

A. G. BEALE & T. NESBITT.
MACHINE FOR CREASING POWDER PAPERS.

No. 474,716.

Patented May 10, 1892.

Fig. 1.

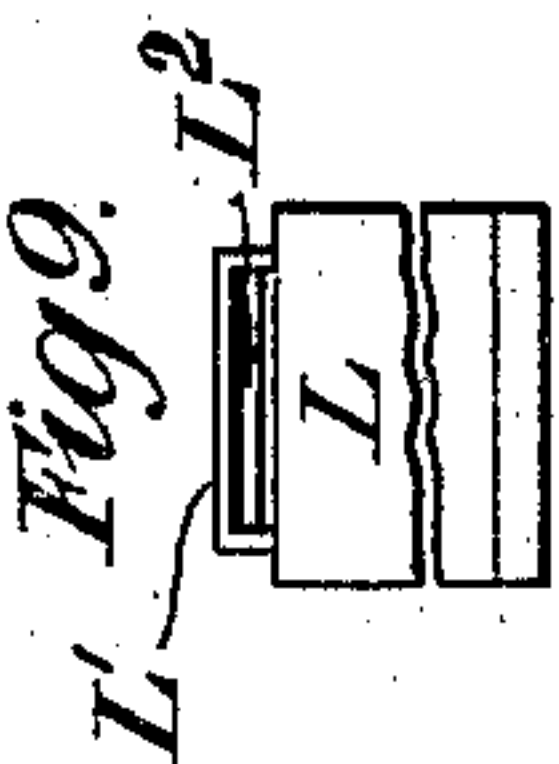
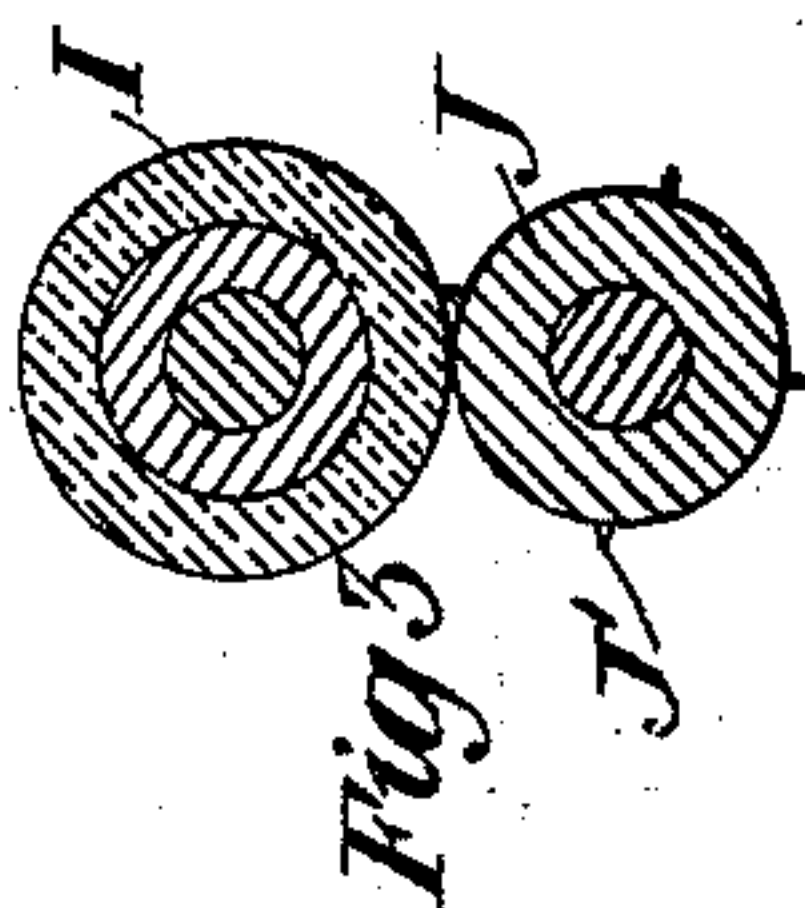
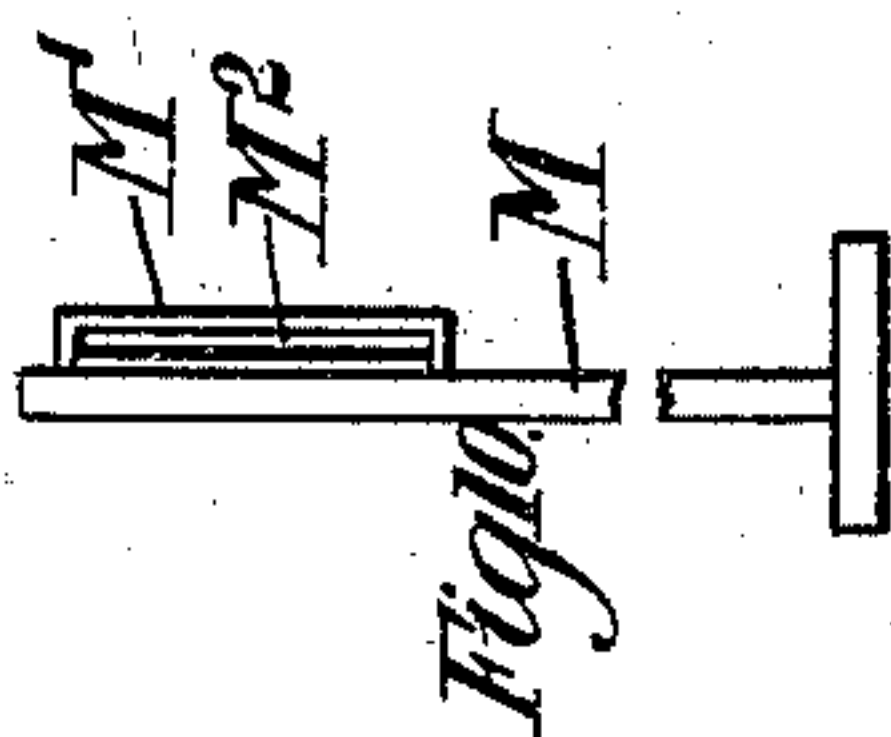
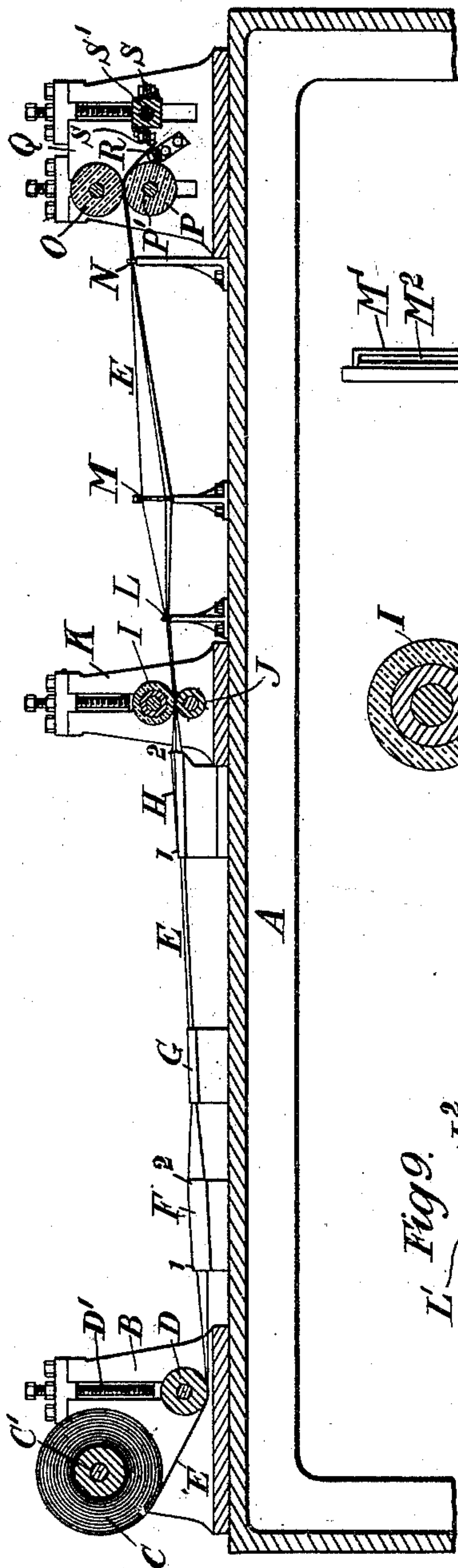
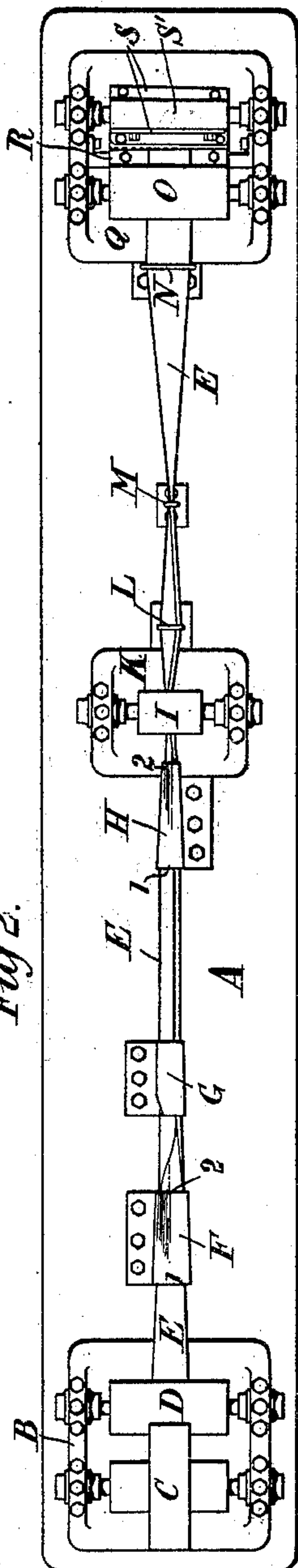


Fig. 2.



Witnesses:

Alex Stewart
Thomas Durant.

Inventors

Alfred G. Beale & Thomas Nesbitt

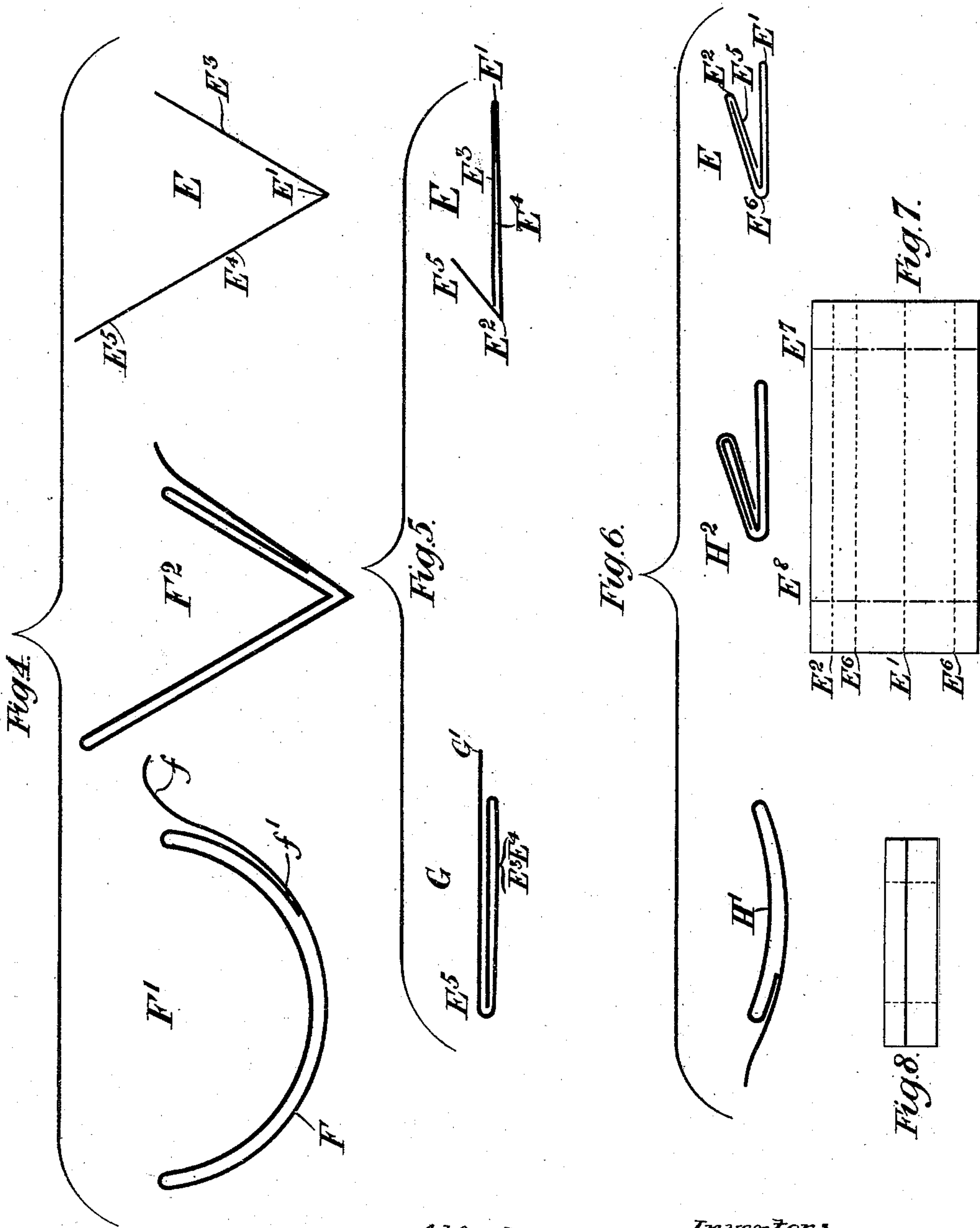
By Church & Church

Their Attorneys.

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Witnesses:

Alvan Macauley.
Thomas Durant

Alfred G. Beale and Thomas Nesbitt

By

Charles H. Hurd
Their Attorneys.

UNITED STATES PATENT OFFICE.

ALFRED GEORGE BEALE AND THOMAS NESBITT, OF TUNBRIDGE WELLS,
ENGLAND.

MACHINE FOR CREASING POWDER-PAPERS.

SPECIFICATION forming part of Letters Patent No. 474,716, dated May 10, 1892.

Application filed September 9, 1891. Serial No. 405,239. (No model.)

To all whom it may concern:

Be it known that we, ALFRED GEORGE BEALE and THOMAS NESBITT, subjects of the Queen of England, residing at Tunbridge Wells, in England, have invented certain new and useful Improvements in Machines for Creasing Powder-Papers, of which the following is a specification.

This invention, which relates to the manufacture of papers such as are used by chemists for wrapping up powders in, will be best understood by reference to the accompanying drawings, in which—

Figure 1 is a sectional side elevation of a machine adapted to carry out this invention, Fig. 2 being a plan thereof. Fig. 3 is a detail, on a larger scale, of one of the creasing-rollers. Fig. 4 represents the first folder in two positions and the paper as turned out. Fig. 5 represents the second folder and its paper, and Fig. 6 the third folder and its paper, Fig. 7 being a plan of the creased paper laid out flat, and Fig. 8 a plan showing the paper folded. Figs. 9 and 10 are details hereinafter referred to.

Like letters and figures represent like parts throughout the drawings.

The object of this invention is to produce powder-papers for chemists or papers of a similar nature adapted for other similar purposes creased by machinery and supplied in detached papers, whereby much time is saved in the folding of the papers after the contents are inserted, while a better result is obtained, as all the papers are not only uniformly folded, but the various lines are parallel and a neater paper is produced.

A represents the bed of the machine, which may be of any convenient description and either of metal or wood.

B is a bracket or head-stock containing the roll C of paper or other suitable material, carried upon a shaft or spindle C', journaled in the two sides of the bracket or head-stock B. This paper is of the same width as the ultimate powder-paper when unfolded.

D is a roller journaled at each end in the bracket or head-stock B, but so arranged that by means of the screw D', a spring, or other equivalent means it can be brought to bear with sufficient pressure upon the strip or band

of paper E to produce upon the said paper the required tension.

F is the first folder, G the second folder, and H the third folder, the details of which will be understood by reference to Figs. 4, 5, and 6. The folder F at its leading end 1 is semicircular, as indicated in the view F', to impart an easy fold to the paper, but at its back end 2 has a sharp angle, as indicated in the view F², to impart the sharp crease required to the paper. These views are upon a considerably larger scale than the other figures for the sake of clearness; but the size and strength of the folders and the whole apparatus would depend upon the paper or similar material to be operated upon and the size and strength of the papers to be creased. The folder F is formed of a piece of thin sheet metal folded so as to produce at its leading end the semicircular shape indicated in F', where *f* shows a projecting end of the metal folded over, so as not to interfere with the passage of the paper, and *f'* shows the other edge terminating within the semicircle. The folder may be secured upon the bed or stand in any convenient manner—as, for example, by screws passing through the projecting lip *f*.

E, Fig. 4, shows an end view of the paper with the crease or fold E' imparted to it.

From the first folder F the paper passes to the second folder G, Fig. 5, in which is produced the second fold E², the doubled portion of the paper E³ E⁴, Fig. 4, being in the lower channel of G and the small fold E⁵, Fig. 4, being in the upper channel of the folder, as indicated in Fig. 5. This folder likewise can be fastened in any convenient manner, as by screws passing through the extension G', Fig. 5. The view of the paper E in Fig. 5 will indicate the condition of the paper after passing through folder G.

Fig. 6 shows the third folder H, in which the paper folded as in Fig. 5, but with the flap E⁵ pressed down flat upon the other folds, has its last longitudinal crease imparted to it. It is entered at the leading end 1, which takes the form of H', Fig. 6. The back end 2 of the folder H is folded to a sharp angle, as shown in H², Fig. 6, the paper coming out, as shown, at E, Fig. 6, the fold E⁶, Figs. 6 and

7, being a double one on account of the paper having been doubled before this crease is made. From the folder H the paper passes between the india-rubber-covered roller I, Figs. 1 and 3, and the wooden or other roller J, which is provided with knives J', set longitudinally in the roller. These two rollers are carried in bearings in the bracket or head-stock K, secured to the frame-work in any convenient manner. As the paper passes between these two rollers they are both revolved and the knife-edges J' impart the cross-creases E⁷ and E⁸, Fig. 7, to the paper, the rubber yielding to the pressure of the knife, so that the paper is not cut, but only marked or creased. This is the last of the folding and creasing part of the process, the subsequent operations of the mechanism relating to the unfolding of the paper in which the creases or lines remain.

L represents the first unfolders, which consists, as shown by the enlarged view, Fig. 9, of a bent wire or staple L', set in or carried by the supporting-bracket or head-stock L, of any convenient description and suitably secured to the framing. The paper passes through the space L², and thus has the fold last formed taken out, the paper emerging from the unfolders L in the same condition in which it left the folder G. From L the paper passes to the second unfolders M, similar to L, but placed vertically, as it is found convenient to give a partial twist to the paper as it passes between the unfolders L and M. Otherwise the construction of M is similar to that of L, the paper passing through the space M² between the bracket or head-stock M and the wire staple or equivalent M'.

The third unfolders N is similar to the first one L, but is for convenience made rather higher, (if the rollers at the end of the apparatus require it,) and as the paper passes through it the last fold has been taken out and it leaves the unfolders N flattened out and of its full width, as when it was on the roll C at the commencement of the operation, but bearing all the longitudinal and cross creases. From the last unfolders N the paper passes between the drawing-rollers O P, journaled in the bracket or head-stock Q, secured upon the bed, and which rollers draw the paper through the whole of the folding and unfolding apparatus, and to one or both of which motion may be imparted by belts or gearing in any convenient manner. After passing the rollers O P the paper is delivered to the fixed cutter R, between which and the revolving cutters S it is nipped and cut off in the required lengths. The revolving cutters S are carried upon a suitable shaft S', journaled in the bracket or head-stock Q or in an independent bracket or head-stock and driven at a suitable speed, preferably by means of gearing connecting the spindle S' with the spindle P' of the roller P, the relation between the rollers O P and the revolving knife or cutter S being such that the length of pa-

per passing over the knife R between the nip of one cutter S and the nip of the next cutter S will be the exact length of the powder-paper required. The papers as they drop from the cutters R and S fall into any suitable receptacle or onto a traveling band and may be collected, counted, and placed in bundles or boxes for sale in quantities, as required, each individual paper being marked or creased, as in Fig. 7, and adapted to be folded, as in Fig. 8, when required for use.

In starting this machine the paper will be in the first instance folded and placed in the folders carried between the resilient and knife-edge rollers and unfolded and placed in the unfolders and carried between the drawing-rollers and placed in position over the fixed separating-knife all by hand, after which the operation of the machine is entirely automatic until the roll of paper is consumed, when a fresh roll will be supplied and may either be again entered by hand or may be efficiently secured to the end of the previous strip, so that it will be automatically drawn into the machine.

As it is sometimes desirable that the papers should bear a printed description of the contents or for other reasons should bear printed matter upon them, this may be done by printing upon the paper before it is rolled up and at suitable intervals and at the right place in the width of the paper and of a proper size to suit the unfolded portion of the paper any matter that it is desired to place upon the finished papers. The intervals would be such as to coincide with the size of the respective papers when cut, and when the printing is adopted care must be taken when first introducing the strip into the machine to place the printed matter in such relation to the knives for separating the papers from the strip that the letter-press will come in the longitudinal center of each paper.

For advertisement purposes the papers could be printed all over and on one or both sides; but usually the object of the printing would be merely for the purpose of indicating the nature of the contents of the folded paper.

We claim—

1. In an apparatus for marking paper for powders, the combination, with the series of folders for forming the paper into a tube, of the series of unfolders succeeding the folders for opening the paper out flat, substantially as described.

2. In an apparatus for marking paper for powders, the combination, with the series of folders for forming the paper into a tube and the series of unfolders succeeding the folders for opening the paper out flat, of the rolls between the series of folders and series of unfolders, between which the paper passes.

3. In a paper folding and creasing machine, the combination, with the folders and unfolders, of the rollers having the cross-creasing projections located between the said folders and unfolders, substantially as described.

4. An apparatus for the creasing or marking of papers which have to be subsequently folded, consisting of a bed or stand, a bracket or head-stock for a roll of paper, and an adjustable tension-roller, the folders to fold and crease the paper, a head-stock provided with a resilient and a knife-edge roller to make the cross creases or marks, the unfolders which unfold the paper and present it opened out, the drawing-rollers, and the separating-knives, substantially as specified.

5. In a paper-folding machine, the combination, with the folders F, G, and H, of the unfolders L, M, and N for unfolding, respectively, the folds made by the folders F, G, and H, whereby the paper is delivered in its original unfolded condition, substantially as described.

6. In a paper folding and creasing machine, the combination, with the folders, the cross-crease rollers, and the unfolders, of the fixed and revolving knives whereby the strip is separated into the required lengths, substantially as specified.

7. In a paper folding and creasing machine, the combination, with the folder H, of the unfolders L for opening the fold formed by H and the cross-crease rollers between the folder and unfolder, substantially as described.

8. In a paper folding and creasing machine, the combination, with the two folders F and G, of the two unfolders N and M for unfolding successively the folds formed by the folders F and G, substantially as described.

In testimony whereof we have hereto set our hands in the presence of two subscribing witnesses.

ALFRED GEORGE BEALE.
THOMAS NESBITT.

Witnesses to the signature of the said Alfred George Beale:

ALFRED J. BOULT,
HARRY B. BRIDGE.

Witnesses to the signature of the said Thomas Nesbitt:

M. C. NESBITT,
M. A. LONGTON.