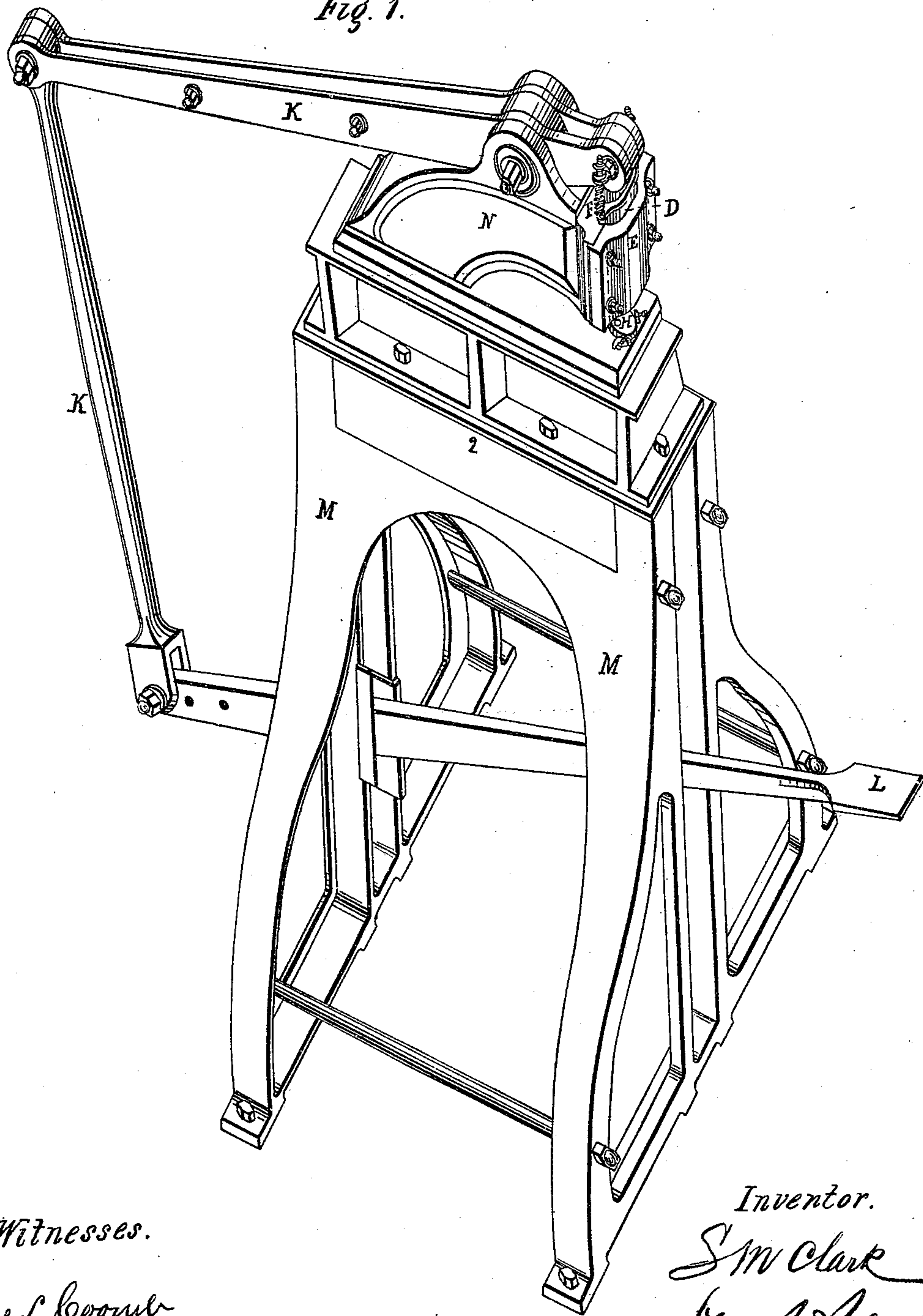


*S. M. Clark. Sheet 1. 2 Sheets.*  
*Paper Punching Mach.*  
*No 64197. Patented Apr. 30. 1867.*

*Fig. 1.*



*Witnesses.*

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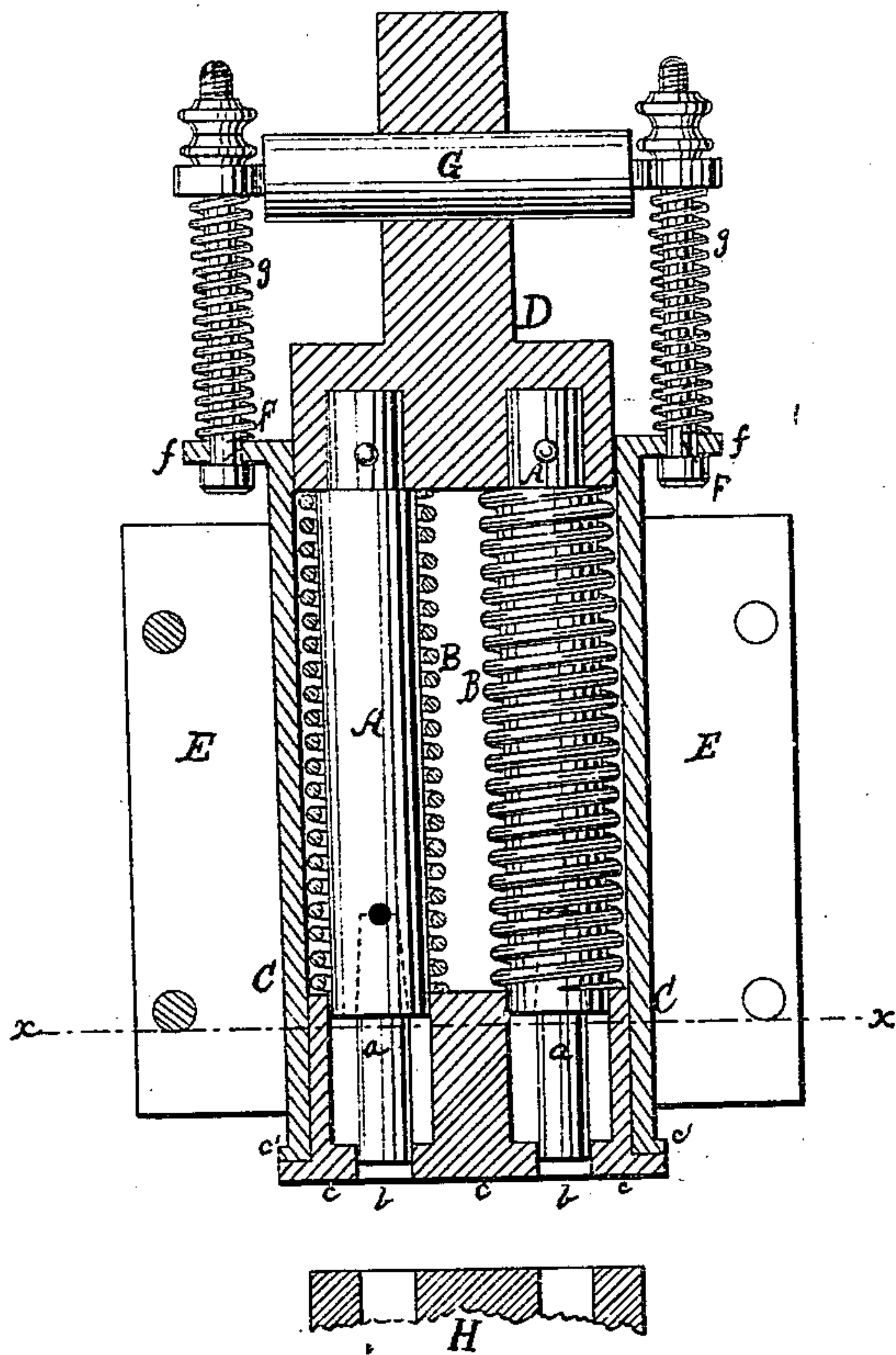
*S. M. Clark. Sheet 1 of 2 Sheets.*

*Paper Punching Mach.*

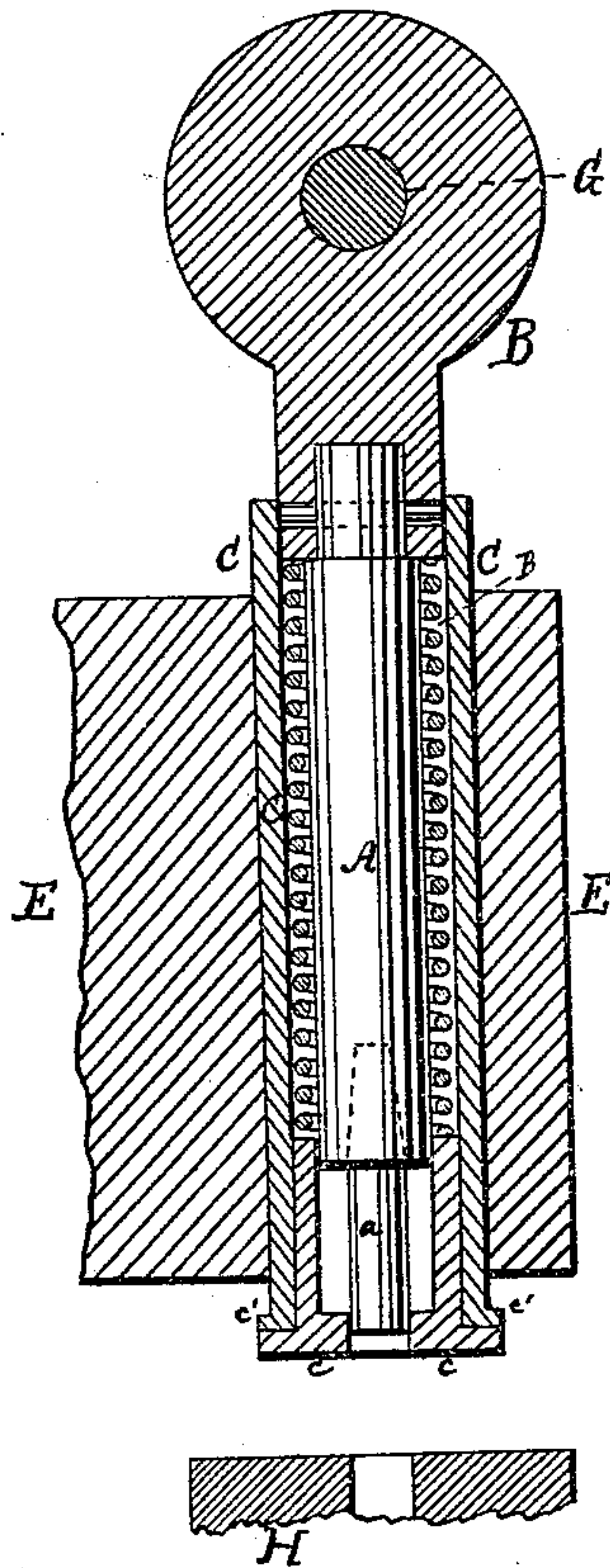
*N<sup>o</sup> 64197.*

*Patented Apr. 30. 1867.*

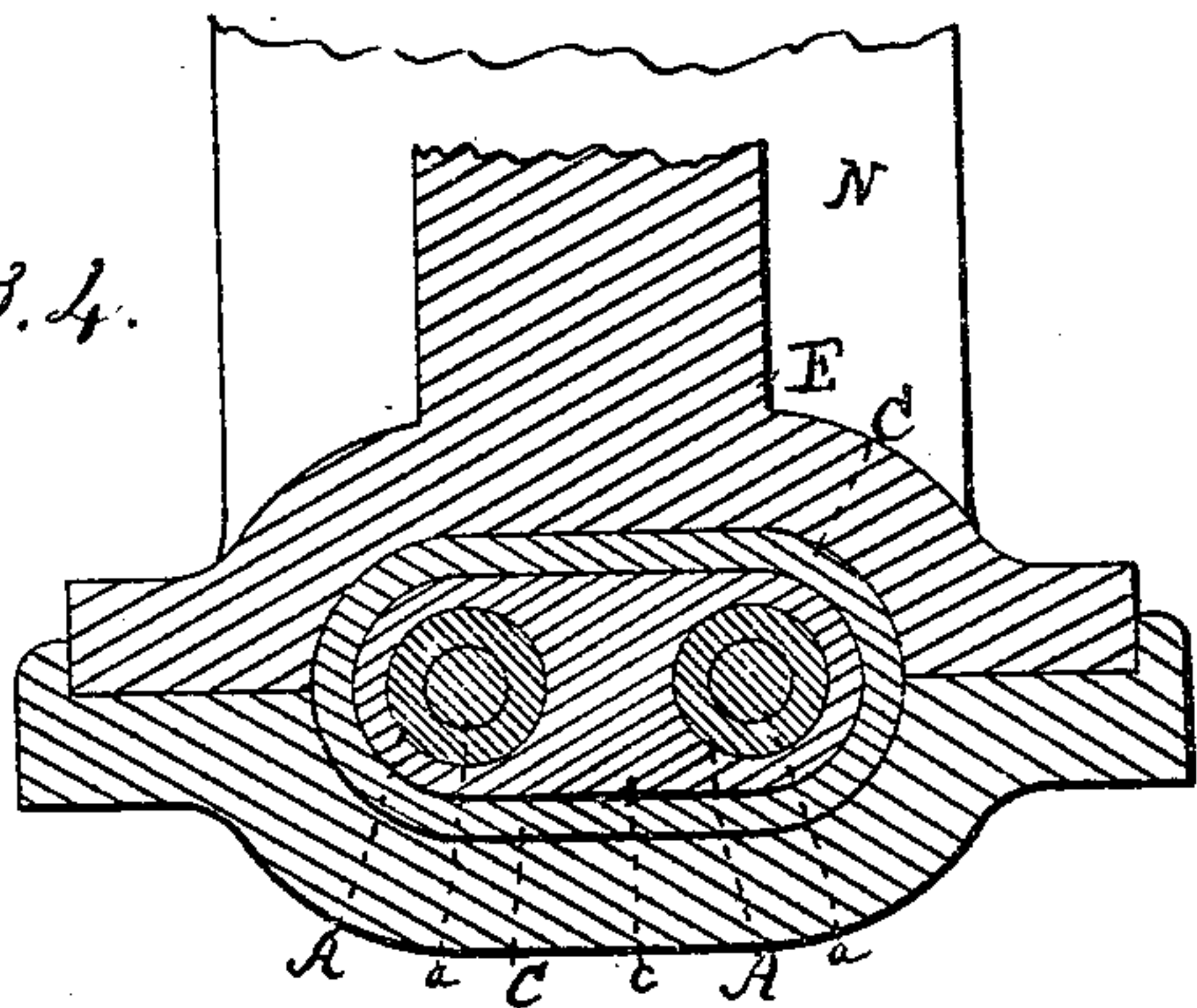
*Fig. 2.*



*Fig. 3.*



*Fig. 4.*



*Witnesses.*

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his atty*



# United States Patent Office.

SPENCER M. CLARK, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR  
TO JOHN Q. LARMAN.

*Letters Patent No. 64,197, dated April 30, 1867.*

## MACHINE FOR PUNCHING PAPER.

The Schedule referred to in these Letters Patent and making part of the same.

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, SPENCER M. CLARK, of Washington, in the county of Washington, and District of Columbia, have invented certain new and useful improvements in Machinery for Punching Paper; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 represents an isometrical perspective view of a machine constructed in accordance with my invention; and

Figures 2, 3, and 4 sectional views of the punching apparatus.

Great difficulty has heretofore been experienced in punching paper on account of the tendency of the paper, owing to its limberness, to gather or "buckle" around the punch, not only preventing the formation of a clean cut hole, but making it difficult to withdraw the punch from the paper after the hole has been formed. Where many thicknesses or folds of paper are placed under the punch, as, for instance, a bundle of bank bills or notes which are to be cancelled, these effects become still more apparent, the action of the machine being impeded and the punch itself clogged by the gathering or "buckling" of the paper. Hence all attempts at punching paper by machinery have heretofore proved abortive, owing to want of means to overcome these difficulties.

The object of my invention is to obviate these defects, and to do this, instead of punching the paper when uncompressed, I combine with the punch, a clamp, so arranged that simultaneously with the operation of punching I am enabled to clamp or compress the paper so as to make it in some measure unyielding, and by applying this pressure around and on all sides of that portion of the paper which is cut by the punch, I not only prevent the buckling or gathering of the paper, but also any difficulty which might otherwise be experienced in withdrawing the punch from the hole it has formed.

To enable those skilled in the art to make and use my invention, I will now proceed to describe the manner in which it may be constructed and operated by reference to the accompanying drawings.

The frame M for supporting the punching apparatus may be of any ordinary or suitable construction. On top of this frame is the die-plate H and the goose-neck N, which extends from the rear of the frame, and has attached to its outer or front end a collar or sleeve, E, in which slides the punching apparatus about to be described. Fig. 2 represents a longitudinal vertical section of this apparatus; fig. 3 is a transverse vertical section of the same; and fig. 4 is a section on line *x x*, fig. 2. The apparatus consists essentially of a punch or series of punches, A, secured in and surrounded by a clamp, C, which slides in the sleeve E, the clamp and punches being actuated directly by means of a lever, K, hung in brackets on top of the goose-neck N, and worked by means of a treadle formed on its lower end. The clamp C is hollow and of any suitable form to contain the punches A. It is open at both ends, and has ears *f* formed at its upper end diametrically opposite each other. Around its lower end is a flange, *c'*. In and to this lower end is fitted a face-plate, *c*, in the bottom of which small holes *b* are formed, corresponding to the openings in the die-plate, and through which project, when actuated by the lever, the punches A. This face-plate has formed around its bottom a flange which rests against the flange *c'* of the clamp C. A little above its bottom it is recessed so as to form suitable openings in which the shanks of the punches A may slide for the purpose hereinafter explained. The upper end of the clamp C is provided with ears *f*, in which are held by their heads the bolts F whose upper ends pass through ears formed on the extremities of the axle G. These bolts have a screw-thread formed on their upper ends, and are provided with nuts, whereby they may be adjusted and held firmly in position, as hereafter described. To the axle G to which the clamp C is thus attached is immovably secured the cross-head D, carrying the punches fitting in the upper end of the clamp. This cross-head, as hereinafter explained, is capable of a limited sliding up-and-down motion in the clamp when actuated by the pressure of the lever K. In its under side the punches A are secured and firmly held in place. Each punch is formed of a shank, A, secured in a mortise in the cross-head D, of greater diameter than the punch proper *a*, whose upper end, of a conical shape, is secured in a corresponding mortise in the shank A, as shown in the drawings. The shanks are of such diameter that they will fit in the interior recesses formed in the clamp-plate *c*, as above explained, while the punches *a* fit likewise in the corresponding holes *b* in the bottom of the clamp. Around the shank A are placed the spiral springs B,



the lower end of the springs resting on the top of the plate *c*, and the upper ends pressing against the under side of the sliding cross-head D. In consequence of this arrangement, the pressure of the springs B against the sliding cross-head D will cause the latter, together with the punches attached to it, to be forced upward until held by the nuts on the ends of the bolts F, which prevent the further upward movement of the shaft G. It will thus be seen that the pressure of the springs B can be adjusted and regulated by means of the nuts on the rods F, so that the punches may be withdrawn to any desired distance within the clamp. Instead of the springs B placed within the clamp, the spiral springs *g* on the rods F may be employed with equally good results, or the two sets of springs B and *g* may be used in conjunction, or instead of the spring or springs, weights may be used, it being immaterial what means are employed provided that a back pressure may be obtained, which, when the pressure of the lever is removed, shall cause the clamp and punches to be withdrawn automatically from the paper. To the axle G, to which the frame D is secured, is jointed the lever K, as shown in the drawings.

In operating the machine, when the lever K is actuated by means of the treadle L, that end of the lever hinged on the same shaft G, to which the punching apparatus is attached, is forced downward, carrying with it the punching apparatus which slides in the sleeve E until the bottom of the clamp C is pressed upon the paper which has been placed on the die-plate H immediately under the punch. The pressure on the treadle being continued, the clamp compresses the paper tightly while the punches now begin to work, being forced out of the clamp and into and through the paper, which, as it is compressed and clamped on all sides of the punches by the pressure of the clamp C, is comparatively unyielding, and therefore unable to buckle round the punches and otherwise impede the working of the apparatus. After the holes have been formed or cut the pressure on the lever is removed, when the punches and clamp are withdrawn automatically by the action of the springs B and *g*. The punches are made to work accurately by the arrangement above indicated, the upper end of the shanks A being mortised in the frame D, and the lower ends being guided and supported in the recesses in the clamp-plate. Each punch is thus steadied and made to operate with entire accuracy. It will also be seen, by the peculiar mode of securing the punches within the clamp, that the paper to be operated on is first compressed by the clamp before being punched, although both the clamp and punches are actuated by one and the same pressure, the same power being brought to bear in pressing the clamp on the paper that is exerted in order to force the punches through it. I would further remark that the punches by any ordinary or suitable means may be arranged so as to be easily removed from or attached to the sliding cross-head D, and thus admit of the employment of punches of different sizes and shapes, as occasion may require. In this event the face-plate *c* of the clamp must also be made removable, so that one plate may be substituted for another according to the size or form of the punches employed.

Having thus described my invention, I claim—

1. The combination, with the punches and surrounding clamps and the springs, of the screw-bolts and rods for adjusting the tension of said springs, and for effecting the combined movement of the clamp and punches, substantially in the manner herein specified.
2. The combination, with the clamp and connecting screw-rods or bolts, of the sliding cross-head, punches, and surrounding springs, under the arrangement and for operation as herein set forth and described.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

Witnesses:

L. B. ALLYN,  
W. H. JENNER.

S. M. CLARK.