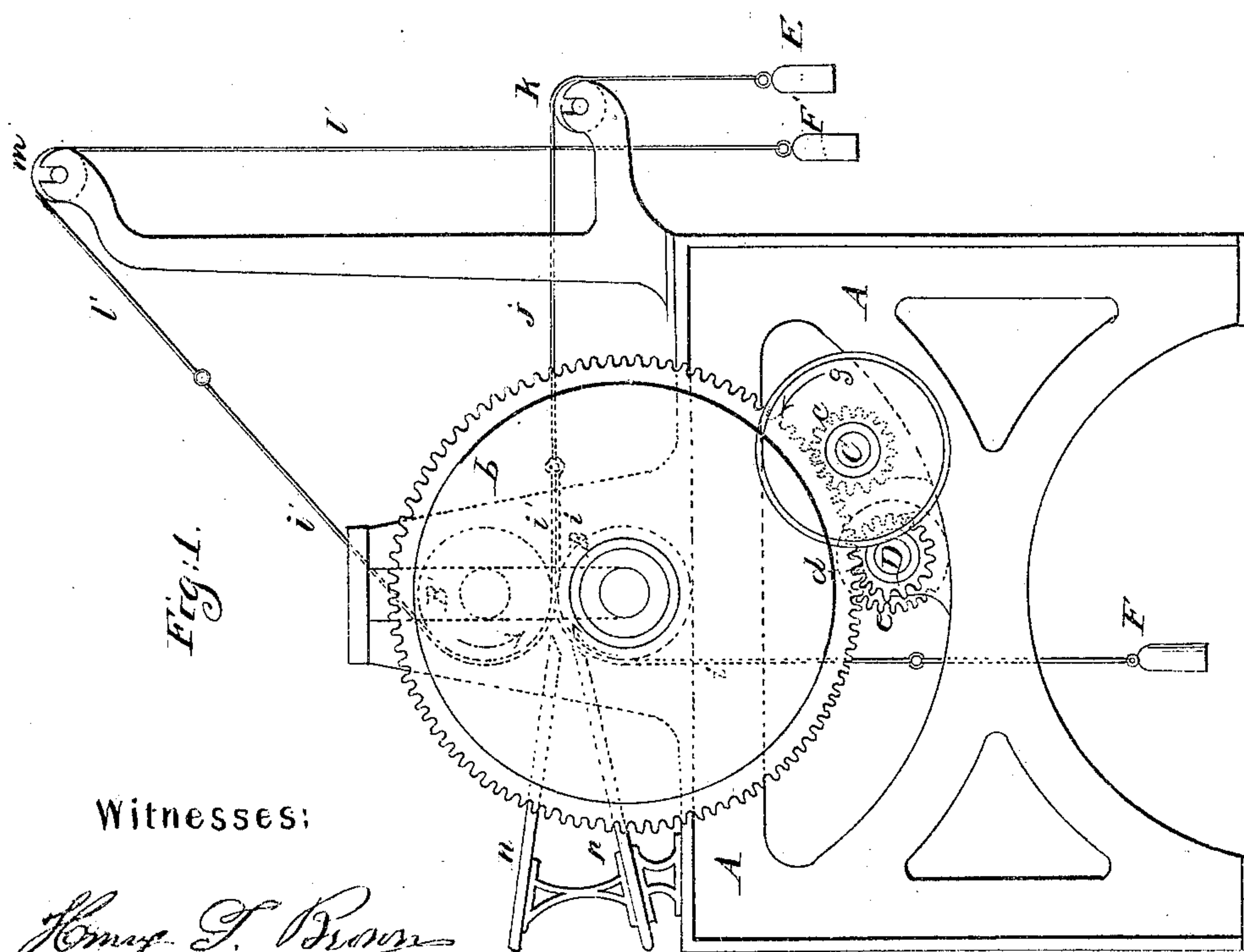
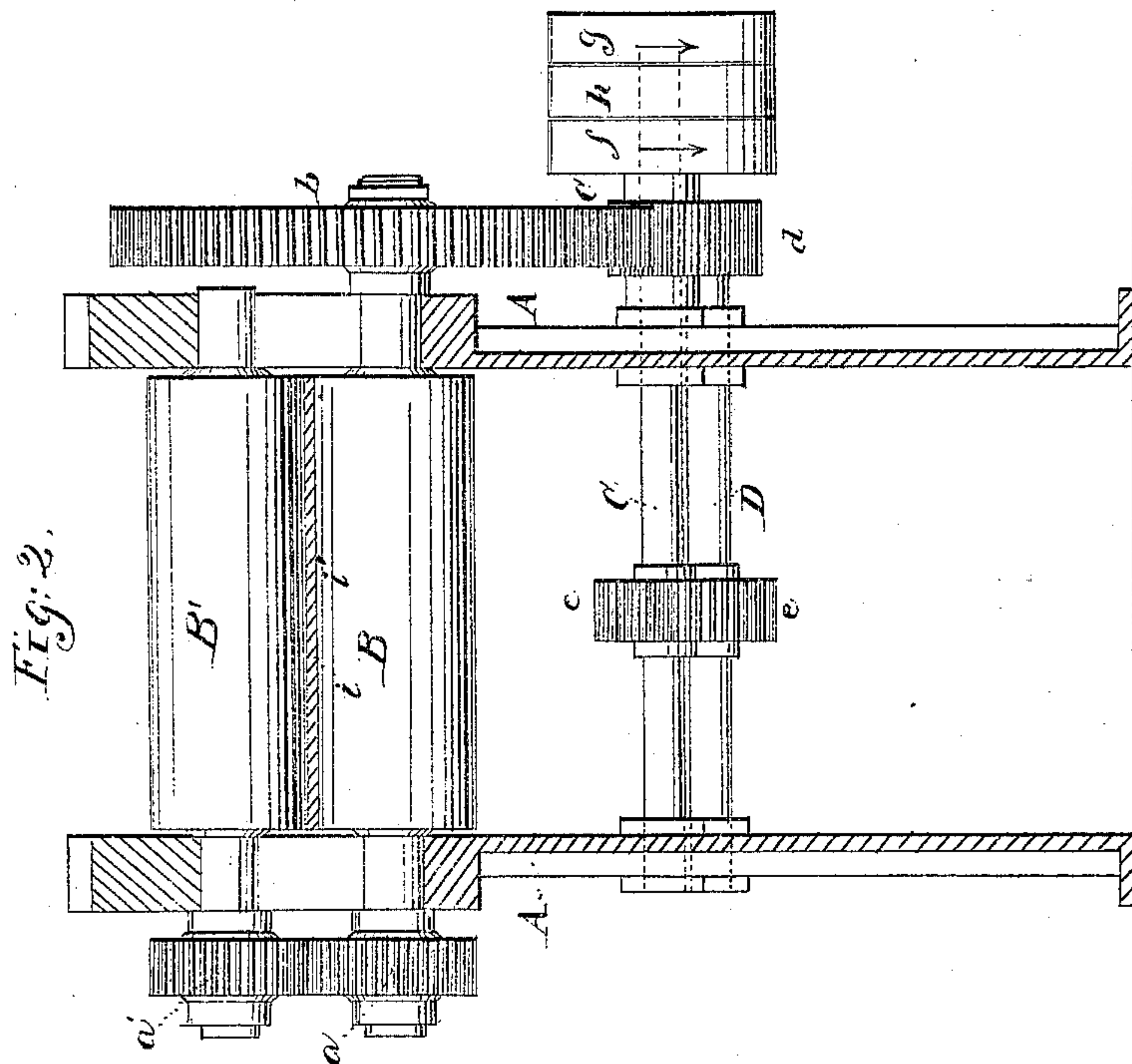


C. T. Bainbridge.
Calendering & Polishing.
N^o 49,691. Patented, Sept. 5, 1865.



Witnesses:

Henry J. Brown
J. H. Coombs

Inventor:

Chas. T. Bainbridge

UNITED STATES PATENT OFFICE.

CHARLES T. BAINBRIDGE, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN MACHINERY FOR PLATING OR FINISHING SHEETS OF PAPER.

Specification forming part of Letters Patent No. 49,691, dated September 5, 1865.

To all whom it may concern:

Be it known that I, CHARLES T. BAINBRIDGE, of the city of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Machinery for Plating Paper; 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, forming part of this specification, in which—

Figure 1 is a side view of a plating-machine constructed according to my invention. Fig. 2 is a vertical section of the same at right angles to Fig. 1, directly in front of the rollers.

Similar letters of reference indicate corresponding parts in both figures.

The finer kinds of writing and other papers are finished by what is termed the "plating process," consisting in subjecting the sheets separately to pressure between polished plates. This process gives a finer finish than calendering, but as heretofore performed has been very slow and tedious, and consequently very expensive. The principal cause of the slowness of the process has been that the plates, which were of steel and inflexible, had to be manipulated by hand to introduce the paper between them and remove it therefrom.

The object of my invention is to simplify and expedite the plating process; and to this end it consists, principally, in the employment of flexible plates of copper or other metal, which are so arranged and have such a reciprocating motion between pressure-rollers as to be kept continually in the machine, and to deliver the paper automatically on that side of the machine on which it enters.

To enable others to make and use my invention, I will proceed to describe its construction and operation.

A is the framing of the machine, containing the bearings for the journals of a pair of horizontal pressure-rollers, B B', which are arranged one above another, the upper bearings being held down by springs, set-screws, or other suitable means of applying the requisite amount of pressure to the upper roller.

The peripheral surfaces of the rollers may be of cast-iron, hard or compressed wood, or any other suitable hard material, and are turned perfectly cylindrical, of equal circumference, and finished up smooth. The shafts of the said rollers are geared together by a pair

of spur-gears, *a a'*, having equal numbers of teeth, so that both are compelled to rotate together but in opposite directions.

Upon the shaft of the lower roller, B, there is secured a spur-gear, *b*, which gears with a pinion, *c*, on the horizontal driving-shaft C of the machine, and with a pinion, *d*, on a horizontal counter-shaft, D, which is geared with the driving-shaft C by means of a pair of spur-gears, *e e*, and thereby driven in an opposite direction to the driving-shaft. The pinion *d* is fast on the counter-shaft but the pinion *c* is loose on the driving-shaft, and has firmly attached to it a loose pulley, *f*.

The driving-shaft is furnished with a fast pulley, *g*, and with a loose pulley, *h*, arranged between *f* and *g*. *i* and *i'* are the flexible plates, which constitute the leading feature of my invention, placed between the rollers B B'. These plates I prefer to make of copper, on account of its flexibility and the high polish which it is capable of receiving. I propose to make the said plates generally of about 32 gage, of a width equal to the length of the rollers, and of a length somewhat greater than the length of the sheets of paper to be plated. In rear of the rollers B B' one end of each of the said plates is connected with the corresponding end of the other one, and with a weight, E, by means of a cord, strap, or chain, *j*, which runs from the said plates in a horizontal direction over a roller or pulley, the journals of which are arranged in bearings at the back of the machine. The upper plate, *i'*, passes around the front of the upper roller, B', and the opposite end to that, connected with the weight E, is connected with a weight, F', by means of a cord, strap, or chain, *l'*, passing over a pulley or roller, *m*, the journals of which are arranged in elevated bearings at the back of the machine. The lower plate, *i*, passes over the front of the roller B, and the opposite end to that connected with the weight E has suspended from it a weight, F. The opposite surfaces of the plates are highly polished.

In front of the pressure-rollers B B' there is arranged a stationary feed-board, *n*, inclining downward toward the space between the said pressure-rollers, and just below this feed-board there is a stationary delivery-board, *p*, which has a downward inclination from the space between the rollers B B'.

The operation of the machine is as follows:

The driving-belt is first placed on the pulley *f*, which is thereby driven in the direction of the arrow shown in Fig. 1, and the pinion *e* is thereby driven in the same direction, and so by its action on the wheel *b* made to produce a rotary motion of the pressure-rollers in the direction of the arrows shown upon them in Fig. 1, and the plates *i i'* are run back between the rollers by the pressure and friction of the latter. Previous to the commencement of this movement the two connected rear ends of the plates are nearly close in rear of the rollers. As the said movement commences a sheet of paper is fed forward from the feed-board *n* between the plates *i i'*, and being seized by the said plates is carried back between them and between the pressure-rollers and subjected to pressure between the said plates. After the whole length of the sheet has passed between the rollers the driving-belt is shifted from the pulley *f* to the pulley *g*, thereby giving motion to the driving-shaft *C*, and through it and the gears *e e* to the counter-shaft *D*, and causing the pinion *d*, by its action on the wheel *b*, to drive the pressure-rollers in the opposite direction to that first described. The pressure-rollers then run back the plates *i i'* between them and carry back the paper, which is thereby subjected to a second pressure between the said plates and delivered onto the delivery-board *p* in a finished state. The driving-belt

is then shifted from the pulley *g* back to the pulley *f* and the operation repeated. The shifting of the belt may be effected by a belt-shifter operated by an automatic device attached to the machine.

In the above-described operation the weights *E F* and *F'* keep the plates *i i'* in proper relation to each other, and the weights *F F'* keep them so bent over the fronts of the pressure-rollers as to provide for the free entrance and delivery of the sheets of paper between and from the plates.

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

1. The flexible plates *i i'*, applied and operating in combination with a pair of pressure-rollers, substantially as and for the purpose herein specified.
2. The weights *E F F'*, attached to the ends of the flexible plates *i i'*, and operating substantially as and for the purpose herein specified.
3. The combination of the flexible plates *i i'*, pressure-rollers *B B'*, weights *E F F'*, feed-board *n*, and delivery-board *p*, the whole arranged and operating substantially as and for the purpose herein specified.

CHAS. T. BAINBRIDGE.

Witnesses:

HENRY T. BROWN,
J. W. COOMBS.