

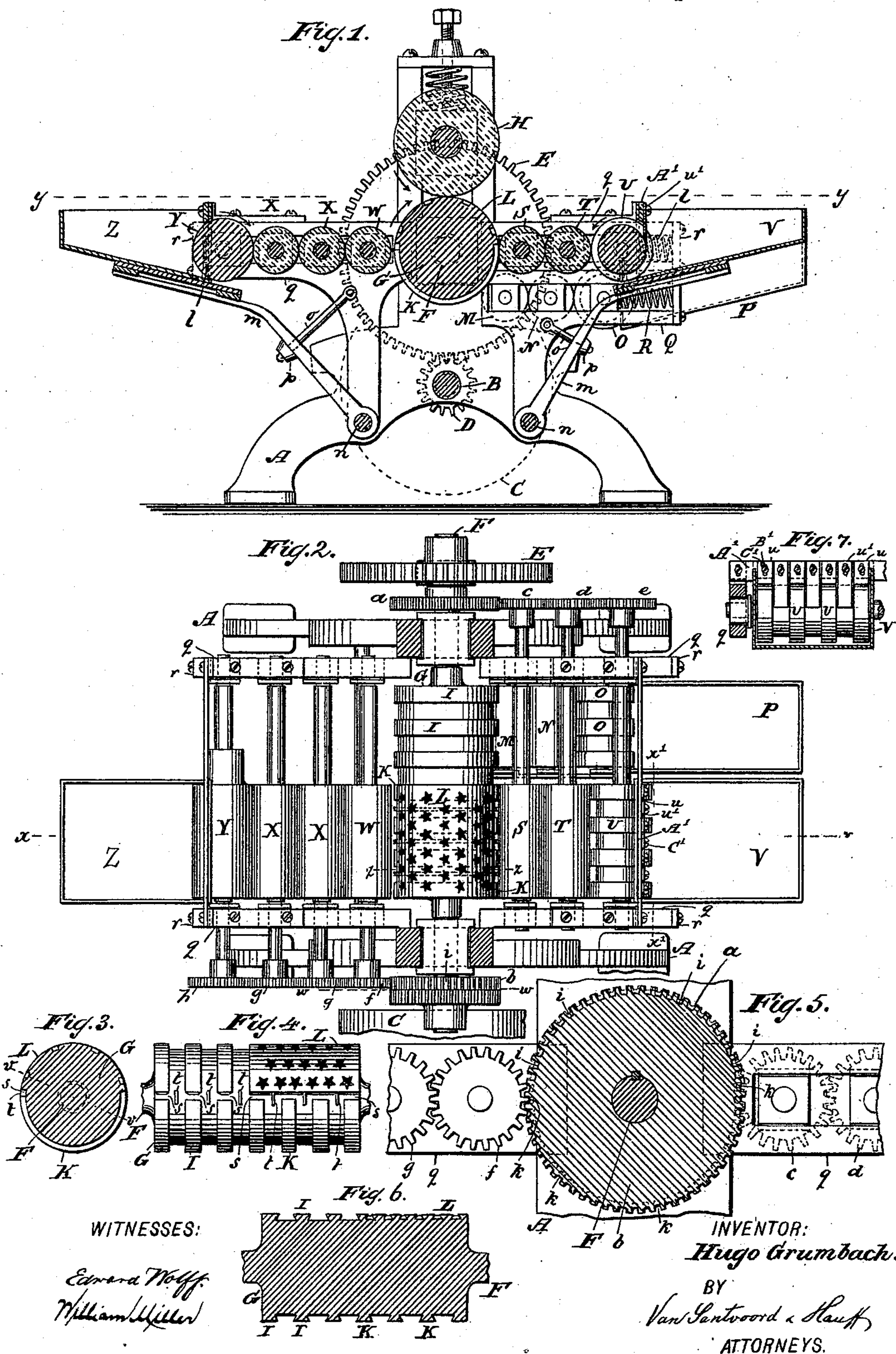
(No Model.)

2 Sheets—Sheet 1.

H. GRUMBACH.  
PRINTING PRESS.

No. 496,305.

Patented Apr. 25, 1893.



(No Model.)

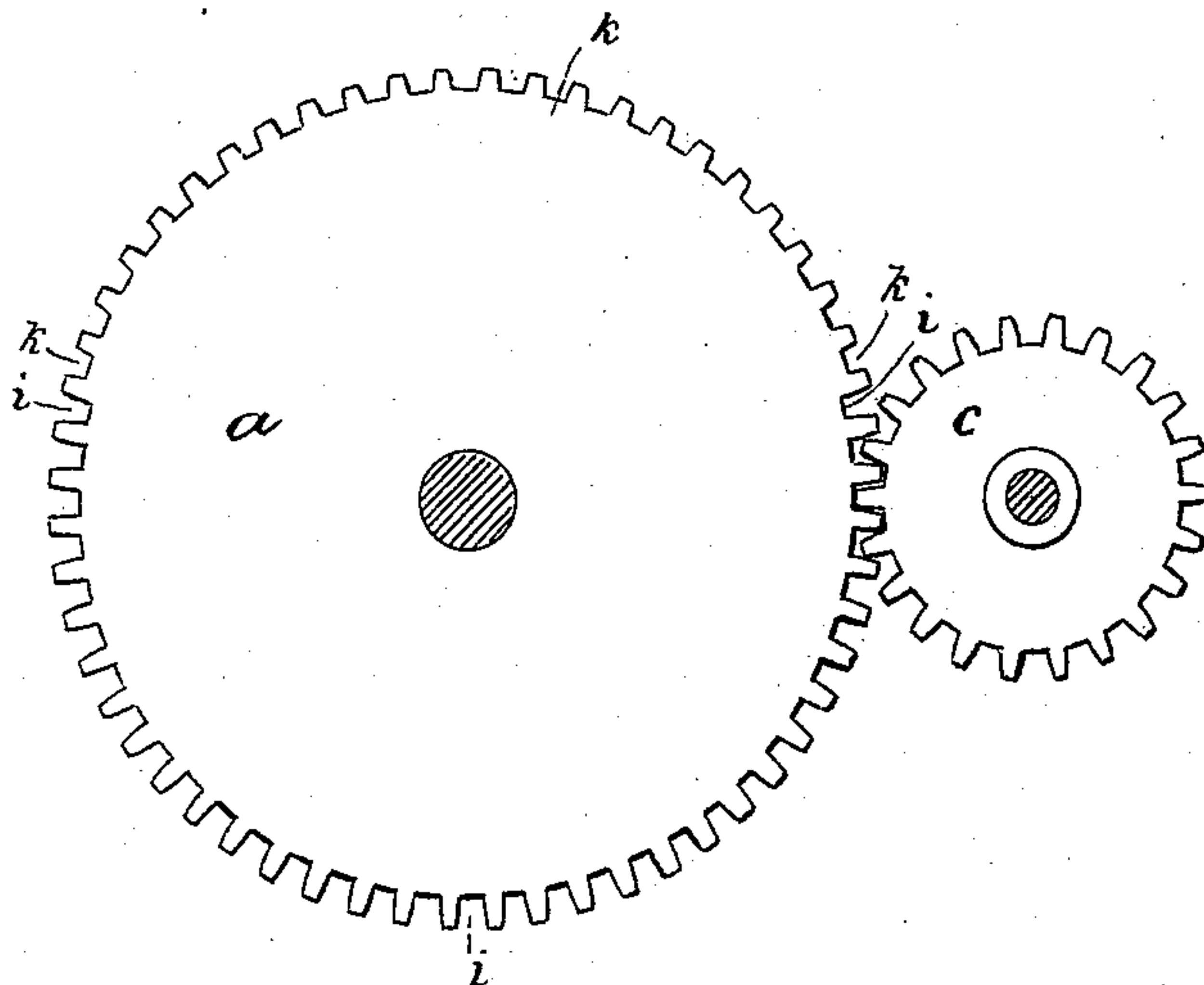
2 Sheets—Sheet 2.

H. GRUMBACH.  
PRINTING PRESS.

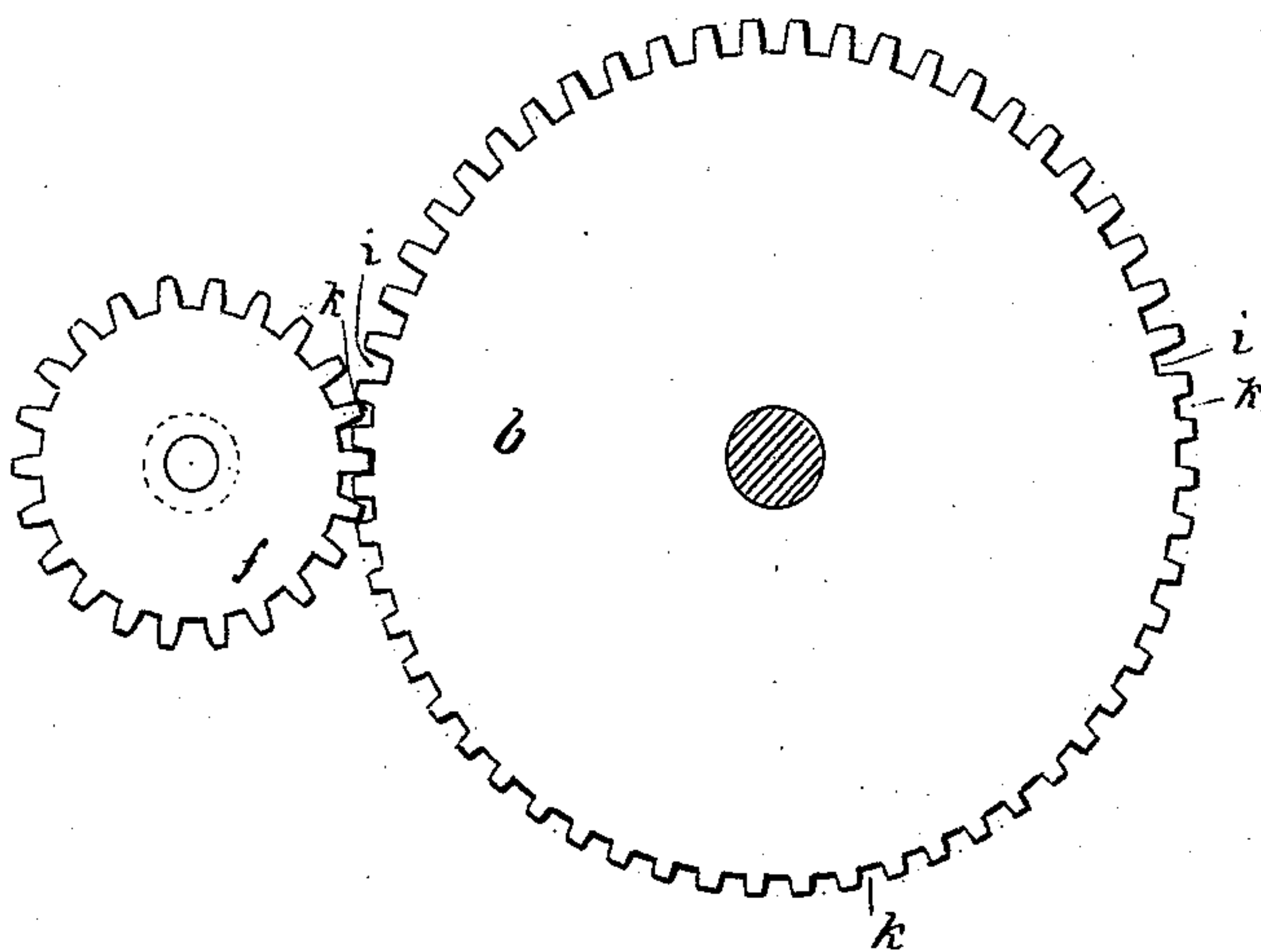
No. 496,305.

Patented Apr. 25, 1893.

*Fig. 8.*



*Fig. 9.*



WITNESSES:

*Edward Wolff.*  
*William Miller.*

INVENTOR:

*Hugo Grumbach.*

BY

*Van Santvoord & Hauff*

ATTORNEYS.



# UNITED STATES PATENT OFFICE.

HUGO GRUMBACH, OF JERSEY CITY, NEW JERSEY.

## PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 496,305, dated April 25, 1893.

Application filed June 23, 1892. Serial No. 437,769. (No model.)

*To all whom it may concern:*

Be it known that I, HUGO GRUMBACH, a citizen of the United States, residing at Jersey City, in the county of Hudson and State of New Jersey, have invented new and useful Improvements in Printing-Presses, of which the following is a specification.

This invention relates to an improvement in printing presses and by means of this invention varied printing such as that of flags can be readily and accurately accomplished as set forth in the following specification and claims and illustrated in the accompanying drawings, in which—

Figure 1, is a section of the press along  $xx$  Fig. 2. Fig. 2, is a plan view of the press sectioned along  $yy$  Fig. 1. Fig. 3, is a section along  $zz$  Fig. 2. Fig. 4, is a detail face view of a printing roller. Fig. 5, is a section along  $ww$  Fig. 2, enlarged. Fig. 6, is a section along  $vv$  Fig. 3. Fig. 7, is a section along  $x'x'$  Fig. 2. Fig. 8 is a detail view of gears. Fig. 9, is a detail view of other gears.

In the drawings the letter A indicates a frame or support and B is a driving shaft with a driving pulley C and a gear D imparting motion to gear E. The gear E has a shaft F on which is mounted the printing roller G. The material to be printed is passed between the printing roller G and the impression cylinder H.

In printing such articles as for example flags, various inks or colors have at times to be applied in various places. Taking for example the United States flag some of the stripes run along the entire field while some of the stripes abut or end at the stars or the blue field. The printing roller G has the ridges or continuous printing surface I adapted to print the continuous or long stripes of the flag and two alternating or interrupted surfaces K L, the surfaces K being adapted to print the shorter stripes and the surface L being adapted to print the blue field of the flag. The continuous surface I is supplied with ink or red color by the ink roller M which is in continuous contact with the surface I. Said ink roller M is in contact with the ink distributing roller N which is inked by the ink receiving roller O, taking ink from the slab or table P. The rollers M, N, O, are suitably supported as on a way or track Q

and are held by a spring or weight R against the surface I. The surface K is inked or colored by the ink roller S and the ink distributing roller T and ink receiving roller U take the red ink or color from slab or table V to the field K. The surface L is inked or colored by the ink roller W, and the ink distributing rollers X and ink receiving roller Y take the blue ink or color from the slab or table Z to the surface L. When the surface K is passing or rotating by the blue roller W the latter has receded somewhat from the printing roller G so as not to be in contact with the surface K. When the surface K has passed the blue roller W the latter moves again into contact with the roller G so as to color the blue surface L. The roller S has a similar motion of receding and going forward so as to avoid the blue surface L and to ink or color the surface K. This motion of the rollers S, W, of receding from and moving into contact with the roller G is effected by the following means.

On the shaft F of the roller G are mounted two gears  $a, b$ . The gear wheel  $a$  conveys motion to the gear-wheel  $c$  and thence to gear wheels  $d, e$ , said wheels  $c, d, e$ , being respectively secured to the shafts of the rollers S, T, U. From the gear wheel  $b$ , motion is conveyed to the gear wheels  $f, g, h$ , secured respectively to the rollers W, X.

As seen in Fig. 5 the gear wheel  $b$  has its periphery shown as a perfect circle. The different portions or segments of this gear have teeth of different depths, the spaces  $i, i, i$ , between a portion of the gear teeth being deeper than the spaces  $k, k, k$ , between another portion of the teeth. The segment with teeth of less depth acts as a cam to force back the gear  $f$  meshing therewith as also the roller W connected to said gear so as to move roller W out of action or out of contact with roller G while the segment with teeth of greater depth allows the roller W to move into action to ink or color its surface L. The gear wheel  $a$  is similarly formed with a circular periphery and having portions or segments with teeth of different depths, the segment with teeth of less depth acting as a cam to force back roller S out of contact with roller G.

The particular shape or concentric circumference portions of the gear wheel act to



move or push back the shafts of the rollers W, S, at suitable intervals so as to push or move said rollers away from the roller G and compress the springs  $l, l$ , against which the rollers W, X, Y and S, T, U are braced. Instead of the springs  $l$  being employed the rollers W S might be made of elastic or compressible material so that as their shafts are moved back the rollers will be compressed or flattened somewhat against the rollers X T sufficiently to move the rollers W, S, out of contact with the roller G. The shafts of the rollers W S are of course made yielding or movable a sufficient degree to enable the rollers W S to move out of and into contact with the roller G.

The slabs or tables V Z are supported on movable or swinging arms  $m$  supported or pivoted at  $n$  and said arms with the tables are held up or in working position by the detents or locking arms,  $o$ , having lock nuts,  $p$ . On releasing the arms  $m$  and lowering or moving the tables V Z out of the way the rollers S T U and W X Y can be slid off their ways,  $q$ , on removing the backs or rear pieces  $r$  of said ways. If desired however the tables V Z might be made stationary. It will be noticed that the receding motion of the rollers S W is effected only at one end of their respective shafts but I have found that such receding motion can readily be made great enough to carry the ink or color roller in each case clear of the printing bed or roller G. If desired however the roller shafts might have both ends made to recede and move forward.

The roller G can of course be made of any suitable size to print any desired kind of flag or said roller G might be made long enough to print several flags or widths of flags at the same time one along side the other.

In practice I have found it of advantage to make cuts or depressions  $s$ , in the roller G so that the end of the material for the flag where the latter is secured to a stick or support will be unprinted or left blank. To prevent the material from sinking into said depressions small ridges or supports  $t$  are secured to the roller G in proximity to the cuts or depressions  $s$ , to support the material in proximity to said cuts.

To prevent the inks or colors from spreading or blurring I make the ridges and depressions in the roller G undercut or with beveled edges.

The rollers O U are preferably provided with ridges corresponding to the flag stripes so that said rollers will only take up the color or ink requisite for printing the stripes and thus prevent blurring or smutting. To remove surplus color I also provide scrapers  $u, u'$ , independently secured to a bar or support A' so as to be adjustable thereon. The scrapers  $u$  remove the excess from the ridges and the scrapers  $u'$  remove the excess from the depressions or spaces between the ridges and as each scraper is independently adjust-

able it can be set to effect the proper scraping at its respective ridge or depression. The scrapers  $u, u'$  are made adjustable by means of a slot B' through which passes a screw or fastening C'.

Of course I do not limit myself to printing the United States flag since other flags, draperies or articles might be printed by making suitable change in the printing surfaces and coloring of the printing roller G.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination with an impression cylinder, and a printing roller, of a movable ink roller, and gear wheels provided with intermeshing teeth for connecting the printing and ink rollers, said gear wheels having circular peripheries and one of said gear wheels having portions or segments provided with teeth of different depths, the segment with teeth of less depth acting as a cam to force back the gear meshing therewith and the movable ink roller on which said gear is mounted, substantially as described.

2. The combination with an impression cylinder, and a printing roller having two surfaces, of two movable ink rollers, and gear wheels provided with intermeshing teeth for connecting the printing and ink rollers, said gear wheels being provided with circular peripheries and having portions or segments with teeth of different depths, the segments with teeth of less depth acting as cams to alternately force back the gears meshing therewith and the movable ink rollers on which said gears are mounted, substantially as described.

3. The combination with a printing roller of an ink roller, an ink table for the roller, a movable or swinging arm or support for the ink table and a detent or lock for holding the arm and table in working position substantially as described.

4. The combination with a printing roller of an ink roller, an ink table for the roller, a movable or swinging arm or support for the ink table and a detent or lock for holding the arm and table in working position said ink roller being movable along a track or way so as to be removable when the ink table is moved out of the way, substantially as described.

5. The combination with a printing roller having ridges, of an ink roller for the bed, a ridged ink receiving roller and independently adjustable scrapers made to act respectively on the ridges and between the ridges of the ink receiving roller substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

HUGO GRUMBACH.

Witnesses:

WM. C. HAUFF.

E. F. KASTENHUBER.