

(No Model.)

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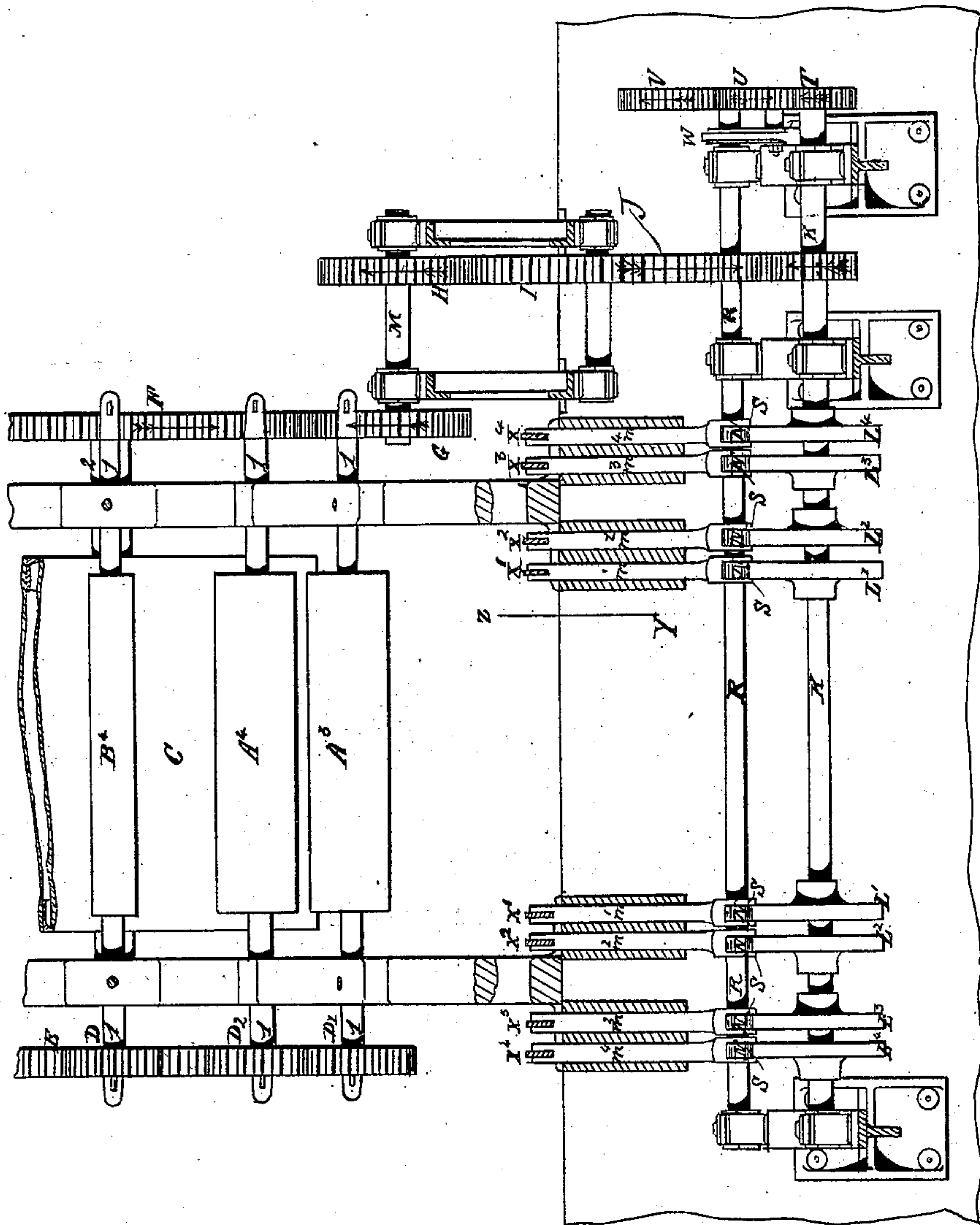
J. KERR & J. HAWORTH.

MACHINERY OR APPARATUS FOR PRINTING FABRICS.

No. 253,718.

Patented Feb. 14, 1882.

Fig. 1.



Witnesses:
James F. Toben,
D. Williams

Inventors:
James Kerr
and
Joseph Haworth
by their attys.
Howe and Fry

(No Model.)

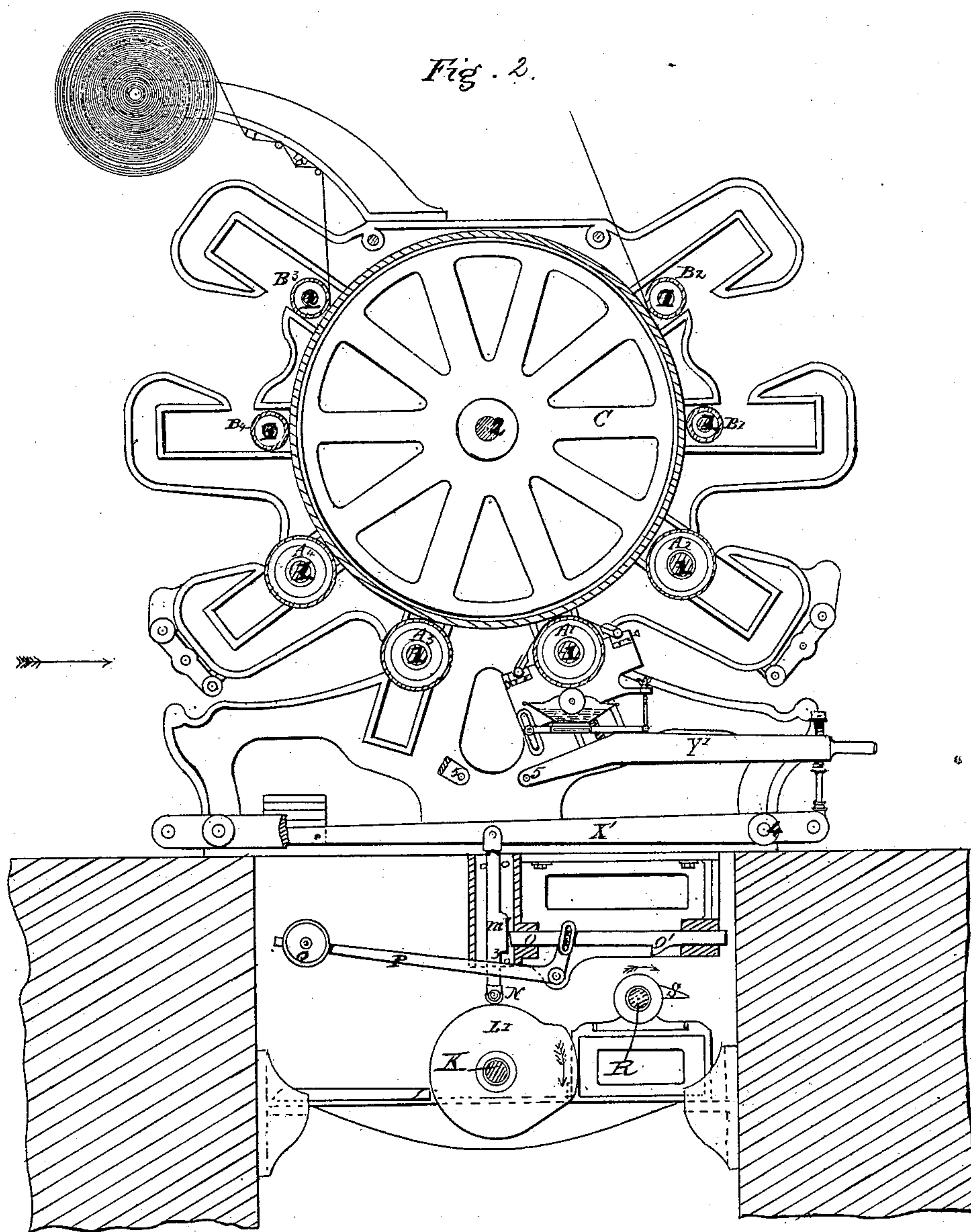
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(No Model.)

4 Sheets—Sheet 3.

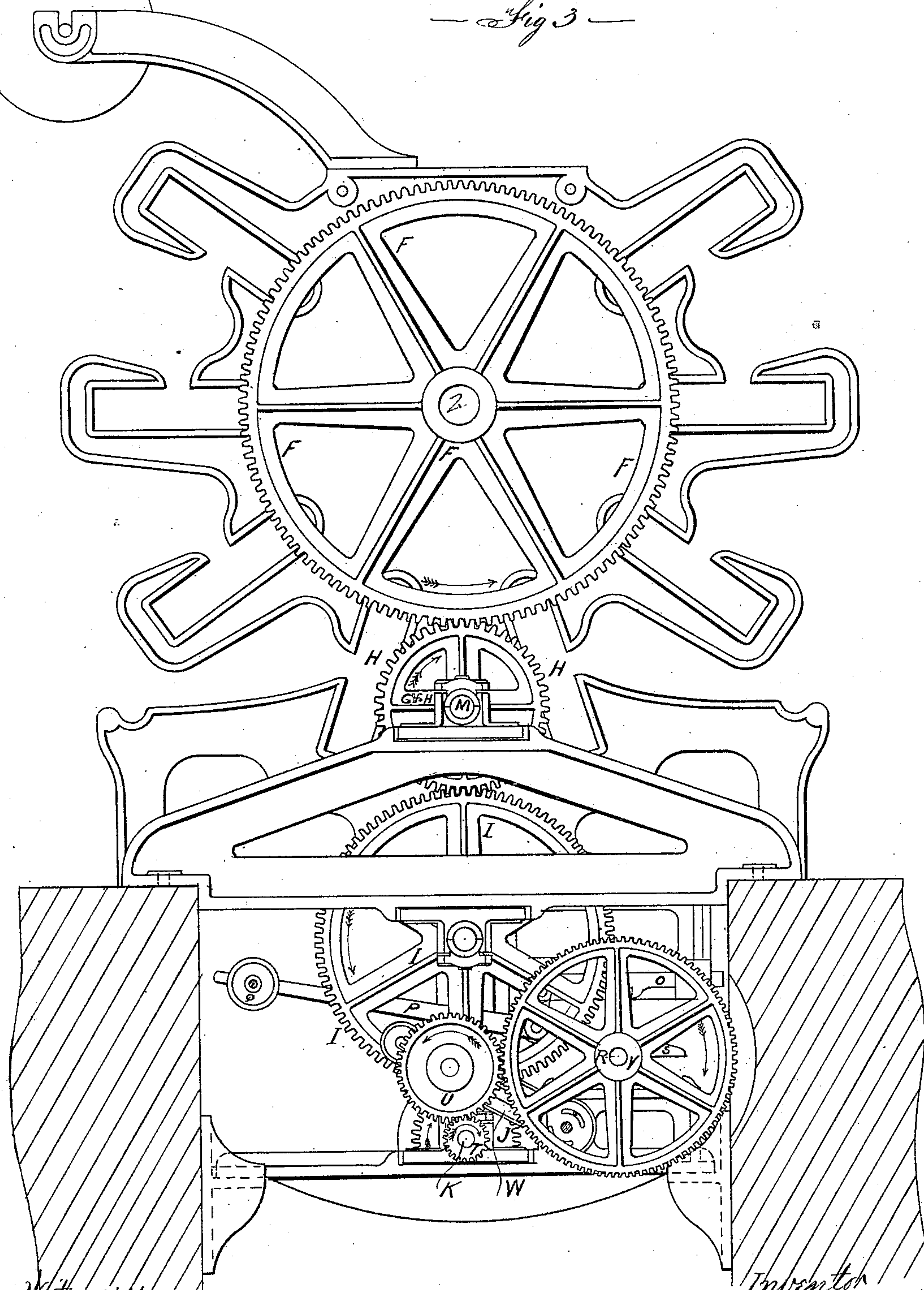
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— Fig 3 —



Witnesses:
David S. Williams
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(No Model.)

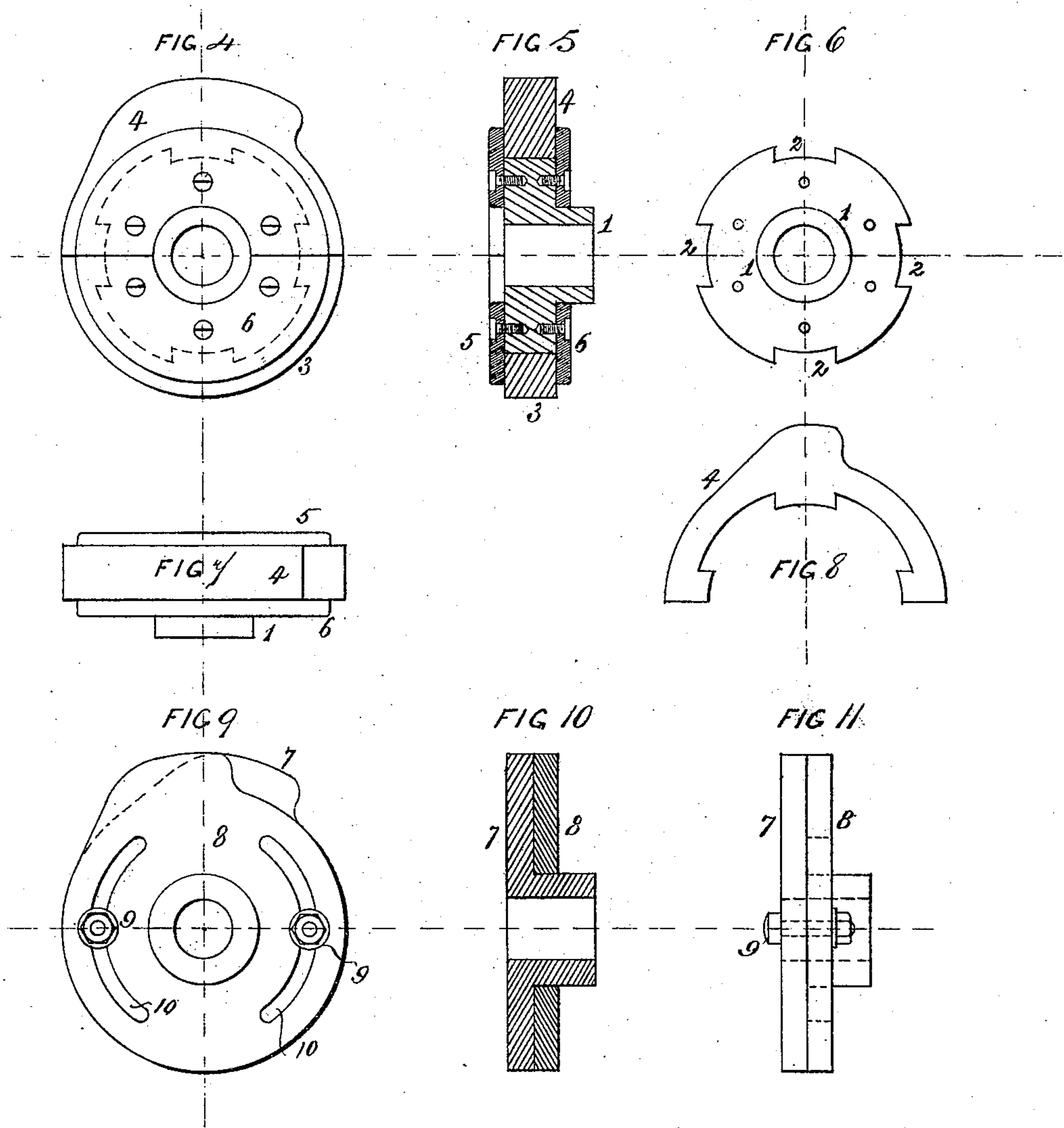
4 Sheets—Sheet 4.

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James F. Tobin

Inventors:
James Kerr and
Jos. Haworth
by their attorneys
Howson and Sons

UNITED STATES PATENT OFFICE.

JAMES KERR AND JOSEPH HAWORTH, OF CHURCH, COUNTY OF LANCASTER,
ENGLAND.

MACHINERY OR APPARATUS FOR PRINTING FABRICS.

SPECIFICATION forming part of Letters Patent No. 253,718, dated February 14, 1882.

Application filed June 13, 1881. (No model.) Patented in England November 9, 1880.

To all whom it may concern:

Be it known that we, JAMES KERR and JOSEPH HAWORTH, subjects of the Queen of Great Britain, and residing at Church, in the county of Lancaster, England, have invented certain Improvements in Machinery or Apparatus for Printing Fabrics, (for which we have obtained a patent in Great Britain, No. 4,602, dated 9th November, 1880,) of which the following is a specification.

Our said invention relates to an improved arrangement of machinery or apparatus whereby the present mode of block or hand printing in some classes of goods can be entirely dispensed with.

According to our said invention we attach to the machine a peculiar self-acting motion acting upon the weighted or pressure levers and thus upon the printing-rollers, so that any pattern can be impressed upon the cloth or fabric being printed during the process of printing other patterns without the necessity for stopping the machine, the characteristic feature of our said invention being that the act of lifting the weighted levers has the effect of moving the printing-rollers away from the fabric being printed, and vice versa, and that the levers are locked when the printing-rollers are in their position away from the fabric. With this apparatus we combine a measuring apparatus, also constituting a part of the machine, so that the distance between such patterns can be varied at will. This combined apparatus is intended to be applied to the production of that class of printing on calico or cloth and other fabrics in which it is desired to print a pattern across the piece at intervals, the interval between the cross-patterns being greater than the circumference of ordinary printing-rollers. We act upon the weighted levers by means of cams or tappets, which are keyed upon a revolving shaft below the machine, and are driven by the machine; or we may substitute for cams or tappets slide-bars provided with inclined projections.

The driving may be effected by means of spur-wheels or chain-wheels keyed upon the shaft of the printing-machine bowl.

All the actuating apparatus is under the machine, below the floor-line, and is thus out of the way of the printer or his attendants.

The machine, when not required for printing blocking-work or other patterns at present put in by hand, may be used as an ordinary printing-machine by merely sliding a wheel out of gear, without the removal of any other parts of the machine.

The measuring apparatus (which releases the lever-locking gear) consists of levers or catches keyed upon a revolving shaft which is driven from the cam-shaft by change-wheels, so that by placing in or connecting certain wheels we obtain the required distance between the cross-patterns.

Our said invention is applicable to any existing printing-machine as well as to new machines adapted for this purpose.

In carrying out our said invention four (or any other suitable number) printing-rollers are employed, upon which are engraved the cross-patterns, the said rollers being required to be brought into and out of contact with the fabric being printed at certain intervals to give the required distance between such cross-patterns. In conjunction with these rollers we employ any suitable number of ordinary printing-rollers, the whole being arranged around the main bowl of the printing-machine, round which the fabric to be printed passes.

Upon the shafts or mandrels of the printing-rollers are keyed spur-wheels gearing into the crown-wheel of the machine. Upon the shaft of the main bowl is keyed a spur-wheel, which drives a spur-wheel upon another shaft. This shaft has keyed upon it another spur-wheel, which is arranged to slide upon the shaft, so as to put the whole apparatus for blocking-work out of action when it is required to do ordinary printing. From the shaft last mentioned motion is communicated by means of gearing to another shaft, which has keyed or otherwise fastened upon it a number of cams or tappets arranged in connection with a series of slides. The cams or tappets in revolving act upon the slides, which, together with weighted levers connected with such slides, are raised or lifted by the lift on the cams; and in this manner the printing-rollers are moved away from the fabric being printed. When any slide is raised a weight upon a lever connected with a locking-bar draws the latter under a lip or catch on the slide, so as to hold the printing-

roller away from the fabric being printed until the cam makes a certain number of revolutions corresponding to the distance between the cross-patterns.

5 From the cam-shaft is driven by means of change-wheels another shaft, upon which are keyed a number of levers or catches, which, in revolving, come in contact with the lips or catches on the locking-bars and withdraw them, 10 so as to allow the weighted levers to fall and bring the printing-roller into contact with the fabric being printed. When the printing-rollers have completed the cross-patterns the cams again raise the slides, together with the 15 weighted levers, and bring the printing-rollers away from the fabric. They are then locked, as before, by the locking-bars being acted upon by the levers and weights before referred to. This arrangement may be applied to any number 20 of printing-rollers consistent with the diameter of the main bowl. The cams or tappets on the cam-shaft, as well as the levers or catches on the shaft carrying them, are placed one behind another to correspond with the distance from one printing-roller to another. 25

And in order that our said invention may be fully understood, we shall now proceed more particularly to describe the same, and for that purpose shall refer to the several figures on 30 the annexed sheet of drawings, the same letters of reference indicating corresponding parts in all the figures.

Figure 1 of the accompanying drawings represents an end sectional elevation of an ordinary printing machine having our said invention applied thereto; and Fig. 2 is a longitudinal section of the same, corresponding to Fig. 1. Fig. 3, Sheet 2, is an end elevation of the machine, showing the gearing for the cam-shafts; Figs. 4, 5, 6, 7, and 8, Sheet 3, views 40 of one form of adjustable cam; and Figs. 9, 10, and 11, views of another form of adjustable cam.

Referring to Figs. 1, 2, and 3, $A^1 A^2 A^3 A^4$ 45 are printing-rollers, on which are engraved the cross-patterns.

$B^1 B^2 B^3 B^4$ are ordinary printing-rollers.

C is the main bowl of the printing-machine.

D $D^1 D^2$ are spur-wheels upon the shafts 1 50 of the printing-rollers, the said spur-wheels gearing into the crown-wheel E of the machine, whereby the printing-rollers receive rotary motion.

F is a spur-wheel, which is keyed upon the 55 shaft 2 of the main bowl C, and drives the wheel G upon the shaft M. This shaft has keyed upon it the wheel H, which is arranged so as to be capable of sliding upon the shaft in order to put the whole apparatus for blocking-work or intermittent printing, to which it 60 imparts motion, out of action when it is required to do ordinary printing. The motion is transmitted from the shaft M through the intervention of the spur-wheel H or carrier-wheel I and a spur-pinion, J, to a shaft, K, which has keyed thereon a number of sets of cams or tappets, $L^1 L^2 L^3 L^4$, corresponding to the

number of cross-pattern-printing rollers employed, the cams or tappets being arranged in duplicate at opposite ends of the machine. 70 These cams or tappets operate in the following manner, the action of one set of them—videlicet, that of the cams or tappets L^1 —being taken as an example of the operation of the whole: The cams or tappets L^1 , 75 Fig. 2, in revolving act through the intervention of the rollers N upon the slides m^1 , which they lift, together with the weighted levers X^1 , centered at 4, and the levers Y^1 centered at 5, carrying the cross-pattern-printing roller A^1 80 and its appurtenances; and in this manner the said roller is brought away from the fabric being printed. While the slides are raised the weights acting upon the levers P draw the sliding-bars or locks O under the lips or catches 85 3 on the slides m^1 , so as to hold the printing-roller from the fabric while the cams make a certain number of revolutions, which is regulated in the following manner, in order to correspond to the distance between the cross-patterns. 90

R is a shaft, which is driven from the cam-shaft K by means of a pinion, T, and a change-wheel, U, which latter is a stud-wheel working 95 upon the radial arm W, and driving the wheel V, Fig. 3, fast upon the shaft R. Upon this shaft are also keyed a number of levers or catches, S, which in revolving come in contact with such of the lips O^1 of the sliding-bars or locks as may be within the range of their motion. For example, assuming that the set of 100 slides m^1 has been locked in the manner hereinbefore described, the corresponding levers or catches S in revolving come in contact with the lips O^1 of the corresponding sliding-bars or locks O, and withdraw them clear of the 105 lips or catches 3 of the slides m^1 , so as to allow the weighted levers X^1 to fall and bring the printing-roller into contact with the fabric being printed. When the printing-roller has 110 completed the cross-pattern the cams L^1 again raise the slides m^1 , together with the weighted levers X^1 , and bring the printing-roller away from the fabric, and the slides are locked, as 115 before, by the locks or sliding-bars O and the levers and weights P. The action of the other cams or tappets is similar to that of the cams or tappets L^1 , hereinbefore described. For example, the cams or tappets L^2 act through the 120 intervention of the slides m^2 , and thus, by operating the levers X^2 , work the printing-roller A^2 , which is locked and released in the manner hereinbefore explained. Similarly with respect to the cams or tappets L^3 , slides m^3 , and levers X^3 , which work the printing-roller A^3 , 125 and also with respect to the cams or tappets L^4 , slides m^4 , and levers X^4 , which work the printing-roller A^4 .

The cams or tappets upon the shaft K are made adjustable, so that varied lengths of 130 cross-patterns may be printed. This adjustment may be obtained by forming the cams in two parts, bolted together, one part sliding behind the other, so as to make the raised part

of the cam longer or shorter, as the pattern requires; or the adjustment may be effected by the removal or addition of certain sections or lengths from or to the cams, or in any other
5 convenient manner.

Figs. 4, 5, 6, 7, and 8 illustrate a form of cam in which the adjustment is obtained by the removal and insertion of sections. The base 1 of the cam which is to be keyed or otherwise secured to the shaft has recesses 2 in its
10 periphery—four in the present instance—for the reception of corresponding projections on the sections 3 4 of the bearing portions of the cam, these sections being held in place by side
15 plates, 5 6, bolted to the base 1. To change the size of the cam, all that is necessary is to remove the section 4, say, (Fig. 4,) and substitute a section with an enlargement of the desired size—say like that shown in Fig. 8.

20 In the modification shown in Figs. 9, 10, and 11 the adjustment is obtained by making the cam in two parts, 7 8, bolted together by bolts and nuts 9, one part being adjustable on the other, when the nuts are loosened, by allowing
25 the bolts to pass through curved slots 10 in the movable piece 8.

We claim as our invention—

1. The combination of the printing-bowl and printing-roller with levers supporting said roller and tending to keep it in contact with
30 the bowl, cams for raising the levers to withdraw the roller, and automatic locking devices, substantially as described, for retaining the levers in a raised position.

2. The combination of the printing-bowl and
35 printing-roller with levers supporting said roller and tending to keep it in contact with the bowl, cams for raising the levers to withdraw the roller, automatic locking devices for the lever, and rotary cams for periodically re-
40 leasing the locking devices, all substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

JAMES KERR.

JOSEPH HAWORTH.

Witnesses:

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U. S. Consul.

ALBERT E. HALL,

Manchester, England.