(No Model.) 2 Sheets—Sheet 1.

A. CAMPBELL.

MECHANISM FOR RAISING THE ROLLERS OF PRINTING PRESSES.

No. 297,752. Patented Apr. 29, 1884.

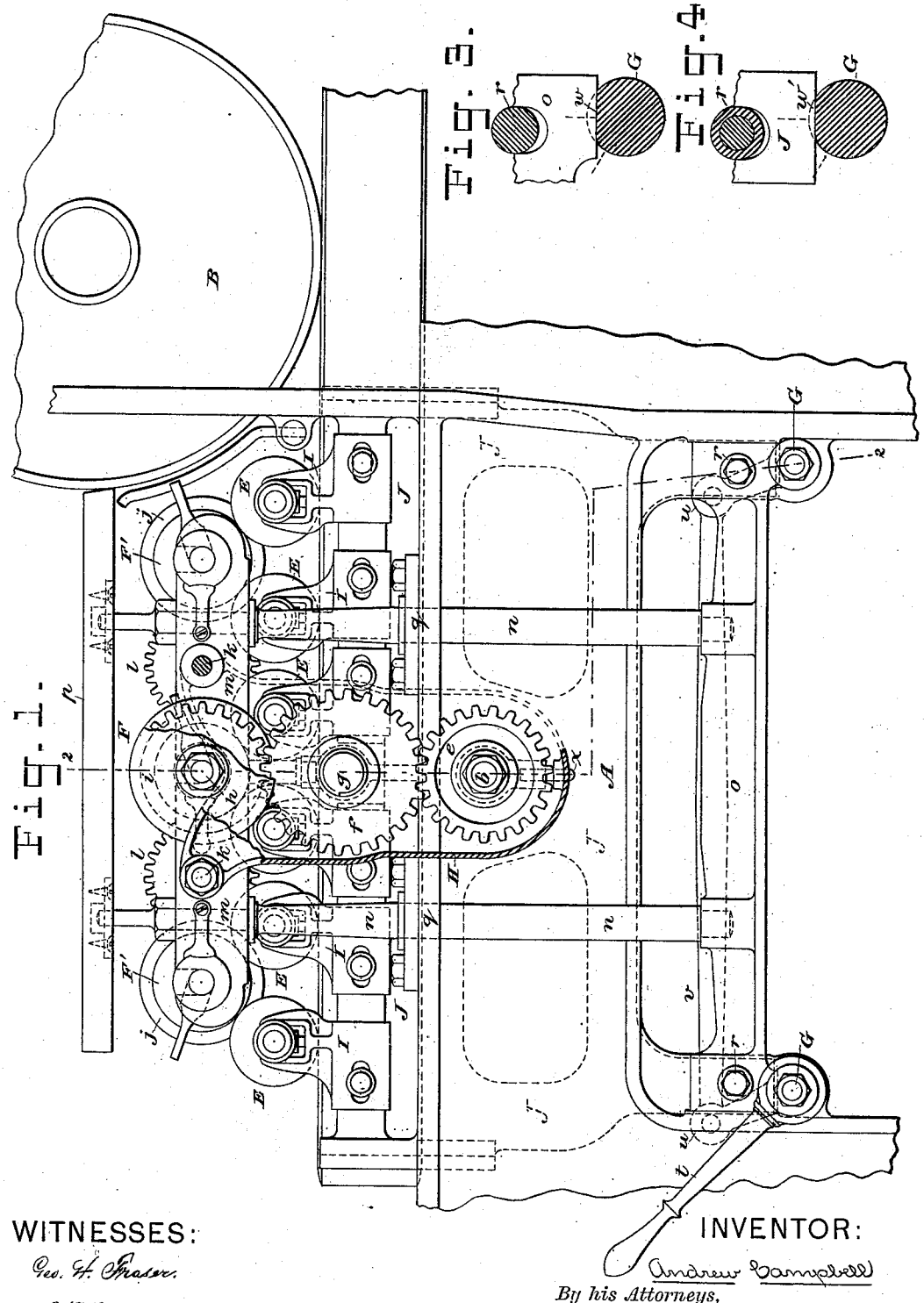

Fig. 1.

Fig. 3.

Fig. 4.

WITNESSES:

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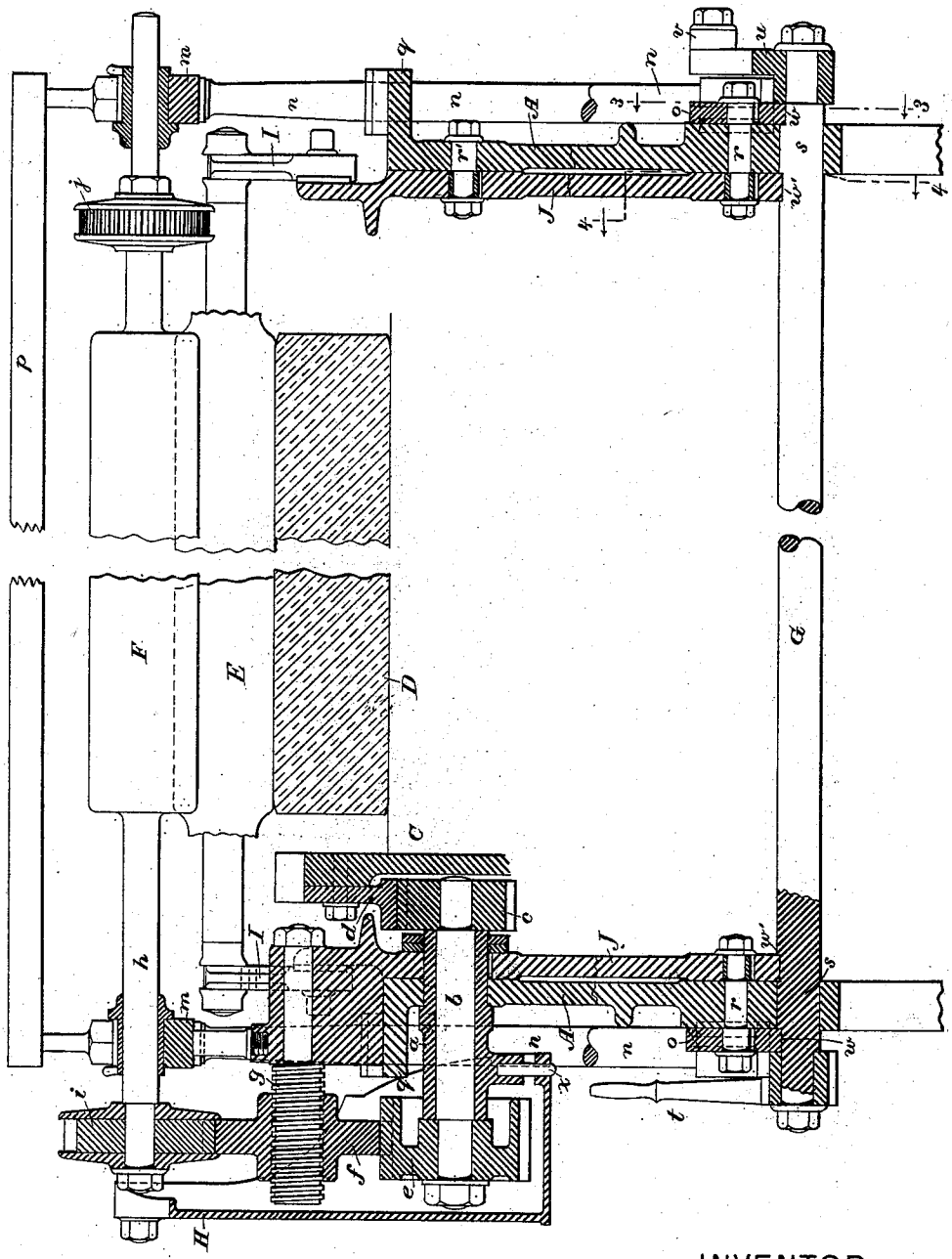
Fig. 2.



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UNITED STATES PATENT OFFICE.

ANDREW CAMPBELL, OF BROOKLYN, ASSIGNOR TO JOHN AND EDMUND McLOUGHLIN, BOTH OF NEW YORK, N. Y.

MECHANISM FOR RAISING THE ROLLERS OF PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 297,752, dated April 29, 1884.

Application filed September 11, 1883. (No model.)

To all whom it may concern:

Be it known that I, ANDREW CAMPBELL, a citizen of the United States, and a resident of Brooklyn, Kings county, New York, have invented certain Improvements in Mechanism for Raising the Rollers of Printing-Presses, of which the following is a specification.

My invention relates to mechanism for simultaneously raising and separating the form and distributing rollers of a printing-press, whereby they are relieved from pressure on each other and on the stone or form.

The main purpose of the invention is to provide a convenient means for thus relieving the rollers while the press is at rest, in order that they may rest wholly on their bearings with their surfaces out of contact with everything. When allowed to stand for a time, resting with its weight on the stone or form or on another roller, the face of the roller is liable to be flattened and made untrue.

My mechanism comprises a set of form-rollers, which have a slight play endwise, and a set of distributing-rollers arranged over these, which have the usual reciprocating end-play. Each set of rollers is mounted in a frame arranged to play vertically; but the frames move independently. Cam-shafts are provided, which, by a partial rotation, raise both sets of rollers slightly, the lower or form rollers high enough to clear the form, and the upper or distributing rollers high enough to clear the form-rollers when the latter are raised. The movement need not be sufficient to disengage the cog driving-gears, and the rollers may be lifted when the press is in operation.

In the drawings which serve to illustrate my invention, Figure 1 is a side elevation of a part of a printing-press provided with my improvements; and Fig. 2 is a vertical section taken, substantially, on line 2 2 in Fig. 1. Figs. 3 and 4 are cross-sections of the cam-shaft on a larger scale, showing the cams formed thereon. These are taken, respectively, on lines 3 3 and 4 4 in Fig. 2.

Let A represent the side frames of a printing-press; B, the printing-cylinder; C, the reciprocating bed; D, the lithographic stone or type-form, as the case may be; E E, the form-rollers, and F F′ the distributing-rollers. On the press-frame is formed or mounted a long bearing, *a*, to receive a shaft, *b*. On the inner end of this shaft is secured a gear-wheel, *c*, which meshes with a rack, *d*, on the bed C. Reciprocation of the bed imparts rotary motion to shaft *b* first in one direction and then in the other. On the outer end of shaft *b* is secured a broad-faced gear-wheel, *e*, which meshes with an intermediate nut-gear, *f*, which turns on a screw-threaded stud, *g*. The boss of the gear-wheel *f* is internally screw-threaded, and the rotation of the gear-wheel *f* first in one direction and then in the other causes the said gear-wheel to move axially along the stud, in and out. On the prolonged spindle *h* of the central distributing-roller, F, is fixed a flanged gear-wheel, *i*, which meshes with the intermediate nut-gear, *f*, and the said roller F is thus given a simultaneous rotary and endwise movement, as will be understood, which movements are simultaneously reversed, its endwise movement being due to the embracing of the wheel *f* between the flanges on the wheel *i*. In order to drive the other distributing-rollers, F′, from the intermediate roller, F, and to give them the same longitudinal movement, I mount on the spindles of the distributing-rollers flanged gear-wheels *j j*, and on rods *k k*, which extend across between the rollers, I mount, loosely, intermediate gear wheels or pinions, *l l*, which mesh with the wheels *j j*. These pinions *l* are free to slide on the rods *k*, and are caused to move axially with the wheels *j*, and so to remain in mesh therewith by their confinement between the flanges thereon.

Having thus briefly described the arrangement of the rollers, I will now describe the means for raising them, beginning with the distributing-rollers. These have bearings at both ends in bars *m m*, mounted on posts *n n*—two at each side of the press—which are connected at the bottom by bars *o o*. As the frames which bear the rollers are alike at each side of the press, it will only be necessary to describe one minutely. The posts *n* project up through the bar *m*, and a platform, *p*, is, by preference, mounted on their upward prolongations. They have bearings at *q* in a flange on the frame A, through which they slide when the rollers are lifted. The bar *o* has slotted bearings on studs *r* in the main frame.

G G are cam-shafts, which have bearings at

s s in the main frame, and are capable of being rocked in said bearings by means of a suitable lever, *t*. In order that both cam-shafts may be rocked simultaneously by one lever, the shafts are provided at one end with cranks or arms *u*, which are connected by a bar, *v*. Any kind of cams may be employed; but for simplicity I prefer to flatten a space on the cylindrical cam-shaft, as shown at *w* in Fig. 3, and arrange the bar *o* to rest on or over this flattened space when the distributing-rollers are at their lowest point. When the cam-shafts are slightly rotated or rocked, the higher surface of the cam-shaft is brought under the bar *o*, and the distributing-rollers are lifted.

The form-rollers E E (six being shown in Fig. 1) are mounted in frames arranged at each side of the press, the same as the distributing-rollers.

I I are the adjustable bracket-bearings for the rollers, which are secured to opposite plates, J J, arranged against the inner sides of the press-frames and guided on studs *r* and *r'*. The lower edges of these plates J J rest on cams *w'*, formed on the cam-shafts G precisely like the cams *w* for the frame which bears the distributing-roller, except that the throw or lift of the cams *w'* is less by about one-half than that of the cams *w*. The stud *g* is borne by the frame J, in order that the gear-wheel *f* shall be lifted half the distance of the gear *i*, and so keep the gears *f* and *i* always in mesh without necessitating the employment of unusually long cog-teeth.

As I have before stated, the lifting devices at both sides of the press are alike. I prefer, however, to arrange the lever *t* on one side of the press and the arms *u* and bar *v* on the other side, as shown in Fig. 2. This construction lifts the rollers simultaneously at both ends, and very evenly, as there are four cams *w* and four cams *w'*.

H is a shield to house the gearing, which is secured to the bar *m*, as indicated in Fig. 1, where a part of the shield is broken away to show the gearing. As this shield moves up and down with the distributing-rollers, it is guided at the bottom by a pin, *x*, set in the bearing *a*, or some other fixed part. The shield slides on this pin.

The drawings show the rollers lowered in their normal working position.

I am aware that it is not new to mount distributing-rollers in a frame and provide said frame with a lever whereby the said rollers may be lifted up clear of the form-rollers, and I am also aware that cams have been arranged to lift distributing-rollers off a revolving cylinder at proper intervals. These features I do not claim. My mechanism is designed to lift both sets of rollers simultaneously and to separate them at the same time. This requires that each set of rollers shall be mounted independently of the other.

Having thus described my invention, I claim—

1. In a printing-press, the combination, with the set of form-rollers and the set of distributing-rollers, each set mounted in movable bearings capable of being moved independently of the bearings of the other set, of the said bearings and means, substantially as described, for simultaneously lifting said movable bearings to different heights, whereby the form-rollers are lifted from the form and the distributing-rollers from the form-rollers, for the purposes specified.

2. In a printing-press, the combination of the form-rollers, a frame capable of vertical motion and affording bearings in which said rollers are mounted rotatively, the distributing-rollers, another frame bearing said distributing-rollers and also capable of vertical motion, and means, substantially as set forth, for lifting both said frames, and thereby lifting the form-rollers out of contact with the form and the distributing-rollers out of contact with the form-rollers, substantially as set forth.

3. The combination of the form and distributing rollers, mounted substantially as shown, the sliding frames in which said rollers are mounted, constructed and arranged substantially as shown, the cam-shafts G G, provided with cams *w w* and *w' w'*, and arms *u u*, and bar *v*, substantially as and for the purposes set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

ANDREW CAMPBELL.

Witnesses:

ARTHUR C. FRASER,

GEO. BAINTON.