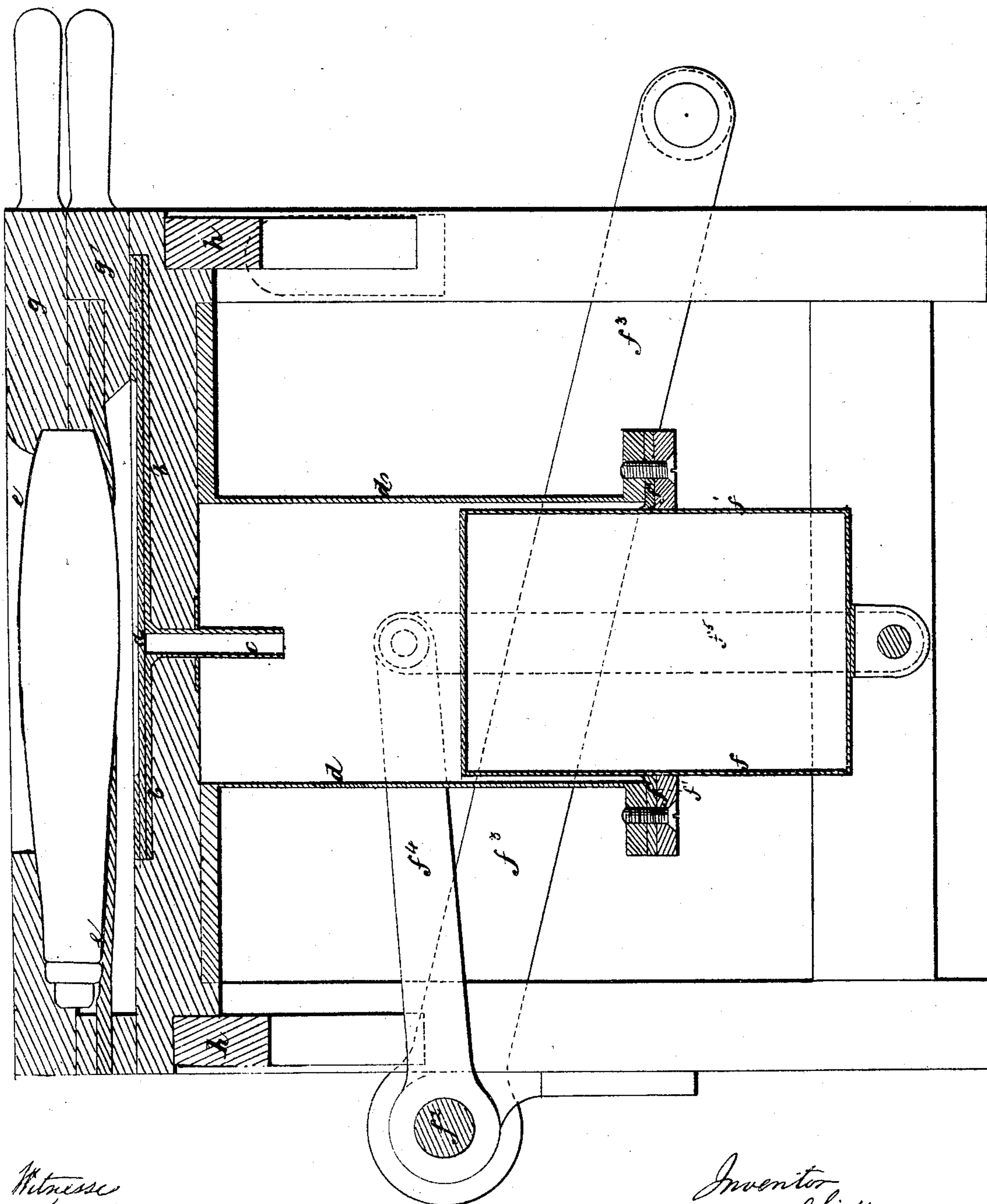


*A. Leighton. Sheet 1 of 3 Sheets.*  
*Printing on Uneven Surfaces.*  
*No 62,640. Patented Mar. 5, 1867.*

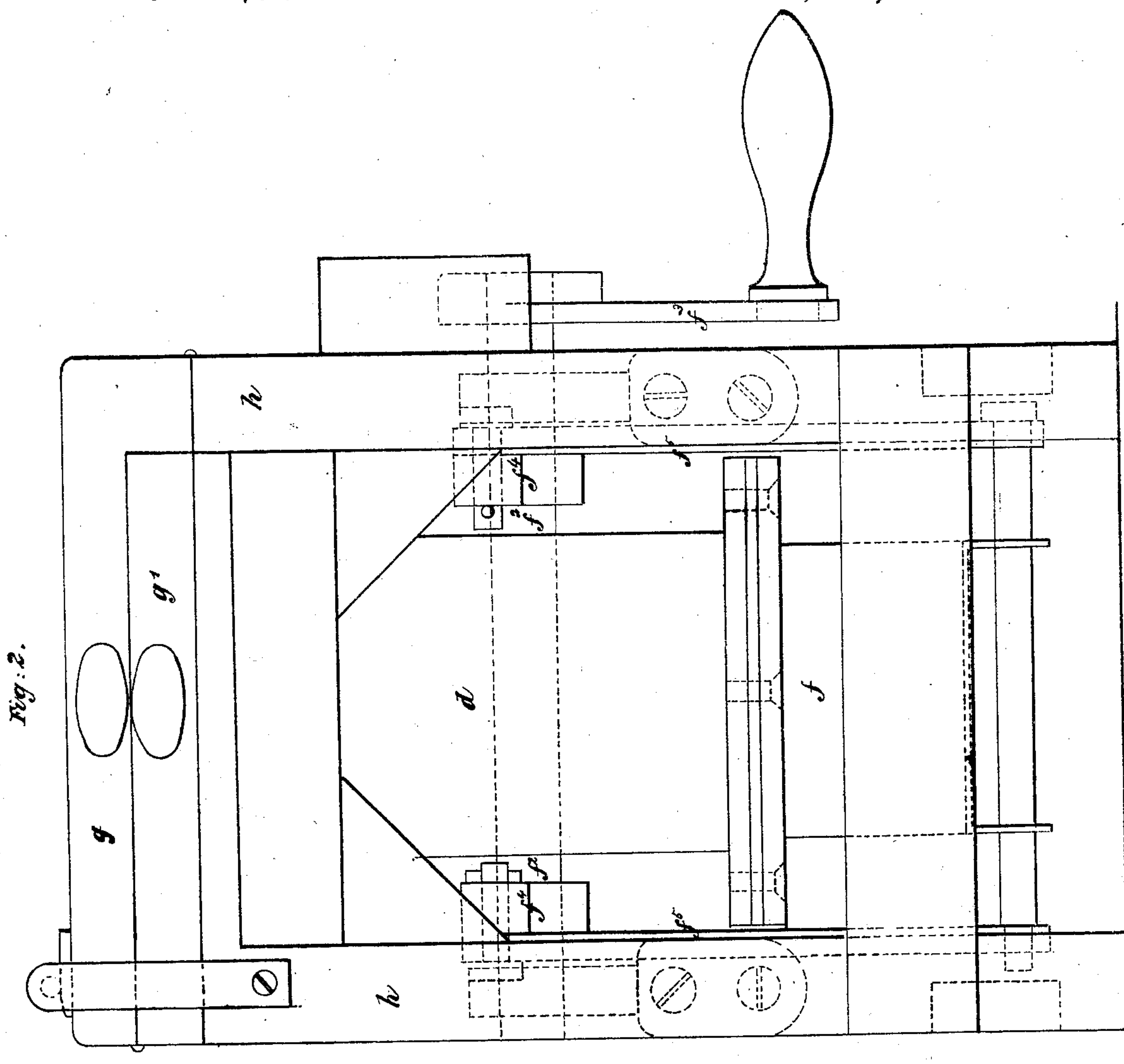
*Fig. 1.*



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*A. Leighton. Sheet 2.3 Sheets.*  
*Printing on Uneven Surfaces.*  
*N<sup>o</sup> 62,646. Patented Mar. 5, 1867.*

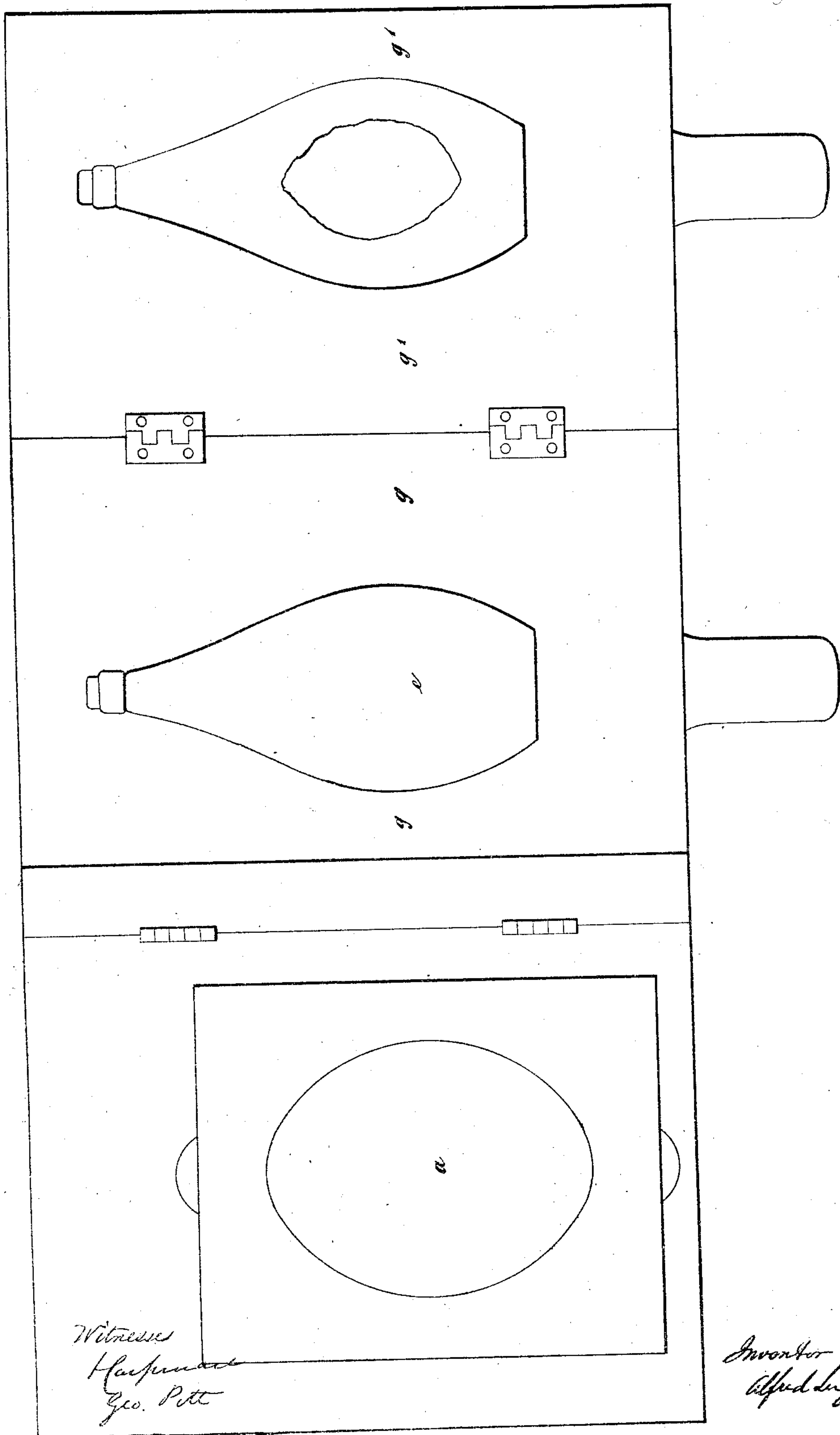


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*A. Leighton. Sheets 3 of 3.*  
*Printing on Uneven Surfaces.*  
*N<sup>o</sup> 62,646. Patented Mar. 5. 1867.*

*Fig. 3.*



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# United States Patent Office.

ALFRED LEIGHTON, OF LONDON, ENGLAND.

*Letters Patent No. 62,646, dated March 5, 1867.*

## APPARATUS FOR PRINTING ON UNEVEN SURFACES.

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

### TO ALL TO WHOM IT MAY CONCERN:

Be it known that I, ALFRED LEIGHTON, of 9 Buckingham street, Strand, in the county of Middlesex, a subject of the Queen of Great Britain, have invented or discovered new and useful "Improvements in Printing and in Apparatus employed therein;" and I, the said ALFRED LEIGHTON, do hereby declare the nature of the said invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement thereof, that is to say:

This invention has for its object improvements in printing and in apparatus employed therein, and is applicable more especially in ornamenting or lettering articles of which the surface is not flat but curved or irregular. The printing surface consists of a flexible elastic sheet, with the device to be printed raised upon it, and this, having been suitably inked, is pressed by fluid pressure against the article to be printed. I employ a sheet of vulcanized India rubber, moulded with the pattern upon it, and it is mounted over a perforated plate, which supports it whilst the ink is applied. There is a chamber under the perforated plate containing air or other fluid, and means are provided for putting this air or fluid under pressure when desired; it may be by forcing a plunger into the chamber, or by opening a valve communicating with another vessel containing fluid under pressure or otherwise.

The article to be printed is placed in a suitable holder. Usually it is convenient to fit it into a suitably-formed recess in a wooden board, hinged to the other parts of the apparatus, and when thus held the article is brought into proper position over the pattern on the flexible sheet, and there secured. The fluid beneath the flexible sheet is then put under pressure, and the pattern surface is thus caused to press sufficiently firm against and print it.

Having thus stated the nature of my invention, I will proceed more fully to describe the manner of performing the same.

#### *Description of the Drawings.*

Figure 1 shows a longitudinal section of apparatus suitable for carrying out my invention.

Figure 2 shows a front elevation thereof; and

Figure 3 shows a plan of the upper parts when opened out.

*a a* is a plate of vulcanized India rubber, which material, by reason of its great flexibility and elasticity, is the material I prefer to employ in constructing the printing surface. The vulcanizable India-rubber compound is moulded and vulcanized in a suitable mould, with the lettering or the other device or devices thereon. It should be stated that it is not new to produce and use printing surfaces formed of vulcanized India rubber; but according to this invention such a printing surface is combined with the pressure of fluid on its back or reverse side, by which the printing surface is made to apply itself and give off its impressions to irregular surfaces, and again and again assume a regular form when having printing ink applied thereto. *b* is a perforated plate, on which the surface *a a* is supported when being inked. The inking surface *a a* is as heretofore. *c* is a tube, communicating with a vessel or chamber, *d*, and with the space below the perforated plate *b*. The vessel or chamber *d* may contain air or water or other fluid, so that when subjected to pressure the fluid may act on all parts of the flexible plate *a a*, and cause it to apply itself to an irregular surface. I, however, prefer to employ air for the purpose. The apparatus shown in the drawings is arranged suitably for printing a pattern upon a bottle or vessel, *e e*, of thin metal. The apparatus may be arranged for printing in like manner upon other articles of varied form, the parts of the apparatus used for holding the article to be printed being varied accordingly. *f* is a plunger, which slides fluid-tight at *f*<sup>1</sup> into and from the chamber *d*; or other means may be resorted to for giving the requisite pressure to the fluid contained in the vessel *d*. Motion is to be communicated to the plunger *f* in any convenient manner. The arrangement shown in the drawing is, however, very convenient for this purpose. *f*<sup>2</sup> is a shaft or axis, which has a lever handle, *f*<sup>3</sup>, fixed thereon, and also two arms, *f*<sup>4</sup>, which, by links or connecting-rods, *f*<sup>5</sup>, give motion to the plunger *f* when the lever handle is moved. The article to be printed is held in a sort of frisket or folding holder, which consists of two parts, *g g'*, which are hinged together, and to the frame *h h*, which carries the other parts of the mechanism, and such parts, *g g'*, are formed in a suitable manner to receive and hold the article to be printed. In the arrangement shown, where the article to be printed is a bottle, the part *g* is recessed to receive it, whilst the part *g'* has a hole through it of suitable dimensions to

present a sufficient part of the surface to be printed. This part  $g'$ , when necessary, may be of flexible and elastic material, fixed at its edges in a frame. In fig. 1 of the drawings, the parts are shown as they would appear immediately before and immediately after the plunger is raised, the printing surface being flat on the perforated plate, so that, on causing the plunger to rise from its position in fig. 1, the fluid will be caused to press on the lower or reverse side of the flexible and elastic printing surface.

Having thus described the nature of my invention, and the manner of performing the same, I would have it understood that what I claim is—

The combined arrangement of a flexible elastic printing surface  $a$ , with a chamber or vessel containing fluid, which, on being subjected to pressure, is caused to act on the printing surface, substantially as described.

ALFRED LEIGHTON.

Witnesses:

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