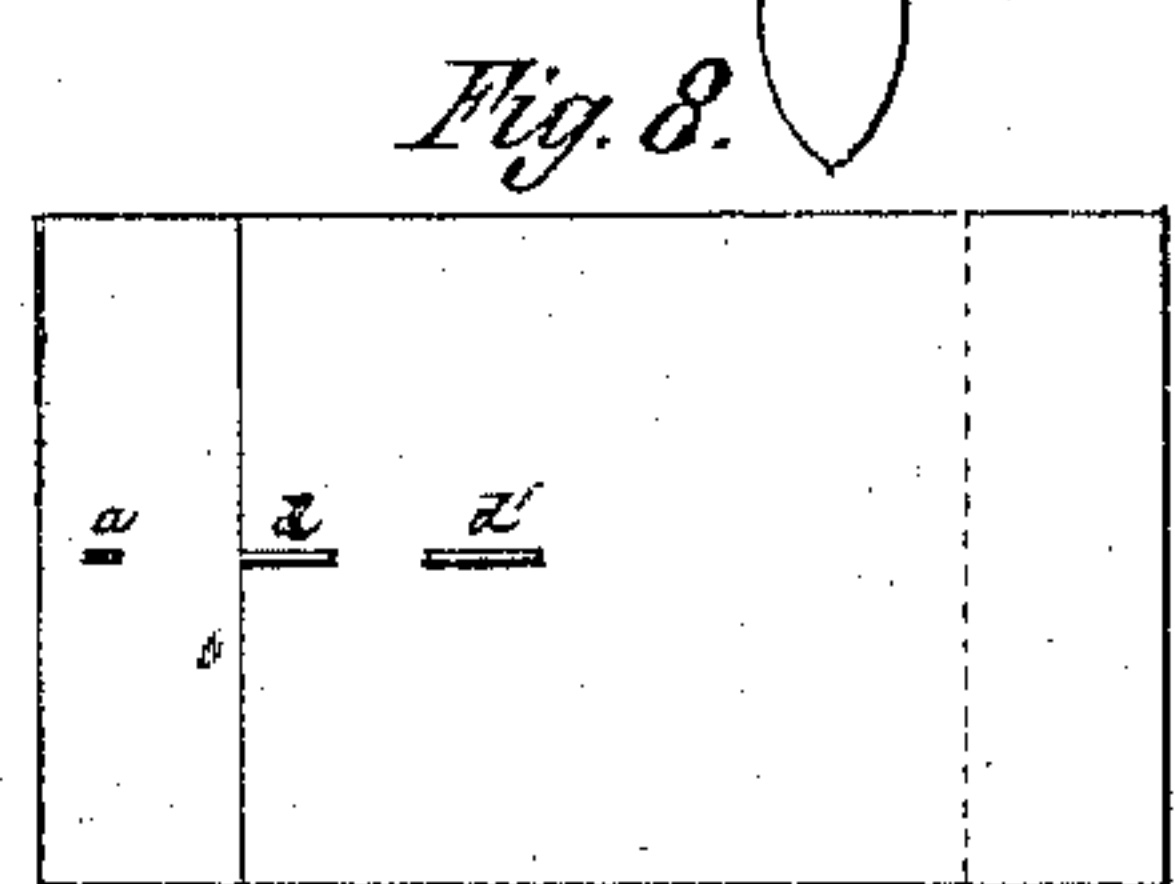
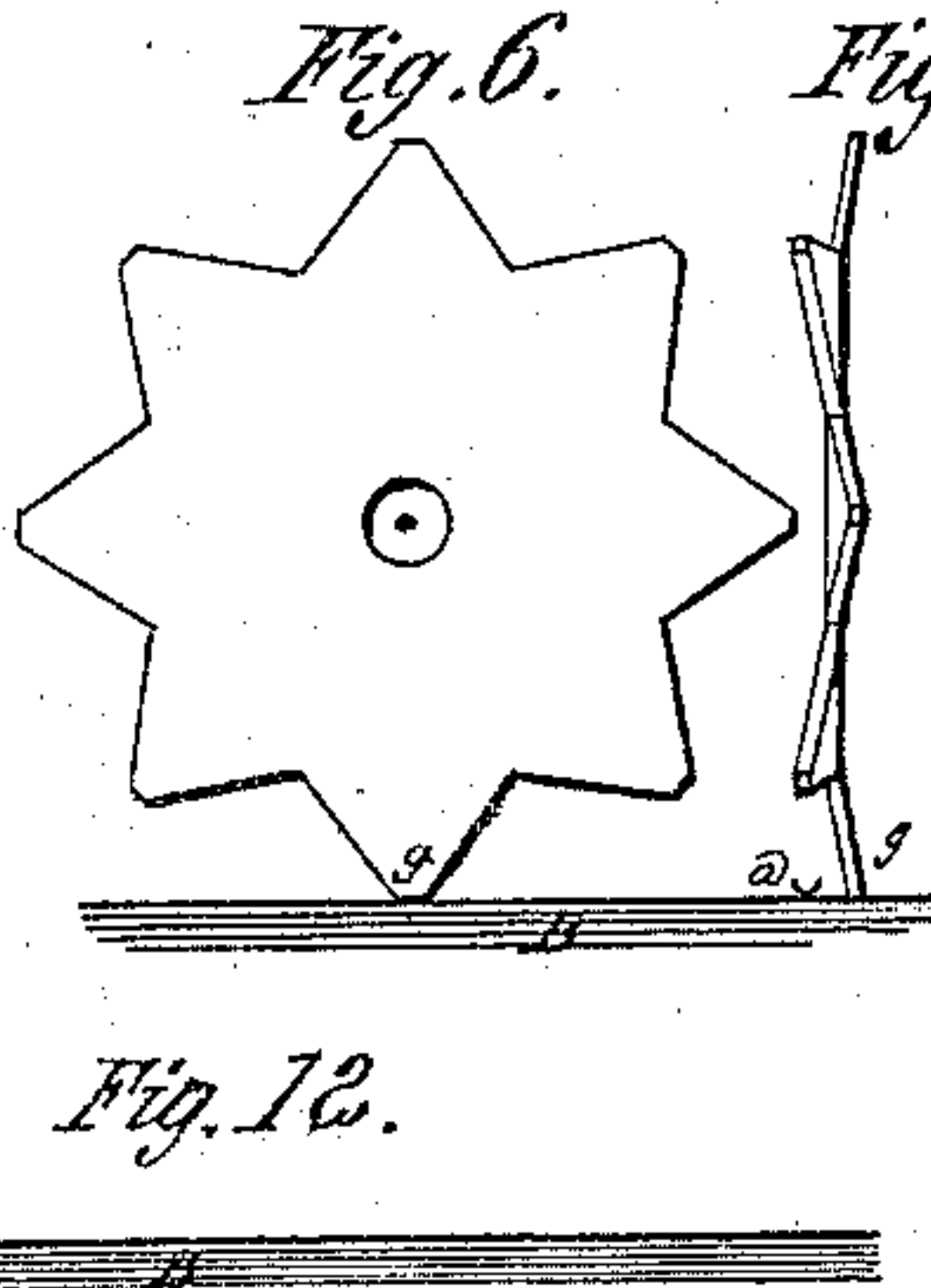
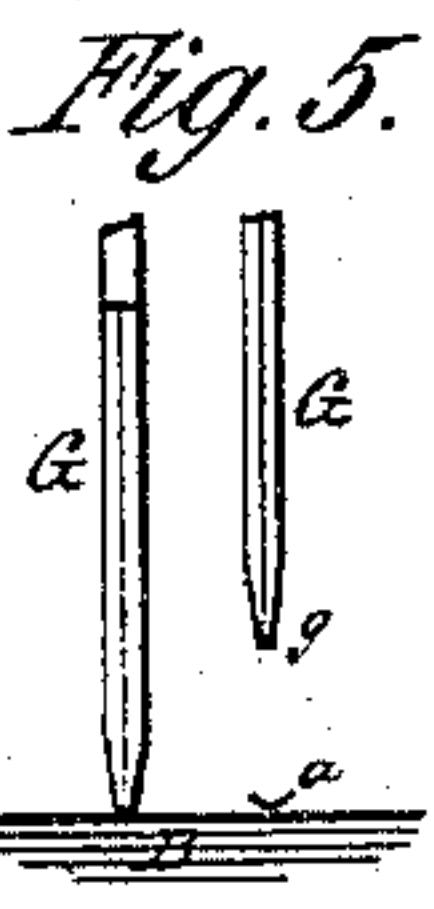
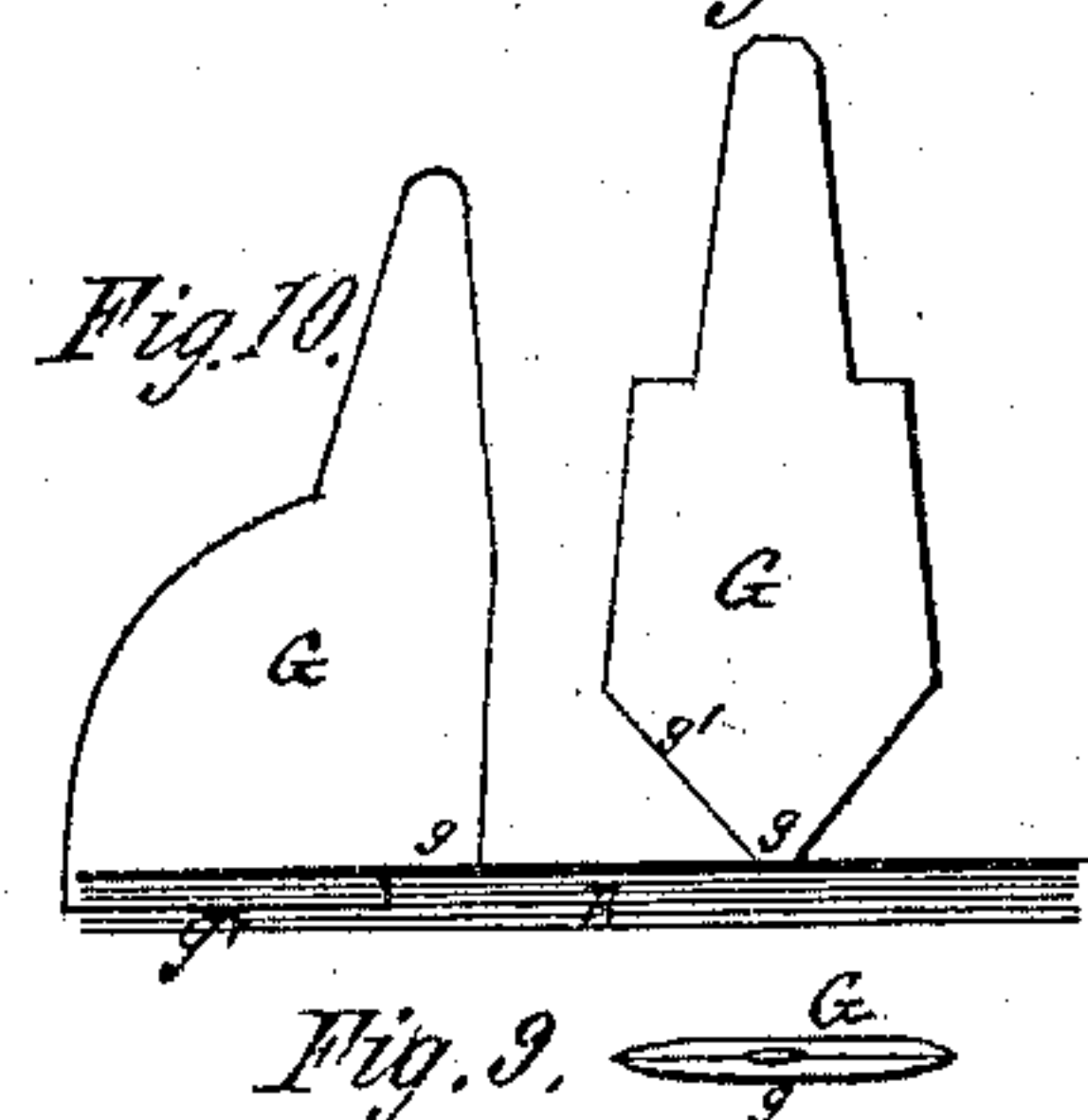
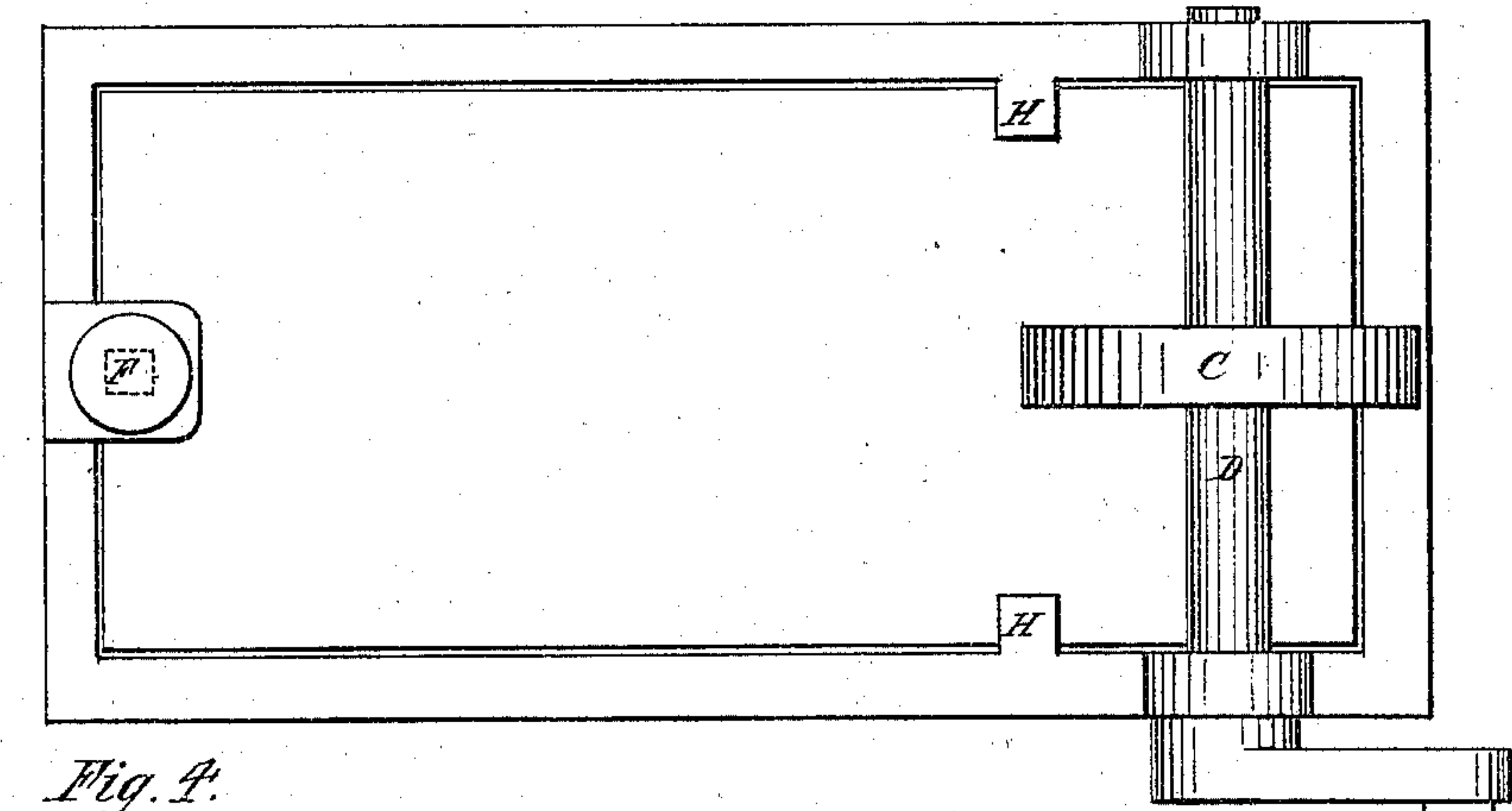
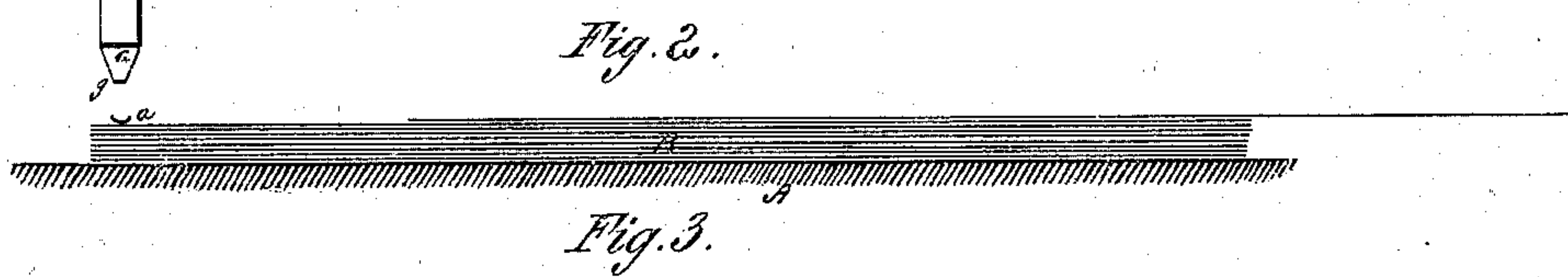
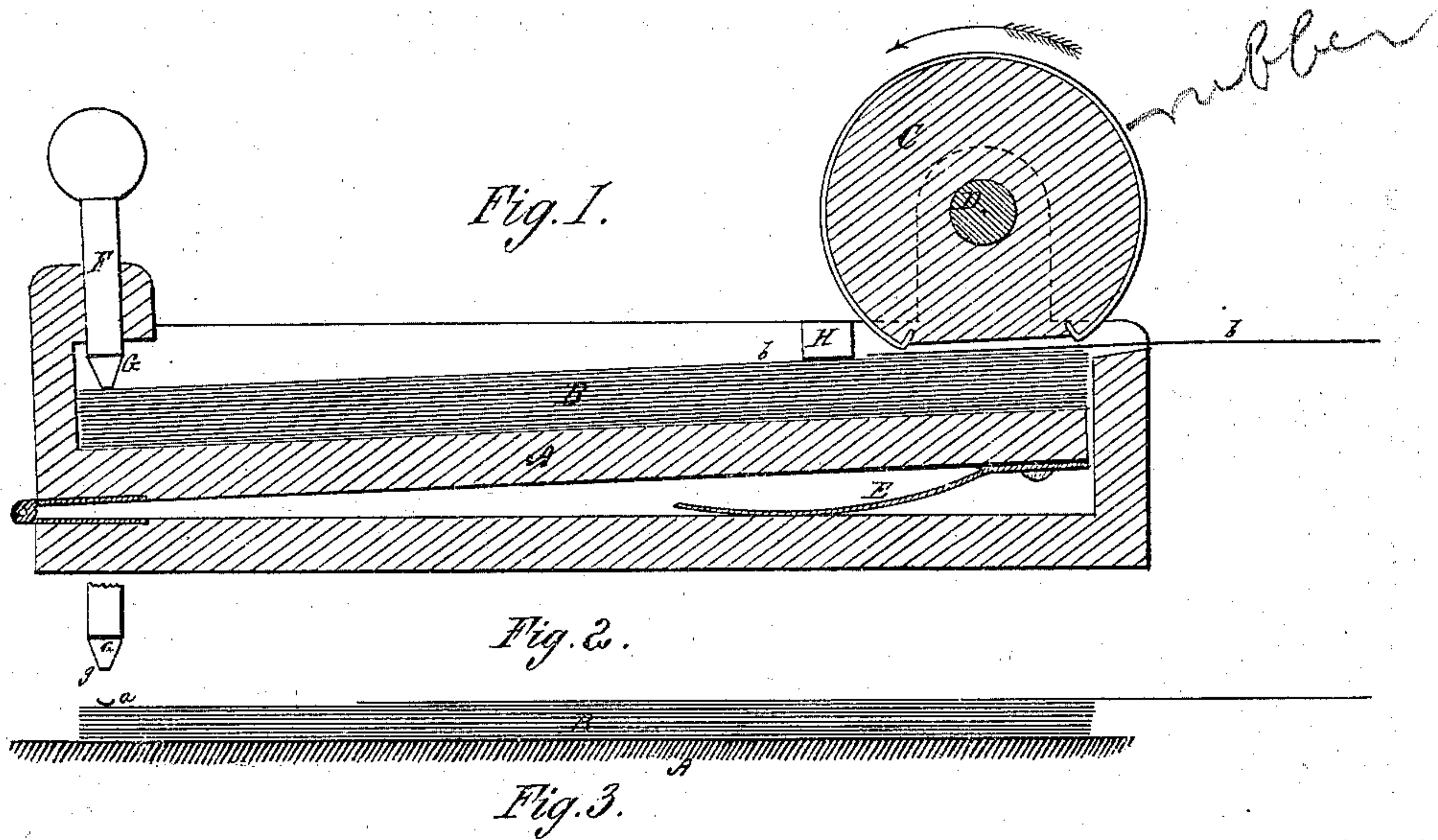


S. SCHOLFIELD & C. E. BAKER.

Paper Feeding-Machines.

No. 135,599.

Patented Feb. 4, 1873.



WITNESSES.
William E Mead
H. B. Chandler

S. Scholfield
Charles E. Baker

UNITED STATES PATENT OFFICE.

SOCRATES SCHOLFIELD, OF PROVIDENCE, RHODE ISLAND, AND CHARLES E. BAKER, OF MONT CLAIR, NEW JERSEY.

IMPROVEMENT IN PAPER-FEEDING MACHINES.

Specification forming part of Letters Patent No. 135,599, dated February 4, 1873.

To all whom it may concern:

Be it known that we, SOCRATES SCHOLFIELD, of Providence, in the county of Providence and State of Rhode Island, and CHARLES E. BAKER, of Mont Clair, in the county of Essex and State of New Jersey, have invented an Improved Method of Separating Superposed Sheets of Paper, of which the following is a specification:

The nature of our invention consists in pressing firmly upon the top of a pile of paper with a suitable holding instrument, and at the same time producing a movement of the top sheet by means of friction-pads, suction-tubes, or by nippers or other suitable devices, as heretofore used for moving sheets of paper singly from one place to another, causing the non-penetrating point of the holding instrument to tear through the moving top sheet, so as to rest with its full holding power on the sheet below, the friction between the two sheets being thereafter insufficient to cause the removal of the lower sheet from under the pressing-point.

The practical efficiency of this device depends upon the nature of the bearing-point, which, if made sharp so as to cut or to penetrate the paper when the necessary preliminary pressure is first applied, will fail to offer the required resistance to the forward movement of the lower sheet. Therefore, in order to attain that degree of certainty necessary in practice, we so construct such point that a chip of greater or less dimensions will always be retained between the pressing-point and the lower sheet, thus greatly increasing its efficiency in preventing the removal of such sheet. When the under sheet of paper is thus held by the non-penetrating point of the holding instrument, with the slight chip previously removed from the top sheet under said point, the amount of pressure required upon the top sheet in order that the friction between it and the under sheet may cause such sheet to be also torn through by the pressing-point is so very great as to render the taking of more than one sheet of paper at a time when under proper conditions practically impossible.

Figure 1 is a sectional side view of the feed-board with a pile of paper thereon. Fig. 2 is an edge view of the pile of paper with the holding instrument raised in order to

show the slight chip previously taken from the top sheet. Fig. 3 is a top view of the feed-board. Figs. 4, 5, 6, 7, 9, 10, 11, and 12 are views illustrating some of the holding devices employed. Fig. 8 is a top view of the pile of paper, showing the tear in the top sheet, and also the chip removed therefrom resting in its original position upon the under sheet.

In the drawing, A is the feed-board, upon which the paper B is to be placed. C is a revolving pad, faced with India rubber or any other suitable material and keyed upon the shaft D. The feed-board may be raised as the paper is being withdrawn by means of a spring, E, or otherwise. At the rear of the feed-board A is placed the weighted sliding bar F, carrying a steel holding instrument, G, at its lower end.

The holding instrument G may be constructed as shown in Figs. 4, 5, and 9, Fig. 4 being a side view; Fig. 5, an edge view; and Fig. 9, a bottom view, clearly showing the non-penetrating point *g*. In this case the rising back edge *g'* is preferably made sharp in order to readily cut through to the back edge of the sheet as the same is being withdrawn. The initial tear around the non-penetrating point *g* of the holding instrument is, however, the real point in which the merit of our invention consists, the sharpened rear edge not being absolutely necessary, but only deemed desirable.

The back edge *g'*, instead of rising above the sheet of paper, as shown in Fig. 4, may be arranged in a plane parallel to the surface of the paper, and may extend below such surface, so as to cut through to the back edge before the sheet has been started, as shown in Figs. 10 and 11; Fig. 10 being a side view, and Fig. 11 a bottom view of the holding instrument, the sharp knife-edge *g'*, as in the former case, producing no essential effect in the discriminate removal of the sheets one at a time, such virtue resting only in the chip-producing bearing-point *g*, which may be made either narrow to an approximate cutting-edge or widened out to any shape or size suitable for obtaining the requisite bearing and tearing surface, the practical requirement in this particular varying greatly, according to the tensile strength of the specific paper under process of manipulation.

The bearing-point *g* may itself extend entirely to the rear edge of the paper, as shown in Fig. 12, and in this case we preferably rough up or cut the edge like a fine saw in order to prevent the slipping of the entire sheet from under the point or edge *g* without producing the required torn chip, which is deemed essential in order to insure the absolute retention of the lower sheet.

When the revolving pad C strikes the surface of the paper the feed-board A will be slightly depressed, thus relieving the top sheet from the friction of the studs H H, and bringing a strain upon such top sheet to tear it from under the holding instrument G, which, as soon as it has penetrated, carrying the slight chip *a* with it, will offer but little resistance to the entire removal of the top sheet, it being cut through to the edge with a narrow slit, *d*, as shown in Fig. 8. The friction between the top sheet and its under one being entirely insufficient to cause the removal of the under sheet from under the pressure-point *g*, the much greater friction of the pad itself, when bearing directly upon the upper surface of the sheet, being necessary for this purpose. When the pad C has made one complete revolution the remaining top sheet *b* of the pile will be raised up to the spurs H H, the sheet *b'* obtained in the revolution of the pad being left free for withdrawal by means of grippers or other suitable devices, this operation being repeated until the whole pile has been removed.

Instead of placing the holding instrument G near the back of the sheet to tear a slit entirely to the edge, it may be placed further in, and may be raised from the paper as soon as the top sheet has been moved sufficiently to separate it from the under one, thus tearing only a short slit entirely within the edges of the paper, as shown at *d'* in Fig. 8.

If the pressure-point *g* is allowed to rest continually upon the top of the pile of paper, then, upon the removal of the top sheet, a slight chip will be left between the pressure-point and the under sheet; and, upon the removal of this sheet, another chip of slightly greater proportions will be added thereto, until, finally, a large mass will be accumulated under the point, thus destroying its efficiency. Therefore it is necessary that the point be lifted from the surface of the paper at proper intervals, at which time the chips may be removed by means of brushes or otherwise.

An arrangement for avoiding the above difficulty is shown in Fig. 5, where duplicate pressing-points are used; and upon the removal of each sheet the point used for that sheet is to be raised from the paper and the other one let down upon the same, so that the chip *a* may be removed with each following sheet in a satisfactory manner.

A spur-wheel, as shown in Figs. 6 and 7, may also be used, Fig. 6 being a side view,

and Fig. 7 an edge view, of the same. The spurs are set like the teeth of a saw, and the wheel is to be raised from the paper and turned by suitable mechanism for the space of one tooth upon the withdrawal of each sheet. Thus the alternate teeth, by striking down in different vertical planes, will allow the preceding chip to be removed with the sheet of paper upon which it rests.

This invention may also be carried into effect by means of the inclined holding-pin, particularly described in another specification, the operating-point of such device, in the matter of its chip-retaining qualities, being considered by us as fully included in the scope of the present claim.

Instead of the friction-pad, shown in the drawing, any device for moving sheets of paper may be used, when arranged in combination with a chip-retaining pressure-point or device.

We are aware that in some attempts heretofore made to remove sheets of paper from a pile sharp knives for cutting through to the edge of the top sheet have been employed, in combination with other penetrating instruments; but experiment has proved that smooth cutting or penetrating instruments, of themselves, do not offer sufficient resistance for the purpose, and all such previous attempts have been abandoned. Therefore we make no claim here to a smooth and perfect cut or penetration made, by a knife or other instrument, in the top sheet of a pile of paper through the act of being drawn by friction-pads or otherwise; but, on the contrary, our improvement depends for its efficiency upon the non-penetrating point or edge *g*, by means of which a chip, *a*, is first torn out, and then held firmly in its original position under such bearing-point, thus furnishing the required resistance to the simultaneous removal of the lower sheet with the upper one while it is being withdrawn; and, since the form and arrangement of the holding instrument G may be extensively varied within certain experimentally-defined limits, we hold that the formation and retention of such a chip, without restriction in the matter of its size or form, to be the distinctive feature of our improvement, or the point in which it differs from all other similar inventions.

We therefore claim—

A holding instrument with a non-penetrating point or edge, when applied under proper pressure to the top sheet of a pile of paper, and constructed, as described, so that, by reason of its desired failure to cut or penetrate the said sheet, it will tear a slight chip therefrom whenever the sheet first commences its proper movement under the action of friction-pads or otherwise.

SOCRATES SCHOLFIELD.
CHARLES E. BAKER.

Witnesses:

WILLIAM E. MEAD,
H. S. CHANDLER.