

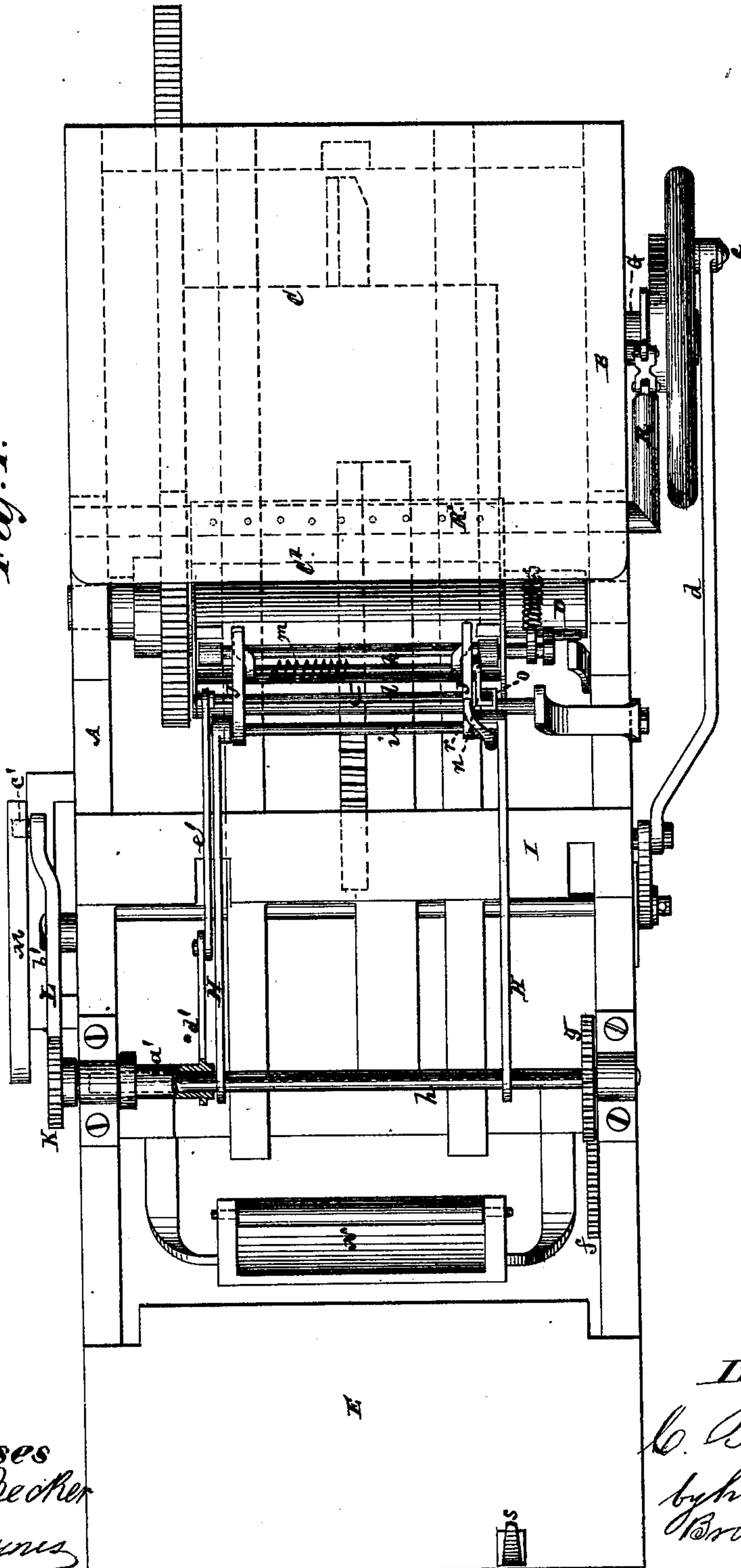
C. B. COTTRELL.

Delivery Apparatus for Printing-Machines.

No. 208,796.

Patented Oct. 8, 1878.

Fig. 1.



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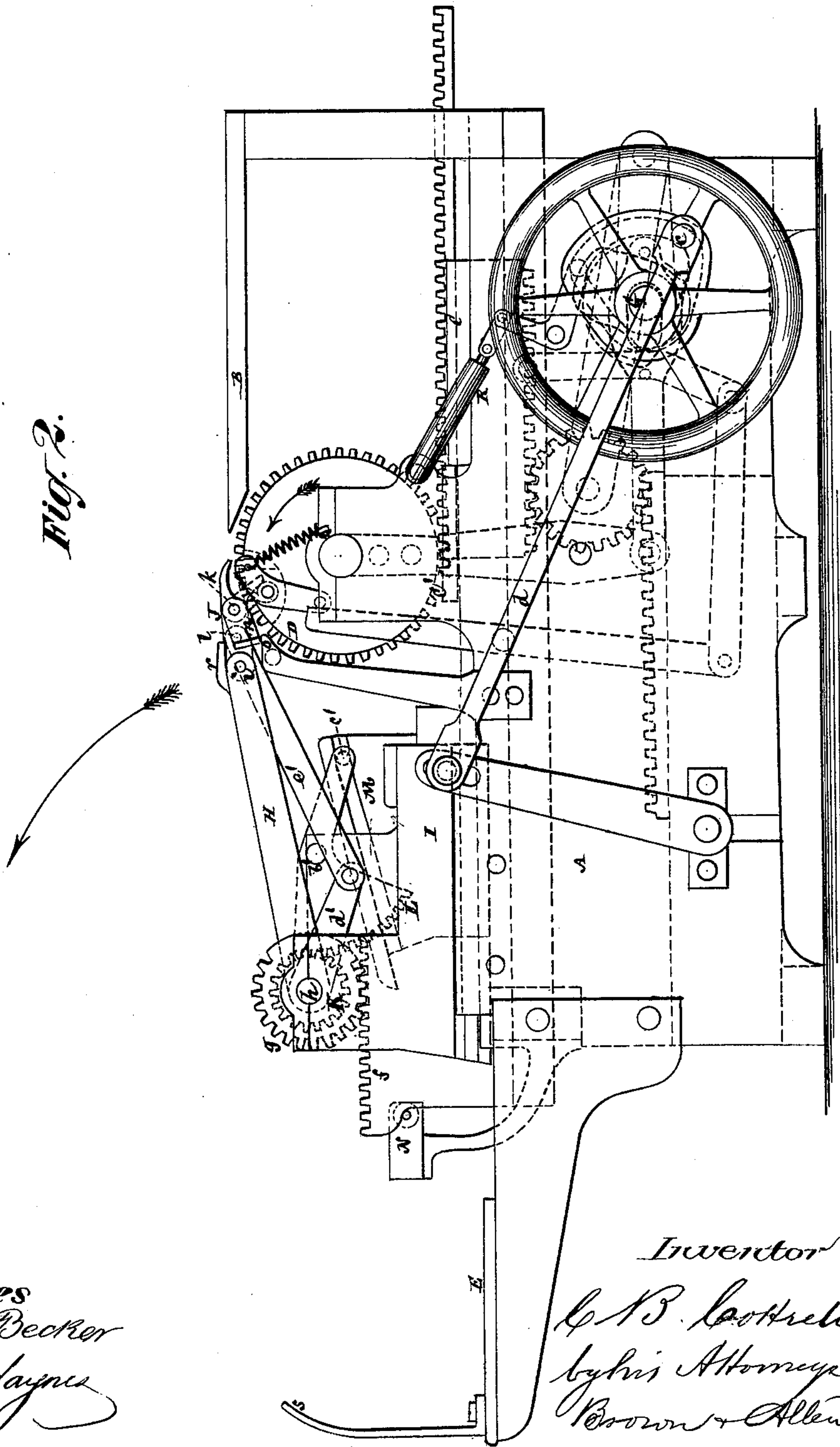
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FIG. 2.

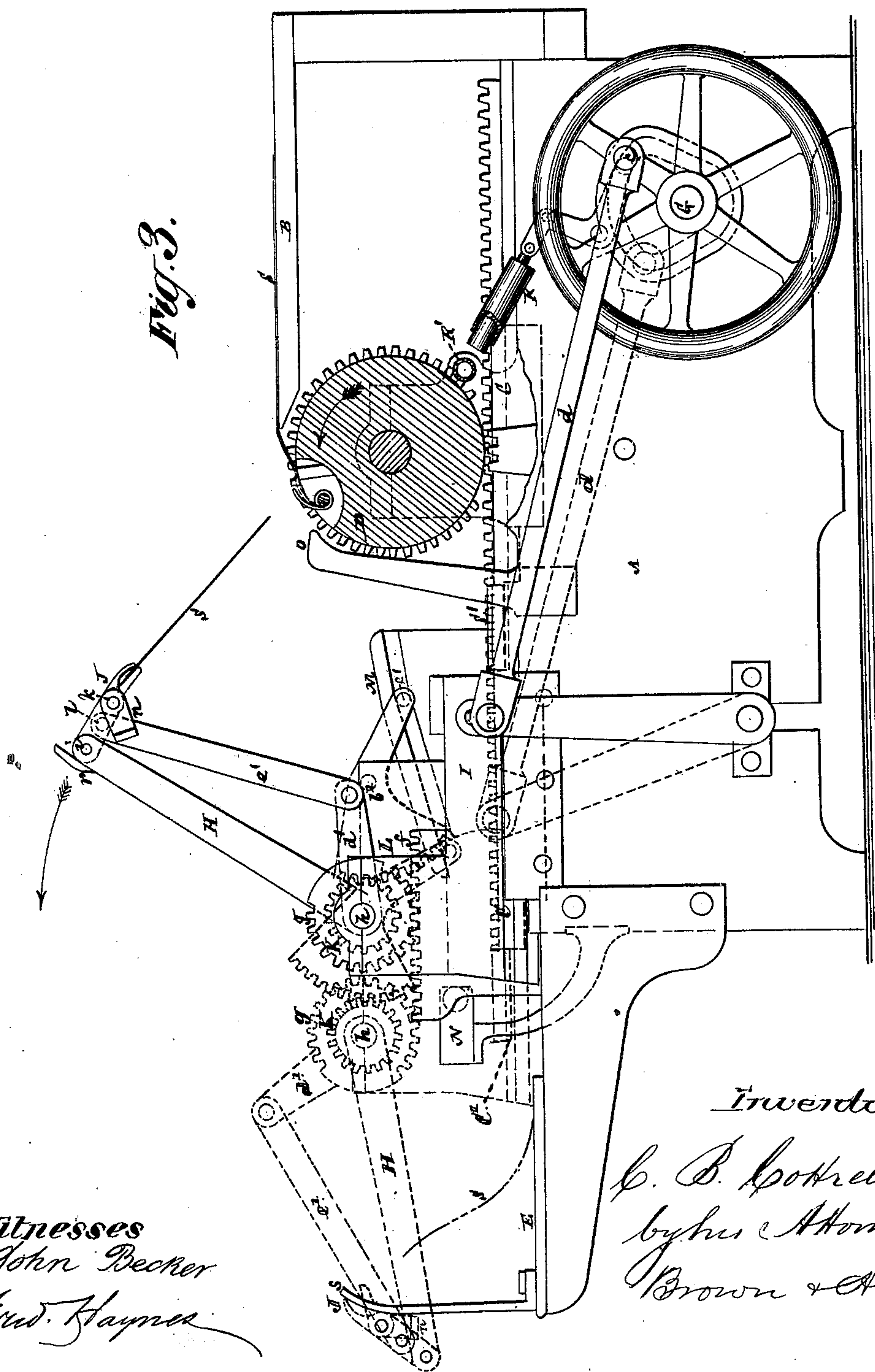


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Fig. 3.



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UNITED STATES PATENT OFFICE.

CALVERT B. COTTRELL, OF WESTERLY, RHODE ISLAND.

IMPROVEMENT IN DELIVERY APPARATUS FOR PRINTING-MACHINES.

Specification forming part of Letters Patent No. **208,796**, dated October 8, 1878; application filed December 19, 1877.

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 certain new and useful Improvements in Delivery Apparatus for Printing-Machines, of which the following is a description, reference being had to the accompanying drawing, forming part of this specification.

This invention consists in a novel arrangement of a reciprocating carriage, carrying a swinging fly-frame, with attached grippers, in combination with the reciprocating type-bed, the feed-table, and the delivery-table of a cylinder printing-press; also, in novel means of controlling the operation of the aforesaid grippers.

Figure 1 represents a plan of a reciprocating-bed printing-press with table-distribution and single impression-cylinder in part, and having my invention applied; Fig. 2, a side view of the same, showing the fly-frame and its attached grippers in position for taking the printed sheet from the impression-cylinder; and Fig. 3 is a longitudinal sectional elevation thereof, showing by full lines the fly-frame with its attached grippers as in the act of conveying the printed sheet from the impression-cylinder to the receiving board or table, and by dotted lines as in the act of depositing said sheet on the receiving-board beyond or back of the fountain and beyond the extreme outward position of the inking-table.

A is the frame of the press; B, its feed-board; C, the reciprocating type-bed, having an attached inking or ink-distributing table, C'; D, the impression-cylinder, and E the receiving table or board, at the opposite end of the press to that at which the feed-board is arranged.

The impression-cylinder D is here supposed to be a stop one—that is, its motion is arrested during the back travel of the reciprocating type-bed and inking-table; but said cylinder might be a continuously-rotating one, and have two revolutions for each reciprocating action of said bed and table.

The means for reciprocating the type-bed with its attached inking-table, and for operating the impression-cylinder, may be similar to those of other reciprocating-bed presses hav-

ing either a stop or two-revolution impression-cylinder, and neither these means, nor yet the grippers *b* of the impression-cylinder, when grippers instead of tapes are used, need description here.

G is the revolving main shaft, from which the several motions of the press are derived. This shaft serves, among other purposes or uses, to rock or vibrate and reciprocate toward or from the impression-cylinder a fly-frame, H, by means of a crank or eccentric pin, *c*, a connecting-rod, *d*, a sliding carriage, I, a fixed rack, *f*, and a toothed wheel or disk, *g*, in gear with said rack.

The toothed disk *g* is fast on a cross-shaft, *h*, which forms the rocking shaft or center of the fly-frame H, and is carried by the sliding carriage I. This frame carries on its outer end the grippers J, which take the sheet S from the impression-cylinder and carry or float it to and over the receiving-board E, where they deposit it.

The grippers J are hung by their upper jaws to vibrate on or are attached to a rock-spindle, *i*, carried by the outer ends of the rocking fly-frame H, and the lower jaws thereof are hung to vibrate with an advance cross-spindle, *k*, carried by the upper jaws. Between these cross-spindles *i* and *k* is a cross-bar, *l*, with which the spring *m*, that is wound round the spindle *k* and serves to close the lower jaws, is connected.

As the reciprocating carriage I is moved toward the impression-cylinder D the toothed disk *g*, by its travel over the fixed rack *f*, rocks the fly-frame H to bring its grippers J up to the advance edge of the sheet on the impression-cylinder, and toward the completion of this stroke or motion of the fly-frame an arm or projection, *n*, on one end of the spindle *k*, rides over a fixed projection, *o*, to open the jaws and to tip or tilt the latter upward till restrained by a stop, *r*, on the fly-frame, for the purpose of enabling the jaws to take the sheet. As the fly-frame H is swung or rocked and reciprocated backward to deliver the sheet, said frame, as it commences to rise, relieves the arm *n* from pressure on the projection *o*, which causes the spring *m* to close the jaws on the sheet, for the purpose of conveying or floating the latter by its one edge to and over the

receiving-board E; and as said rocking frame H and the reciprocating carriage I, which carries it, complete their backward movement, the arm *n* on the spindle *k* rides over a stop or guide, *s*, to open the jaws J again and to deposit the sheet S on the receiving-board B.

By supporting the fly-frame H in the reciprocating carriage I, and so that its shaft *h* has its bearings in said carriage, a fly-frame of reduced radius may be used for flying or conveying the sheet from the impression-cylinder to the receiving-board, arranged at a given distance apart. This is due to the reciprocating action of the carriage B.

To keep the swinging or rocking jaws J from dropping by their weight on or with the spindle *i* out of proper working line or position when working toward or from the impression-cylinder D, and to keep the forward ends of said jaws raised and turn or direct them into proper positions for taking hold of the sheet for floating or carrying it backward, and for depositing it on or over the receiving-board E, said jaws have combined with them means for mechanically adjusting their position while moving forward and backward relatively to the impression-cylinder. Thus, on one end of the rock-shaft *h* is a sleeve, *a'*, on which is secured a pinion, K. This pinion gears with a toothed sector or lever, L, having its pivot or fulcrum *b'* in the carriage I, and having a stud, *c'*, on its one end, which works within a grooved fixed guide, M, so that as the carriage I is reciprocated the toothed lever L is rocked by the grooved guide M to turn the pinion K, and with it the sleeve *a'*, and by an arm, *d'*, attached to said sleeve, and rod *e'*, connecting said arm with the jaws J, or their connecting cross-bar *l*, said jaws are turned and kept in their required working positions, to take, float, and deliver the sheet. If desired, the cross-bar *l* may drop into a notch in one arm of the fly-frame H, to support the jaws when lowered to deliver the sheet.

N is the fountain of the press, beyond or back of and below the level of which and beyond the extreme outward position of the inking-table C' (see dotted lines in Fig. 3) the receiving-board E for the sheets is arranged, thus leaving the fountain readily accessible and free from interference or interruption by

the receiving-board, and the latter free from being interfered with by the inking-table.

In the combination of parts, as shown, the impression-cylinder D, ink-fountain N, and reciprocating ink-distributing table C' are all arranged between the feed and receiving boards B E; and the fly-frame H, which is also arranged between said boards, takes the sheet from the impression-cylinder and carries it over the fountain N and over the inking-table C' to the receiving board or table E.

R is an air-blast pump, the plunger of which may be operated by bell-crank or otherwise from the shaft G, and which has connected with it a perforated tubular distributor, R', arranged under and in close proximity to the back of the impression-cylinder D, throughout the length of the latter, or thereabout. The object of this pump and its air-distributor is to blow a jet or jets of air through the perforations in the distributor under the tail of the sheet on the impression-cylinder, to prevent said sheet, by its dampness, from sticking to said cylinder, and so to facilitate the taking of the sheet from the impression-cylinder by the sheet-delivery devices.

I do not claim, broadly, a reciprocating carriage carrying a swinging fly-frame with attached grippers; but

I claim—

1. The combination, with a reciprocating-bed printing-press having its feed-table and the table for receiving the printed sheets on opposite sides of the impression-cylinder, of a reciprocating carriage arranged between the cylinder and the sheet-receiving table and above the reciprocating type-bed, and a fly-frame with attached grippers carried by said carriage, substantially as herein described, and operating to take the printed sheet from the cylinder and deposit it face upward upon the receiving-table, as herein set forth.

2. The combination of the sliding carriage I, the rocking fly-frame H, having attached grippers J, the sleeve *a'*, connected with the jaws to rock the latter, the pinion K, the toothed lever L, and the guide M, essentially as described.

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