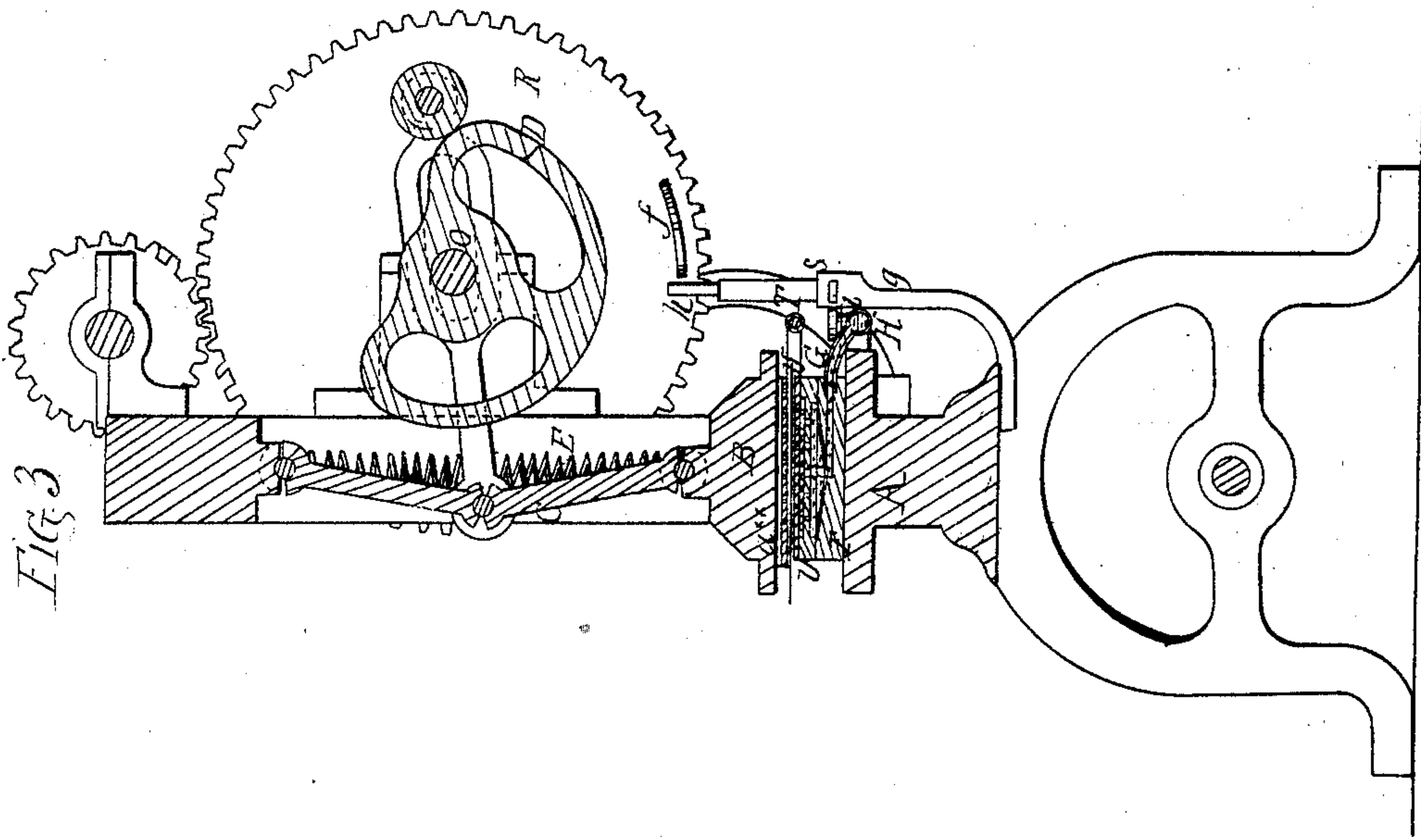
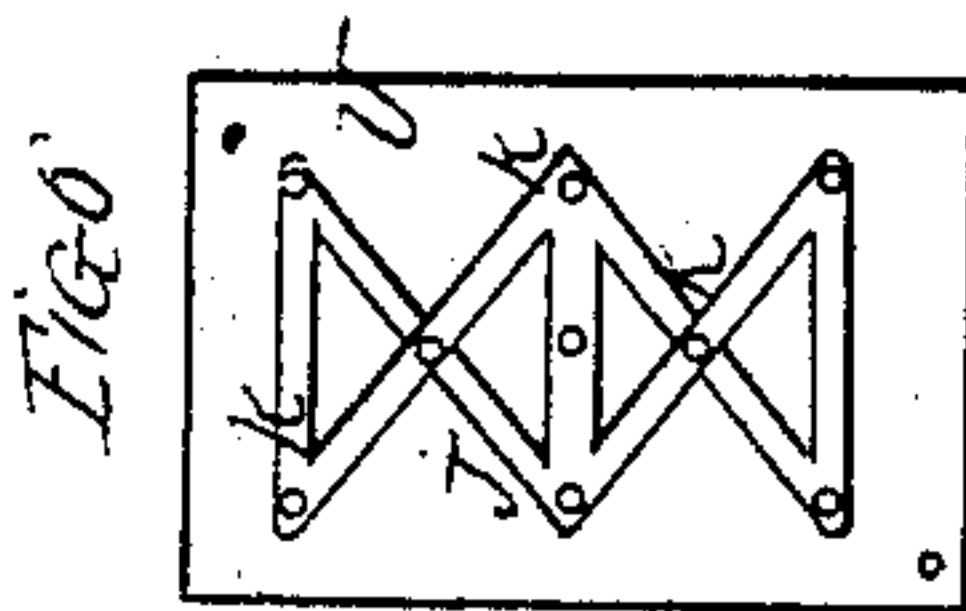
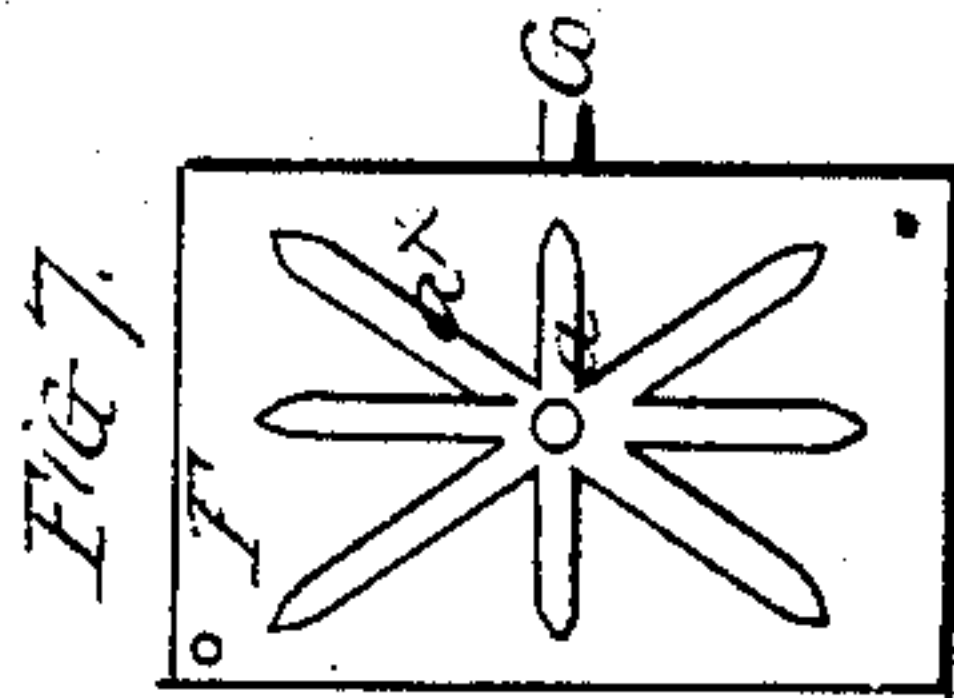
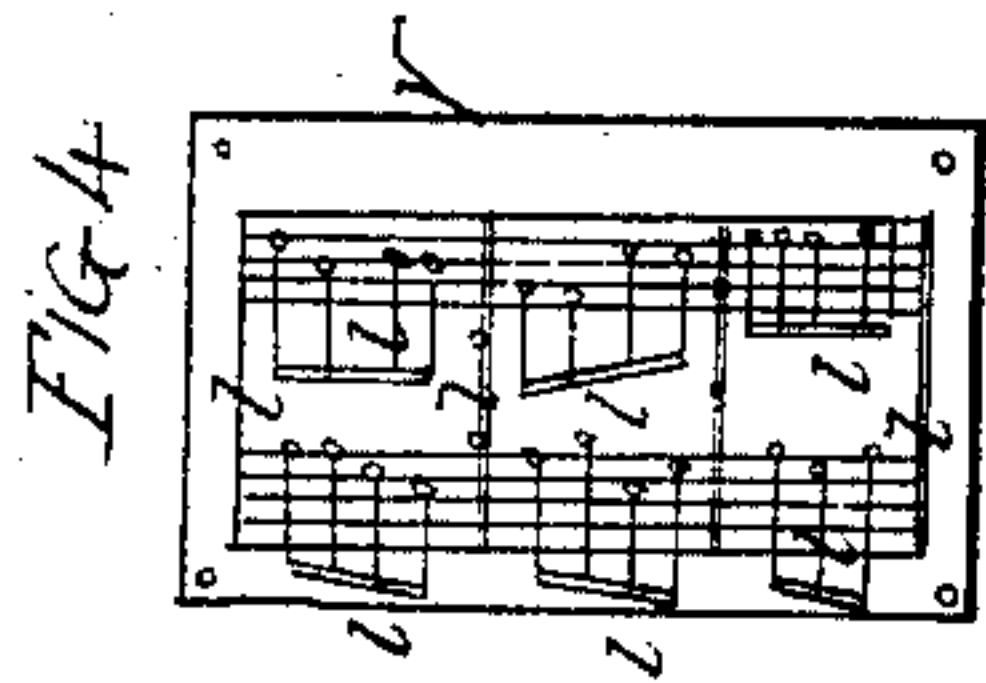
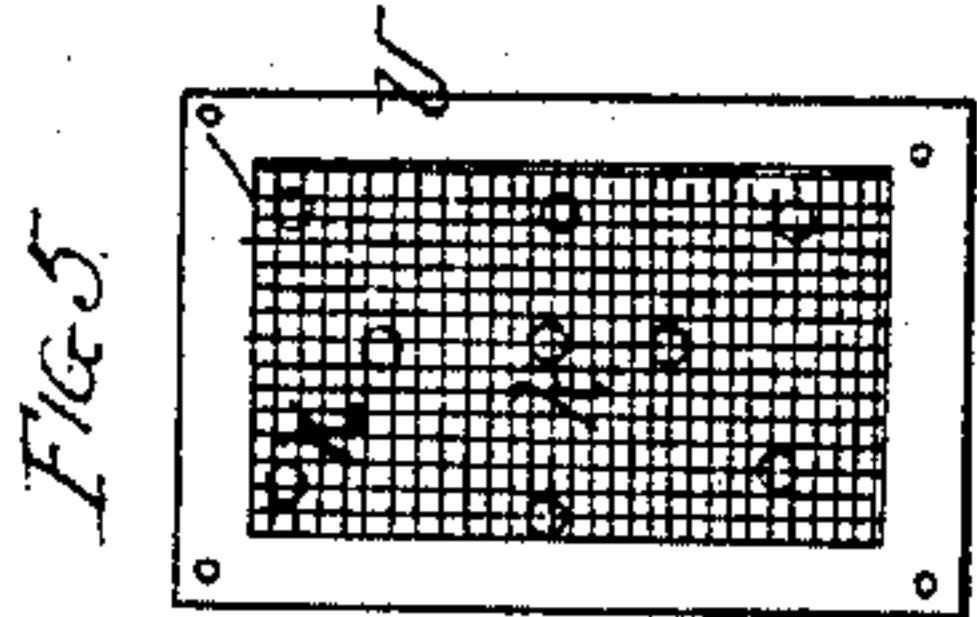


W. H. Oakes. Sheet 1. of 2 Sheets.  
 Copper Plate Printing.  
 No. 30,495. Patented Oct. 23, 1860.



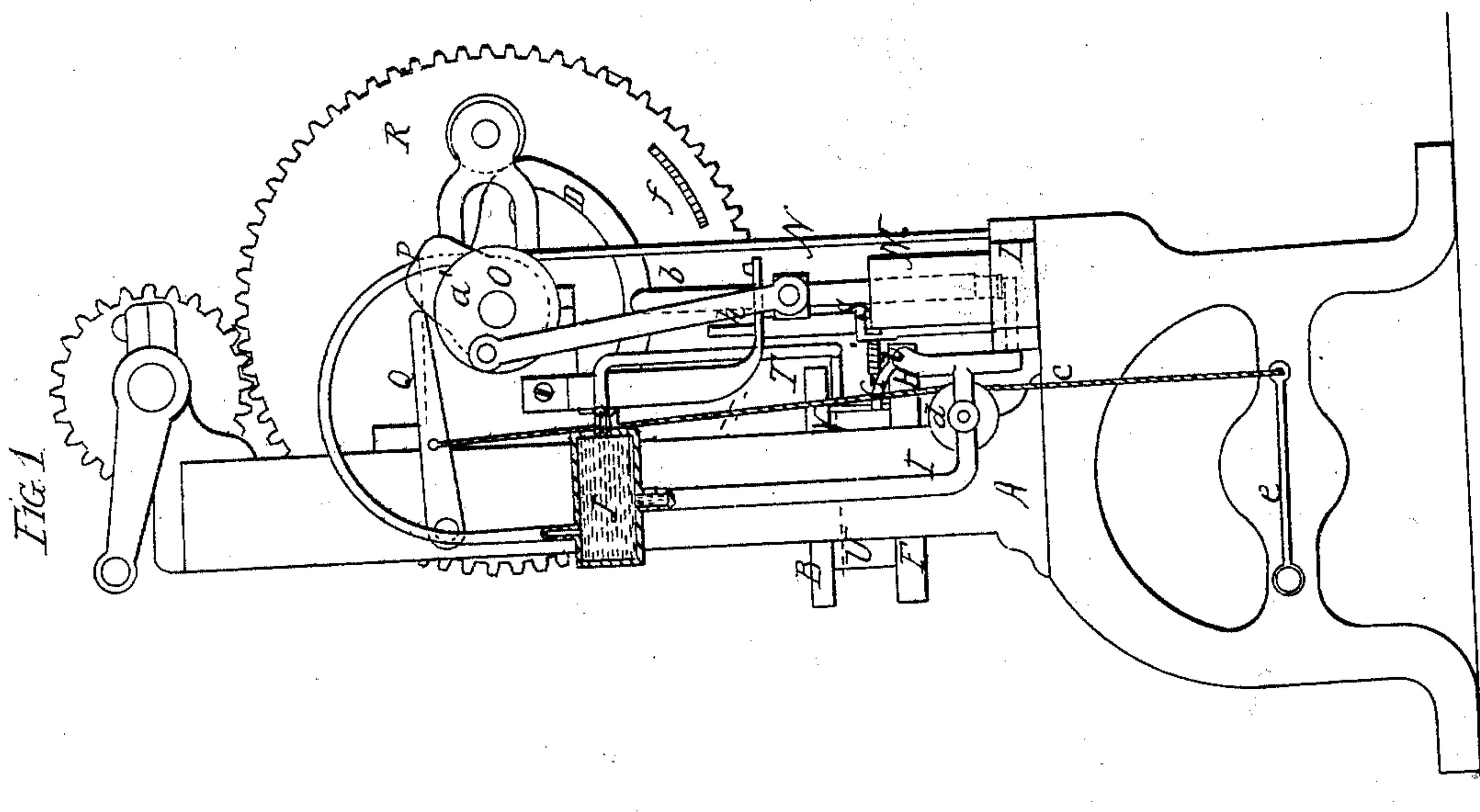
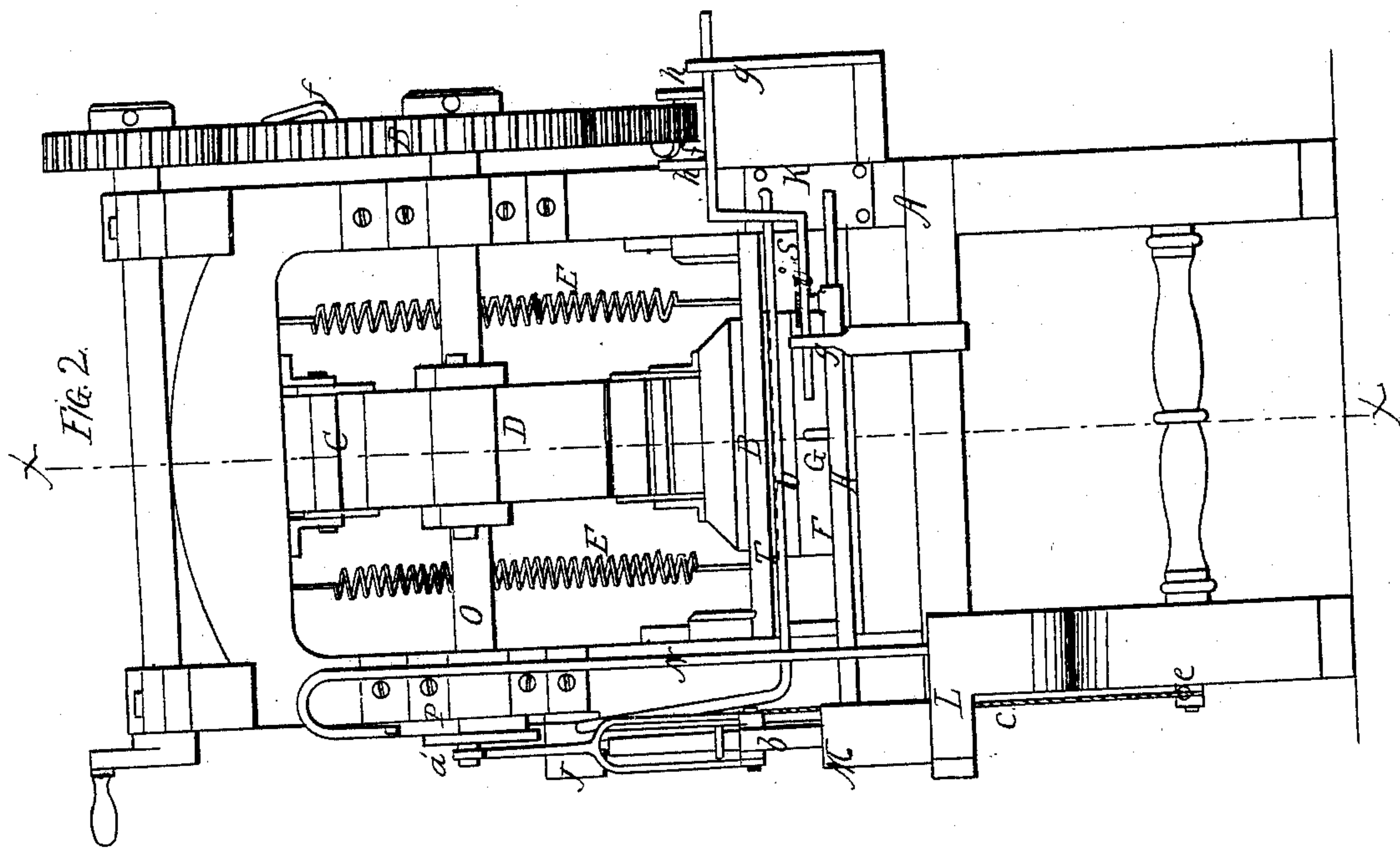
Witnesses

*James M. Cooke*

Inventor

*W. H. Oakes*

W. H. Oakes. Sheet 2. of 2 Sheets  
 Copper Plate Printing.  
 N<sup>o</sup> 30,495. Patented Oct. 23, 1860.



Witnesses

Drummond  
 J. H. Cook

Inventor

W. H. Oakes



# UNITED STATES PATENT OFFICE.

W. H. OAKES, OF NEW YORK, N. Y.

## PLATE-PRINTING.

Specification of Letters Patent No. 30,495, dated October 23, 1860.

*To all whom it may concern:*

Be it known that I, W. H. OAKES, of the city, county, and State of New York, have invented a new and useful Improvement in Plate-Printing; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1, is a side elevation of a press constructed and arranged to print according to my invention. Fig. 2, a back view of the same in elevation. Fig. 3, a vertical section of the same, taken in the plane indicated by the line  $x, x$ , Fig. 2. Fig. 4, a detached face view of the engraved plate to be printed from. Fig. 5, a detached face view of the bed-piece on which the plate to be printed from rests. Fig. 6, a detached inverted plan of the same. Fig. 7, a detached face view of the block on which the bed rests.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to an improvement in printing from engraved plates, or those which have the design, figure, pattern, or lettering to be printed sunk in their surfaces and which has hitherto required the paper or other substance which is to receive the impression to be pressed into the recesses or sunken portions in order to receive the impression, the recesses or sunken portions being filled with ink and the raised portions wiped perfectly clean. This kind of printing, commonly termed copper-plate printing, compared with the operation of a typographical press is very slow and tedious work. In the former process the plate requires to be covered or smeared over entirely with ink in order to fill the sunken portions, and the surplus ink must then be wiped off and the surface of the plate left perfectly clean in order that the sheet to receive the impression be not soiled. In the latter process the design being a raised surface no wiping and but little manipulation is required.

The object of the within described invention is to expediate the process of "plate printing" and at the same time perform equally as good work as by the old process. To this end I employ an ink of a fluid nature and inject the same into the recesses or sunken portions of the plate from under-

neath the latter and through proper perforations therein, the ink being injected into the plate with sufficient force and while the paper, or other substance to receive the impression, is being pressed upon its face side to leave an impression on the paper corresponding to the configuration formed by the sunken portions of the plate, the ink being drawn from the recesses of the plate as soon as an impression has been given, in order to admit of the adjustment of a succeeding sheet and a repetition of the operation.

To enable those skilled in the art to fully understand and construct my invention I will proceed to describe it:

A, represents the framing of a printing press. B, a platen operated by a toggle C, cam D, and springs E, E. These parts constitute an ordinary platen press, are well known and therefore do not require a minute description besides other forms of platen presses might be used in printing according to my invention.

In the framing A, and directly underneath the platen B, there is a fixed block F, the upper surface of which is grooved as shown at  $a^x$ , in Fig. 7, said grooves all diverging from a common center  $a$ , and communicating at that point with a tube G, which passes out through the side of the block and communicates with a horizontal pipe H. One end of the pipe H, is connected to a pipe I, which extends upward and communicates with an ink reservoir J, and the opposite end of pipe H, communicates directly with another ink reservoir K, an ink reservoir being at each side of the press. The pipe H, extends below its connection with the pipe I, and communicates with a box L, on which a cylinder of a pump M, is placed, the box L, having a valve opening inward at its junction with pipe H.

N, is a pipe the lower end of which communicates with the box L, and the upper end with the ink reservoir J. The lower end of pipe N, has a valve opening upward.

On one end of a shaft O, on the framing on which shaft the cam D, is placed, there is a crank pulley  $a'$ , to which the piston rod  $b$ , of the pump M, is attached and on the same shaft O, adjoining the pulley  $a'$ , there is placed a wiper P, which actuates



a lever Q, attached to the frame and which lever has a cord *c*, connected to it, said cord passing around a pulley *d*, of a valve stem, the valve being in pipe I, at its lower end, 5 the lower end of cord *c*, is attached to a spring *e*, which spring has a tendency to keep the valve in pipe I, closed.

At the end of the shaft O, the end opposite to that where the crank pulley *a'*, is attached, there is placed a toothed wheel R, at 10 each side of which there is a projection *f*, both of which are shown in Fig. 2.

S, is a slide which is fitted in bearings *g, g*, attached to the frame. This slide has 15 uprights *h, h*, attached to it between which the wheel R, and projections *f*, rotate as shown in Fig. 2. The slide S, is connected in any proper way with the stem *i*, of a valve in the pipe H.

20 T, is a tube which forms a direct communication between the two reservoirs J, K.

U, is a bed on which the plate to be printed from rests. This bed has its upper surface grooved longitudinally and transversely the grooves intersecting each other 25 and forming sunken passages over nearly the entire surface of the bed U, see Fig. 5. The under surface of bed U, is grooved in zig-zag form as shown at *j* and the bed is perforated with holes *k*, the perforations 30 extending entirely through the bed and communicating with the grooves *j*. The bed U, is placed on the block F, the grooves *j*, communicating with the grooves *a\**, in the upper surface of the latter. 35

V, is the plate to be printed from having the design engraved punched or otherwise sunken in its upper surface. A music plate 40 is shown in Fig. 4. This plate is perforated with holes *l*, one hole at least being in each isolated sunken portion of the plate. The plate V, is placed on the bed U, and there is a direct communication between the sunken portions in the plate, the grooves in 45 the upper and lower surfaces of bed U, the grooves *a\**, in the upper surface of block F, and the tube G.

The operation is as follows. The reservoirs J, K, are filled with quite fluid ink and 50 the plate V, being properly adjusted on its bed U, the shaft O, is rotated by any convenient power and the platen B, is raised and lowered through the medium of the cam D, toggle C, and springs E, E. Just 55 previous to each descent of the plunger B, a sheet of paper or other substance or material to receive the impression is placed on the plate V, and as the platen B, descends, the wiper P, on shaft O, actuates lever Q, 60 and the cord *c*, opens the valve in pipe I, so that when the platen B, has descended on the sheet which was placed on plate V, and is kept pressed thereon by the action of the

cam the valve in pipe I, will be open and the ink from reservoir J, will pass down pipe I, 65 and through pipes H, and G, into the grooves *a\**, *j*, in the block F, and bed U, and then pass through the perforations *l*, into the surface portions of plate V, and be forced against the sheet on the same with a 70 pressure due to the weight of reservoir J, above the plate. This pressure (hydrostatic) causes the impression on the sheet, the configuration of course coinciding with that of the sunken portions of the plate. 75 The valve in the pipe I, now closes and the piston of the pump M, rises the rod *b*, being drawn up by the crank pulley *a'*. The pump M, draws the ink from the recesses in the plate V, and said ink passes into the box 80 L, leaving the recesses in plate V, perfectly empty by the time the platen B, has reached its culminating point. Another sheet is now placed on the plate V, the printed one being 85 previously removed, and as the platen B, descends the plunger of pump M, also descends and forces the ink which was drawn into box L, from plate V, at the upward movement of the plunger up through tube N, into reservoir J. At the commencement of the 90 downward movement of platen B, the slide S, is actuated and the valve stem *i*, turned so as to open the valve in pipe H, and allow ink to pass into the tube G, and grooves *a\**, *j*, and recesses of plate V, in advance of the 95 ink from reservoir J, the latter serving only as a means for giving the pressure. The employment of reservoir K, is essential as it insures a quick operation of the press, saving the time which would be otherwise consumed in the passage of the ink from the reservoir J, after the platen B, has descended. The slide S, is operated to close the 100 valve in pipe H, as the platen B, commences to rise. The ink reservoir K, is kept supplied from J, by the tube T. 105

From the above description it will be seen that the manipulation of wiping off the plate and the tedious manner of giving the impression which attends the ordinary 110 "plate printing" process is avoided.

The platen B, may be perforated as shown at *a\**, to allow the escape of air from between it and the sheet as the latter is pressed down upon the plate V, the air also being 115 allowed to escape from between the sheet and the plate, the air passing up through the sheet as the plate is pressed down.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is— 120

1. Printing from engraved plates by having the sunken portions thereof, which form the design to be printed, charged or filled with fluid ink from below the plate, the ink 125 being forced up through perforations in the



plate against the paper or substance to receive the impression, while said paper or other substance is pressed upon or against the plate.

5 2. The arrangement of the ink reservoirs J, K, with the pipes I, H, tubes T, G, pump M, and grooves  $a^x$ ,  $j$ , in the block F, and bed

U, in connection with the perforated plate V, substantially as and for the purpose set forth.

W. H. OAKES.

Witnesses:

M. M. LIVINGSTON,

J. H. COOKE.