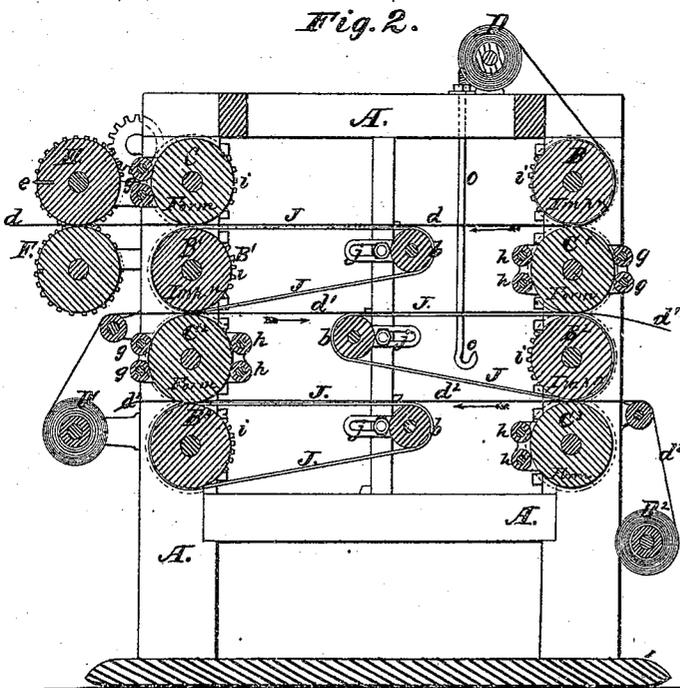
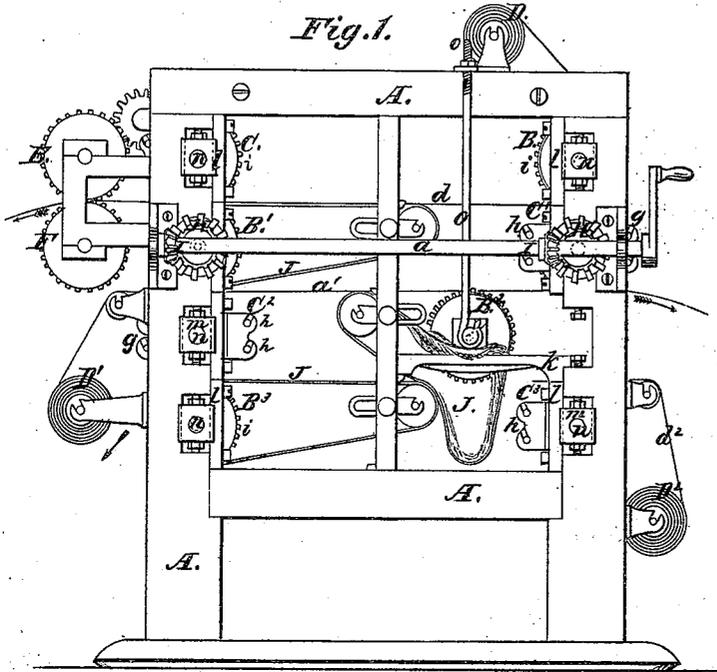


Hoe & Tucker. Sheet 1. 2. Sheets  
 Printing Press.

N<sup>o</sup> 92,050.

Patented Jun. 29, 1869.



Witnesses.

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# United States Patent Office.

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Letters Patent No. 92,050, dated June 29, 1869.

## IMPROVEMENT IN PRINTING-PRESSES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that we, RICHARD M. HOE and STEPHEN D. TUCKER, both of the city, county, and State of New York, have invented certain new and useful Improvements in Printing-Machines; and we do hereby declare the following to be a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of our improved machine.

Figure 2 is a vertical sectional view.

Figures 3 and 4 represent our machine as constructed with three cylinders in each series, the operation of which will be fully set forth hereafter.

Similar letters of reference indicate like parts in the several drawings.

Our invention consists—

First, in so arranging and combining with each other, two series of alternating form-cylinders and impression-cylinders, with the necessary inking-machinery, that any described number of rolls of paper or succession of separate sheets may be printed on both sides in passing once through the machine;

Second, in applying to the impression-cylinders a travelling-blanket, in the form of an endless web or apron, instead of applying it to the surface of the cylinder as heretofore, whereby a greater surface of blanket can be employed, so that the "set-off" from the printed side of the paper, being distributed over this larger surface of blanket, will consume a correspondingly longer time before it can become sufficient to react injuriously on the paper;

Third, in so arranging the travelling-blanket that it will aid in sustaining the paper as it passes from one series of cylinders to the other;

Fourth, in combining the travelling-blankets with a series of form and impression-cylinders; and

Fifth, in mechanism for sustaining the cylinders, whereby they can be easily and quickly removed and replaced, when it is required to change the form or blanket, or for any other purpose.

To enable others skilled in the art to make and use our invention, we will describe the construction and operation of the same.

A represents the frame-work of the machine, so constructed as to properly hold and support the various operative parts.

In the sides of this frame are arranged suitable bearings *m m*, for the journals *n n* of the impression-cylinders *B B'* and form-cylinders *C C'*. The cylinders of each series are connected together by gear-wheels *i i*, secured on their journals, through the medium of which the proper movements are communicated to each cylinder.

On the ends of the journals of the cylinders *B' C'*

are secured two bevel-gears *H H*, which are driven by the pinions *I I* on the shaft *a*, through which the necessary power is applied to operate the machine.

The form-cylinders *C C' C''* are provided with the necessary inking-apparatus *g g h h*, and the impression-cylinders *B B' B''* are furnished with travelling-blankets *J J*.

These blankets are made in the form of an endless band, of the same width as the cylinders around which they pass, and are held in proper position by the rollers *b b b*, which, furnished with adjustable bearings *f f*, hold the blankets at all times at the proper tension, and support the paper in its passage to the next pair of cylinders.

Suitable bearings or supports for the rolls of paper, *D D' D''*, are arranged upon the frame, and proper mechanism, of a form similar to that now in use in printing-machines, is attached to and combined with the machine for each roll of paper, when rolls are used, for separating the sheets from the rolls as they are printed.

The machine being provided with the necessary attachments of sheet-fliers, receiving-tables, inking-apparatus, &c., connection is made with the driving-power, and the operation proceeds as follows:

The sheet *d* from the first roll passes around the impression-cylinder *B*, and receives an impression on its undersurface from the form-cylinder *C'*. The sheet then passes through to the opposite set of cylinders, and receives the second impression on its upper surface from the form-cylinder *C*.

The second sheet *d'* at the same time receives an impression on its under surface from the form-cylinder *C''*, and on its upper surface from the form-cylinder *C'*, from which the under surface of the first sheet *d* is also printed.

Simultaneously with these operations, the third sheet *d''* is printed on its under surface from the form-cylinder *C''*, and on its upper surface from the form-cylinder *C'*.

The printed sheets, after being separated from the rolls by the cutting-mechanism, are laid upon the receiving-table by the sheet-fliers.

By the arrangement of the cylinders it will be seen that the form-cylinders *C' C''* print the opposite sides of the separate sheets at the same time, and that the cylinders *B' B''* perform the office of impression-cylinders for the form-cylinders *C C' C''*.

It will also be evident, that by an addition of another impression-cylinder to the form-cylinder *C''*, and of another form-cylinder to the impression-cylinder *B''*, a fourth roll of paper may be printed upon, and so on *ad libitum*.

The cylinders from which two sheets are imprinted at the same time, are necessarily furnished with a second set of inking-rollers, *h h*.

When it becomes necessary to change the blankets, the side of the frame *l* is removed, and the bar *k* placed in position, as shown in fig. 1. The cylinder, with its journal-box *m*, is drawn out of the frame on to the bar *k*, and the blanket drawn from the cylinder over the end, and laid in folds on the bar, between it and the end of the journal *n*. The rod *o* is then attached to the end of the journal, and the cylinder is raised from the bar, by means of the nut on the end of the rod *o*, sufficiently to allow of the bar being removed, so that by lifting one end of the roller *b* from its bearing, the blanket is drawn from the roller, and quickly removed from the machine.

By proceeding with the operation in a reverse manner, a new blanket may be easily and expeditiously placed in position on the cylinder.

In constructing a machine with our improvements, we prefer to use the arrangement, represented in figs. 3 and 4, of three cylinders in each series, the left-hand series containing two form-cylinders *C C*<sup>2</sup> and one impression-cylinder *B*<sup>1</sup>, and the right-hand, one form-cylinder *C*<sup>1</sup> and two impression-cylinders *B B*<sup>2</sup>.

By this arrangement the stereotype-forms, containing the principal part of the matter composing the paper, may be arranged upon the form-cylinders *C C*<sup>2</sup>, from which one side of each sheet is printed, while the forms for the other side may be kept open as long as possible, in order to get in the latest news, such being the custom in all newspaper-printing offices; and as it is very important to get to press with the least delay possi-

ble, it will be readily seen that less time will be consumed in taking one stereotype, and using one form to print the other side of each sheet, than more.

Having thus fully described our invention,

What we claim, and desire to secure by Letters Patent, is—

1. The combination and arrangement, in a printing-machine, of two series of rollers, consisting of two printing-cylinders and one impression-cylinder, with two impression-cylinders and one printing-cylinder, with the requisite inking-machinery, arranged and operating substantially as and for the purposes set forth and specified.

2. Arranging the endless blankets for the impression-cylinders, as shown, whereby the same are made to perform the twofold duty of blankets and sheet-conveyers, thus dispensing entirely with the use of tapes for conveying the sheets, substantially as described and specified.

3. The mechanism for sustaining the cylinder for changing the form or blanket, consisting of the rod *o* and bar *k*, substantially as described.

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