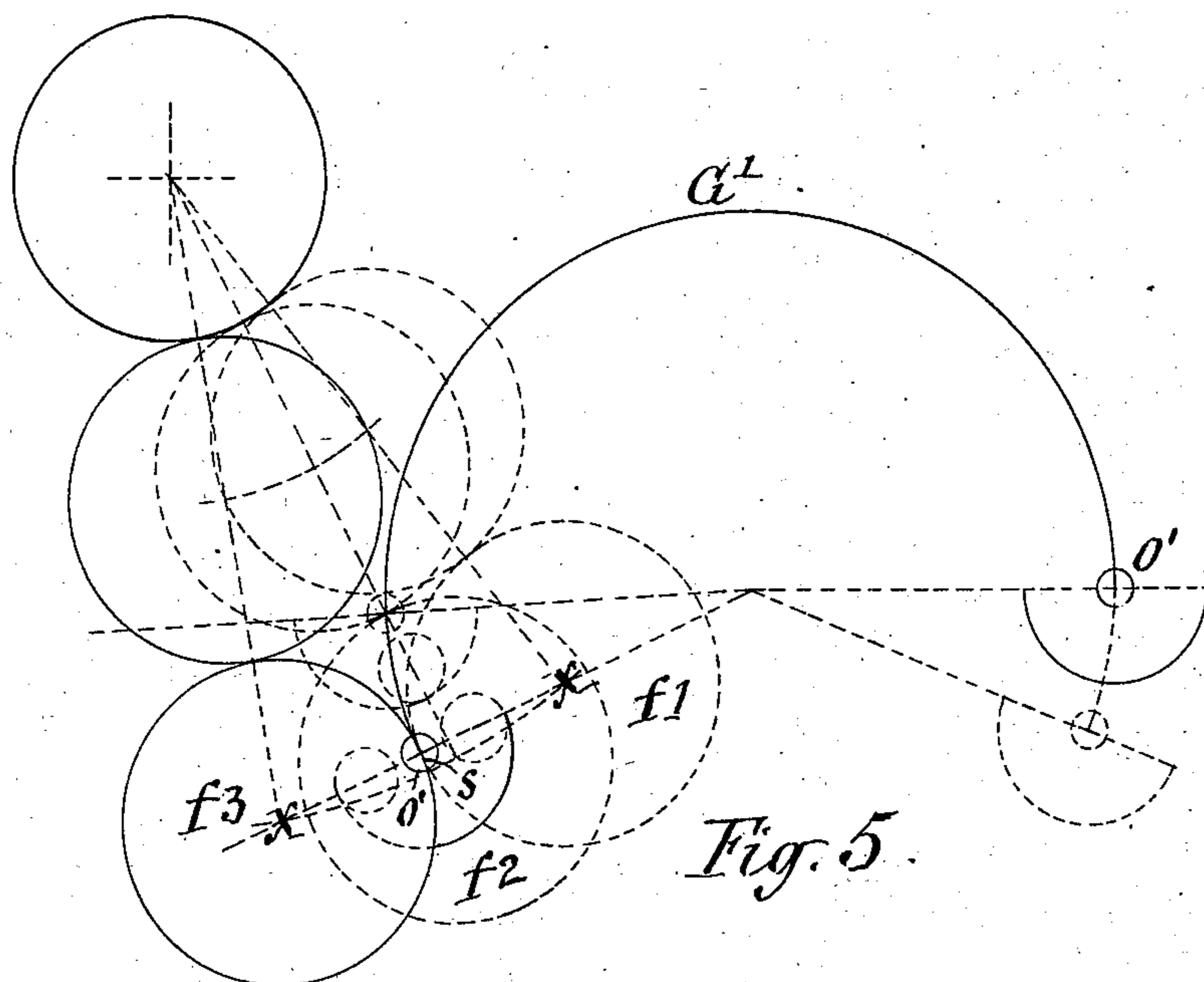
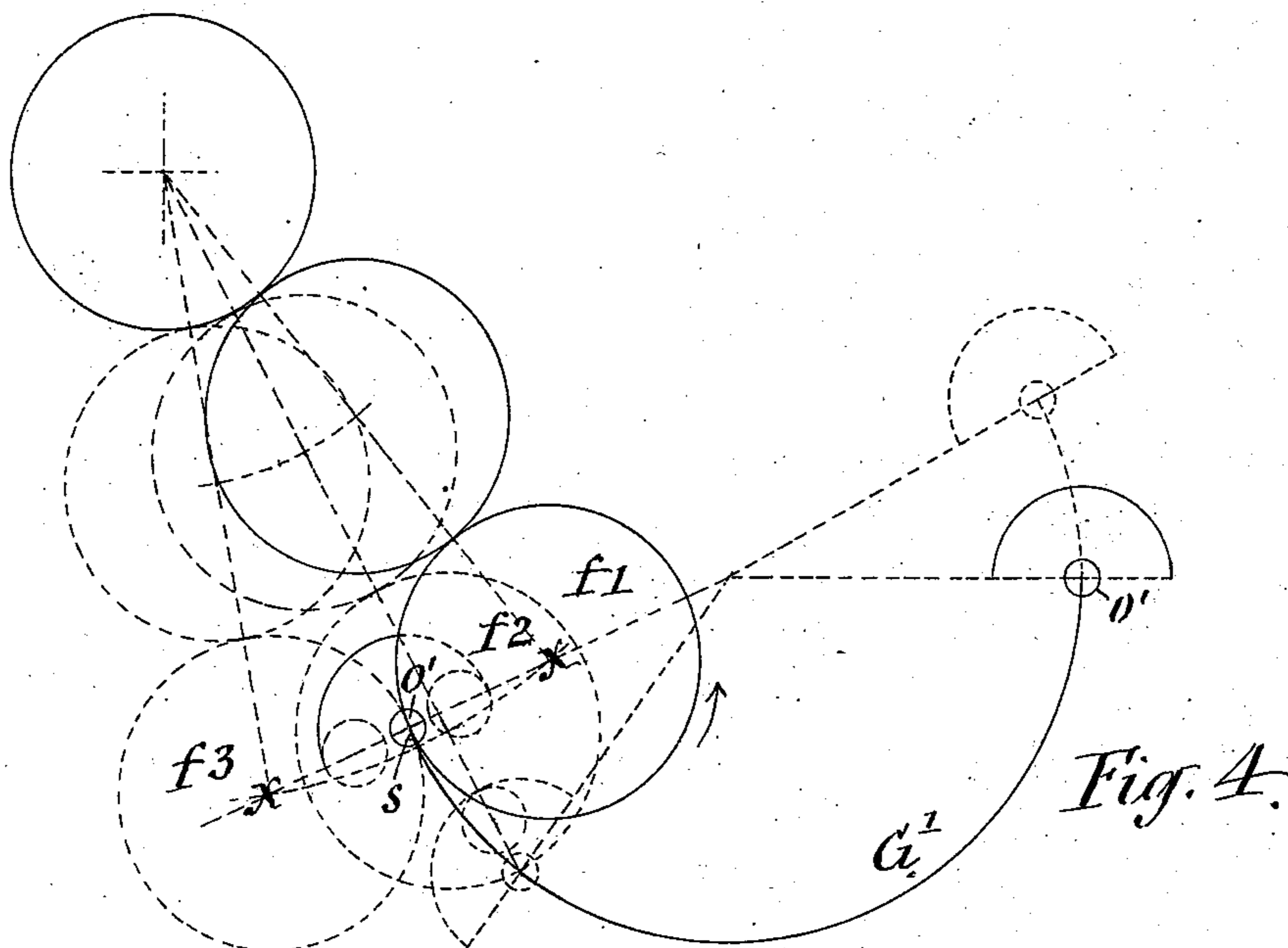
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No. 379,933.

Patented Mar. 27, 1888.



WITNESSES:

C. L. Bendison,
J. J. Laas.

INVENTOR,

Charles H. Campbell,

BY

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UNITED STATES PATENT OFFICE.

CHARLES H. CAMPBELL, OF WATERTOWN, NEW YORK, ASSIGNOR TO THE
BAGLEY & SEWALL COMPANY, OF SAME PLACE.

BED-MOTION FOR CYLINDER PRINTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 379,933, dated March 27, 1888.

Application filed August 19, 1887. Serial No. 247,350. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. CAMPBELL, of Watertown, in the county of Jefferson, in the State of New York, have invented new and
5 useful Improvements in Bed-Motions for Cylinder Printing-Machines, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

10 This invention relates to the class of printing-presses in which the type or form is carried on a reciprocating bed under an impression-cylinder which carries the sheets to be imprinted, and either oscillates or rotates continuously in one direction, and moves syn-
15 chronously with the bed during the period of imprinting the sheet.

My invention has special reference to the reversing of the motion of the bed at the ends
20 of its strokes. This has hitherto been effected by ordinary devices which acted alike at both ends of the stroke of the bed and reversed the movements thereof with equal velocities. This has been found to be objectionable for the fol-
25 lowing reasons:

In the operation of the press the press bed passes from the back end (which is the end from which the paper is fed) to the front end, at which the ink-fountain is located, and
30 while reversing at this latter end the bed has to overcome the resistance due to the labor of driving the ink-rollers, which it traverses successively until all of said rollers are acted upon by the bed. This gradually-increasing resist-
35 ance to the movement of the bed causes said movement to easily reverse at the front end of the press.

In moving toward the back end of the press the resistance due to the ink-rollers diminishes;
40 but before the bed is entirely relieved from said resistance the form carried on the bed comes in contact with the impression-cylinder to imprint the paper carried on said cylinder, and this operation causes a greater resistance
45 to the movement of the bed than that caused by the ink-rollers. Immediately after the form has passed from under the impression-cylinder the movement of the bed is reversed. This reversing, however, is very difficult, owing
50 ing to the sudden relief of the press-bed from

the aforesaid resistance and the consequent thrust of the bed to the point of the reversal of its movement. This result is plainly noticeable by the wear of the parts and by the necessity of adjusting the recoil or cushioning
55 springs (when used) to a higher degree of tension at this end of the press.

The object of this invention is to provide simple and effective means for reversing the movement of the press-bed with equal facility
60 at either end of its stroke.

The invention consists, essentially, in the combination, with the press-bed and gearing for driving the same, of a mangle-wheel adapted to transmit motion to the press-bed,
65 and a swinging arm having at its free end a gear engaging a rack and driven from a suitable gear concentric with the axis of oscillation of the arm, all as hereinafter more fully described, and specifically set forth in the claim. 70

In the annexed drawings, Figure 1 is a side elevation of a press-bed-reversing mechanism embodying my invention. Fig. 2 is an end view of the same. Fig. 3 is a side elevation of a modification of my invention, and Figs. 4
75 and 5 represent diagrams illustrating the effect of my invention.

Similar letters of reference indicate corresponding parts.

F denotes a shaft journaled in suitable bearings on the press frame, and having secured to it the mangle-wheel G, which has projecting from its side the segmental rack G', arranged concentric with said wheel, in the usual manner. Said rack may be either formed of a
85 series of pins, *a a a*, projecting from the side of the wheel G, and sustained at their outer ends by a strap, *b*, as shown in Figs. 1 and 2 of the drawings, or consist of a segmental plate secured to the side of the aforesaid wheel, and
90 provided with the cogs along its edges, as shown in Fig. 3 of the drawings. Semicircular guides *d d* are secured to the wheel G, concentric with the last teeth at the ends of the rack G', for the purpose hereinafter explained. From the
95 wheel G motion is transmitted to the press-bed either direct, by providing the periphery of said wheel with cogs meshing with the usual rack, *r*, on the under side of the press-bed, or indirect, by the medium of a separate gear- 100

wheel, H, secured to the shaft F, and, if desired, an intermediate pinion, c, may be arranged to transmit motion from either of the aforesaid wheels to the rack, as represented in dotted lines in Fig. 1 of the drawings and in full lines in Fig. 2 of the drawings.

A represents the driving-shaft of the reversing mechanism, said shaft being supported in suitable bearings secured to the press-frame and having pivoted to its swinging arm E. To the said driving-shaft, at one side of the arm E, is also rigidly attached a pinion, P, and on the free end of the arm E is journaled a short shaft, e, which is parallel with the driving-shaft A, and has secured to one of its ends either a star-wheel or a pinion, f, engaging the rack G'. To the opposite end of the shaft e is rigidly attached a pinion, P'', which receives motion from the pinion P by an intermediate pinion, P', pivoted to a stud-pin which projects from the side of the arm, as represented in Fig. 1 of the drawings; but I do not limit myself specifically to the aforesaid means of transmitting motion from the driving-shaft A to the star-wheel or pinion f, inasmuch as the same effect can be produced by various other means—as, for instance, by the employment of sprocket-wheels in lieu of the pinions P P'' and a drive-chain connecting said wheel, or by attaching to the driving-shaft A and shaft e miter-pinions meshing with corresponding pinions on the ends of a shaft journaled in bearings on the side of the arm E, as illustrated in Fig. 3 of the drawings.

The arm E swings between two stops, h h, which limit the movement thereof, so as to maintain the pinion or star-wheel f in engagement with the rack G'. A roller, l, is pivoted on the side of the star-wheel f, and adapted to travel through the segmental spaces between the ends of the rack and adjacent guides d d.

The operation of the described reversing mechanism is as follows: The driving-shaft A, rotating in the direction indicated by an arrow in Fig. 1 of the drawings, imparts rotary motion to the pinion or star-wheel f. Through the medium of the pinions P' P'', or their desired described equivalents, and the aforesaid star-wheel f, oscillatory motion is imparted to the mangle-wheel. As the said wheel f approaches the end of the rack G', the roller l encounters the semicircular guide d, and in traveling along the said guide it maintains the star-wheel f in engagement with the last pin or tooth on the end of the rack and causes said star-wheel to travel from one side of the rack to the other, and thus reverses the movement of the latter.

It will be observed that during the travel of the roller l around the end of the segmental rack G' the movement of the latter is momentarily stopped, and the period of said stoppage is longer and the reversing of the movement of the rack is slower at one end of the

rack than at the opposite end thereof. This latter effect is illustrated in Figs. 4 and 5 of the drawings. When the rack represented by the line G' in Fig. 4 of the drawings is with its last teeth in the position indicated by the small circles o' o', the arm E begins to swing outward and carries the wheel f from the position shown by the circle f' to the position of the circle f³, and in this movement the axis of the wheel f moves in the line of the arc x x, and as the wheel passes the position indicated by the circle f² said wheel compels the rack to continue its previous movement to a distance equal to the versed sine s of the aforesaid arc before the reverse movement of the rack begins, and consequently said reverse movement is rendered more sudden. When the rack G' is with its last teeth in the position represented by the small circles o' o' in Fig. 5 of the drawings, the arm E begins to swing inward and carries the wheel f from the position indicated by the circle f³ to the position of the circle f', and in this movement the motion of the rack is partially checked, owing to the wheel f being carried in opposite direction from the movement of the rack a distance equal to the versed sine s of the arc x x; hence the reversing of the movement of the rack is rendered more easy.

The relative position of the press-bed to the reversing mechanism determines whether the wheel G is to be geared direct to the bed or whether motion is to be transmitted from the said wheel to the bed by an intermediate gear. The arrangement of said parts is to be made with the view of bringing the quicker action of the reversing mechanism to operate on the press-bed when in its forward position and least resisted in its movement.

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

In combination with the reciprocating press-bed and mangle-wheel, the arm E, pivoted at one end and carrying on its free end a pinion or star-wheel engaging the mangle-wheel, a pinion secured to the shaft of the aforesaid pinion or star-wheel, a driving-pinion concentric with the pivot of said arm, intermediate gears pivoted to the arm and arranged to transmit motion to the pinion or star-wheel on the free end of the arm, and stops h h at opposite sides of the free end of the arm, substantially as described and shown.

In testimony whereof I have hereunto signed my name, in the presence of two witnesses, at Watertown, in the county of Jefferson, in the State of New York, this 29th day of July, 1887.

CHARLES H. CAMPBELL. [L. S.]

Witnesses:

J. J. VAN WINKLE,
GEORGE A. BAGLEY.