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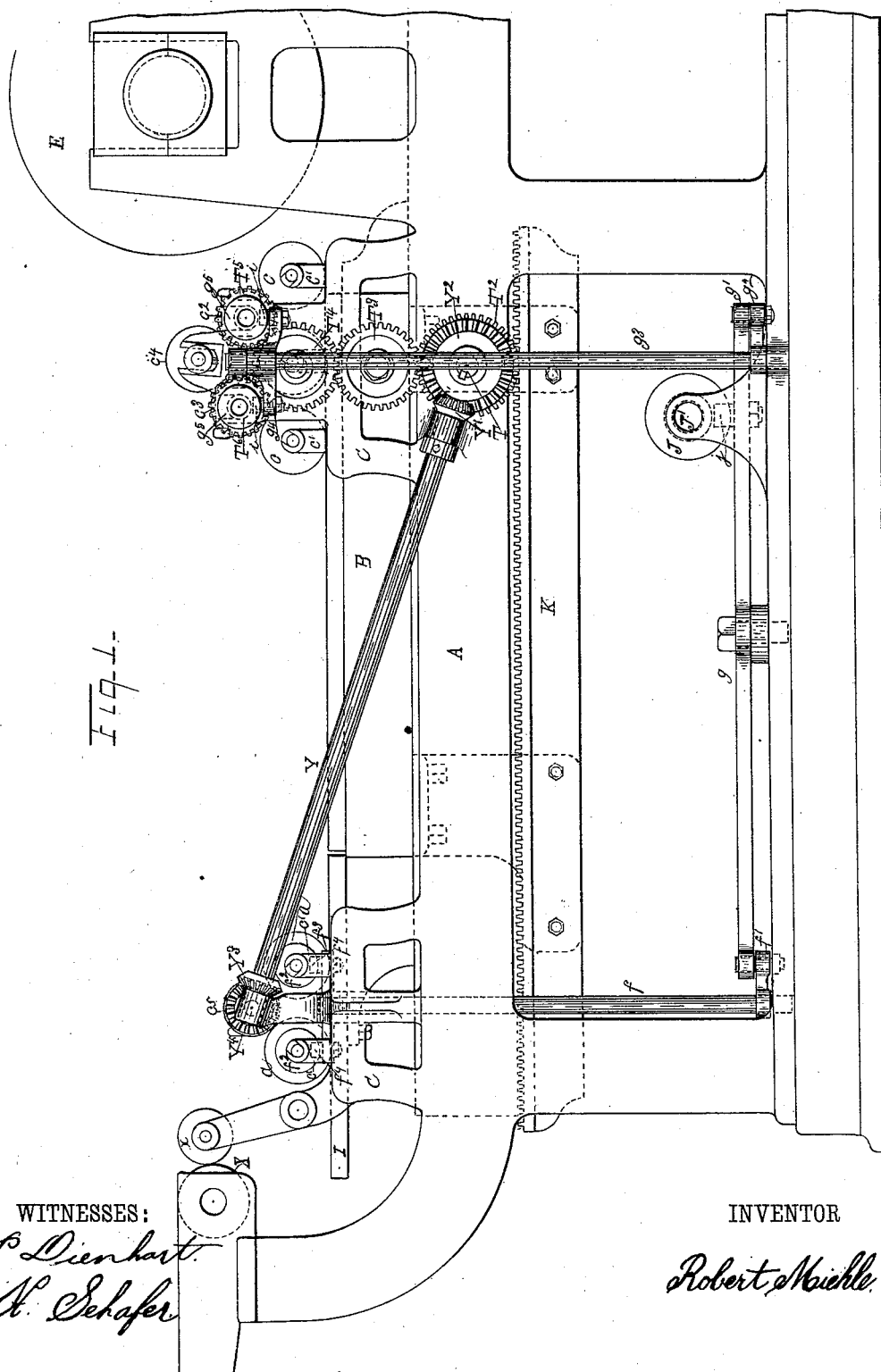
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R. MIEHLE.

INKING APPARATUS FOR PRINTING MACHINES.

No. 347,364.

Patented Aug. 17, 1886.



N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.)

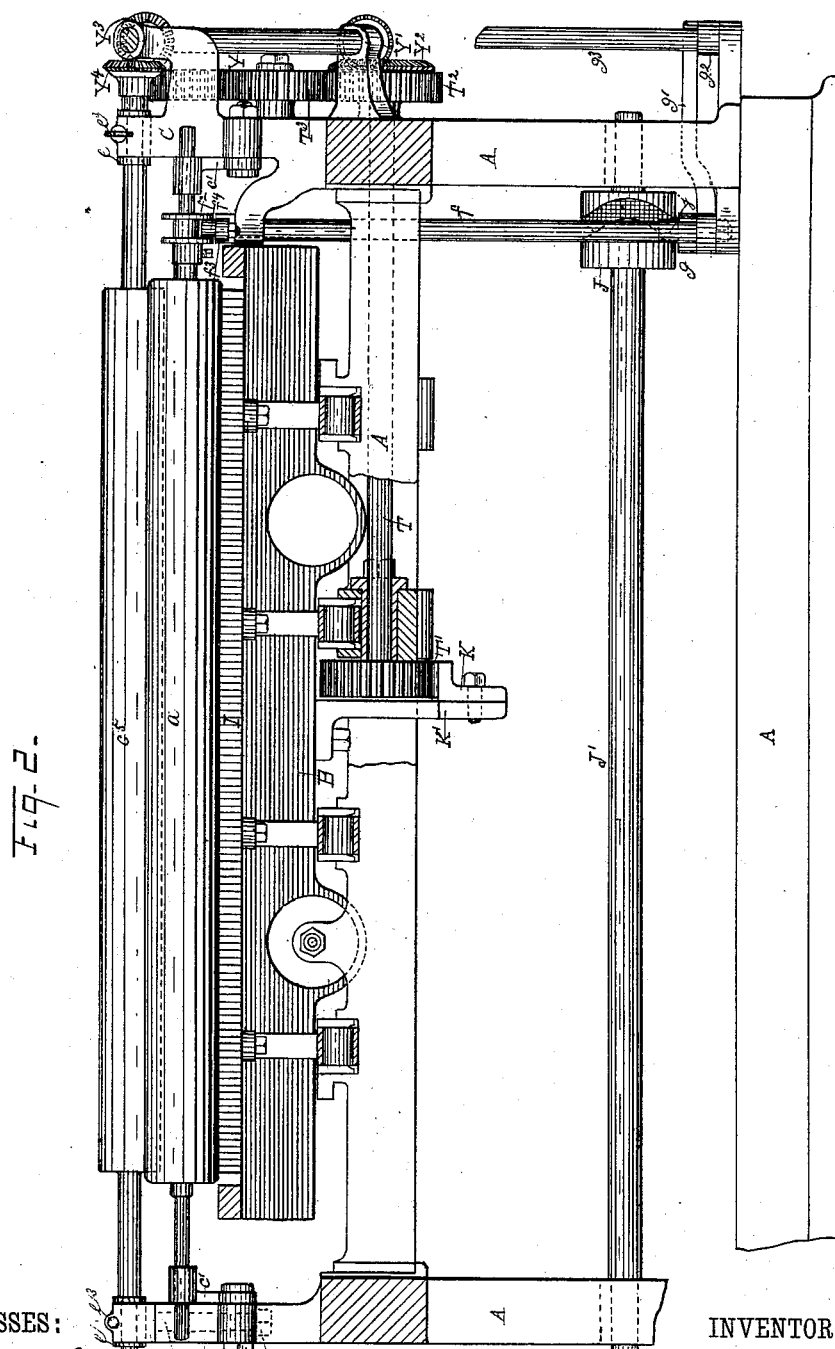
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WITNESSES:

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INVENTOR

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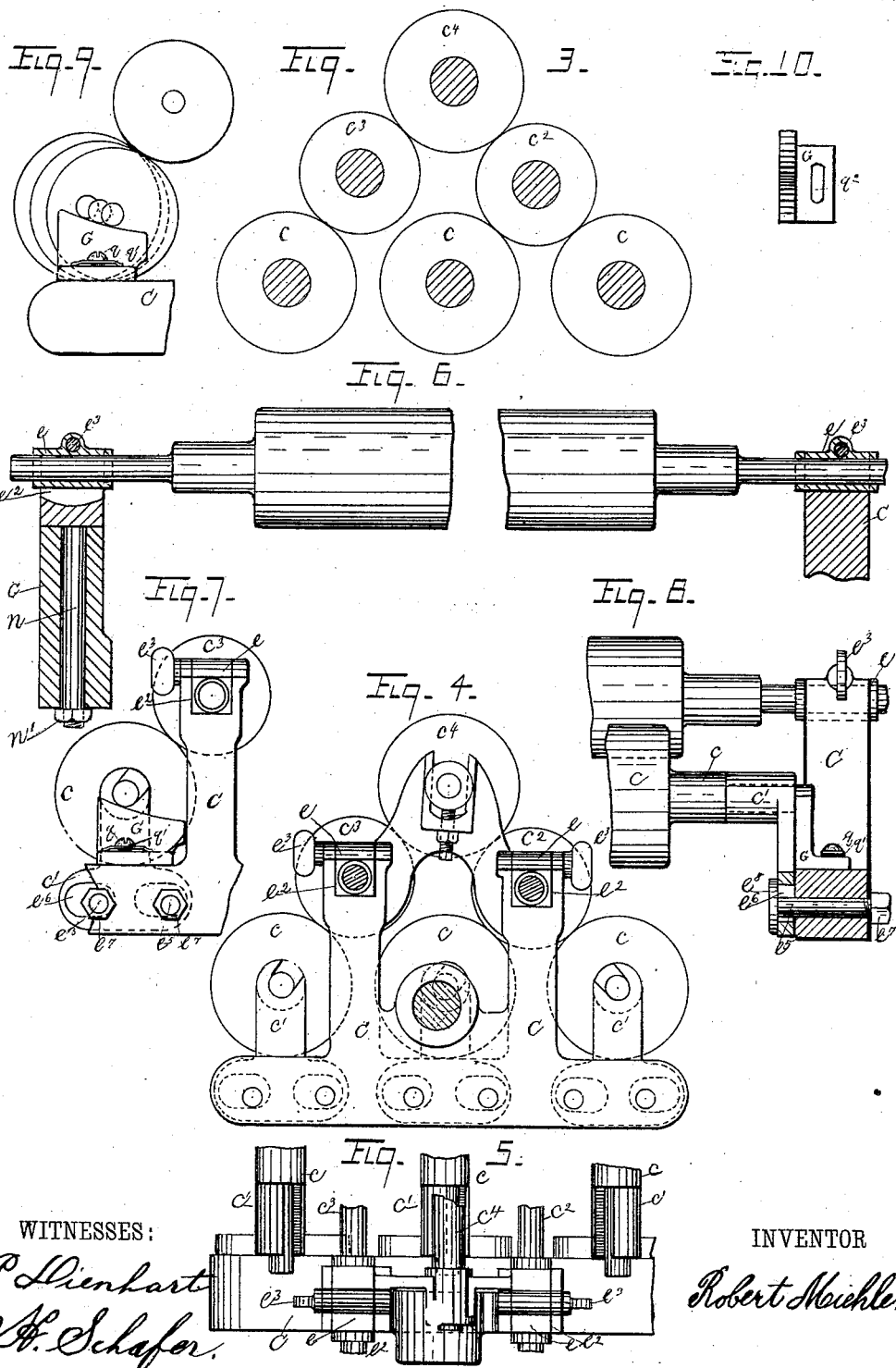
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UNITED STATES PATENT OFFICE.

ROBERT MIEHLE, OF CHICAGO, ILLINOIS.

INKING APPARATUS FOR PRINTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 347,364, dated August 17, 1886.

Application filed June 18, 1885. Serial No. 169,113. (No model.)

To all whom it may concern:

Be it known that I, ROBERT MIEHLE, a citizen of the United States, and a resident of the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Inking Apparatus for Printing-Machines, of which the following is a specification, to wit:

This invention relates to the inking apparatus of printing-presses, wherein the bed which contains the form is reciprocated.

The invention consists in the combination, with the bed and ink-table and the arrangement hereinafter described, of the rollers which distribute the ink upon the ink-table receiving a continuous motion synchronous with the full backward and forward movement of the bed.

It furthermore consists in other combinations of arrangements of parts, hereinafter fully described and claimed.

In the drawings, Figure 1 is a side view showing the gearing for operating the inking-rollers and their respective positions of the present improvement. Fig. 2 is a transverse vertical section of the same, showing the rollers for distributing the ink upon the ink-table, also the position of the rack for imparting motion to the inking-rollers. Fig. 3 is a sectional end view of the form-rollers and distributing-rollers which are mounted above the same. Fig. 4 is a sectional end view similar to Fig. 3, showing the bearings of the form-rollers and distributing-rollers with the line of section between the gearing and roller-frame. Fig. 5 is a plan view showing the ends of the rollers in their respective positions in relation with the roller-frame. Fig. 6 is a longitudinal view showing one of the riding-rollers with its central portion broken out to reduce its length, with the frame and bearings in section. Fig. 7 is a side view showing the inclined wedge in its proper position upon the frame for adjusting the form-rollers. Fig. 8 is an end view of the same. Fig. 9 is a side view showing the different positions of the form-rollers upon the inclined wedge when of different sizes. Fig. 10 is a top plan view of the inclined wedge.

The description of the parts which make up the several combinations of the arrangement herein claimed is as follows:

A designates the press-frame. This may be of any desired form. E is the cylinder in its usual position; B, the form-bed, which is reciprocated when in operation.

Upon the under side of the bed B are hangers K', having a rack, K, secured thereon, in which engages a pinion, T', upon the inner end of shaft T, the same being journaled into the press-frame A, as shown in Fig. 2, its outer end being provided with a gear, T², for communicating motion to gear T³, which engages gear T⁴. This gear in turn imparts motion to the riding (or distributing) rollers c² c³ by meshing with gears T⁵ T⁶ upon their outer ends, as shown in Fig. 1. These rollers have connections with the form-rollers c c c and distributing-roller c', as follows:

The rider c², as shown in Figs. 1, 3, and 4, is placed above and engages the form-roller c nearest the cylinder and center form-roller c, so as to impart a turning movement to both. The other roller, c', is slightly raised and engages the outer form-roller c, as clearly indicated in Fig. 3, the distributing-roller c' serving to make connection between the riding-rollers c² and c³, so that the ink will be distributed equally upon all the rollers after the form-rollers c c c have rolled upon the ink-table I.

The side vibrating movement for the riding-rollers c² c³ is obtained by means of the cam J upon shaft J', which imparts an oscillatory movement to the vertical shaft g³ through the medium of rock-lever g, the stud j thereon engaging into groove of cam J, as shown in dotted lines in Figs. 1 and 2, the link g' making a connection between the lever g and crank-arm g² upon the lower end of shaft g³. The same is provided with a cross-lever, g⁴, upon its upper end, having studs i i, which engage the grooved collars g⁵ g⁵ upon the outer ends of roller c² c³, as shown in Fig. 1. The groove of cam J is such that it will with one revolution rock the lever g, so as to impart one oscillatory movement to the vertical shaft g³ while the bed is moved in both directions of its full length of stroke, the shaft J' receiving its movement from the main driving-shaft, or by any other suitable means. This part of the press mechanism it was thought unnecessary to show.

The following is a description of the rollers which distribute the ink upon the ink-table and the mechanism by which they receive their sidelong vibratory movement: I designates the ink-table, which is mounted upon the forward end of the bed B, its upper surface being flush with (or a trifle higher than) the type (or printing) surface, and in the frames C are mounted rollers *a a*, which lie parallel with the ink-table I, (or the line of movement thereof,) their position being such that the inner roller *a* toward the cylinder E will pass over the ink-table I as much as to just clear the printing-surface when the bed B has received its extreme forward movement. The duty of these rollers is to distribute the ink upon the ink-table when received from the transfer-roller *x*, which engages the fountain-roller X, and the riding-roller *c*², which engages the distributing-roller *a a*, as shown in Fig. 1. The cam J, which is employed to impart the sidelong movement to the riders *c*² *c*³, is also used to impart movement in like manner to the distributing-rollers *a a* by the extension upon rock-lever *g*, which engages the crank-arm *f'* upon the lower end of the vertical shaft *f*, (this shaft is placed upon the inner side of the press-frame A, as shown clearly in Fig. 2,) the said shaft having upon its upper end a cross-lever, *f*³, provided with studs *f*⁴, which engage the grooved collars *f*² upon the rollers *a a*, which, when the shaft *f* is oscillated, impart a sidelong movement to the same.

It will be seen by the above description that the sidelong movement of the rollers *a a* and the riding-rollers *c*² *c*³ are identical; but this movement may be somewhat varied from the above by forming the groove of cam J to impart any additional number of movements desired. It would then be necessary to provide a separate cam for the distributing-rollers *a a*, as one oscillatory movement of the vertical shaft *g*³ is sufficient for vibrating the rollers *c*² *c*³.

The continuous motion of the rollers *a a*, with the movement of the bed B, as mentioned in the first part of the specification, is obtained by means of the riding-roller (or cylinder) *c*⁵, which has a position above the rollers *a a*, so as to engage and impart a turning movement to the same, the roller *c*⁵ receiving its movement from the shaft Y by the bevel-gear Y¹ upon the outer end of roller *c*⁵, which meshes with the bevel-gear Y³ upon the upper end of shaft Y, as shown in Figs. 1 and 2. This shaft is set somewhat at an angle from a horizontal line, to connect with and receive a turning movement from the shaft T by the bevel-gear Y¹ upon the lower end of shaft Y, meshing with bevel-gear Y² upon the outer end of shaft T, the same receiving movement by engaging rack K upon the bed B with pinion T, which is secured upon its inner end. In practice the gearing between the roller *c*⁵ and rack K should be proportioned to communicate a mo-

tion to the rollers *a a*, which will be synchronous with the movement of the bed.

It is evident that a belt or chain may be used instead of the shaft Y and bevel-gearing between shaft T and roller *c*⁵, if it be desirable to modify the above arrangement, and not depart from the spirit of the invention. In some cases a side vibratory movement may be given to the roller *c*⁵. In such cases the bevel-gear Y¹ would be fitted with a key-seat, (or slot,) so as to slide endwise upon a spline placed upon the roller *c*⁵. The gear Y¹ would then be housed in at either side, to keep it in its proper position with the bevel-gear Y³.

In order to describe the means by which the riding-rollers *c*², *c*³, and *c*⁵ are held in their respective positions, I will describe the arrangement of but one, as the same arrangement is used for all three riding-rollers. Upon each end of the roller (or the stocks thereof) is a sleeve, (or bush,) *e*, which is fitted into slots *e*² of the roller-frame C. The same are held in place by the pins *e*³, as shown in Figs. 4 and 6.

To allow the riding-roller being easily removed, one of the pins *e*³ is provided with a screw-thread, which, when the roller is to be removed, allows the pin to be readily taken out and again replaced when the roller is put back.

When the roller-gearing which communicates motion to the inking-rollers is placed at the inner side of the frame C, both the pins *e*³ of each distributing-roller may be made removable, and also the vertical pin *n* may be placed at each end of said rollers, and the attendant may then raise either side, as the distributing-rollers are not always removed from the press when it is necessary to remove the form-rollers *c*. In such cases one end of the distributing-roller may be raised and placed upon the usual bracket provided therefor, the screw serving to keep the pin from working out when properly fastened. Still it is not necessary that the one pin *e*³ should be provided with a screw-thread, as it may be provided with a spring-catch, which would serve as well, and could then be more easily removed.

When the form-rollers *c c c* and the rollers *a a* are to be removed, the thumb-screws *e*³ are withdrawn from the frame C, and one end of the riders raised out from the slots *e*². The other ends may be then withdrawn from the opposite sleeve, which is secured into the frame C. The rollers *c c c* and *a a* may then be lifted out, as the sockets *c'* in which they are held are open at the top, this operation being reversed when the rollers are replaced, and to allow the riding-rollers *c*², *c*³, and *c*⁵ to be moved in any direction. When one end is raised, there is provided an extra joint upon one end by the pin *n*, formed upon the under side of the slot *e*², or that portion of the frame C which forms the same. The same passes down through the frame C, and is held in place by the nut *n'*, as shown in Fig. 6 and in the dot-

ted lines in Fig. 2. This joint prevents the sleeves *c* from binding while withdrawing the rollers or replacing them.

The sockets, (or bearings) *c'*, for the rollers *cc* 5 *c* and rollers *a* are formed with two elongated slots, *e'*, and are held in place by the bolts *e'*, which pass through the slots *e'* and also through frame C. When the nuts *e'* are drawn up tight against the frame C, the flanges *e'* upon 10 the bolts *e'* serve to clamp the sockets *c'* firmly in place.

To adjust the form-rollers *c c c* properly with the riding-rollers *c' c'* and the printing-surface which they roll upon, there is provided an inclined wedge, G, which is held upon the frame 15 C by the screw *g*, and has a position just below the outer portion of the stocks (or journals) of each of the rollers *c c c*, which extend outward from the sockets *c'*, as shown in Figs. 7 20 and 8. The incline of the wedge is such that when any of the rollers *c c c* are pressed against the riding-roller they will also be adjusted automatically with the surface they are to roll upon, which will be readily understood by 25 referring to Fig. 9. In this figure the form-roller is represented in three different sizes when being of a full size, medium, and a small size, this being due to the fact that these rollers are made of composition which has a great 30 tendency to shrink, and when such shrinkage occurs it is only necessary to loosen the nuts *e'* upon the bolts *e'*, and allow the roller to slide down the incline until it comes in contact with the riding-roller. The socket *c'* is 35 then brought to bear against the journal of the roller *c* with sufficient pressure, so that the roller *c* will properly bear against the riding-roller, after which the nuts *e'* are brought up, so as to firmly clamp the socket *c'* against 40 frame C, the inclined wedge G, as heretofore stated, serving to adjust the roller properly with the printing-surface with the same pressure as it has against the riding-roller; and to prevent the incline being worn off by the end 45 of the roller-journal, which rests upon the same, the wedge G is provided with an elongated slot, *q'*, for the screw *g*, as shown in Fig. 10, so that the same may be drawn back after the roller has been adjusted, the spring 50 *g'*, as shown in Figs. 7, 8, and 9, serving to hold the wedge G in place while adjusting the roller or when disengaged from the same.

The advantage the removable inclined wedge G, just described, has over the automatic device heretofore used for adjusting the rollers 55 is, by being made independent and removable of the roller-socket, it always preserves the proper incline for adjusting the form-rollers *c*, regardless of the wear upon the socket and 60 journal thereof.

What I claim is—

1. In a printing-press, the combination of three form-rollers set at equal distances apart, or nearly so, and three distributing-rollers 65 placed above the same, with but one of the distributing-rollers having engagement with two

form-rollers, and one of said distributing-rollers being slightly raised, so as to engage but one form-roller, the other one of the said distributing-rollers making a connection between 70 all six rollers, substantially as described.

2. In a printing-press, the combination, with the reciprocating type-bed, ink-table, and a series of form-rollers which receive the ink from the ink-table to deposit the same 75 upon the form, of the distributing-rollers *a a*, having a riding-roller above the same for imparting a continuous motion to said distributing-rollers by mechanism, substantially as described, whereby the said distributing-rollers 80 will receive a turning movement, which is at all times the same as the back and forward movement of the said bed, the position of the said distributing-rollers being such that they will just pass over the ink-table, substantially 85 as described.

3. In a printing-press, the combination, with the bed B, ink-table I, distributing-rollers *a a*, riding-roller *c'*, of the shafts Y and T, having bevel-gear connections, and the shaft T, 90 having a pinion engaging rack K, substantially as and for the purpose set forth.

4. In a printing-press, the combination, with the roller-frame and form-rollers, of the distributing or riding roller having its bearing 95 provided with a pivot to allow of the same being raised at one end, substantially as described.

5. In a printing-press, the combination, with the roller-frame and form-rollers, of the distributing or riding roller having its bearing 100 and bearing-support each provided with a pivot to allow of the said roller being raised at one end, substantially as and for the purpose set forth.

6. In a printing-press, the combination of 105 the frame C, roller *c*, and the distributing or riding roller having sleeves or journal-boxes *e*, and inserting-pins *e'*, one of which is provided with means, substantially as described, for securing it in the frame C, as and for the 110 purpose set forth.

7. In a printing-press, the combination of the frame C, roller *c*, distributing or riding roller having sleeves or journal-boxes *e*, and inserting-pins *e'*, one of which is provided 115 with means, substantially as described, for securing it in the frame C, and the vertical joint-pin *n*, formed upon the portion of the frame C in which the said journal-box is held, as and for the purpose set forth. 120

8. In a printing-press, the combination, with the frame C, distributing or riding roller, the form-roller *c*, and the socket and journal thereof, of the inclined wedge G, being removable 125 so as to be independent of the socket and journal of the said form-roller *c* after the same has been adjusted, substantially as described.

9. In a printing-press, the combination, with the frame C, distributing or riding roller, the form-roller *c*, and the socket and journal thereof, of the inclined wedge G, having an elongated slot, *q'*, and screw *g*, the said incline G 130

being removable, so as to be independent of the socket and journal of the said form-roller *c* after the same has been adjusted, substantially as described.

- 5 10 In a printing-press, the combination, with the frame C, distributing or riding roller, the form-roller *c*, and the socket and journal thereof, of the inclined wedge G, being provided with an elongated slot, *q*², screw *q*, and the

holding-spring *q*', substantially as described, 10 and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ROBERT MIEHLE.

Witnesses:

A. W. GROM,
H. SCHAFER.