No. 743,910. PATENTED NOV. 10, 1903.

# F. H. MOWBRAY & W. BLACK.

## MULTICOLOR PRINTING MACHINE.

APPLICATION FILED JUNE 2, 1903.

NO MODEL.

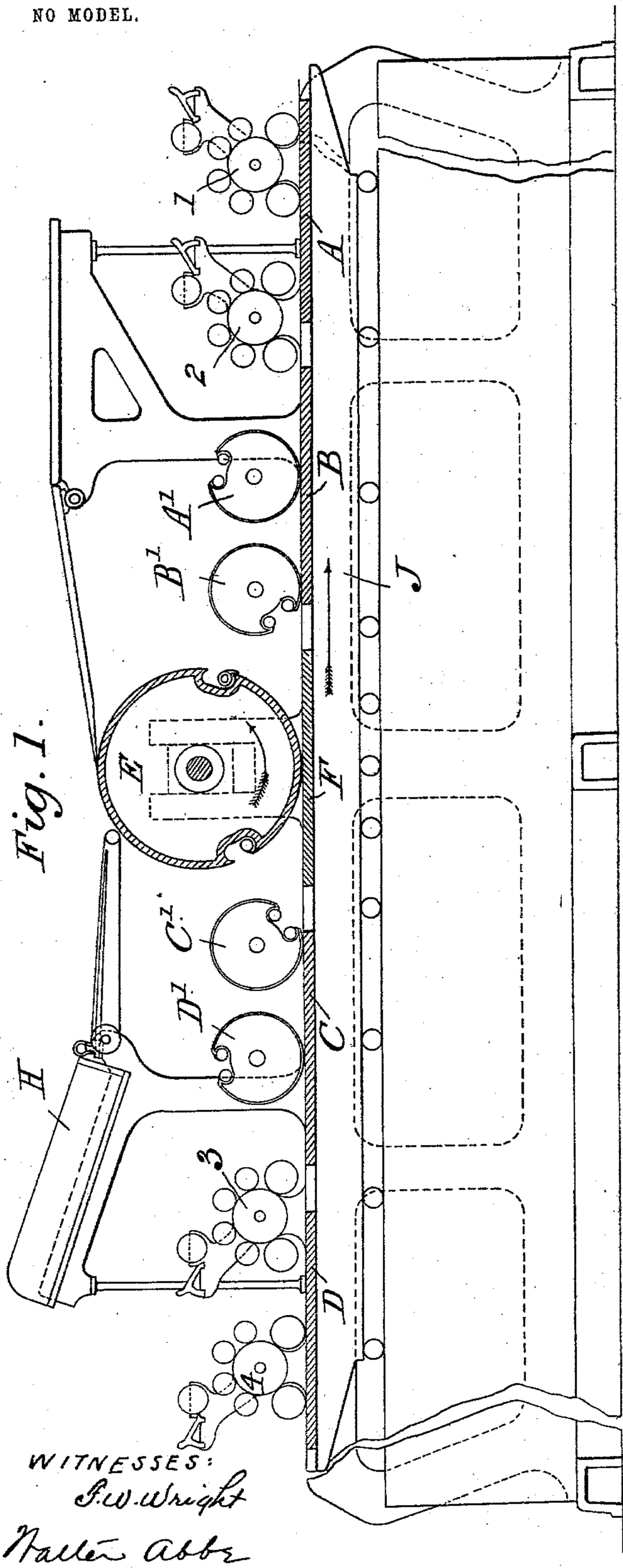


Fig. 1.

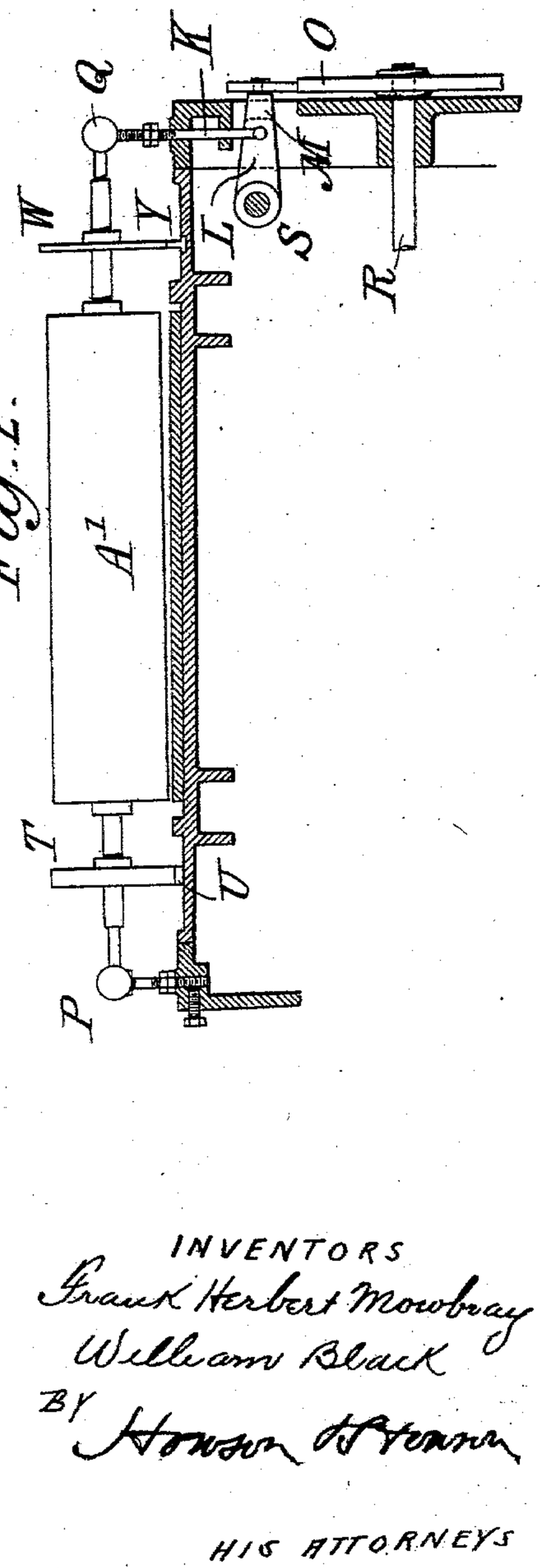


Fig. 2.

WITNESSES:
F. W. Wright
Walter Abbe

INVENTORS
Frank Herbert Mowbray
William Black
BY
Howson & Howson
HIS ATTORNEYS

No. 743,910. Patented November 10, 1903.

# UNITED STATES PATENT OFFICE.

FRANK HERBERT MOWBRAY, OF BALHAM, AND WILLIAM BLACK, OF WANDSWORTH COMMON, ENGLAND, ASSIGNORS OF TWO-THIRDS TO THE PRINTING ARTS COMPANY, LIMITED, OF LONDON, ENGLAND.

## MULTICOLOR-PRINTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 743,910, dated November 10, 1903.

Application filed June 2, 1903. Serial No. 159,822. (No model.)

*To all whom it may concern:*

Be it known that we, FRANK HERBERT MOWBRAY, engineer, residing at Glenburnie, Balham Park road, Balham, and WILLIAM BLACK, engineer, residing at 49 Comyn road, Wandsworth Common, in the county of Surrey, England, subjects of the King of Great Britain and Ireland, have invented certain new and useful Improvements in Multicolor-Printing Machines, of which the following is a specification.

This invention relates to machines for printing in several colors at one impression in which a number of flat part-design plates are each inked in a given color and impart the color part-designs thus formed to a series of elastic transfer-rollers which match and blend the color part-designs in correct register upon a common collecting plate or form employed to print the complete colored picture or design at one impression onto paper or other material. In machines hitherto devised for this class of work it has been proposed to place all the color part-design plates and the collecting plate or form in fixed registering relation upon a common reciprocating table, the collecting plate or form being seated at one end of the row of plates. This arrangement would necessitate an extremely long stroke of the table for a given size of work as compared to that of ordinary one-color-printing machines and would detract most seriously from the finish of the work if such machines were operated at speeds sufficiently high for economical work.

The object of this invention is to provide means whereby the stroke of the table is greatly reduced as compared with arrangements hitherto proposed for any given size of work and number of colors. We effect this by mounting the collecting plate or form at or about the middle part of the reciprocating bed or table and mounting the color part-design plates in registering relation upon the said bed or table at either end of the collecting plate or form. The impression-cylinder occupies a central position in the machine, with a transfer roller or rollers on each side, so that the transfer roller or rollers on the one side of the impression-cylinder serves or serve for the color part-design plates on the corresponding end of the bed or table and the transfer roller or rollers on the other side of the impression-cylinder serves or serve for the color part-design plates on the other end of the bed or table. The impression-cylinder may be of the continuous type or of the stop type, according to the class of work required.

In Figure 1 of the accompanying drawings, F is a collecting plate or form secured to the central portion of the reciprocating bed or table J, and A B C D are four color part-design plates, whereof two, A B, are secured to the bed or table in advance of the form F and the other two, C D, are secured to the table behind the form F. E is the impression-cylinder, occupying a central position in the machine. Two elastic transfer-rollers A′ B′ in gearing relation with the bed or table J occupy a position in advance of the impression-cylinder E, and two other elastic transfer-rollers C′ D′ are arranged behind the said impression-cylinder. Inking sets 1 2 3 4 are provided, one set for each of the color part-design plates A B C D, the inking-rollers of each set being arranged to come into contact with its corresponding color part-design plate only, which may be done by means of rails and inking-roller disks in the usual manner.

The color part-design plates A B transfer their inked part-designs to the form F by means of the transfer-rollers A′ B′, and the color part-designs of the plates C and D are transferred to the said form by the transfer-rollers C′ D′. These transfer operations and the printing are preferably confined to one stroke of the table.

The form-plate F is shown in the position when printing the paper or material upon the impression-cylinder E, the arrow indicating that the bed or table J is moving in a right-hand direction. As the movement of the table is continued in this direction the transfer-rollers A′ B′ will impart to the now denuded form F the ink which they have received from their color part-design plates A B. On the return stroke the transfer-roll-

ers A′ B′, the impression-cylinder E, and the transfer-rollers C′ D′ will all be lifted to clear the plates A B C D, but on the commencement of the next right-hand stroke the transfer-rollers C′ D′ will impart to the form F the remaining colored part-design which they have received from the color part-design plates C D while the transfer-rollers A′ B′ were transferring to the form F. In this manner the form F receives all four colors and imparts them at one impression to the paper or material on the cylinder E, the printed sheets or material leaving the cylinder E from its upper part and being delivered into the box H.

Means which may be used for lifting the transfer-rollers are shown in Fig. 2. In this figure, A′ is a transfer-roller supported at one end in a swivel-bracket P and at the other end in a swing-bracket Q. The driving of the transfer-roller is effected by a rack V, supported upon the bed of the machine and gearing with a spur-wheel T. At the other end of the transfer-roller is a disk W, actuated during the forward stroke of the table by a rail Y, whereby the transfer-roller is raised clear of any plates with which it is not desired that it should come into contact. On the return stroke of the table the raising of the transfer-roller is performed by a rod K, actuated by an arm L, supported upon a longitudinal shaft S, to which shaft is also secured an arm M, supporting a wheel N, which is in turn actuated by a cam O, supported upon a cam-shaft R.

Having now particularly described and ascertained the nature of this invention and in what manner the same is to be performed, we declare that what we claim is—

In a machine for printing in several colors at one impression, a collecting or printing plate or form mounted midway between a number of color part-design plates upon a reciprocating bed or table, common to all the said plates and an impression-cylinder, and a number of elastic transfer-rollers and inking sets all arranged so as to coact substantially as hereinbefore described.

In testimony whereof we affix our signatures in presence of two witnesses.

FRANK HERBERT MOWBRAY.
WILLIAM BLACK.

Witnesses:
WILLIAM GERALD REYNOLDS.
WILLIAM JOHN WEEKS.