

No. 614,243.

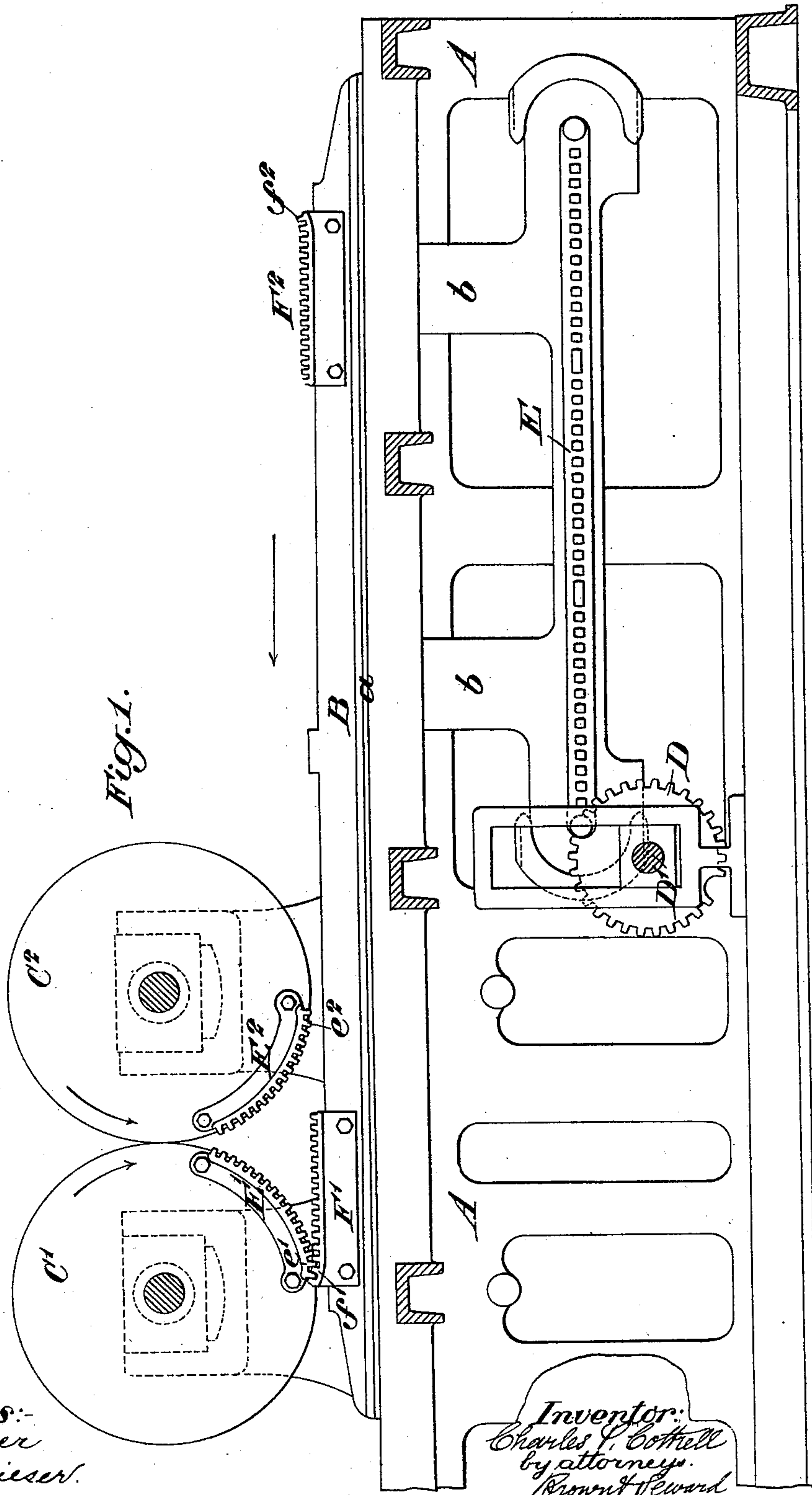
Patented Nov. 15, 1898.

C. P. COTTRELL.
PRINTING MACHINE.

(Application filed Nov. 19, 1897.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:
M. E. Fletcher
Edward Vieser.

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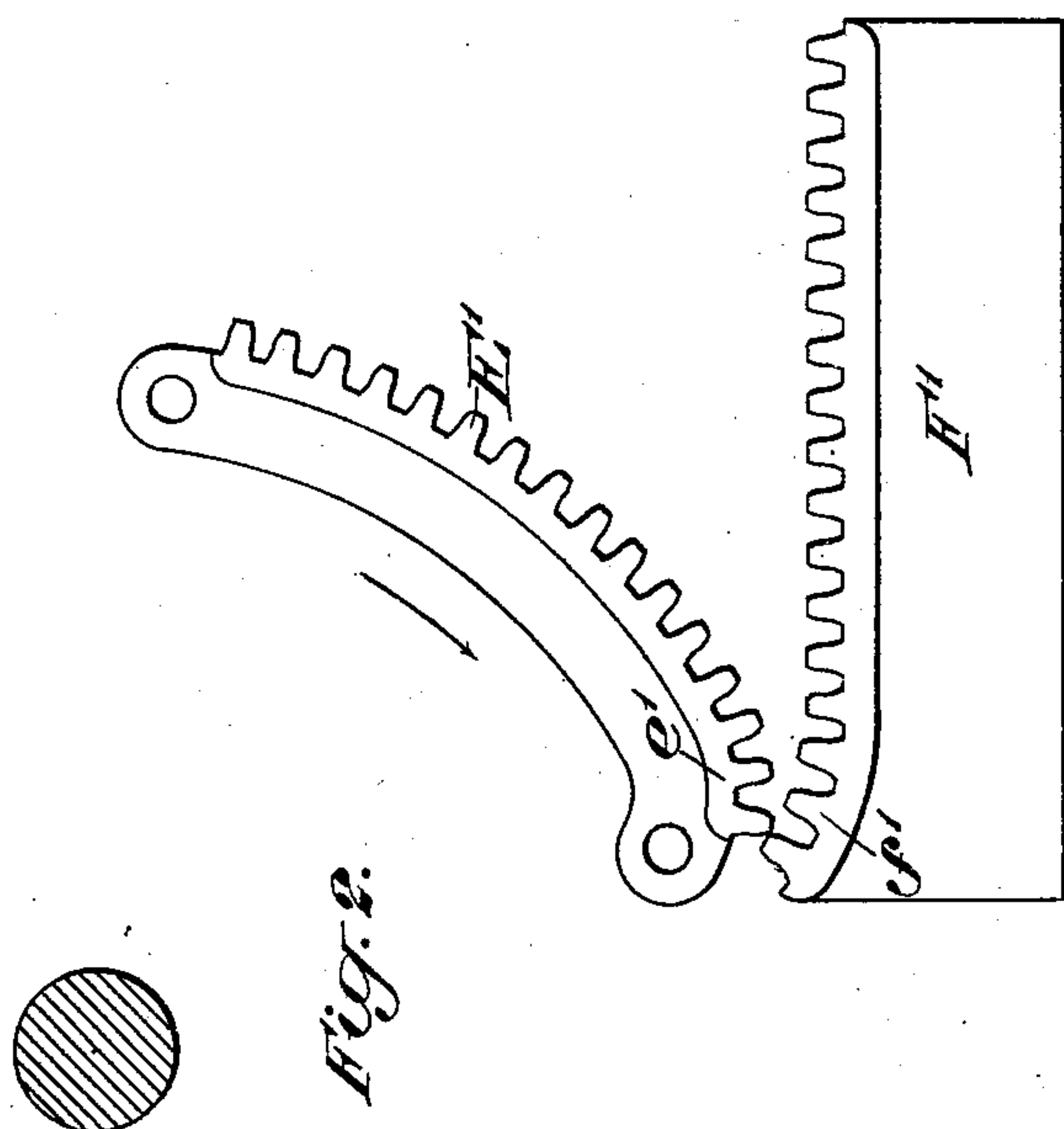
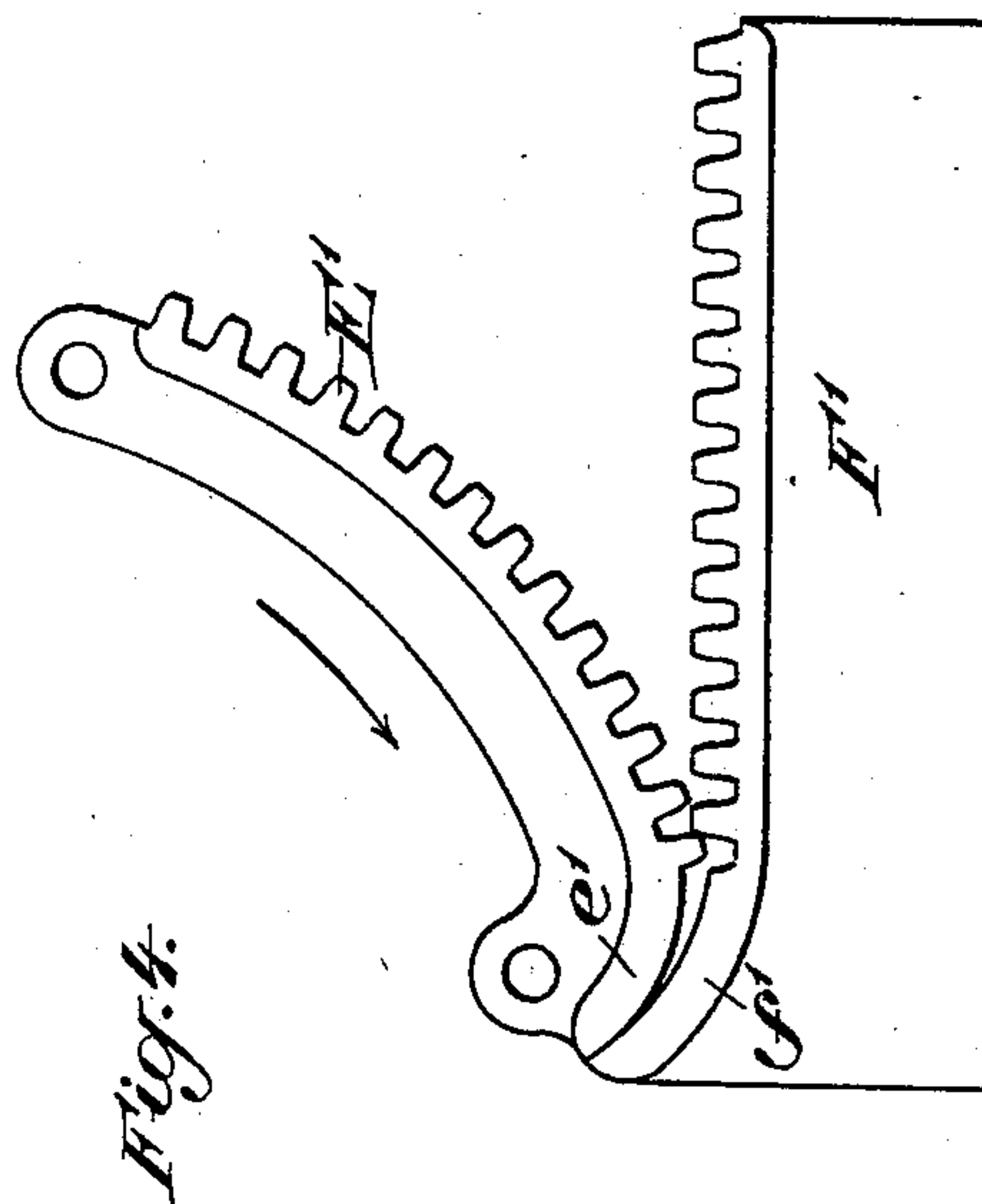
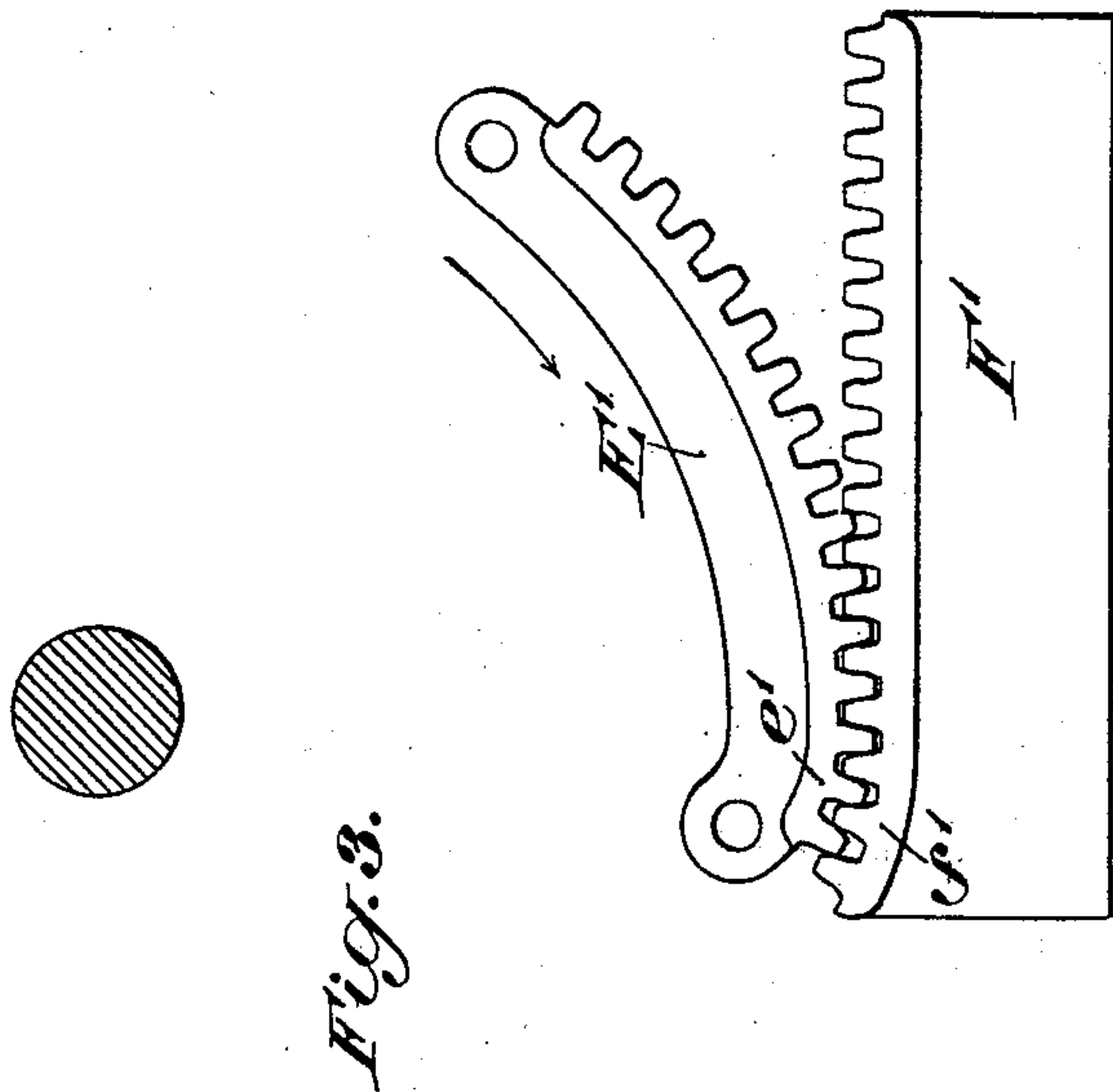
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2 Sheets—Sheet 2.



Witnesses:-
M. C. Fletcher.
Edward Tieser.

Inventor:
Charles P. Cottrell
by attorneys
Brown & Howard

UNITED STATES PATENT OFFICE.

CHARLES P. COTTRELL, OF STONINGTON, CONNECTICUT, ASSIGNOR TO THE
C. B. COTTRELL & SONS COMPANY, OF SAME PLACE.

PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 614,243, dated November 15, 1898.

Application filed November 19, 1897. Serial No. 659,074. (No model.)

To all whom it may concern:

Be it known that I, CHARLES P. COTTRELL, of Stonington, in the county of New London and State of Connecticut, have invented a new and useful Improvement in Printing-Machines, of which the following is a specification.

This invention relates to what is known in flat-bed cylinder printing-machines as "registering-gearing," which is used for the purpose of bringing the cylinder and bed to corresponding speeds in changing the direction of the movement of the bed.

The object of this invention is to provide an effective gearing for this purpose of more simple construction than those heretofore known.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 represents a longitudinal sectional elevation of those portions of a perfecting printing-machine which are necessary to the illustration of my invention, the section being taken just inside one of the side frames and showing the ends of the two cylinders and their attached segments and the side of the bed with its attached racks. Figs. 2 and 3 are side views of one of my segments and racks on a larger scale than Fig. 1, showing them in different relative positions. Fig. 4 represents a side view of a segment and rack, illustrating a modification of my invention.

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

In Fig. 1, A is the framing of the machine; and B the bed, running on the ways *a*.

C' C² are the first and second impression-cylinders.

The bed may be and is represented as driven in a well-known manner by a mangle-wheel D and a mangle-rack E, the said wheel being on the oscillating section D' of the mangle-shaft and the rack E being connected by hangers *b* with the bed. The cylinders may be driven independently of the bed in any suitable manner—as, for example, by such gearing as is common in flat-bed cylinder printing-machines—and therefore I have not thought it necessary to represent any gearing for this purpose.

E' *e'* designate the registering-segment of

the first impression-cylinder, and F' *f'* the rack on the bed corresponding therewith; E² *e*², the registering-segment of the second impression-cylinder, and F² *f*² the rack corresponding therewith. The segments in the examples shown in Figs. 1, 2, and 3 have the greater portion of their length in the form of true arcs E' E², concentric each with the axis of its respective cylinder; but each has its head—that is to say, that terminal portion *e'* or *e*², which comes first into gear with its respective rack—gradually turned inward toward the axis of the cylinder, and consequently of gradually shorter radius than the concentric portion E' or E² and eccentric to the cylinder. The racks F' *f'* F² *f*² in the same example are straight for the greater portion of their length that they may gear with the concentric portions of the segments, but have their outer ends—that is to say, that terminal portion *f'* or *f*² of each which comes first into gear with its respective segment—turned gradually upward, so that each may gear with the eccentric portion *e'* or *e*² of the said segment, and that the racks may enter into gear with those parts of the segment of shortest radius, and owing to the gradually-increasing radius of the segment may gradually and easily pass into gear with the concentric portion thereof, as may be understood by reference to Figs. 1, 2, and 3, Fig. 2 representing the rack F' *f'* as just entering into gear with the segment E' *e'* at the proper moment for the commencement of the movement of the bed to the left, Fig. 1 representing the bed as having started to the left and the rack fully in gear with the eccentric portion of the segment, and Fig. 3 representing the curved portion of the rack and the eccentric portion of the segment as leaving each other and the straight portion of the rack and concentric portion of the segment as coming into gear, while the bed continues its movement to the left.

The straight portion F' of the rack and the corresponding concentric portion E' of the segment operate together like those of the ordinary registering-gearing—that is to say, while they are properly in gear the bed and the operating-surface of the cylinder both have the normal corresponding speed re-

quired for printing, but the eccentric portion of the segment having a shorter radius than the concentric portion corresponds with a slower movement of the rack and the bed as compared with that of the cylinder. Now as at the time of the cylinder and bed coming into gear the bed is inclined to move at a slower speed than the cylinder, the correspondingly-greater movement of the cylinder during a given movement of the bed is compensated for by the shorter radius of the segment, and the segment and the rack come into gear without thumping, and the bed is by the progressively-increasing radius of the rack gradually and quietly brought up to the speed of the cylinder, so that by the time the concentric portion of the segment and straight portion of the rack come into gear the relative movements of the bed and cylinder have become normal.

The operation of the segment $E^2 e^2$ of the cylinder C^2 and the rack $F^2 f^2$ at the other end of the bed is precisely the same as that described with reference to $E' e'$ and $F' f'$, except that the movement of the bed is reversed.

The eccentric curvatures of the heads $e' e^2$ of the segments and the corresponding curvatures of the portions $f' f^2$ of the racks may be varied considerably without departing from the spirit of my invention; but I have found in practice that the curves of the heads $e' e^2$ of the segments may be in true arcs of circles described with a radius much shorter than the radius of the concentric portions $E' E^2$ of the segment, as may be understood by reference to Figs. 2 and 3. The curves of the raised portions $f' f^2$ of the racks will be so laid out that said portions may run properly in gear with the portions $e' e^2$ of the segments which are eccentric to the cylinder.

In the modification of my invention shown in Fig. 4 the concentric portion E' of the segment and the straight portion F' of the rack are toothed; but the eccentric portion e' of the segment and the corresponding curved portion f' of the rack are toothless, the faces of the said toothless portions being laid out on curves corresponding with the pitch-lines of the teeth of the eccentric portions of the segments and the teeth of the raised curved

portions of the racks described in Figs. 1, 2, and 3, so that there is between the said faces a simple frictional contact by which the cylinder and bed may be brought properly into register.

This improvement is obviously applicable to flat-bed cylinder printing-machines in which only a single impression-cylinder is used.

What I claim as my invention is—

1. The combination with the impression-cylinder and the reciprocating bed of a printing-machine, of a registering-segment provided on said cylinder and having a portion of its length eccentric to the axis thereof, and a registering-rack on the bed for gearing directly with the eccentric portion of said segment, substantially as and for the purpose herein described.

2. The combination with the impression-cylinder and the reciprocating bed of a printing-machine, of a registering-segment provided on the cylinder and having one portion of its length concentric with the axis of the cylinder and another portion eccentric to said axis, and a registering-rack fixedly attached to the bed and having a portion of its length straight for gearing directly with the said concentric portion of the segment and a curved portion for engaging directly with the eccentric portion of the segment, substantially as herein described.

3. The combination with the two impression-cylinders and the reciprocating bed of a perfecting printing-machine, of two registering-segments one on each cylinder with a portion of its length eccentric to the axis thereof and two racks carried by the bed one near each end thereof, one of said racks for engaging directly with the segment on one cylinder and the other for engaging directly with the segment on the other cylinder, the said racks having their outer ends curved one to correspond with the eccentric portion of one segment and the other to correspond with the eccentric portion of the other segment, substantially as and for the purpose herein described.

CHARLES P. COTTRELL.

Witnesses:

A. R. STILLMAN,
B. F. LAKE.