(No Model.) 2 Sheets—Sheet 1.

C. B. COTTRELL.

PRINTING MACHINE.

No. 433,234. Patented July 29, 1890.

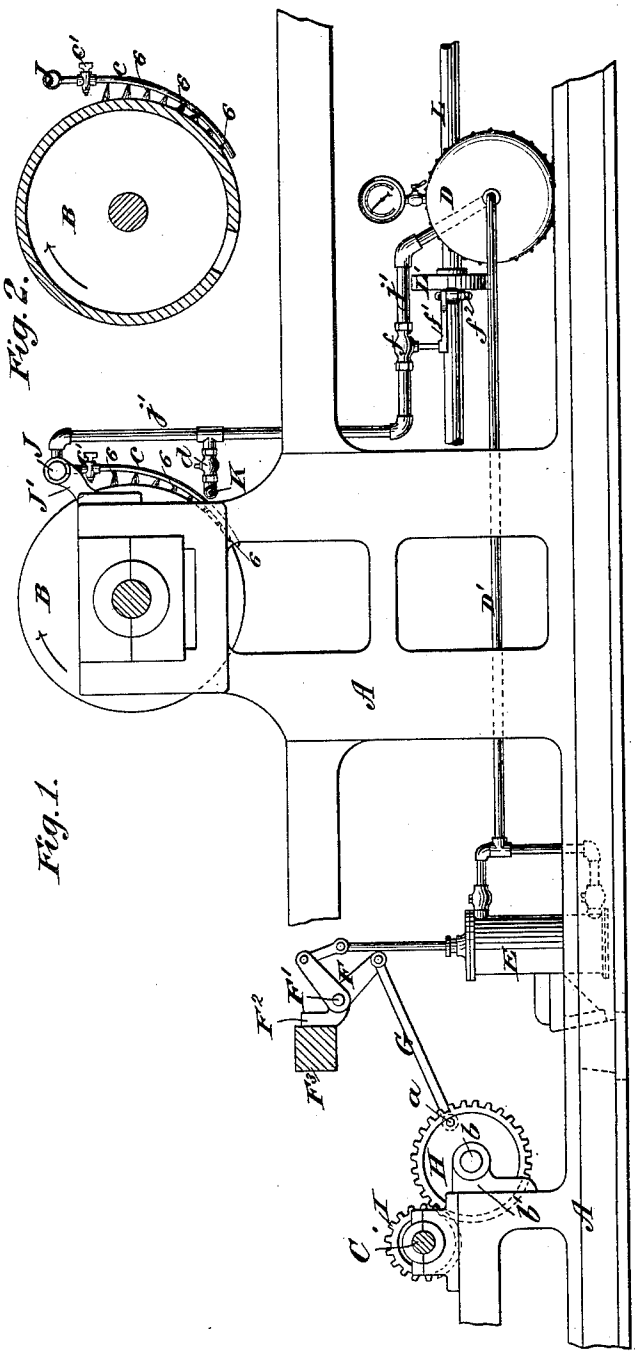


Fig. 2.

Fig. 1.

Witnesses:—
D. F. Haywood
C. Sundgren

Inventor:—
Calvert. B Cottrell
by his attorneys
Brown & Seward

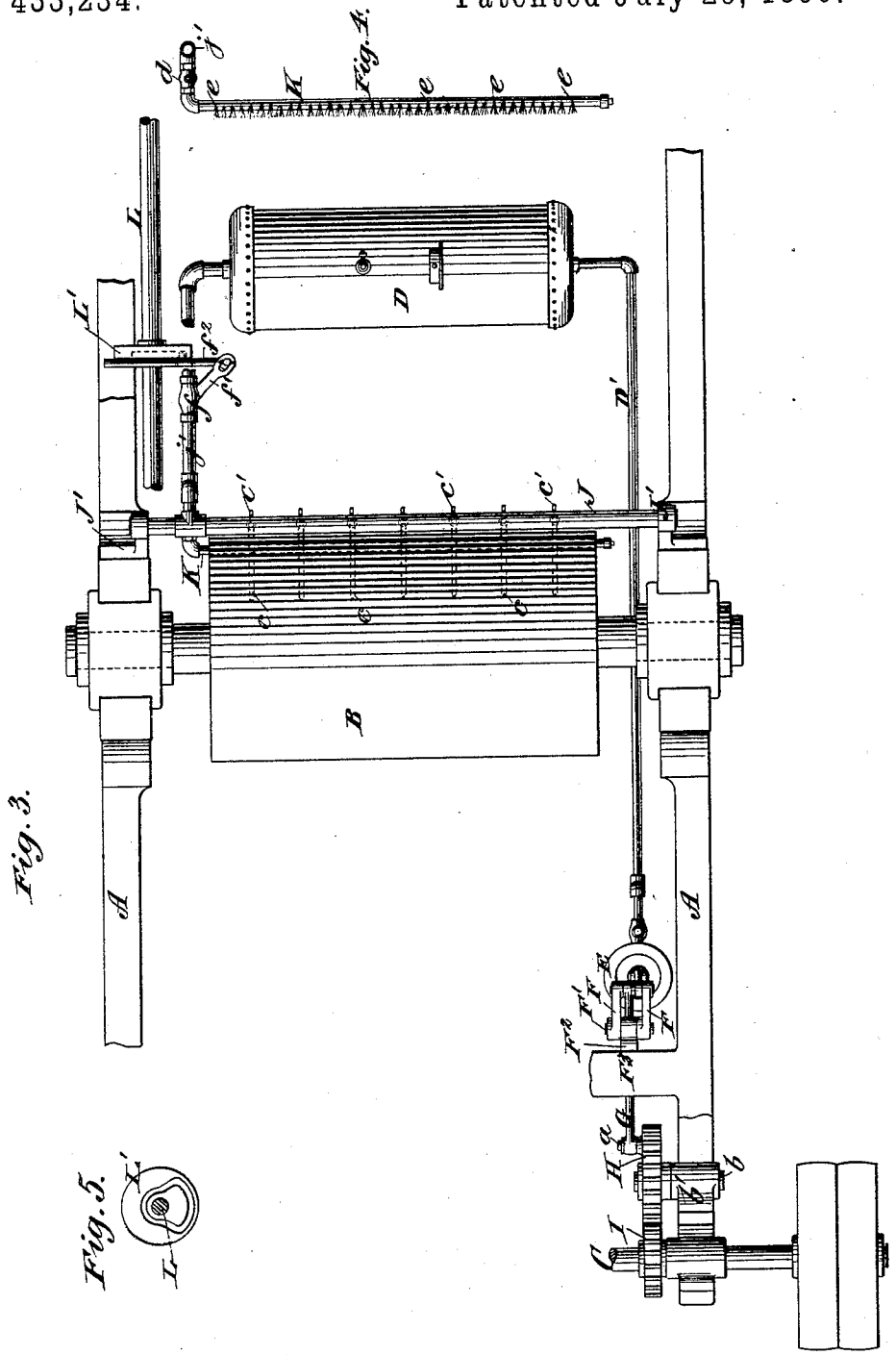
THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

C. B. COTTRELL.

PRINTING MACHINE.

No. 433,234. Patented July 29, 1890.



Witnesses:-
D. H. Hayward
C. L. Sundgren

Inventor:-
Calvert B. Cottrell
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CALVERT B. COTTRELL, OF WESTERLY, RHODE ISLAND.

PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 433,234, dated July 29, 1890.

Application filed May 8, 1890. Serial No. 351,040. (No model.)

To all whom it may concern:

Be it known that I, CALVERT B. COTTRELL, of Westerly, in the county of Washington and State of Rhode Island, have invented a new and useful Improvement in Printing-Machines, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to the employment of currents or jets of air to hold the sheets against the cylinders of printing-machines, and is especially applicable for the holding of sheets against the second or further advanced cylinder of a chromatic printing-machine.

I will proceed to describe my invention with reference to the drawings, and afterward point out its novelty in claims.

Figure 1 represents a side view illustrating the application of my invention to the second cylinder of a two-color-printing machine, showing only such parts of the machine as are necessary for the explanation of the invention. Fig. 2 represents a sectional view of the second impression-cylinder with a part of the apparatus which constitutes my invention. Fig. 3 is a plan corsesponding with Fig. 1. Fig. 4 is a plan view of a portion of the apparatus which constitutes my invention. Fig. 5 is a side view of a cam which is employed in carrying out my invention.

Similar letters and numbers of reference designate corresponding parts in all the figures.

A designates the side framing of the machine.

B is the second impression-cylinder, which may be supported in bearings in the side frames in the usual way.

C is the main or driving shaft of the machine.

D is a compressed-air reservoir, which may be kept supplied with compressed air by any suitable means, but is represented as supplied through a pipe D′ by a compressor E, operated through a bell-crank F working on a pivot F′ in a bracket F^2, secured to one of the arms F^3, which supports the bed-track. The said bell-crank derives motion through the rod G from a crank *a*, carried by a spur-gear H, driven by a spur-gear I on the main or driving shaft C, the said gear H turning freely on a fixed stud *b* in a bracket *b*′, secured to one of the side frames A.

J is a horizontal pipe supported in stationary brackets J′ on the side frames of the machine, and arranged parallel with the cylinder near the upper part thereof on that side whence the sheet passes downward to the bed or printing form. This pipe is closed at the ends and is connected by a pipe *j*′ with the reservoir D. It is furnished at short intervals throughout its length with branch pipes *c*, which nearly conform to the periphery of the cylinder. The direction of the said pipes from the supply-pipe J corresponds with the direction of the revolution of the cylinder, as may be understood by reference to Figs. 1 and 2, wherein an arrow is shown upon the cylinder to indicate the direction of its revolution. These branch pipes are closed at their ends, but have numerous perforations through which air may issue in jets directed toward the cylinder B, as indicated at 6 6 in Fig. 1. Each of the said branch pipes is furnished with a stop-cock *c*′ near its connection with the pipe J.

K represents a horizontal pipe arranged parallel with the cylinder close outside of the perforated branch pipes not far from the extremities of the latter. This pipe K is connected at one end with the pipe J′ to receive air therefrom, and is closed at the other end; but it has a line of perforations *e* very near together on the side which is toward the cylinder. The said pipe is furnished with a stop-cock *d*, by which it may be opened and closed at pleasure.

The pipe J′ is fitted with a stop-valve *f*, the arm *f*′ of which is connected with a rod f^2, which derives motion from a cam L′ on the side shaft L of the printing-machine, the said cam being so timed as to produce the opening of the said valve to admit air from the reservoir into the several perforated pipes at such times as the sheet on the cylinder B is passing the said pipes, but to keep the said valve closed at other times.

By means of the several stop-cocks *c*′ and *d*, the quantity of air delivered through the several branch pipes *c* and the pipe K may be regulated as found necessary by the at-

tendant, who can see between the several branch pipes *c* the effect upon the sheet at different parts of its width and of the length of the cylinder. The branch pipes conforming approximately to the cylinder, the jets issuing from them serve to hold the sheet against the whole of that portion of the circumference of the cylinder opposite which the said branch pipes are placed, thereby holding it over a large surface, and not merely on a single line. The pipe K having its numerous perforations in line with the cylinder near the extremities of the branch pipes, the jets issuing from it serve to hold the last end of the sheet against the cylinder all the way across the latter. The curved pipes *c* constitute practically an apron, over which air is distributed in regular quantities over a large portion of the surface of the sheet, and through which the effect of the air may be watched to enable the distribution to be properly regulated.

I do not claim, broadly, the combination, with the impression-cylinder of a printing-machine, of an air-blast pipe for directing air against the sheets to hold them to the cylinder; but

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with the impression-cylinder of a printing-machine, of a series of curved and perforated pipes constituting an apron conforming approximately to the periphery of the said cylinder, and means, substantially as described, for supplying air through said pipes, all substantially as herein set forth.

2. The combination, with the impression-cylinder of a printing-machine, of an air-supply pipe arranged lengthwise of the cylinder and a series of perforated curved branch pipes from said air-pipe conforming approximately to the periphery of the said cylinder, substantially as herein set forth.

3. The combination, with the impression-cylinder of a printing-machine, of a series of curved and perforated pipes constituting an apron conforming approximately to the curvature of the cylinder, means, substantially as described, for supplying air to said pipes, and separate stop-cocks, one for each of said pipes, for regulating the distribution of air at different parts of the said apron, substantially as herein described.

4. The combination, with the impression-cylinder of a printing-machine, of a perforated air-distributer for delivering air against the sheets on said cylinder, of a cam-actuated valve for producing the admission of air to said distributer during those parts of the revolution of the cylinder in which the sheets pass between it and the distributer, and for shutting off the air therefrom at other times, substantially as herein set forth.

5. The combination, with the impression-cylinder of a printing-machine, of a series of curved perforated pipes substantially conforming to the periphery of the cylinder, a perforated pipe arranged longitudinally of the said cylinder, means, substantially as herein described, of supplying air to said several pipes, and separate stop-cocks for said curved and longitudinally-arranged pipes for separately regulating the supply of air thereto, substantially as herein set forth.

CALVERT B. COTTRELL.

Witnesses:

FREDK. HAYNES,

F. GEORGE BARRY.