

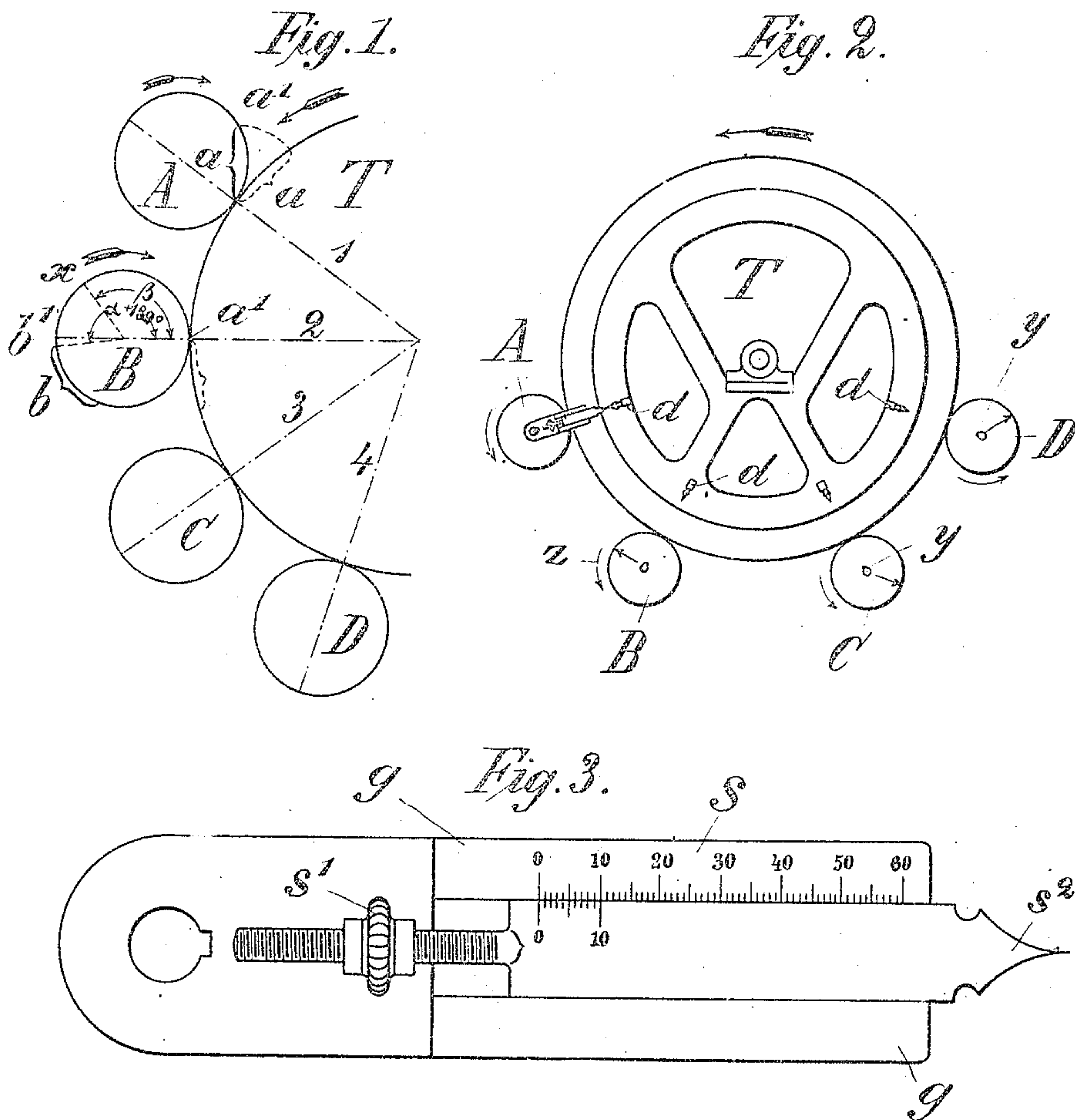
No. 896,899.

PATENTED AUG. 25, 1908.

F. W. H. DIETRICH.
MULTICOLOR PRINTING MACHINE.

APPLICATION FILED DEC. 4, 1907.

2 SHEETS—SHEET 1



Witnesses.

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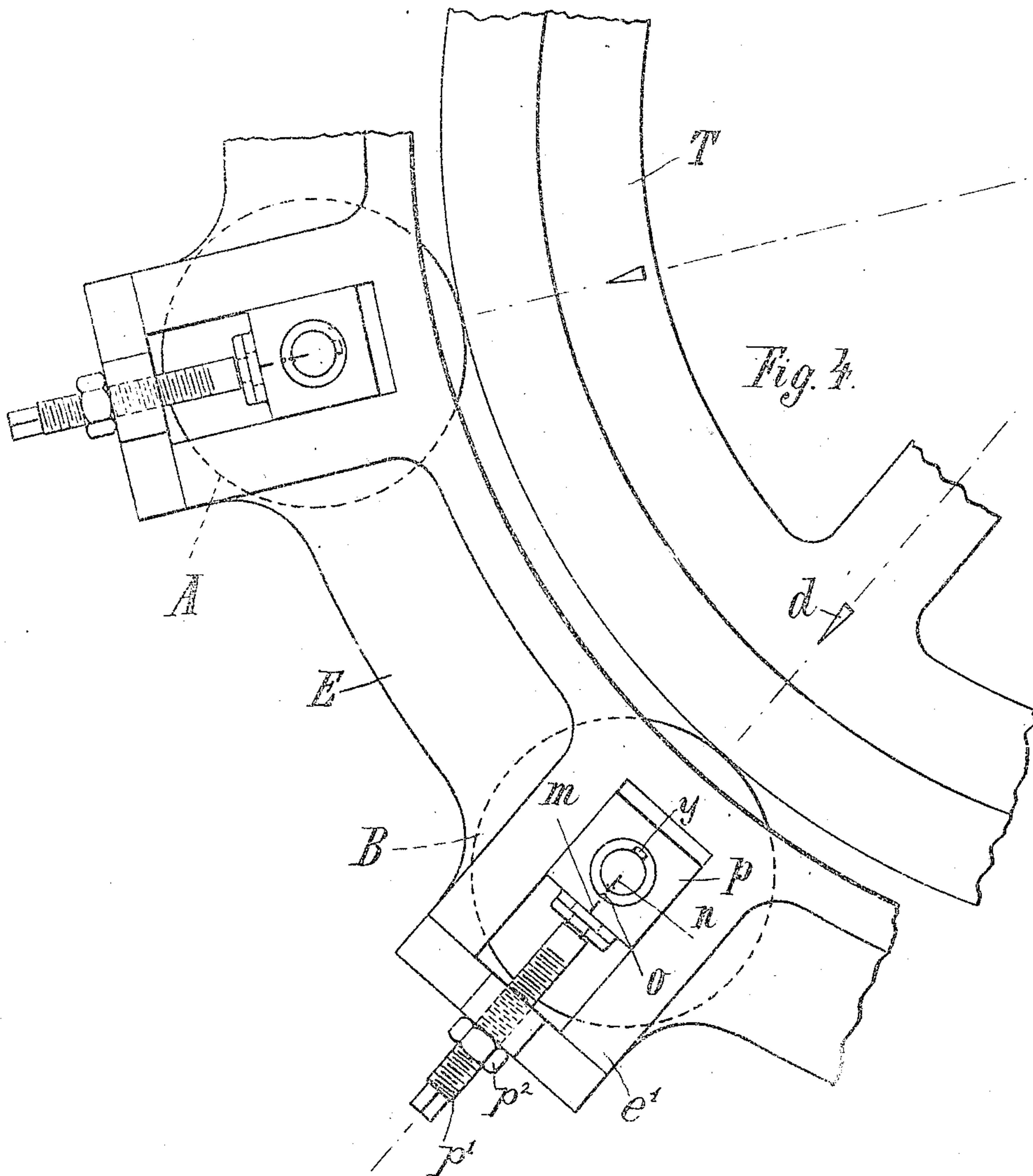
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2 SHEETS—SHEET 2.



Witnesses.

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UNITED STATES PATENT OFFICE.

FRANZ WILHELM HERMANN DIETRICH, OF ALTONA, GERMANY, ASSIGNOR TO WILHELM JVEN, OF MUHLENBERG, GERMANY.

MULTICOLOR-PRINTING MACHINE.

No. 896,899.

Specification of Letters Patent.

Patented Aug. 25, 1908.

Application filed December 4, 1907. Serial No. 405,096.

To all whom it may concern:

Be it known that I, FRANZ WILHELM HERMANN DIETRICH, a subject of the Emperor of Germany, and resident of No. 85 Oevelgönne, Altona, German Empire, have invented certain new and useful Improvements in Multicolor-Printing Machines, of which the following is a specification.

This invention relates to multi-color-printing machines of the kind which print endless webs of paper or fabric with polychrome patterns by means of a number of rollers which become operative in succession, each of these rollers carrying a part of the pattern as a printing block and each being given one color. In machines of this kind, the adjustment of a set of rollers corresponding to a pattern has been found very difficult and tedious, as in adjusting the machine for a fresh pattern, it was only possible to get the adjustment perfect by taking proofs, that is to say in the first place, it was necessary to take a proof of the portion of the pattern on the first roller in its color, then to adjust the second roller in such a manner that its impression should come as far as possible in its proper place close to or with regard to the impression from the first roller, and then to correct the position of the second roller in case the correct position for it did not happen to have been found at the first trial, whereupon the composition had to be tested once more by taking a second proof off the first roller, and these experiments had to be repeated with every additional roller. In addition to causing loss of time and labor, this method has the drawback of giving a great amount of waste of the material to be printed upon.

The present invention has for its object to abbreviate the time of adjustment considerably by enabling the rollers to be adjusted correctly relatively to each other at once so that adjustment can be effected speedily and securely by quite inexperienced workmen.

The invention consists broadly in providing indexes or other appropriate indicating devices on the spindles of the rollers for ascertaining the angles at which certain points on the several rollers must lie relatively to each other or to a line joining the center of the printing roller and the center of the impression cylinder in order to obtain accurate printing, the adjustment of these indicators relatively to each other or to a certain line of

reference insuring the correct relative positions of the roller types.

Reference is taken to the accompanying drawing in which similar letters refer to similar parts.

Figure 1 is a diagrammatical view illustrating the principle of the invention. Fig. 2 a diagrammatical end-view of an impression cylinder operating in combination with four rollers. Fig. 3 an elevation of a gage used in connection with this invention and Fig. 4 an enlarged detail view of the adjustable bearings for the rollers.

The invention may be best understood by first taking reference to Fig. 1. For example if it is required to bring the four pattern rollers A, B, C, D, and the portions of the pattern upon them in the proper order one after the other into contact with the web passing round the impression cylinder T and assuming a and b to be two portions of the pattern of which b is to follow a and to come exactly against the end a' of a in another color, it would be necessary for the end b' of b to be situated in the line 2 joining the centers of the cylinder and roller at the moment at which the end a' of the impression a leaves the line 2. Therefore, when the pattern a starts to pass the line 1 joining the centers of A and T that is to say when it begins its printing operation, the point b' must have such a position relatively to the line 2 and to the line 1 respectively that the periphery of B is able to turn or roll on T just to such an extent that the time the impression of a' on the cylinder T reaches the line 2 the point b' will also pass the same point that is the common point of intersection of the circles B T and the line 2. The position of the point b' relatively to a' is therefore defined by the angle $\alpha + 180^\circ$ at the center belonging to that arc of the periphery of the roller B which in its development is equal to that of the portion of the periphery of the impression cylinder T situated between the lines 1, 2 plus the length a .

If in another example a designates a number of parallel, one-colored strips, and b strips of equal length which are to be located between the strips a , the point b' would have to correspond to an angle β at the center the arc of which in its development is equal to that of the portion of the periphery of the printing cylinder T situated between the

lines 1, 2. The point b' must then be located at X in order that when the pattern impression a reaches the line 2, the point X may also reach the same place.

5 When the angles such as mentioned above have been ascertained for all the rollers of one set, the adjustment is very readily effected by means of appropriate setting devices provided on the rollers. Pointing
10 marks d are preferably arranged laterally on the impression cylinder T in the direction of the lines which connect the center of the impression cylinder shaft with the centers of the pattern printing rollers A, B, C, D, one
15 journal of each of the printing rollers being provided with a rib y for attaching to the same the channeled hub of an angle setting device. These ribs y might be formed on the
20 journals of the rollers in such a position that their center-lines when placed opposite the lines joining the centers and the pointing marks d would at once indicate the correct position of the portion of the pattern on their
25 rollers relatively to each other. However, this would not give sufficiently exact results and since for practical reasons this mode could not well be carried out, the ribs may advantageously be arranged in such a position that they coincide with the beginning of
30 the part of the pattern which first comes into contact with the printing surface. In the first place a pointing instrument such as a scale or a gage S shown in Fig. 3 is arranged on the end of the roller A as indicated in Fig. 2.
35 This instrument preferably consists of a pointer s^2 which is arranged to slide between two guideways g and may be adjusted by means of a nut s' , so that it can be brought opposite the first pointing mark d of the impression cylinder T; in this position the portion of the pattern situated on A just begins to come into contact with the impression cylinder. The gage or instrument S is then placed upon the second roller B and brought
45 opposite the second pointing mark d ; the pointer of the gage S also serves to bring the journal of the roller B by adjusting its bearing to exactly the same distance from the center of the impression cylinder as is the case with the roller A. Since the various sets of pattern rollers are rarely of the same diameter, and the surface of the impression cylinder temporarily must be turned true the gages are made adjustable. When the second roller has been arranged in this manner
55 at the proper distance from the impression cylinder T, it is rotated backwardly in the direction of the arrow z (Fig. 2) to the same extent as was explained with reference to
60 Fig. 1, the magnitude of this angle having

been determined experimentally in the preparation of new pattern rollers for all the rollers relatively to the first roller A; for this purpose the journal of the roller may be provided with an indicator, which when adjusted by means of the gage S attains a position opposite the same. This indicator may be represented by the latter itself, while the journal bearing carries a lateral mark m , Fig. 4, to which the indicator is then set.

As clearly illustrated in said Fig. 4 a frame E is mounted in close proximity to the impression cylinder T and has guide-ways e' radially arranged with regard to the axis of said cylinder.

The journals of the rollers rest in bearing blocks p slidably mounted in said guide-ways and are movable toward and from the impression cylinder by means of adjusting screws p' which may be locked in position by lock-nuts p'' as is usual with adjustable bearings.

In Fig. 4, the indicator is represented by an arrow n on the end of the journal and by a longitudinal notch o , which in setting the roller should coincide with the mark m on the bearing p .

I claim:

1. Means for adjusting the rollers on multi-color printing machines having an impression cylinder and a series of printing rollers operating with the impression cylinder, in combination with a series of pointing marks on the end surface of the cylinder and with a removable pointer provided with an opening
95 varying in contour, the journals of the rollers shaped to fit into the opening of the pointer to allow the latter being set on the journal of each roller in a predetermined direction.

2. Means for adjusting the rollers on multi-color printing machines having an impression cylinder and a series of printing rollers operating with the impression cylinder, pointing marks on the cylinder corresponding in number with the printing rollers and an adjustable pointer for the rollers to adjust the same in respect to the pointing marks.

3. Means for adjusting the rollers on multi-color printing machines having an impression cylinder and a series of printing rollers operating with the impression cylinder, pointing marks on the latter corresponding in number with the printing rollers, a pointer arranged to slide on the end of the roller and a scale in connection with the slidable pointer, to properly adjust the same.

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