

(No Model.)

2 Sheets—Sheet 1.

# J. BROOKS. CYLINDER PRINTING PRESS.

No. 455,386.

Patented July 7, 1891.

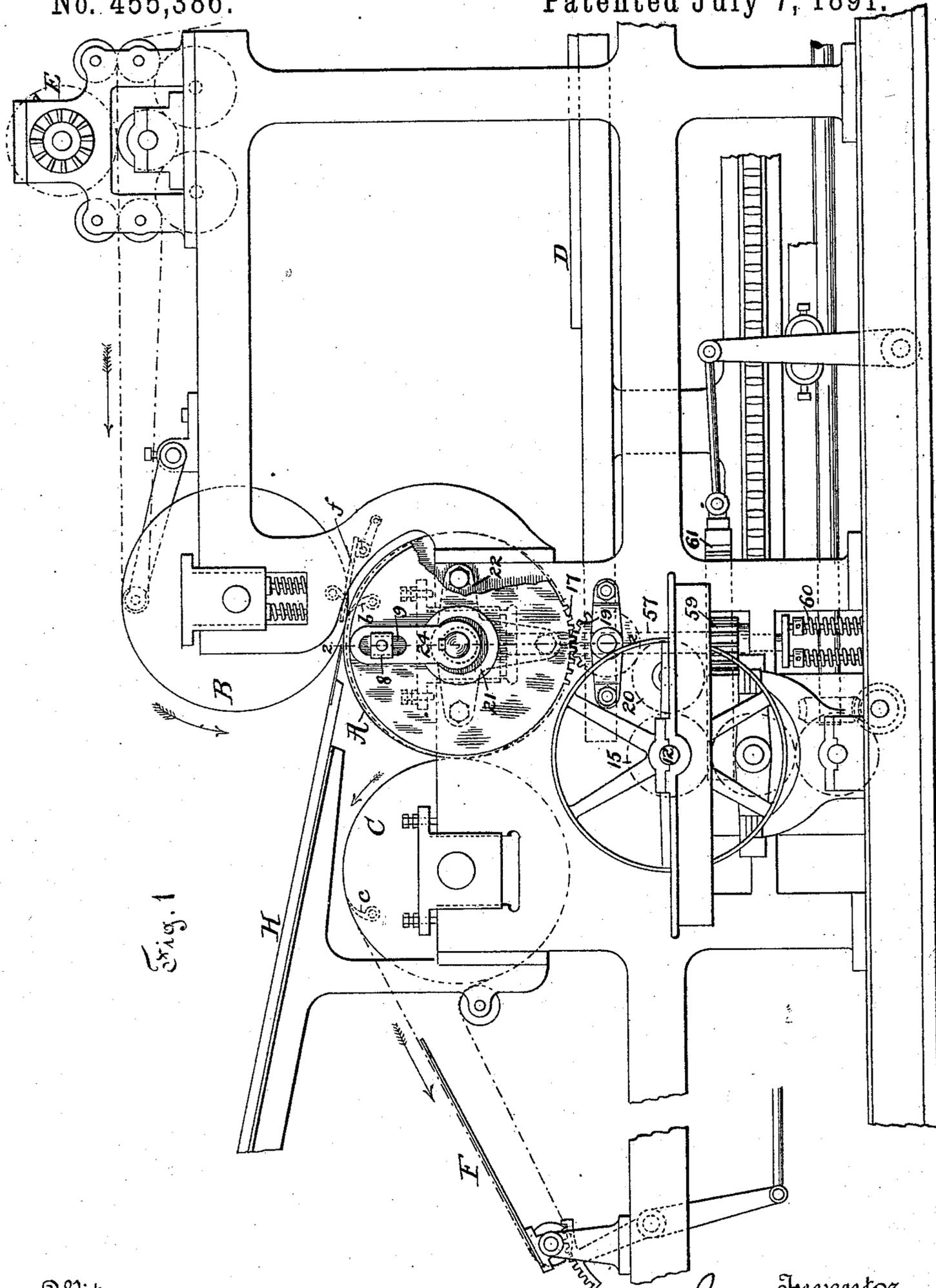


Fig. 1

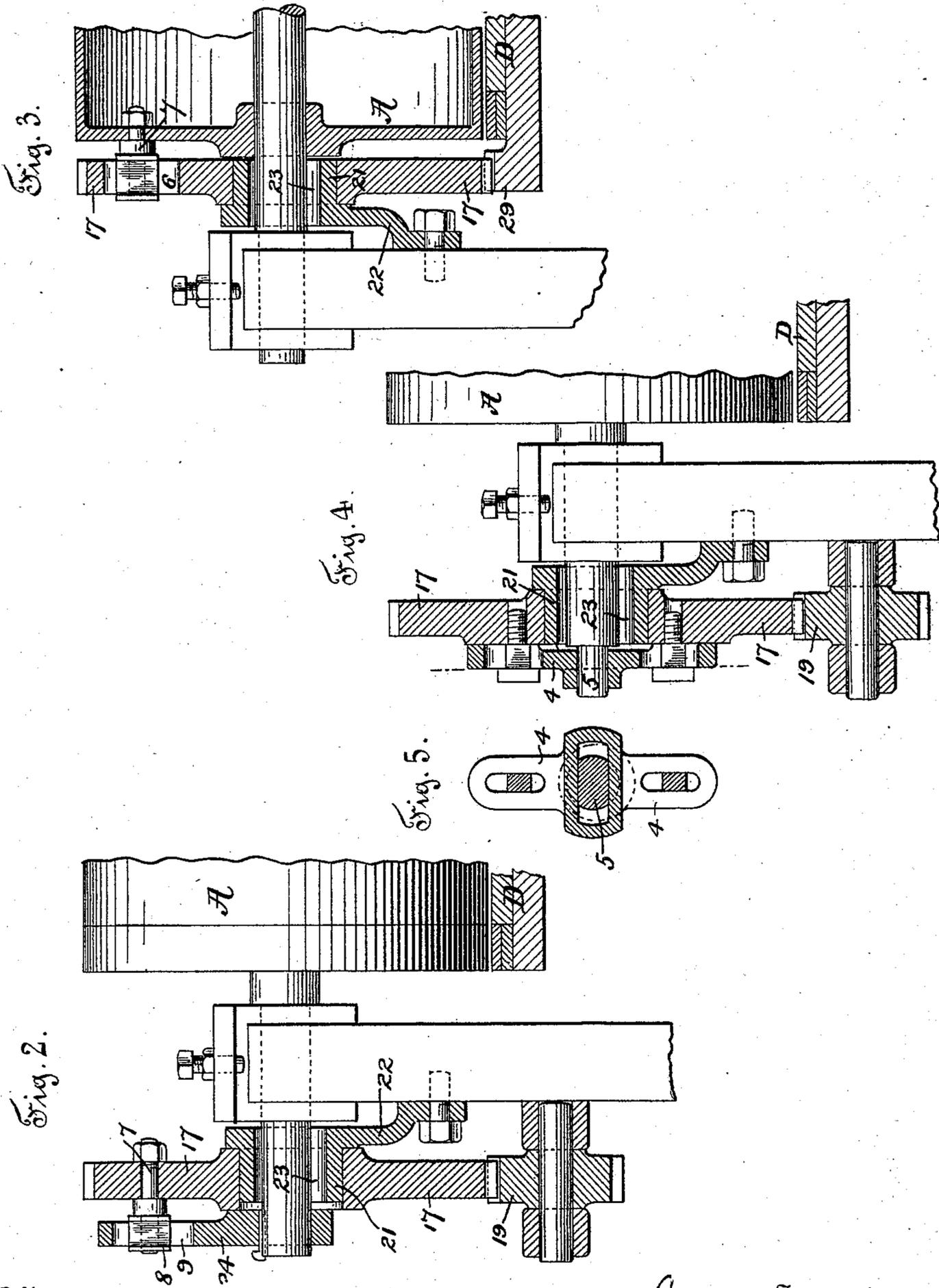
Witnesses  
 Chas. Hanimann  
*E. H. Graham*

Inventor  
*John Brooks*  
 By his Attorney  
*Ras. W. Fisher*

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# UNITED STATES PATENT OFFICE,

JOHN BROOKS, OF PLAINFIELD, NEW JERSEY.

## CYLINDER PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 455,386, dated July 7, 1891.

Application filed December 3, 1890. Serial No. 373,399. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN BROOKS, a citizen of the United States, residing at Plainfield, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Cylinder Printing-Presses, of which the following is a specification.

This invention relates, generally, to cylinder printing-presses, and more particularly to that class of such presses that are known in the art as "two-revolution presses," in one form of which the cylinder has continuous rotary motion and in another form has oscillating motion. In this class of cylinder-presses the impression-cylinder makes one revolution in contact with the form and its second revolution idly or out of contact with the form, and this effect has been produced by imparting a rising-and-falling movement to the impression-cylinder, by which, when it is raised, it revolves out of contact with the form and when lowered in contact therewith. In this rising-and-falling movement of the impression-cylinder in presses heretofore constructed it has resulted in the inaccurate register of the sheets with the form, by reason of the lost motion which occurs between the gearing of the impression-cylinder and that of its driver—such as a pinion or rack—which, in order to accommodate the vertical movements of the cylinder, necessarily vary as to the depth of engagement of the intermeshing teeth of the gears or gear and rack.

The object of the present invention is to obviate this defective registry of the sheets, to overcome the lost motion referred to between the intermeshing teeth of the gearing, and to enable the impression-cylinder to take the sheets accurately and present them in accurate register to the form.

To this end the invention embraces the novel features hereinafter fully set forth.

The accompanying drawings illustrate the invention with one type of a two-revolution cylinder-press, said type of press being merely taken for the purpose of illustrating the invention, and not in any manner limiting the invention to an embodiment therewith, as it is obvious that the invention is equally applicable to other types of presses wherein a cylinder subjected to changed positions is re-

quired to make accurate register with another device, such as a form.

In said drawings, Figure 1 is a side elevation of so much of a cylinder-press embodying the invention as is necessary to a proper understanding thereof. Fig. 2 is an enlarged central transverse sectional elevation of a portion of the press on the line 2 2 of Fig. 1. Figs. 3 and 4 are similar views showing modified structures. Fig. 5 is a detail elevation of a portion of Fig. 4.

Heretofore it has been proposed in double-cylinder and other presses to obviate the lost motion between the gear of the impression-cylinder and that of its driver by the interposition of two intermediates between the driving-pinion and the cylinder-gear, involving the use of three gears outside of the driver, as instanced in Letters Patent No. 437,417, granted to me September 30, 1890. By the present invention such gearing is entirely dispensed with and the connection between the intermediate toothed wheel and the cylinder-shaft is had by the simple coupling device hereinafter described. The present construction, as will hereinafter appear, provides a simple and direct means of effecting the same result, and while the coupling device herein described and claimed may be modified within wide limits it is to be understood that it excludes as its equivalent gearing such as is set forth and claimed in said Patent No. 437,417.

Referring to said drawings, particularly to Figs. 1 and 2, it will be understood that the cylinder-press illustrated consists of an impression-cylinder A, mounted in suitable bearings in the frame-work B and having grippers *b* for taking the sheet, a delivery-cylinder C, with grippers *c*, to which the sheet is delivered from the grippers of the impression-cylinder, and a delivering mechanism—such as a fly F—for delivering the sheets upon a table. It also embraces a type or form bed D, reciprocating by the usual mechanism beneath the impression-cylinder, which mechanism need not be particularly specified, as the same is of the character shown and set forth in Letters Patent No. 413,491, granted to me October 22, 1889. The sheets may be delivered to the grippers of the impression-

cylinder and to a common feed-gage *f* either from a feed-table H or by an automatic sheet-feeding mechanism from a web leading to a sheet-conductor B, with an interposed severing mechanism E, as is set forth in an application filed by me April 19, 1890, Serial No. 348,716, to which no claim is herein made. The impression-cylinder, as usual, is raised and lowered by the reciprocation of a rack 61, that meshes with a horizontal pinion 59, carrying a nut engaging with a screw-threaded rod 57, that is arranged vertically in bearings in the frame-work and seated upon spiral springs 60, with its opposite end bearing against the under side of the box carrying the journal of the impression-cylinder, as is fully described in said Patent No. 413,491, which mechanism is duplicated upon the other side of the press for simultaneously acting upon both ends of the impression-cylinder.

In consequence of the rising and lowering movement imparted to the impression-cylinder by the mechanism just described, it results that the teeth of the gear usually fast to the impression-cylinder shaft and in mesh with a driver—such as a pinion 19, (which is driven in the present instance from the driving-shaft 12 through pinions 15 and 20)—changes their degree of meshing with the teeth of said driving-pinion, so as to cause more or less lost motion between the intermeshing teeth. In order to obviate this, the present invention employs an intermediate toothed wheel 17, of the same pitched diameter as that of the cylinder, but instead of being secured to the cylinder-shaft is mounted to rotate loosely upon a fixed hub 21, that projects from a bracket 22, fast to the side frame. This hub 21 is provided with an enlarged perforation 23 to surround the shaft of the impression-cylinder and to permit such shaft to move vertically up and down in the hub without obstruction. This toothed wheel 17 is in gear with the pinion 19 and through it and the pinions 20 and 15 with the driving-shaft 12, and thus said gear-wheel 17, being mounted independent of the impression-cylinder and not partaking of its vertical movements, is in constant mesh with its driving-pinion 19.

Motion is imparted from the toothed wheel 17 to the cylinder-shaft by any suitable connection or coupling device that will permit the vertical movement of the cylinder and its shaft without destroying its connection with said gear-wheel 17. Thus, as shown in Figs. 1 and 2, the shaft of the impression-cylinder is provided with an arm 24, rigidly connected with the impression-cylinder shaft and having near its outer end a radial slot 9, in which slides a box 8, carrying an inwardly-projecting pin 7, that takes into a perforation in the toothed wheel 17. By reason of the loose connection between the pin 7 and the arm 24 said arm, the cylinder, and its shaft may move up and down independent of the pin,

and yet by reason of the pin be in constant and fixed engagement with the toothed wheel 17. In lieu of this construction of coupling device, as shown in Fig. 3, the pin 7 may be permanently carried by the impression-cylinder and bear against a flange or between a pair of flanges 6, projecting from the inner side of the intermediate wheel 17. In both instances described it will be apparent that the arm 24 or impression-cylinder is connected with the intermediate wheel 17, so that the cylinder may move vertically without breaking such connection or changing its positive and constant coupling of the intermediate wheel with the impression-cylinder. The same result is also effected in Fig. 4, wherein the arm 24 is entirely dispensed with and the impression-cylinder shaft is squared at 5 to enter a horizontal slot in a bar 4, carried by the intermediate wheel 17, the connection between the bar and the intermediate wheel being slotted to allow movement of the cylinder-shaft and to enable the bar to accommodate itself to such movement.

It is obvious that instead of continuously driving the intermediate wheel 17 by means of the pinion 19 and its immediate connections said wheel may be oscillated, as for instance, by a rack 29, (shown in Fig. 3,) which rack will, as usual, be provided on the side of the form-bed.

While a specific mode of varying the position of the impression-cylinder is shown and described, it is to be understood that such mode may be varied without departing from the invention, the latter being equally applicable to other modes of effecting the same result.

What is claimed is—

1. The combination, with a cylinder having vertical movements to and from a coating instrumentality, such as the form-bed, of a driver, an intermediate wheel in constant mesh with the driver and fixed with respect to the vertical movements of the cylinder, and a coupling device connecting said intermediate wheel with said cylinder, substantially as described.

2. The combination, with a cylinder having vertical movements to and from a coating instrumentality, such as a form-bed, of a driver, an intermediate wheel in constant mesh with the driver and fixed with respect to the vertical movements of the cylinder, and a slidable coupling device connecting said intermediate wheel with said cylinder, substantially as described.

3. The combination, with a cylinder having vertical movements to and from a coating instrumentality, such as a form-bed, of a driver, an intermediate wheel mounted normally concentric with the axis of said cylinder and in constant mesh with the driver, and a coupling device connecting said intermediate wheel with the cylinder, substantially as described.

4. The combination, with a cylinder having

vertical movements to and from a form-bed,  
of a driver, a fixed hollow hub surrounding  
the shaft of the cylinder, an intermediate  
wheel mounted loosely on said hub and in  
5 constant gear with the driver, and a coupling  
device connecting said intermediate wheel  
with said cylinder, substantially as described.

5. The combination, with a cylinder having  
vertical movements to and from a form-bed,  
10 of a driver, an intermediate wheel in constant  
mesh with the driver, a pin connecting the  
cylinder with said wheel, but permitting the  
cylinder to change its vertical position irre-  
spective of said wheel, substantially as de-  
15 scribed.

6. The combination, with a cylinder having

vertical movements to and from a form-bed,  
of a driver, an intermediate wheel in constant  
mesh with the driver, an arm carried by the  
cylinder-shaft, and a pin connecting the arm 20  
and intermediate wheel together, but permit-  
ting the arm and cylinder to move vertically  
irrespective of said wheel, substantially as  
described.

In testimony whereof I have set my hand, 25  
in the presence of two witnesses, this 29th day  
of November, 1890.

JOHN BROOKS.

Witnesses.

GEO. H. GRAHAM,  
N. MARLER.