A. Dougherty.
Printing Press.

Sheet 1. 3 Sheets.

No. 57486. Patented Aug. 28. 1860.

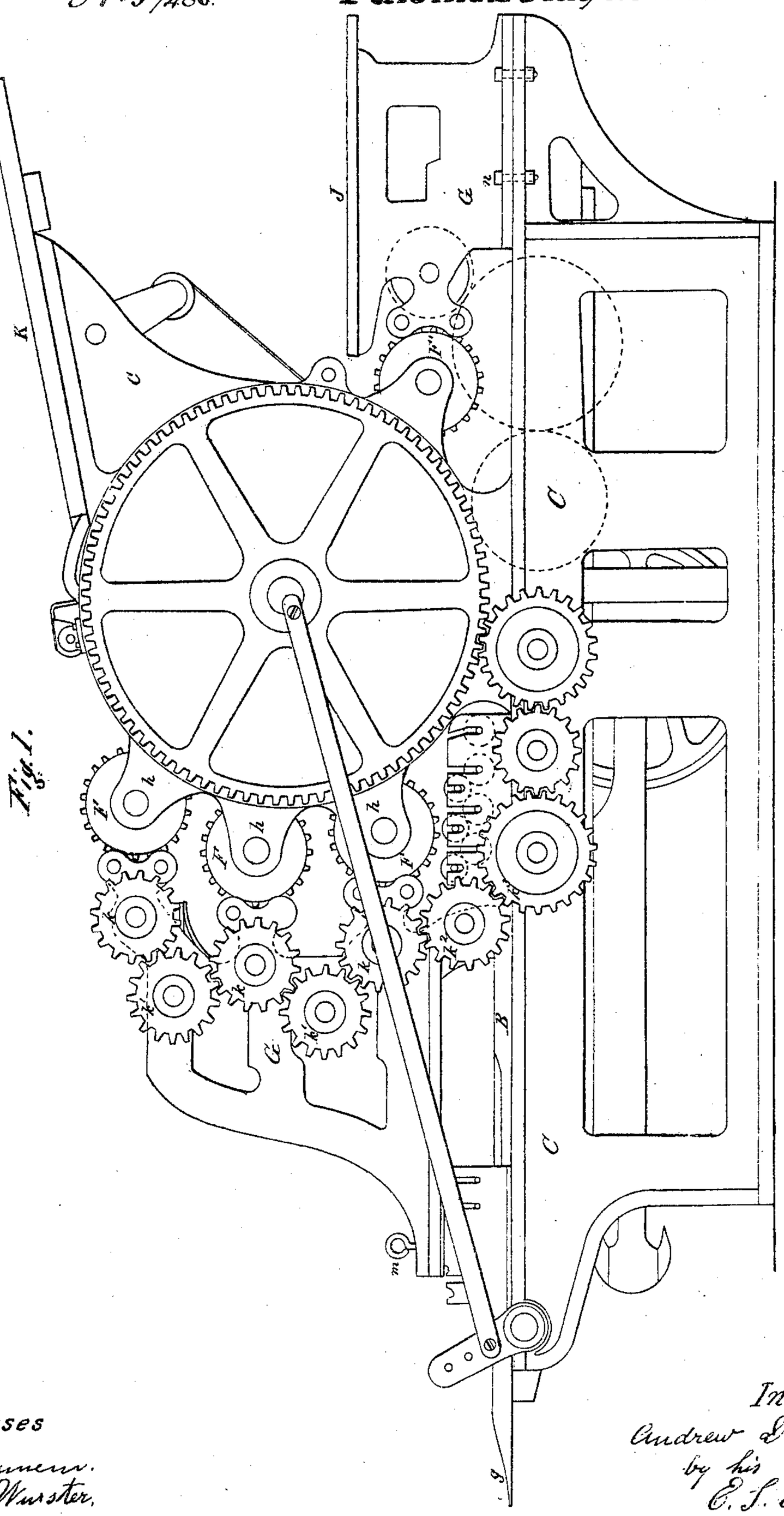

Fig. 1.

Witnesses
W. L. Jenney.
F. P. Wurster.

Inventor
Andrew Dougherty
by his attorney
E. S. Renwick

A. Dougherty. Sheet 2. 3 Sheets.

Printing Press.

No. 57486. Patented Aug. 28. 1866.

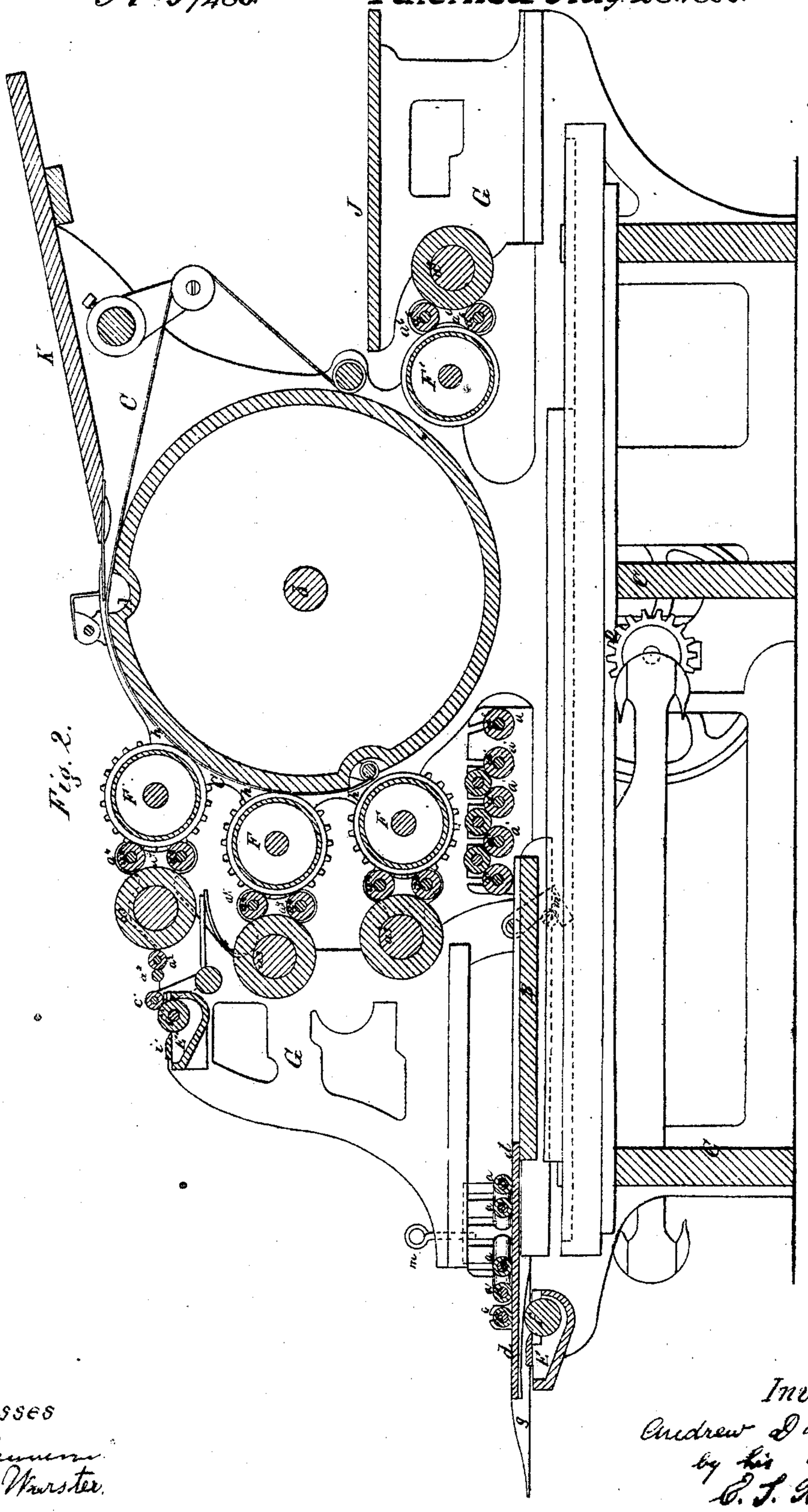

Fig. 2.

Witnesses

W. L. Pennington

F. W. Worster.

Inventor

Andrew Dougherty

by his Attorney

C. F. Fenwicky

A. Dougherty.
Printing Press.

Sheet 3.3 Sheets.

No. 57486. Patented Aug. 28. 1866.

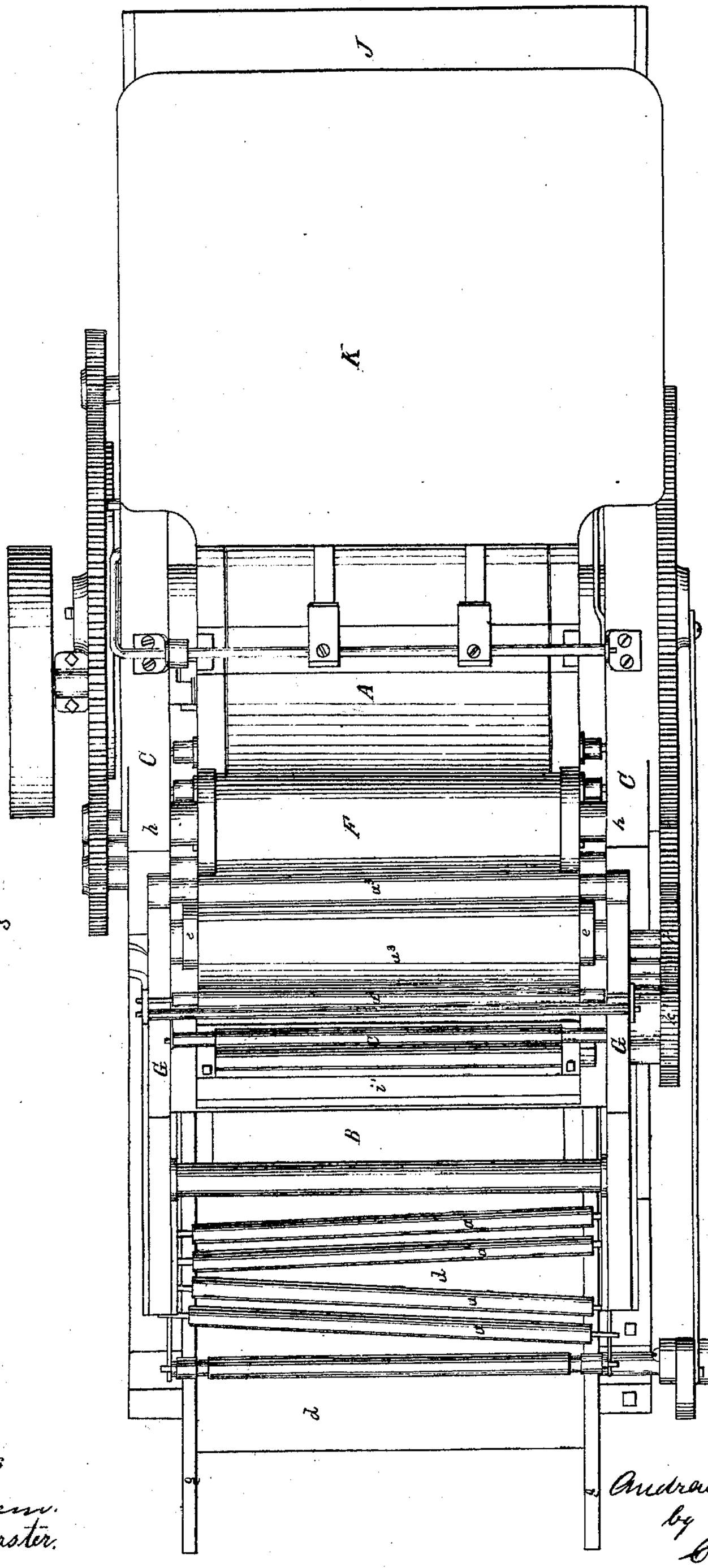

Fig. 3.

Witnesses
W. L. Gennens.
F. W. Wurster.

Inventor
Andrew Dougherty
by his Attorney
C. L. Remrick.

UNITED STATES PATENT OFFICE.

ANDREW DOUGHERTY, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN PRINTING-PRESSES.

Specification forming part of Letters Patent No. **57,486**, dated August 28, 1866.

To all whom it may concern:

Be it known that I, ANDREW DOUGHERTY, of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Printing-Presses; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 represents a side view of a printing-press embodying my invention. Fig. 2 represents a vertical longitudinal section of the same; and Fig. 3 represents a plan of the same.

Upon the 9th day of August, A. D. 1859, Letters Patent of the United States were granted to me for an improvement in printing-presses. The object of my present invention is to extend the utility of the said improvement; and it consists of the combination, in a printing-press, of the following instrumentalities, viz: first, a printing or main cylinder for carrying a sheet of paper and presenting it to printing-surfaces; second, a reciprocating carriage for holding a form of type or other flat printing-surfaces, and applying them to the paper carried by the main cylinder; third, inking apparatus for such flat printing-surfaces; fourth, one or more impression-cylinders for carrying curved printing-surfaces and applying them to the paper carried by the main cylinder; fifth, inking apparatus for such curved printing-surfaces; and, sixth, a carriage holding the inking apparatus for such curved printing-surfaces, and arranged so that it may be moved to and fro, whereby access is readily obtained to the printing-surfaces.

My invention consists, further, of the combination of the aforesaid instrumentalities with, first, one or more impression-cylinders for curved printing-surfaces arranged at the side of the main or printing cylinder opposite that at which the first impression cylinder or or cylinders are situated; second, an inking apparatus for such second impression-cylinder; and, third, a carriage therefor; so that the same press contains a reciprocating carriage for flat printing-surfaces, the inking apparatus therefor, at least two impression-cylinders and inking apparatus arranged at opposite sides of the printing-cylinder, and two carriages for said inking apparatus.

My improvements are embodied in the printing-press the principal parts of which are represented in the annexed drawings, the remainder being omitted in order to render the drawings more simple, and because the parts omitted do not differ materially from the corresponding parts of other presses.

The main cylinder A of this press is constructed in the manner customary in cylinder printing-presses, and is fitted with gripers and such other appliances as are necessary to enable it to seize, carry, hold, and deliver the sheet of paper to be printed. This cylinder is mounted upon a shaft, *b*, which is supported by the sides of the frame C of the press.

The reciprocating type-carriage B is arranged to move to and fro horizontally beneath the main cylinder A, being supported on suitable ways which are secured to the frame C of the press. It is constructed and driven as is customary in roller printing-presses, a convenient mode of driving it being by means of a rising-and-falling pinion, D, operating in connection with a rack secured to the carriage.

The carriage is provided with an inking-table, *d*, which by the motion of the carriage is moved to and fro beneath two sets of distributing-rollers, *a a a a*, *a' a' a' a'*, and a vibrating inking-roller, *c*, which supplies ink to one of the sets, *a a a a*, of distributing-rollers from the ductor *f* of the font E beneath the level of the carriage. The vibrating roller *c* is alternately raised and lowered by two inclined planes, *g g*, secured to the carriage B.

The printing-press represented in the drawings is provided with three impression-cylinders, F F F, arranged at one side of its main cylinder A, and adapted to hold curved printing-surfaces and to apply them to the sheet of paper carried by the main cylinder. The shaft of each of these impression-cylinders is supported in puppet-heads *h h*, secured to the frame C of the press. An inking apparatus is provided for each of these impression-cylinders, and these several inking apparatus are connected with a carriage, G, which is arranged to slide toward and from the main cyl-

inder A upon ways formed upon the sides of the frame C of the press. Each inking apparatus consists, in this example, of an ink-font, E′, with its ductor-roller f' and stripper i', a vibrating roller, c', and distributing-rollers a^2 a^2 a^3 a^4 a^4; but one complete set of these is shown in the drawings, in order to render them less complicated.

The vibrating roller c' is conveniently operated by cams e e, secured to the journals of one of the distributing-rollers, a^3.

The main distributing-cylinders a^3 a^3 a^3 have cog-wheels k k k' fitted to their shafts, which are connected, by intermediate cog-wheels, k' k', with each other, so that when one set of inking-cylinders are turned the others are turned likewise.

The cog-wheel k of the lowest inking apparatus upon the carriage gears into a cog-wheel, k^2, which is in the proper position, when the carriage is in place for printing, to gear into one, k^3, of a train of wheels which are supported by the frame C of the press, and which then impart motion from the main cylinder A to the inking-rollers of the carriage G. The carriage is provided with stops m m', (two at each side,) by which it is held in its place, when the press is at work, with the last inking-rollers a^4 a^4 of each set in position to apply ink to the type or other curved printing-surfaces carried by the impression-cylinder F.

As the inking apparatus of the impression-cylinders F F F at the side of the main cylinder are combined with the carriage G, the first may be readily removed from the impression-cylinders by moving the stops m m' and sliding back the carriage, thereby permitting free access to the impression-cylinders for the purpose of adjusting the printing-surfaces thereto, or for other purposes. Moreover, when such purposes have been accomplished, the inking apparatus are readily restored to their precise positions by moving the carriage G back to its place, and then the whole are secured by replacing the stops m m'.

An additional impression-cylinder, F′, is arranged at the side of the main cylinder A opposite that at which those F F F, above described, are situated. An inking apparatus composed, of a font, ductor-roller, vibrating roller, and distributing-rollers a^5 a^6 a^6 (the last only of which are represented in the drawings) is provided for this impression-cylinder F′, and is secured to a carriage, G′, which is arranged to slide to and from the main cylinder A upon the frame of the machine in manner similar to the carriage G, first described. This carriage is held in place with the last two distributing-rollers, a^6 a^6, of its inking apparatus in proper positions to apply ink to the curved printing-surfaces upon the impression-cylinder F′ by means of stops, which in this example are bolts n, (one at each side of the carriage.) The carriage also supports the delivery or fly table J, upon which the printed sheets are delivered. The combination of the inking apparatus of the supplementary impression-cylinder F′ with the carriage G′ enables the said apparatus to be readily removed to permit access to the impression-cylinder or for other purposes, and to be readily restored to its exact position for working.

The press is provided with a feeding-table, K, and also with the endless tapes and pulleys therefor, and other appliances which are necessary and usual for the purpose of carrying the sheet of paper through the press and delivering it. The press is also provided with the gearing required to cause the printing-surfaces of the reciprocating carriage and impression-cylinders to move at the same speed as the paper upon the main cylinder, and with vibrating pawls to turn the ductor-rollers of the several ink-fonts. As, however, the construction of all these is well understood by builders of printing-presses, and they form no part of my present invention, I have not deemed it necessary to represent them fully in the drawings or to describe them in detail.

The press thus described is well adapted to the printing of colored illustrations with letter-press, as curved type or blocks for printing the colored illustrations may be affixed to the impression-cylinders F F F F, while the type for the letter-press may be placed upon the carriage B. In this case the illustration may be printed in five colors, or, by increasing the number of impression-cylinders, a larger number of colors may be used.

Having thus described a press embodying my invention, I declare that I do not claim the invention of the individual members of which the press is composed, nor any particular number of impression-cylinders operating in connection with a main or printing cylinder for carrying the paper, nor any particular construction of the inking apparatus or other members of the press, my invention being limited to certain new combinations.

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

1. The combination, in a printing-press, of the following instrumentalities, viz: the printing-cylinder, reciprocating carriage for flat printing-surfaces, inking apparatus therefor, impression-cylinder for curved printing-surfaces, inking apparatus therefor, and carriage for the inking apparatus, all operating in the combination substantially as set forth.

2. The combination, in a printing-press, of the following instrumentalities, viz: the printing-cylinder, reciprocating carriage for flat printing-surfaces, two impression-cylinders for curved printing-surfaces arranged at opposite sides of the main printing-cylinder, two inking apparatus therefor, and two carriages for the inking apparatus, all operating in the combination substantially as set forth.

In testimony whereof I have hereunto set my hand this 2d day of April, A. D. 1866.

ANDREW DOUGHERTY.

Witnesses:

J. F. HARRISON,

CHARLES J. ARMS.