

(No Model.)

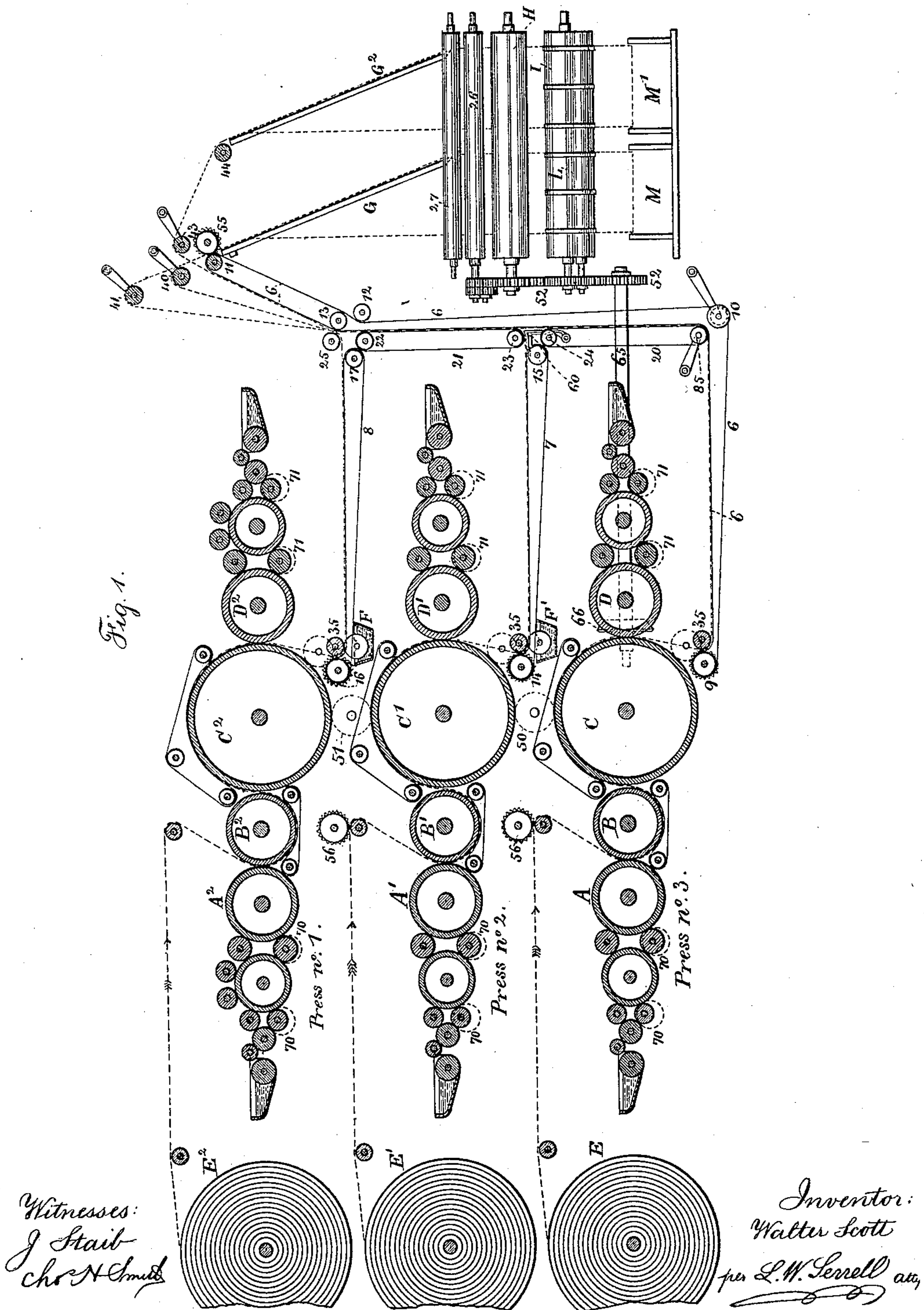
3 Sheets—Sheet 1.

W. SCOTT.

MACHINE FOR PRINTING, FOLDING, AND CUTTING SHEETS.

No. 467,265.

Patented Jan. 19, 1892.



(No Model.)

3 Sheets—Sheet 2.

W. SCOTT.  
MACHINE FOR PRINTING, FOLDING, AND CUTTING SHEETS.  
No. 467,265. Patented Jan. 19, 1892.

Fig. 2.

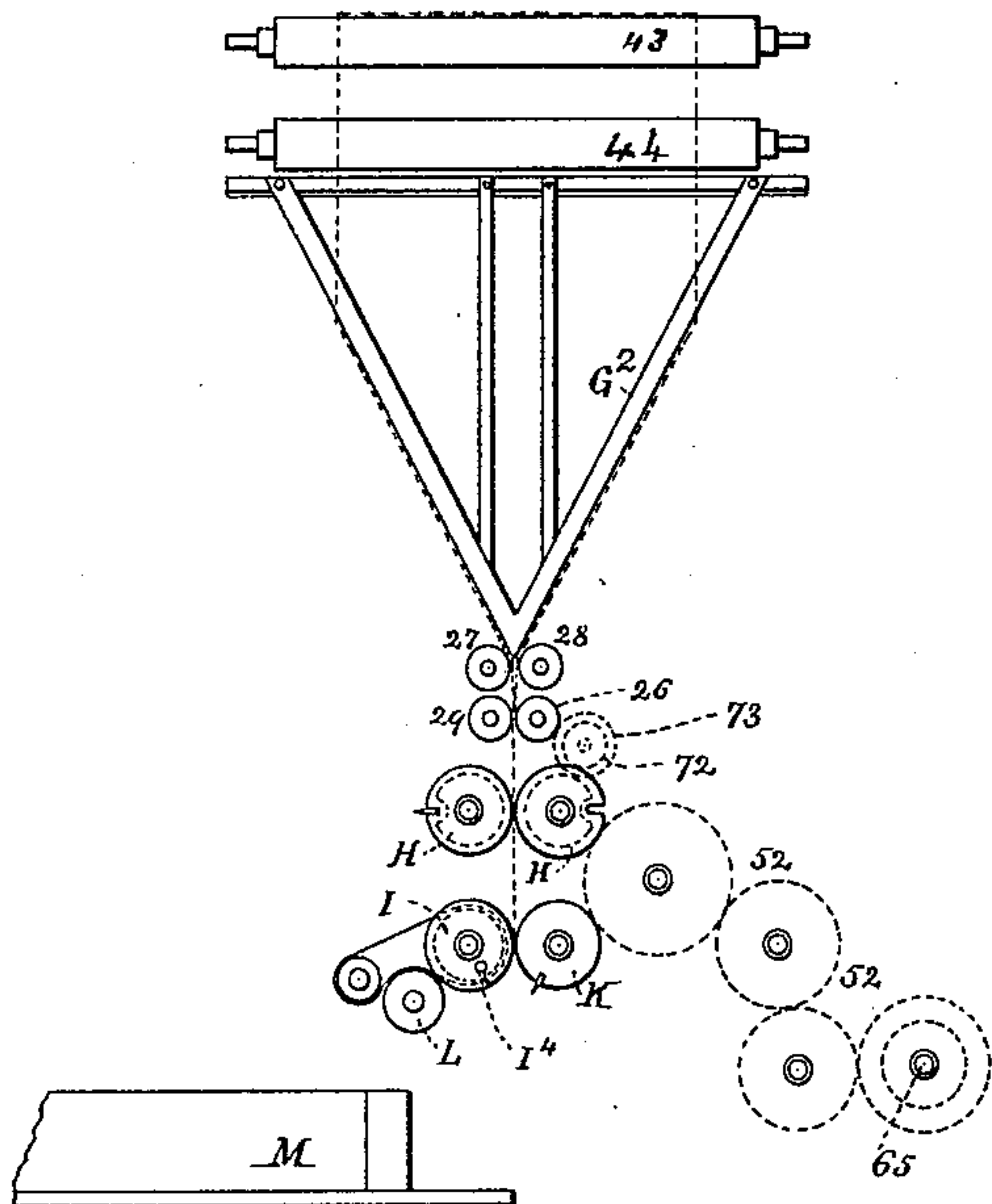


Fig. 3.

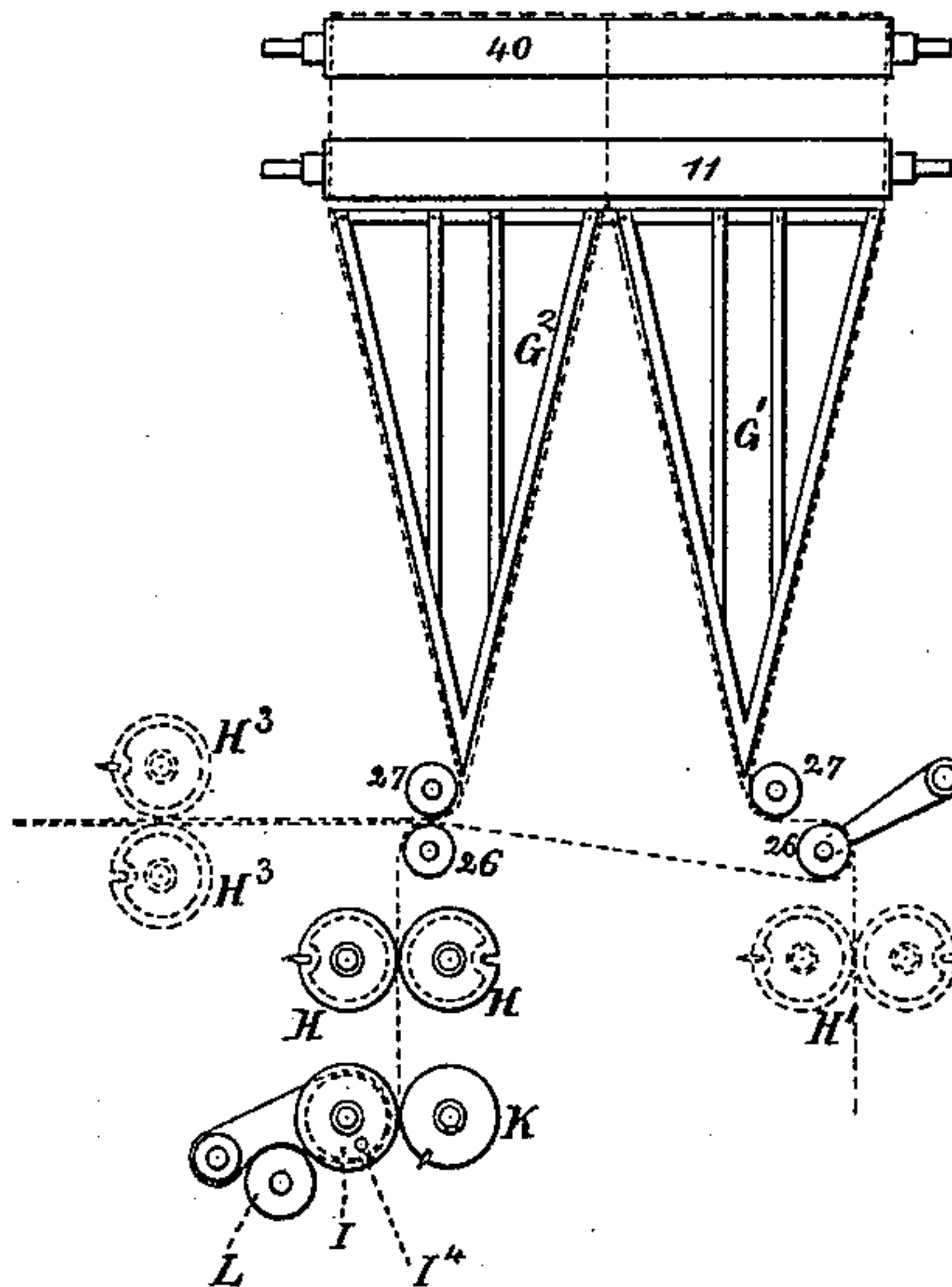


Fig. 5.

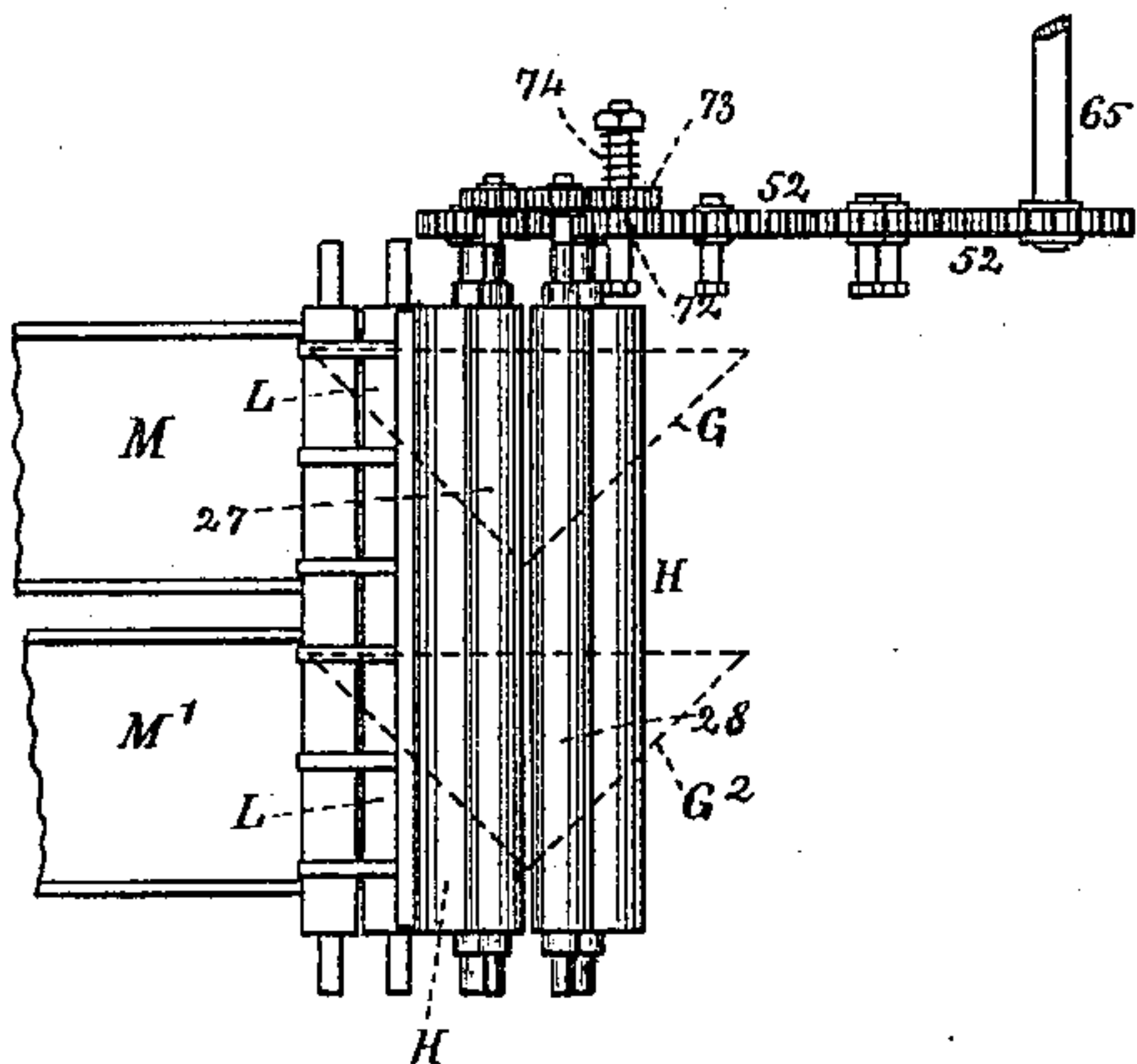
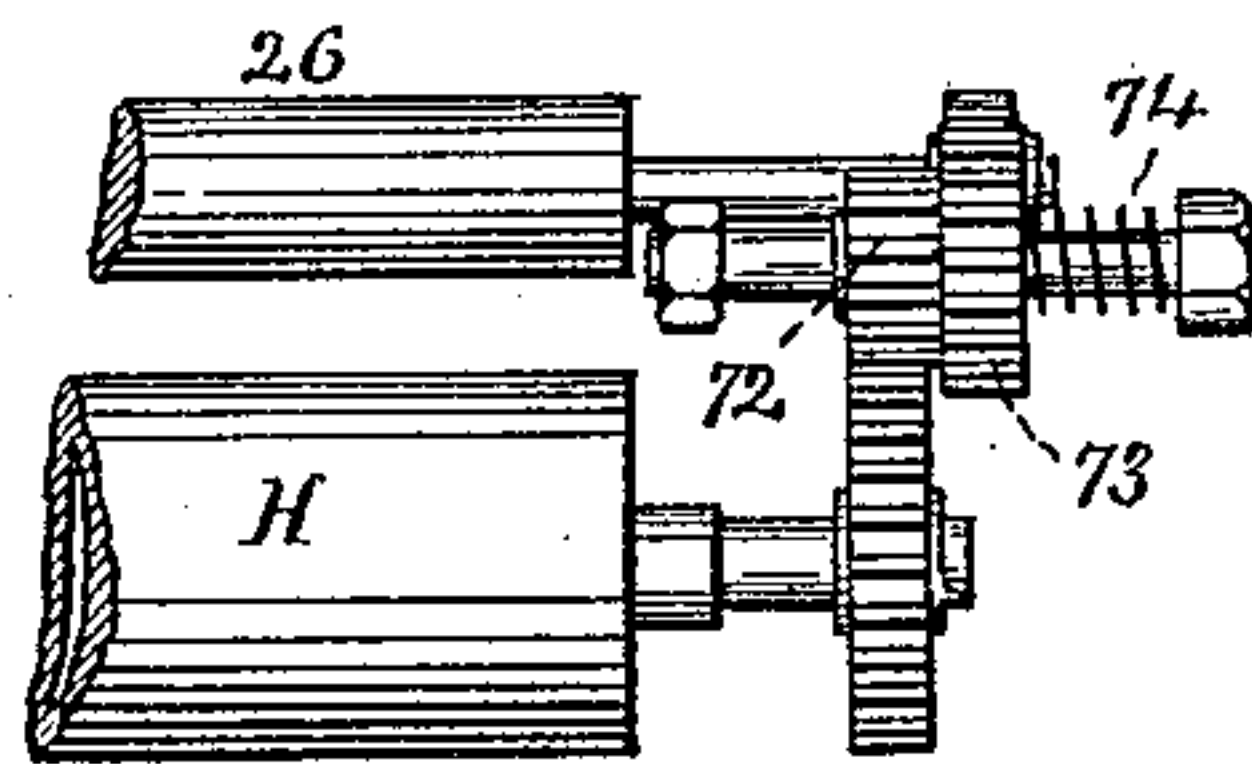


Fig. 4.



Witnesses:  
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Chas. H. Smith

Inventor:  
Walter Scott  
per Lemuel W. Seerell atty.

(No Model.)

3 Sheets—Sheet 3.

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Fig. 6.

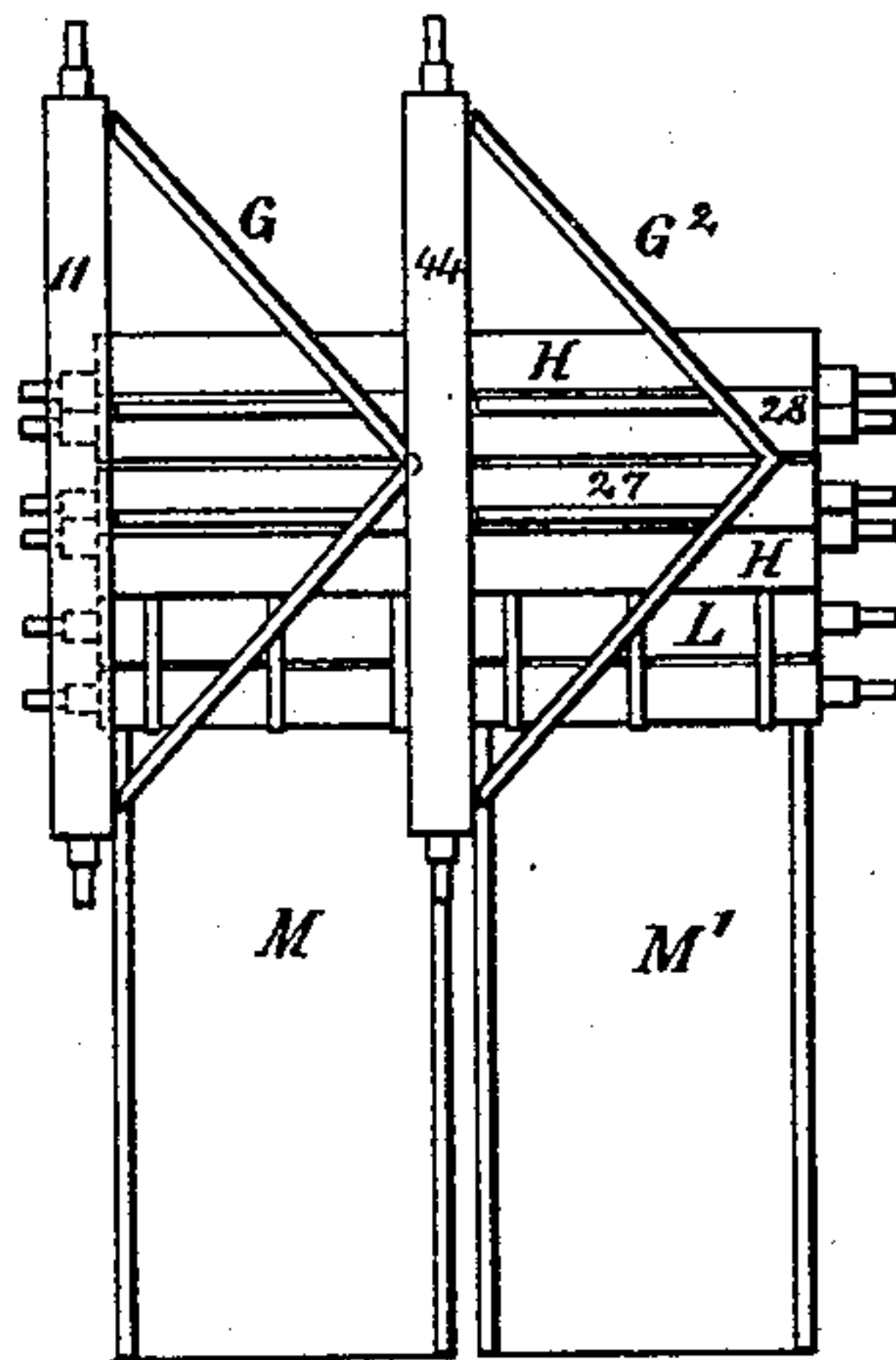
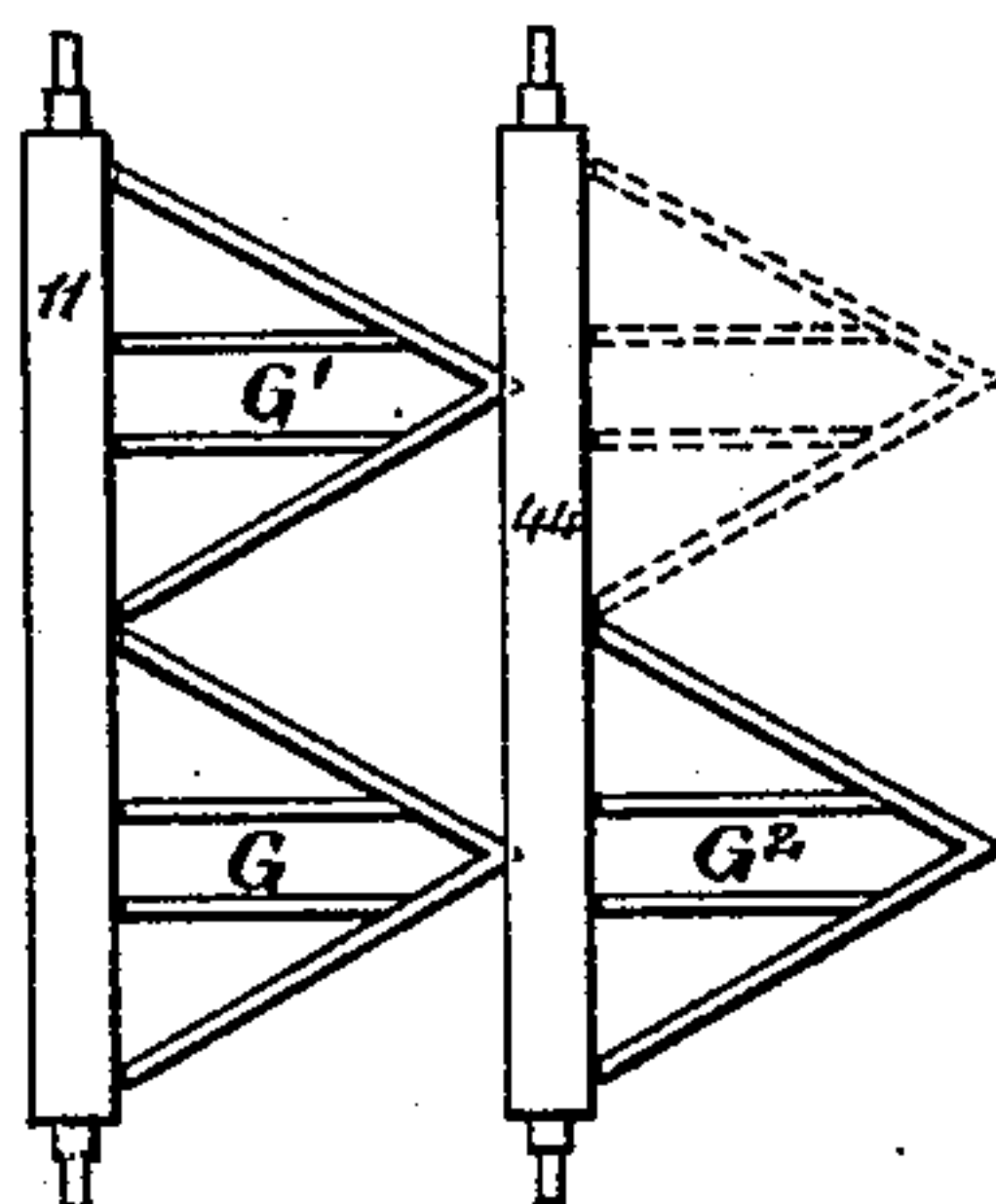


Fig. 7.



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Chas. A. Smith

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# UNITED STATES PATENT OFFICE.

WALTER SCOTT, OF PLAINFIELD, NEW JERSEY.

## MACHINE FOR PRINTING, FOLDING, AND CUTTING SHEETS.

SPECIFICATION forming part of Letters Patent No. 467,265, dated January 19, 1892.

Application filed June 28, 1889. Serial No. 315,886. (No model.)

*To all whom it may concern:*

Be it known that I, WALTER SCOTT, of Plainfield, in the county of Union and State of New Jersey, have invented an Improvement in Machines for Printing, Associating, Folding, and Cutting Sheets, of which the following is a specification.

In printing from rolls or webs of paper, especially in the printing of newspapers, it is desirable to be able to associate together two sheets to make an eight-page paper, three sheets to make a twelve-page paper, or four sheets to make a sixteen-page paper, or to bring together one sheet containing four pages and a single leaf with two pages to make up a six-page paper and two sheets and a leaf to make a ten-page paper, three sheets and a leaf to make a fourteen-page paper, and so on, and in daily papers that are printed with great rapidity it is desirable to bring together the sheets or leaves in such a manner as to be sure that all papers are alike, thus avoiding the unreliability of associating together by hand sheets printed on separate presses.

My present improvements are made with reference to bring together the product of three web-printing presses in such a manner that the printed sheets can be associated properly previous to being cut off, and the devices are arranged in such a way that the products can be associated to form one large paper or one or more papers with a smaller number of pages, or any desired number of sheets can be brought together, the product to compose one complete paper or two or more complete papers, as may be desired, from time to time.

In the drawings, Figure 1 is a diagrammatic sectional view of three web-printing presses and the appliances therewith connected for associating the sheets. Fig. 2 is a diagrammatic view illustrating the manner in which the web is folded. Fig. 3 is a similar view illustrating the manner in which a web split longitudinally or two narrow webs run edge to edge can be folded. Fig. 4 represents a friction-gear for the roll 26, and Fig. 5 is a plan view of the folding and cutting rolls. Fig. 6 is a plan view of the delivery apparatus with the folders corresponding to those in Fig. 2, and Fig. 7 is a plan of the folders corresponding to the preferred form shown in Fig. 3.

A A' A<sup>2</sup> represent the first printing or type cylinders; B B' B<sup>2</sup>, the first impression-cylinder, and C C' C<sup>2</sup> the second impression-cylinders, and D D' D<sup>2</sup> the second type-cylinders in the respective presses, and I have designated the respective presses as "press No. 1," "press No. 2," and "press No. 3."

I remark that the inking devices are to be of any desired character and that the rolls or webs of paper are represented at E E' E<sup>2</sup> as one above the other and all at one end of the machine, where they are easy of access, and the directions in which the webs of paper pass through the respective presses are indicated by the dotted lines and arrows.

At F and F' paste-fountains are illustrated with wheels, by which single lines of paste can be applied at the proper places on one or two of the webs. These presses are one above the other, and the shafts in the respective presses are parallel and the presses occupy but little space.

The respective printed webs are conveyed away by the sets of tapes 6, 7, and 8, the tapes 8 running around the rollers 16 and 17, the sets of tapes 7 running around the rollers 14 and 15, and the sets of tapes 6 passing around the rollers 9 10 11 and being guided by the rollers 12 and 13. The sets of tapes or belts 20 21 pass around the respective rolls 22 23 and 24 85, and these are to be arranged substantially as shown, so that the product from the press No. 3 passes along upon the belt 6 beneath the roll 85 and up vertically, the printed web from the press No. 2 passes along on the belt 7 beneath the roll 23 and up vertically against the sheet from the press No. 3, and the web from the press No. 1 passes along on the belt 8 and comes against the sheets from the presses Nos. 2 and 3 between the roller 13 and the roller 25, and the three webs pass up over the roller 11 and descend upon a suitable folding device—such as the folding-incline G—to the rolls 26 27. These rolls 26 and 27 may be placed as seen in Fig. 3, so that the fold is flattened in passing partially around each roll, and there may be associated with the rolls 26 and 27 other rolls 28 and 29, arranged as seen in Fig. 2, to act in pairs.

At H, I have represented cutters that are



adapted to separating webs passing through between them, and at I, I have shown a cylinder with a range of grippers I<sup>4</sup>, and at K another cylinder with a folding-blade, so that the advancing end of the associated sheets may pass in between the rollers I and K, and the blade of the roller K will crease the middle of the associated sheets and press the same into the grippers I<sup>4</sup> on the cylinder I, so that such fold of the sheet will be carried by the cylinder I over the roll L, at which place the grippers are to be opened and the transversely-folded sheet will pass over the roll L and drop down into the receptacle or box M.

I remark that the cutter-cylinders H, the converging folding-bars forming the folding-incline G, the cylinder K with a blade, the cylinder I with grippers, and the parts associated and acting with the devices named are well known in printing and folding machinery, and do not require specific description herein, as their mode of operation will be apparent to any person skilled in the art.

The printing-presses may be run in the following manner: A half-width web may be run upon the printing-presses No. 1, No. 2, or No. 3 and carried up over the roll 11 and down the incline G and cut off by the cylinders H. If such webs extend over the folding-incline they will be folded in the middle. If at one side of the center they will only be turned. A full-width web may be run on either of the presses No. 1, No. 2, or No. 3 and carried up over the roller 11 and folded in the middle and passed down between the rolls 26 and 27 and cut off by the cylinders H, the converging folding-incline G being adapted to the width of sheet; or, if desired, the web may be split longitudinally and in the middle by the rotary cutter upon the roller 9, 14, or 16 of the respective presses, or there may be a cutter at 55 to act against the roll 11 for the same purpose, or the slitter may act on the web before it reaches the printing-cylinders, as indicated at 56.

The full-width sheet may be printed upon the press No. 1 and a half-width sheet upon the press No. 2, and a line of paste may be applied in the proper place upon the whole-width sheet, so that when the product of press No. 1 and press No. 2 come together at the roll 25 the edge of the half-width web will adhere to the whole-width web and they will pass up together over the roll 11 and down over the folding-incline G to be cut off by the cylinders H as one product. The whole-width sheet may be printed on press No. 2 and the paste applied to the edge of the half-width web printed on press No. 1, in order that the half-width web may be folded outside of the whole-width web. Two whole-width webs may be printed on presses No. 1 and No. 2 with or without paste applied to the surface of the web printed on press No. 1, the webs coming

together with the proper registration and passing up over the roll 11 and being folded and passed down between 26 and 27 and cut off, as aforesaid. The product from the presses No. 1 and No. 2 may be associated with a half or a whole sheet from press No. 3, the products coming together between the rolls 13 and 25, and I remark that the half-width web may be printed on press No. 2 and go in between two whole-width webs from presses Nos. 1 and 3, as I am not limited, but may use half or whole width webs or quarter-width webs, or I may split either the whole or the half width webs longitudinally, according to the products to be delivered from the press. In all instances the plates or stereotypes on the respective presses are to be placed in the proper positions for bringing pages in the proper order upon the associated sheets, either in printing cutting, and delivering one product, or in printing, cutting, and delivering two similar products or two different products, and I remark that where the half-width web is printed on either press 2 or 3 and below the whole-width web printed on press No. 1 the half-width will be folded inside the whole-width sheet. In order to still further increase the capacity of this press for the delivery of printed sheets associated together in any desired manner, I provide for carrying the product from the press No. 2 up and over an adjustable roller 40 previous to passing down upon the sheet from the press No. 3 that goes up over the roll 11. This allows for obtaining an accurate registration of the sheets as they lie upon one another without varying the position of the types or plates upon the printing-cylinders or the position of the gearing connecting one press with the other, and I provide another adjustable roller 41, which may be made use of for the same purpose in connection with the product from the press No. 1. I also provide for delivering the products from the respective presses or the presses jointly in two ranges—that is to say, the web from the press No. 2 can pass up over the rolls 43 and 44 and down upon the second converging folding-incline G<sup>2</sup>, so that the product from the press No. 2 may be folded separately as it passes between the rolls 26 and 27 and cut off by the same cutting-cylinders H, but delivered into the separate box or receptacle M', the product from the press No. 3 going into the box M. I have described the simpler form shown in Figs. 2 and 6; but I prefer to make the press with the folders and rollers arranged as shown in Fig. 3. In this arrangement the webs that are full width may be split in the middle or half-width webs may be run through edge to edge, and the webs that come on the folders G G<sup>2</sup> can be led and folded, as before described. The webs that come on the folder G' can be associated, as before described; but the second set of rollers 26 27 are provided



below the folder G' in Fig. 3, and thence the folded webs are led to the cutters H, or one folded web may pass between the cylinders H' (shown by dotted lines) and cut off; but where the cutting-cylinders H' are not used the roll 26, around which the web from the folding-incline G' passes, should be adjustable to obtain the proper register of the folded webs as they lie one on the other before passing between the cutting-cylinders H. (Shown by full lines in said Fig. 3.)

I remark that the three presses, as hereinbefore described, are capable of being run to produce what are known as two, four, six, eight, ten, twelve, sixteen, twenty, or twenty-four page papers or signatures, and in so doing whole or half width webs of paper are run through the respective presses and folded longitudinally and sometimes slit longitudinally before folding, the type-forms on the presses and the folding devices being easily changed or adapted to the printing of the different webs of paper and to associating the products together in the manner before described, and cutting off the webs and delivering the products in the form of papers or signatures.

In cases where the web from the press No. 1 passes up over the rolls 40 and 44 to the incline G<sup>2</sup> and the web from the press No. 3 passes over the roll 11 to the folder G the web from the press No. 2 may be slit longitudinally or be two half-width webs edge to edge, and one-half product pass over the roll 11 and down the folder G upon one-half of the whole-width sheet from the press No. 3 and the other half product from press No. 2 go over the roll 44 and down the folder G<sup>2</sup> beneath the web from the press No. 1.

It is to be understood that any suitable character of gearing may be employed for connecting and driving the respective parts of the presses; but where the respective cylinders are provided with gears of the same size as the cylinders themselves they can be connected by the intermediate gears 50 and 51, (shown by dotted lines in Fig. 1,) and the train of gearing at 52, Figs. 1 and 2, for driving the respective rolls 26, cutters H, and folders I and K may receive motion from the shaft 65 and bevel-gears at 66. It is preferable to mount the rolls 10 85 40 41 43 in bearings on crank-arms, as represented, so that such rolls may be adjusted in their positions for varying the distances traveled by the respective webs and obtaining the proper registration of the sheets one upon the other, and I also provide stationary guide bars or plates at 60 to insure the proper movement of the webs as they come together at the rolls 15, 23, and 24 and pass up between the ranges of tapes or belts 6 and 21 to the rolls 13 and 25. Gear-wheels may be provided at 70 71 to give motion to the rollers of the inking apparatus from the respective type-cylinders.

It will be apparent that if the paper is sufficiently strong the respective webs may be drawn along through the machine by the action of the rolls and cylinders without the use of tapes or belts, and in some places bars may be used in place of rolls for the paper web to pass around, such bars being the known equivalents of rolls.

If the cutter-cylinders are placed in the position indicated by dotted lines H<sup>3</sup>, Fig. 3, the roll 26 can be dispensed with and the web be passed directly to the cutters from the roll 27, which acts to crease the fold of the web as it passes around its curved surface.

It is advantageous to have either the rolls 26 or 27 traveling faster than the paper to keep a tension on the same, but not sufficient to injure the same. I have indicated at 72 a gear receiving motion from a gear on the cylinder H and a larger gear 73 to drive the roll 26; but the pressure of the roll 29 on the paper and against the roll 26 must be comparatively light to allow the roll 26 to slip on the paper without injuring it. If the gears 72 and 73 are kept one against the other by a pressure, such as from a spring 74 (shown in Fig. 4) that produces a friction, one gear may slip upon the other to produce the proper tension by the rolls 26 29 on the paper.

I prefer to place the rolls 26 and 27, that are at the lower end of the conveying-folder G, in the position indicated in Fig. 3 to act directly against each other, as it dispenses with the rollers 28 and 29 without otherwise changing the devices or their operation.

I claim as my invention—

1. The combination, with two printing-machines for printing on separate webs, of one incline upon which the two webs are folded, two separate rolls 11 and 40, parallel to each other and adjacent to the receiving end of the incline and over which the respective webs pass, and cutting-cylinders for separating the folded webs transversely, substantially as specified.

2. The combination, with two web-printing presses and the tapes or belts for conveying away the printed webs, of two separate rolls over which the webs pass, two separate inclined converging folders for folding the respective webs longitudinally and separately, a pair of rolls between which the folded webs pass, and cutting-cylinders for separating the webs transversely into papers or signatures, substantially as set forth.

3. The combination of three printing-machines to print upon three webs of paper, a cutter for slitting one web longitudinally, rolls around which the webs are passed and each part of the slit web associated with a web of twice its width, folding-inclines for folding such webs and their associated half-web, and cutting-cylinders for separating the webs transversely after being folded, substantially as specified.



4. The combination, with three presses, one  
above the other, for printing webs from separate  
rolls, of separate folding-inclines, separate  
rollers over which the webs can be directed  
5 to one or more of such folding-inclines,  
and one pair of cutting-cylinders, and  
rolls for directing the folded webs to such cut-

ters as one or separate products, substantially  
as specified.

Signed by me this 26th day of June, 1889.

WALTER SCOTT.

Witnesses:

GEO. T. PINCKNEY,

WILLIAM G. MOTT.