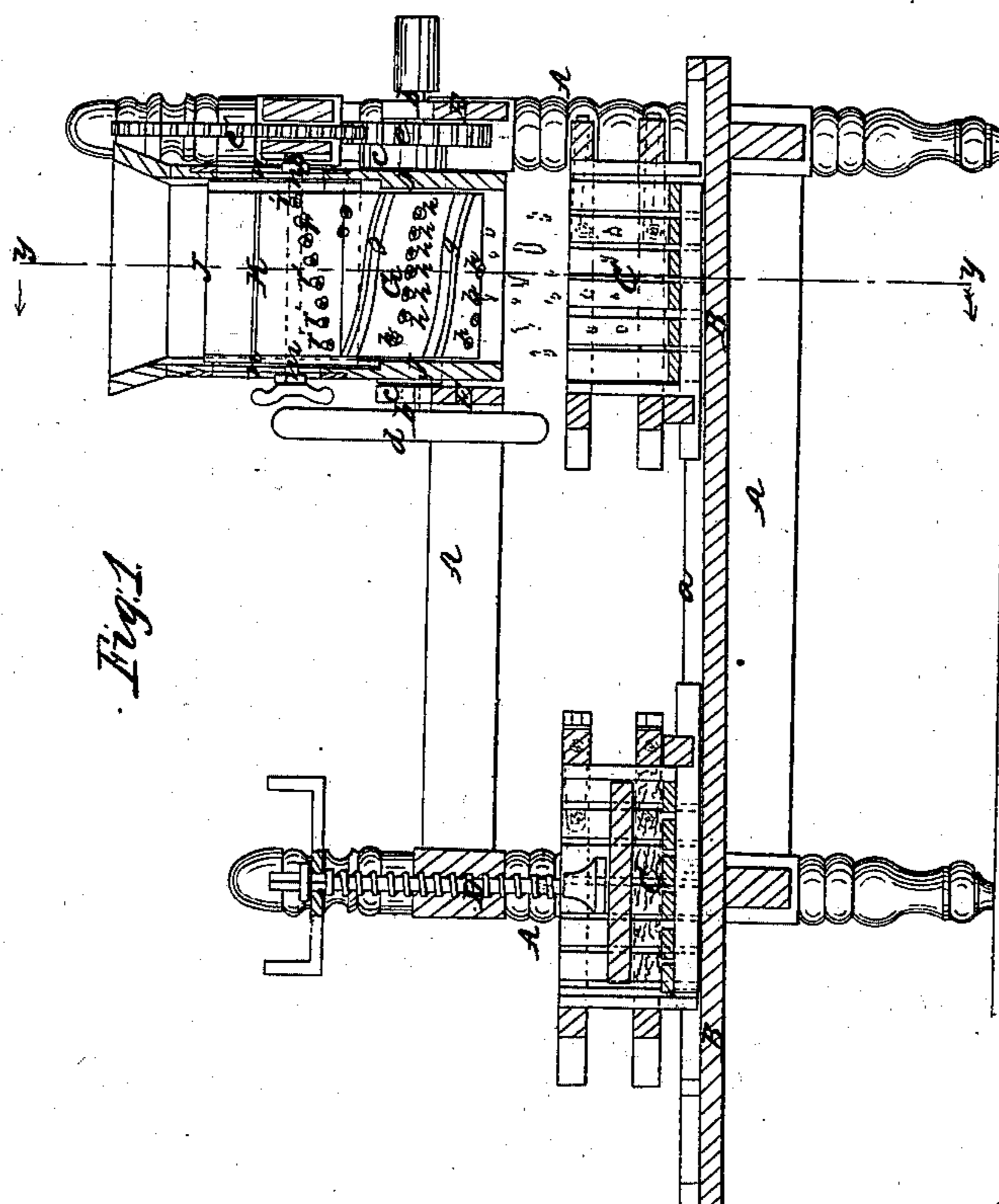
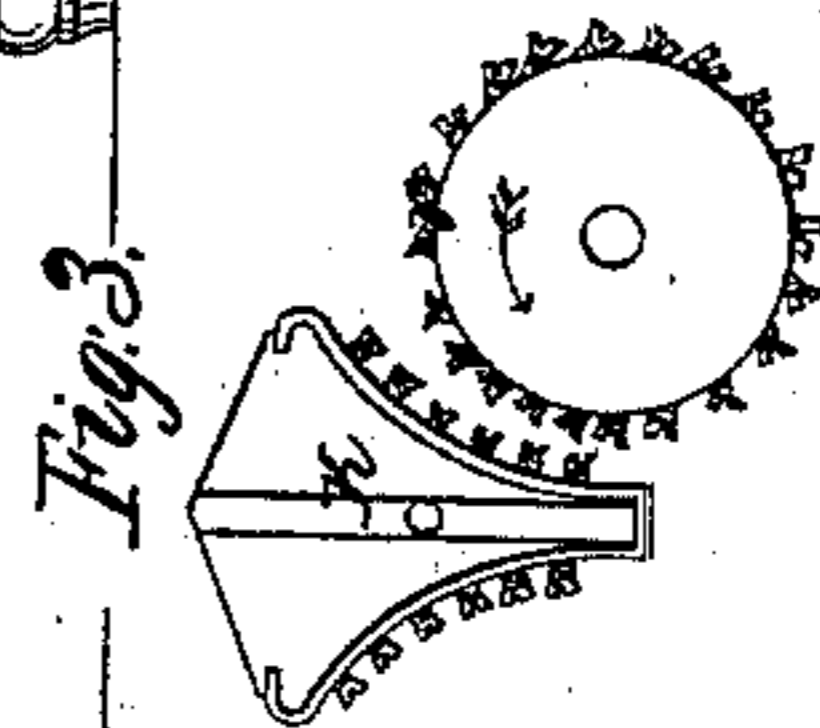
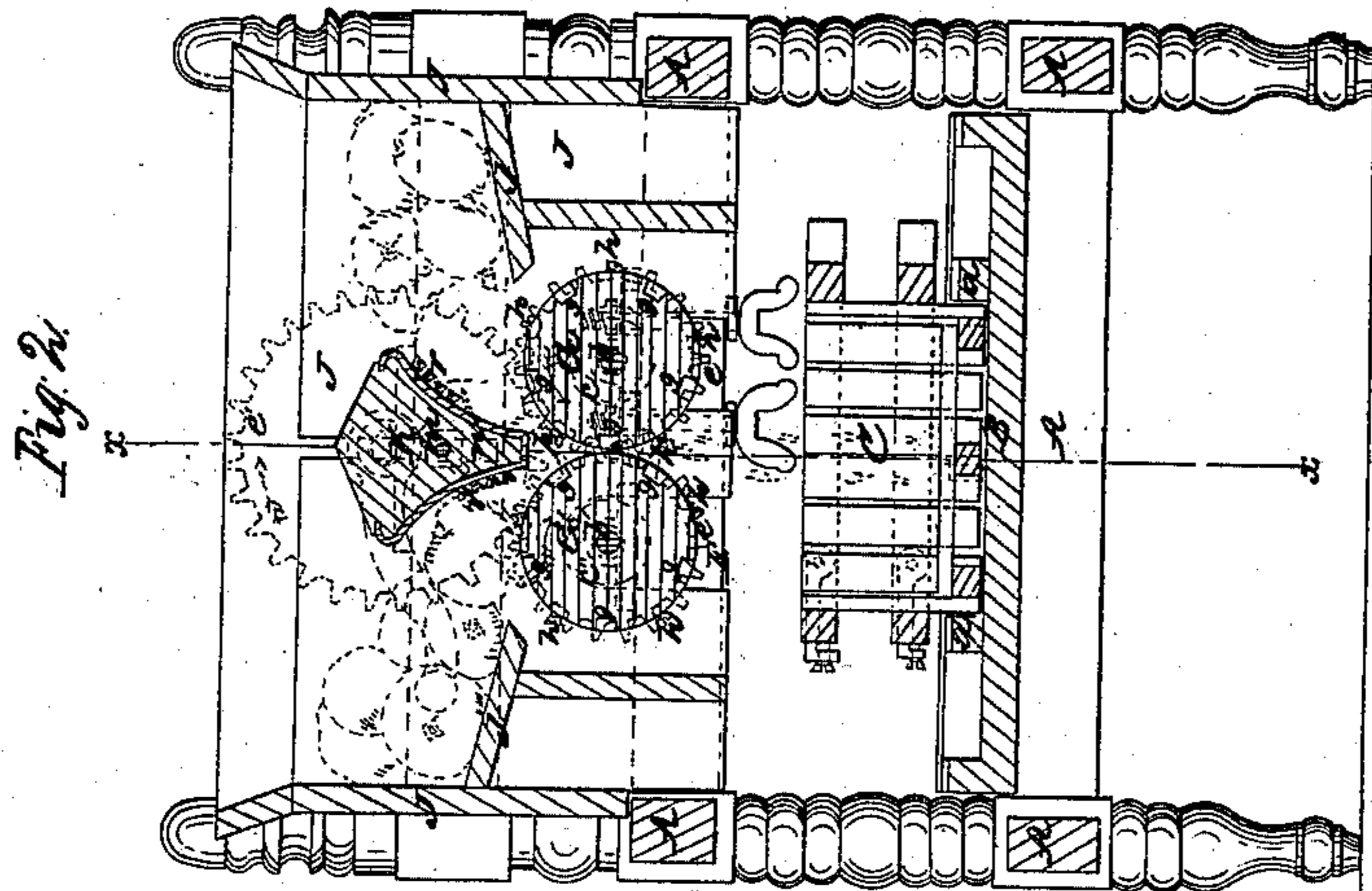


S. & R. W. CALDWELL.
CIDER MILL.

No. 32,044.

Patented Apr. 16, 1861.



Witnesses.
J. W. Brown
R. S. Spencer

Inventors.
S. Caldwell
R. W. Caldwell
per *Munroe*
Attorneys

UNITED STATES PATENT OFFICE.

SAMUEL CALDWELL AND R. W. CALDWELL, OF CHILLICOTHE, OHIO.

CIDER-MILL.

Specification of Letters Patent No. 32,044, dated April 16, 1861.

To all whom it may concern:

Be it known that we, SAMUEL CALDWELL and R. W. CALDWELL, both of Chillicothe, in the county of Ross and State of Ohio, have
5 invented a new and useful Improvement in Cider-Mills; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of
10 this specification, in which—

Figure 1, is a longitudinal section through the machine, taken in the vertical plane indicated by the red line x, x , in Fig. 2. Fig. 2, is a transverse section through the crushing
15 apparatus, taken in the vertical plane indicated by the red line y, y , in Fig. 1. Fig. 3, is a transverse section through one of the crushing cylinders of Figs. 1 and 2 and through the concave.

20 Similar letters of reference indicate corresponding parts in the three figures.

To enable those skilled in the art to make and use our invention, we will proceed to describe its construction and operation.

25 The mill which we are about to describe is a double machine wherein two crushing cylinders are used, with a double concave to prepare the apples as they pass to each cylinder.

30 A, represents the quadrangular frame of the mill which contains and supports the crushing apparatus and also the pressing apparatus.

35 B is an inclined floor for supporting the press boxes-C, C, and for conducting off the juice which escapes from these press boxes. This floor B is constructed with ledges around it and two parallel guide pieces a, a , between which the press boxes are moved.
40 These guides a, a , keep the press boxes in a proper position for receiving the pomace as it comes from the mill, and for receiving the pressure from screw D, which expresses the juice from the pomace.

45 E, E, are two transverse beams, on which the shafts of crushing cylinders G, G', have their bearings. The shaft b , of cylinder G, has its bearings in stationary boxes c, c , but the shaft b' of cylinder G' has its bearings
50 in movable boxes c', c' , which allow the cylinder G', to be adjusted at any desirable distance from the cylinder G. The cylinders G, G', may be rotated by belts communicating with any convenient prime mover
55 and the large balance wheel d will equalize the motion of the cylinders; or the cylin-

ders may be rotated by spur gearing e, e, e' , to which a crank motion may be applied so that manual labor may be conveniently applied. These two crushing cylinders G, G',
60 are arranged in a horizontal position, and their axes are in a direction with the length of the machine; and their height above the inclined floor B is such as to allow the press boxes to slide underneath of them. The
65 surface of each cylinder is made up of grooves or channels g, g, g , which run from end to end of each cylinder in a direction obliquely to the axis thereof. These channels g, g, g , are made at regular intervals
70 around the cylinders; and between the channels on the elevated surfaces are arranged rows of projections h, h, h , which consist simply of common screws, the shanks of which are screwed into the cylinders so that
75 the surfaces of their heads will be in tangential planes with the surfaces of the cylinders. These screw head projections are also arranged in rows obliquely to the axis of their respective cylinders. The channels
80 and projections of one cylinder are made at opposite angles to the channels and projections of the other cylinder, so that when these two cylinders G, G', are brought together, so that their surfaces will touch each
85 other, and then rotated, the projections on one cylinder will mesh into the channels in the opposite cylinder, thus allowing the two cylinders to be brought as near together as it may be found desirable. At the same time,
90 by the arrangement of channels as herein described we are enabled to employ the projections h, h, h , which together with the channels g, g, g , greatly assist in mashing
95 the apples.

Surrounding the crushing cylinders G, G', is the hopper box J, having two inclined
100 floors j, j' , which incline from the ends of box J toward their respective cylinders G, G, so that the apples put into the hopper will be conducted on top of the crushing cylinders. The width of the hopper is equal to the length of the crushing cylinders and the sides of this hopper fit closely against these cylinders.
105

K, is a double concave head which may be made entirely of metal or its concave sides and flat bottom may be covered with plates of metal—the body being made of wood. This concave K, has tenons pro-
110 jecting from its ends which fit into vertical grooves cut into the sides of the hopper J.

This concave has also a hole made through it in a direction with its length through which passes a bolt *m*, for securing the concave in the hopper. This concave is situated in the middle of the length of the hopper box in a vertical plane passing between the two crushing cylinders, and the bolt *m*, which secures this concave to the hopper, passes through vertical slots *n*, *n*, through the sides of the hopper, which slots allow the bolt *m* to be adjusted so as to raise or depress the concave. The bolt *m* is furnished, on one end, with a nut *p*, which on being loosened the concave may be adjusted and the spaces between its sides and the surfaces of the crushing cylinders may be regulated according to the rapidity with which it is desired to feed the apples to the cylinders. This concave *K*, is furnished with projections *r*, *r'*, shown in Figs. 1 and 2, which are arranged in inclined rows on each side of the concave, and these projections, together with those on the crushing cylinders, partially crush the apples before they are submitted to the action of the cylinders altogether. The bottom of the double concave head *K*, is not brought to a sharp edge, but a flat surface is formed which leaves a space below it to accumulate the pomace and to prevent the mill from clogging.

We have described above a double mill wherein the apples are fed to the crushing cylinders from both ends of the hopper *J*, but it will be seen that by removing the crushing cylinder *G*, and depressing the concave so as to bring one of its sides in the relation to cylinder *G'*, as represented in Fig. 3, the machine will be converted to a single mill, wherein the operation of crushing is substantially the same as in the double mill.

The operation of the entire mill is as follows: One of the press boxes is moved up under the cylinders *G*, *G'*, and these cylinders are rotated by any convenient power in the directions indicated by the arrows in Fig. 2. The double concave block *K*, is adjusted so that it will be at a proper distance from the crushing cylinders, and this block *K* is then screwed tightly in its place. The mill is now in a condition for receiving the apples which are put into the hopper *J* on each side of the concave head *K*, as represented in Fig. 2 in red lines. The apples first pass between the concave sides of the head *K*, and the surfaces of the cylinders *G*, *G'*, and are here reduced until the pieces will pass under the head *K*, where they are immediately acted upon by both the crush-

ing cylinders, and when the pomace is fine enough it is drawn down between these cylinders and finally crushed into a very fine mass, which falls into the press box placed under the mill to receive it. When the press box has been filled it is moved to the opposite end of the machine and brought under the screw *D*, when the juice is pressed out in the usual manner. During this operation of pressing another press box is put under the crushing cylinders to receive the pomace. After the juice has been thoroughly pressed from the pomace, the pomace is removed from the box by unhooking and opening the sides thereof, which are hinged together for this purpose. Now it will be seen that the concave head *K*, performs a very important office in crushing the apples, and preventing the apples from choking up the cylinders, for this head *K*, when properly adjusted with reference to the cylinders, together with these cylinders, partially crushes the apples and reduces them to such a fineness that the pieces will be readily acted upon by the cylinders and be crushed between them with very little expenditure of labor. The head *K* also keeps the whole apples back from the bite of the cylinders until they are reduced as above described.

By adjusting the head *K*, nearer to the crushing cylinders the crushing operation will be slower and by elevating this head *K*, the operation will be faster in proportion as the head is moved from the cylinders. The crushing cylinders themselves may be separated, by loosening the bolts which confine the bearing boxes of shaft *b'*, and these cylinders may thus be made to act upon the pomace with greater or less crushing force.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent, is,

1. The combination of the adjustable spiked concave block *K* with a single adjustable spirally spiked and grooved cylinder *G'* in the manner and for the purpose herein shown and described.

2. The combination of the adjustable spirally grooved and spiked cylinders *G*, *G'* with each other and with the adjustable spiked concave block *K*, in the manner and for the purpose herein shown and described.

SAMUEL CALDWELL.
R. W. CALDWELL.

Witnesses:

JACOB MCFARLAND,
L. LIST.