

M. GALLY.

INKING APPARATUS FOR PRINTING PRESSES.

APPLICATION FILED NOV. 17, 1902.

NO MODEL.

4 SHEETS—SHEET 1.

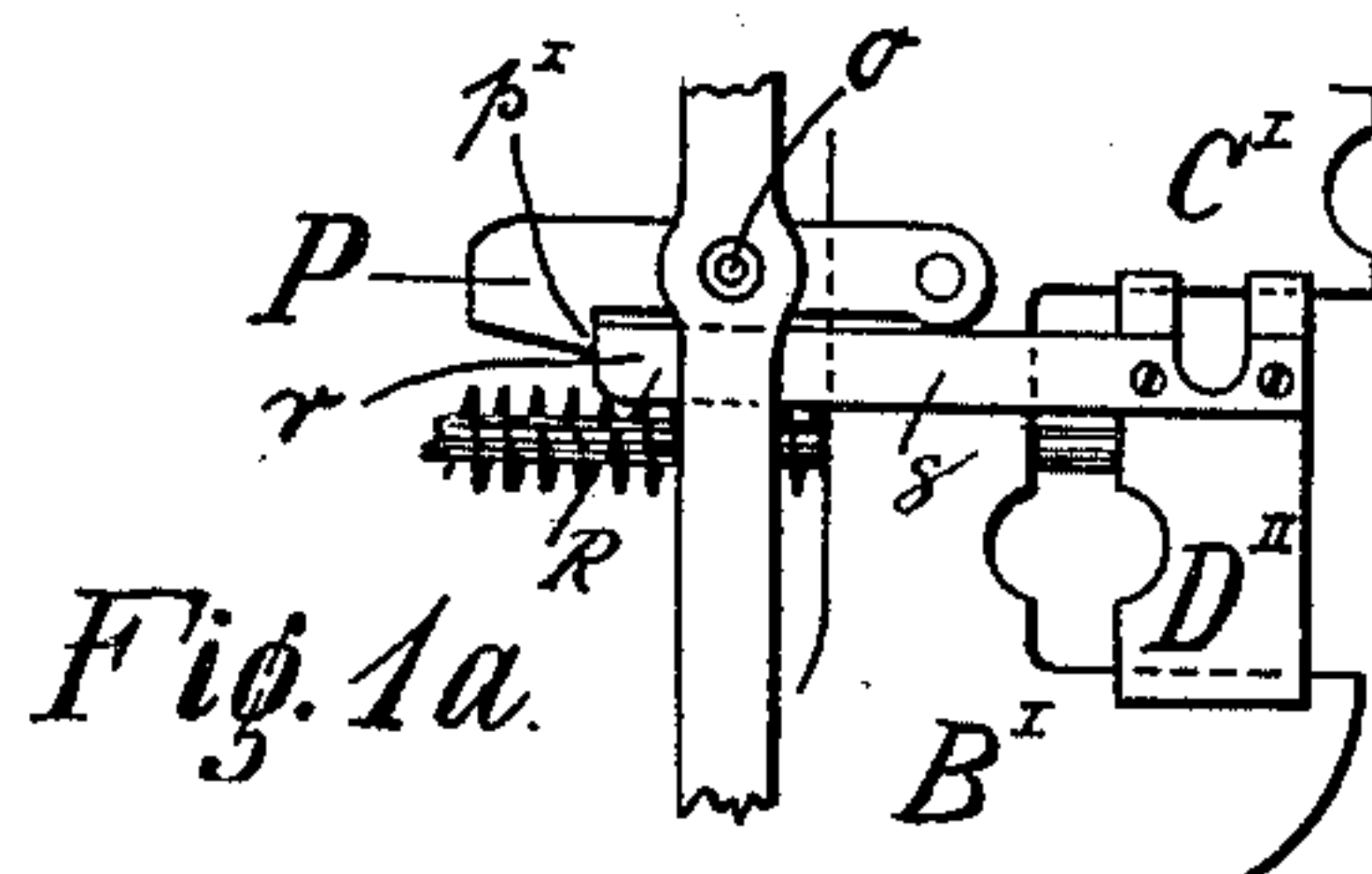
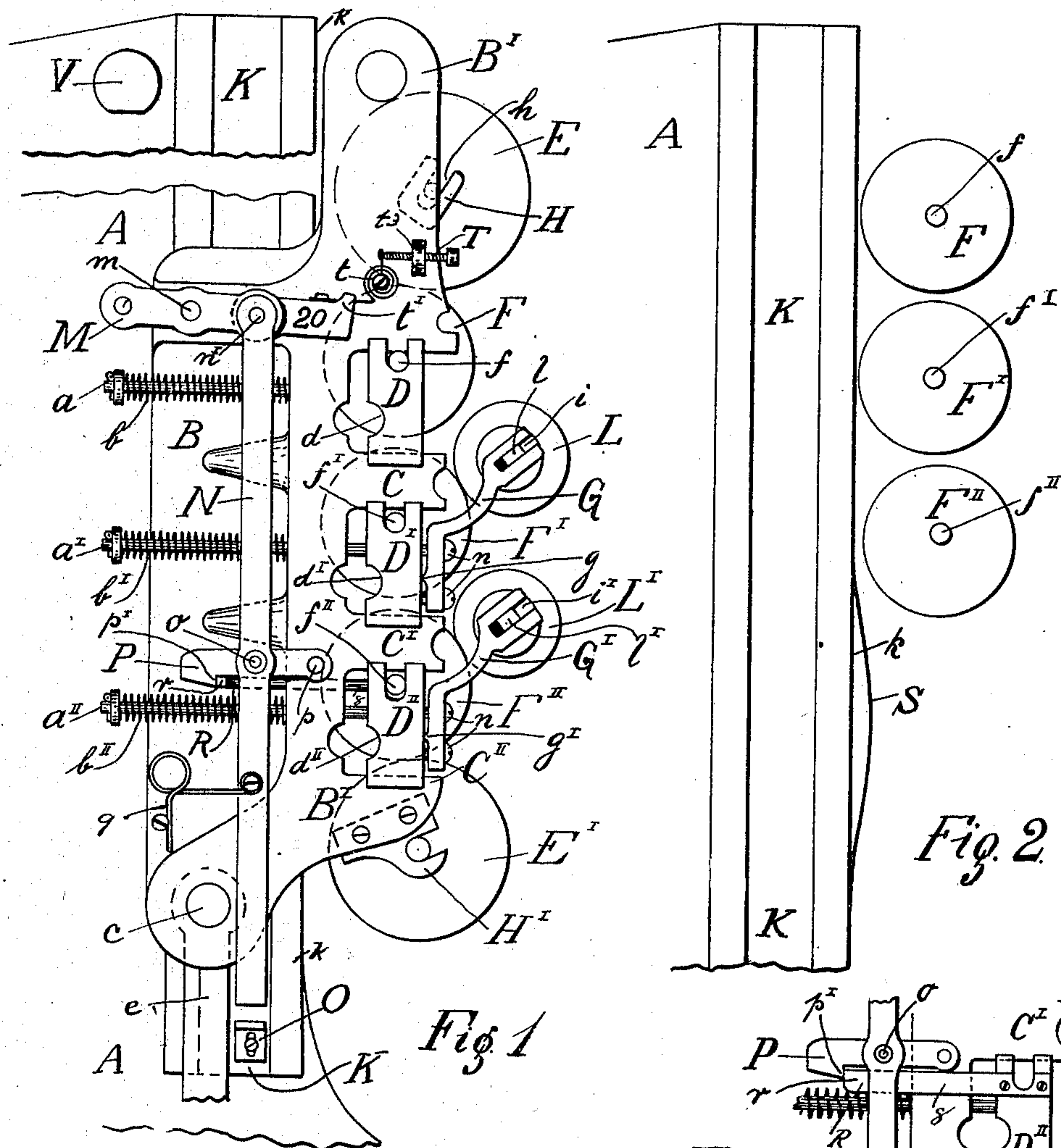
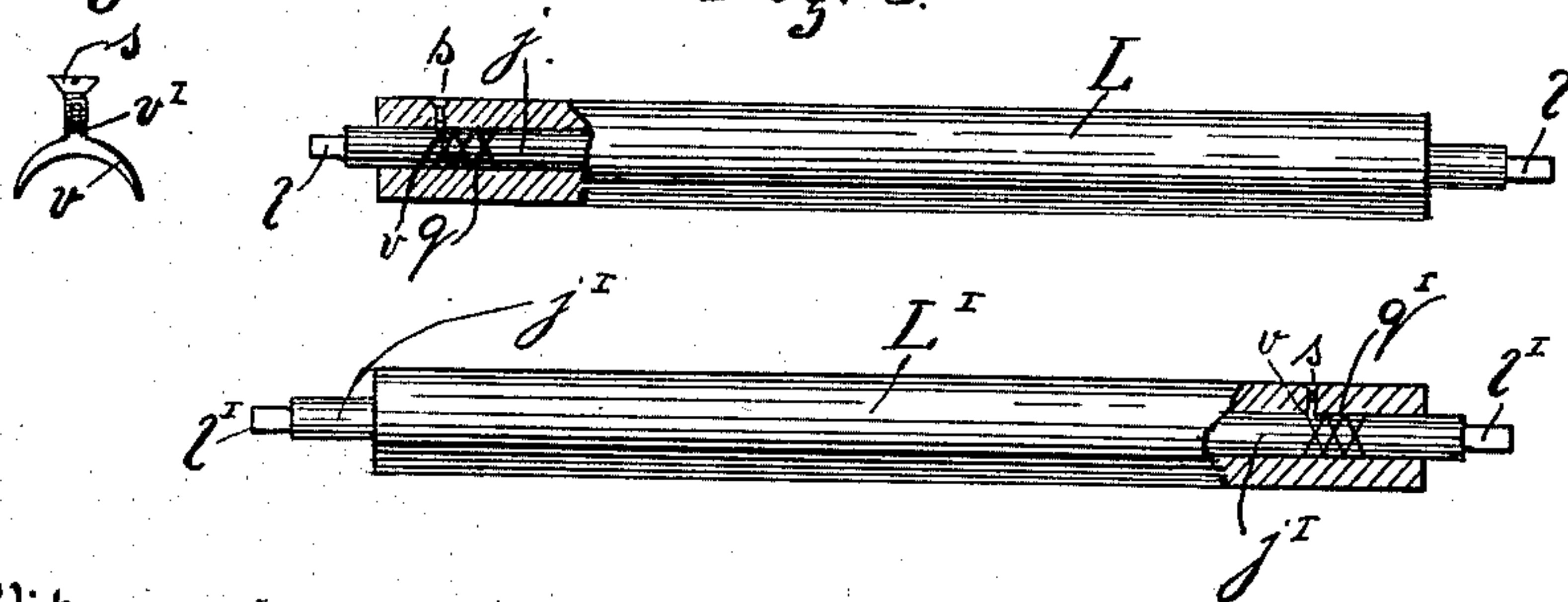


Fig. 3a

Fig. 3



Witnesses
Ivan Konigsberg.
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No. 733,023.

PATENTED JULY 7, 1903.

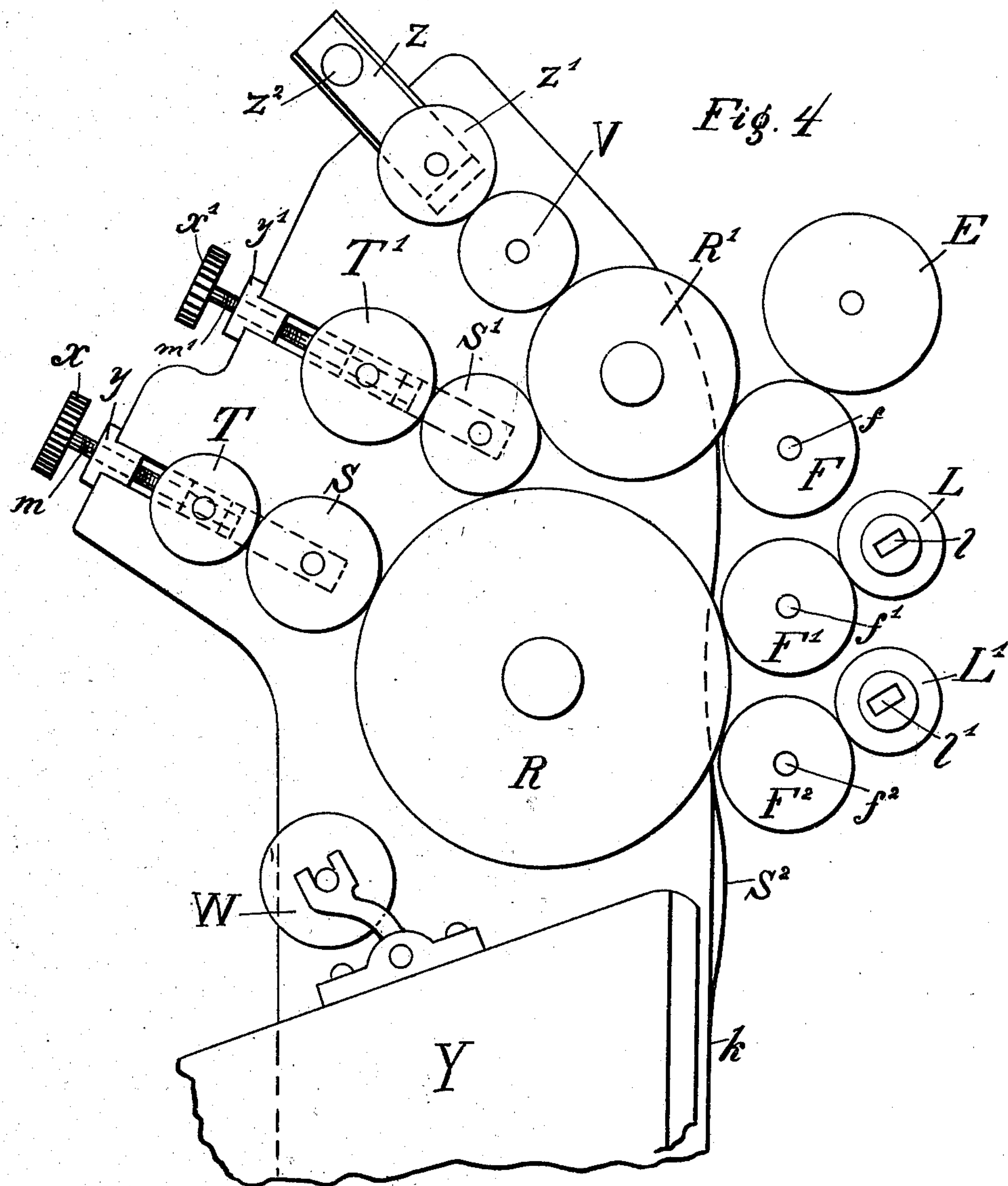
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4 SHEETS—SHEET 2.



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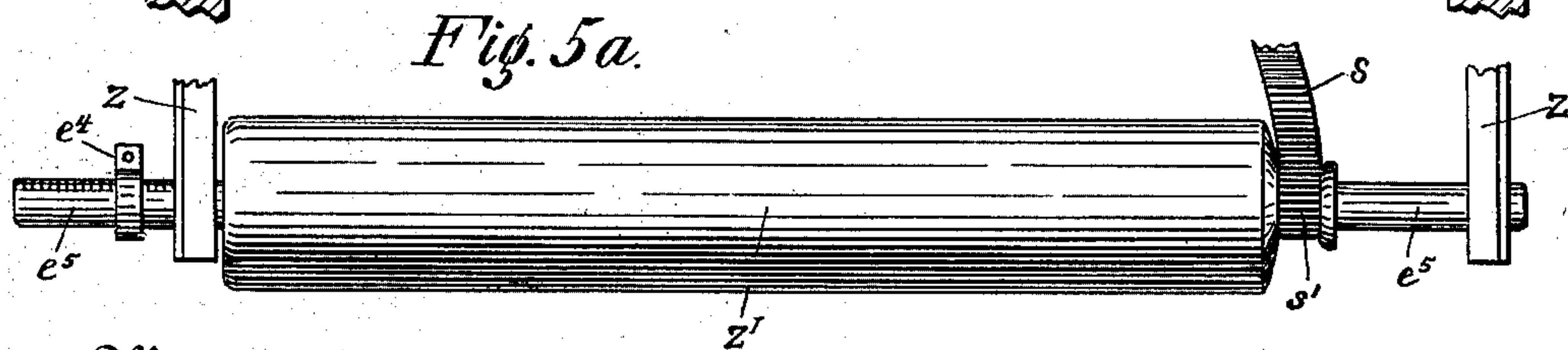
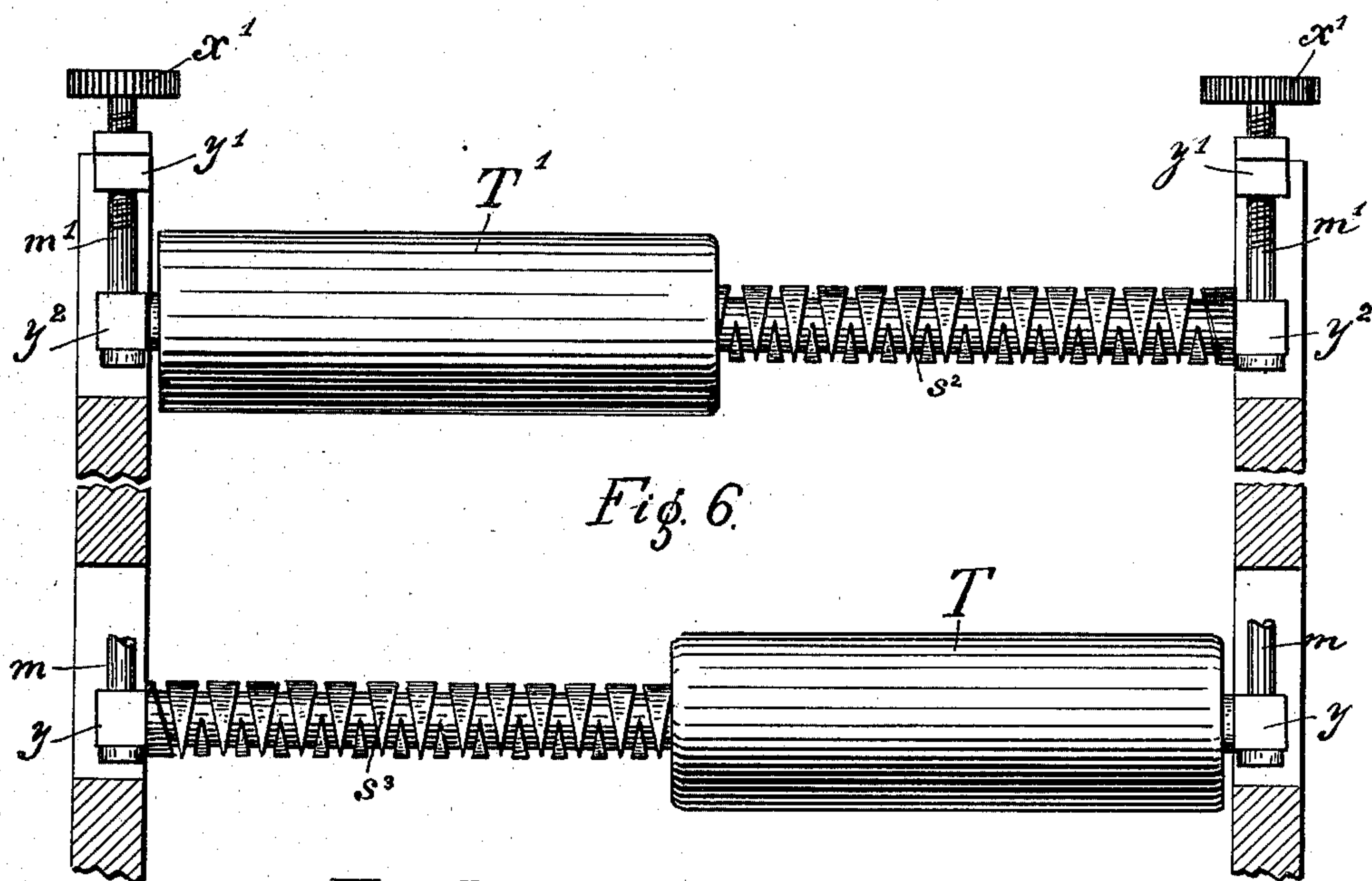
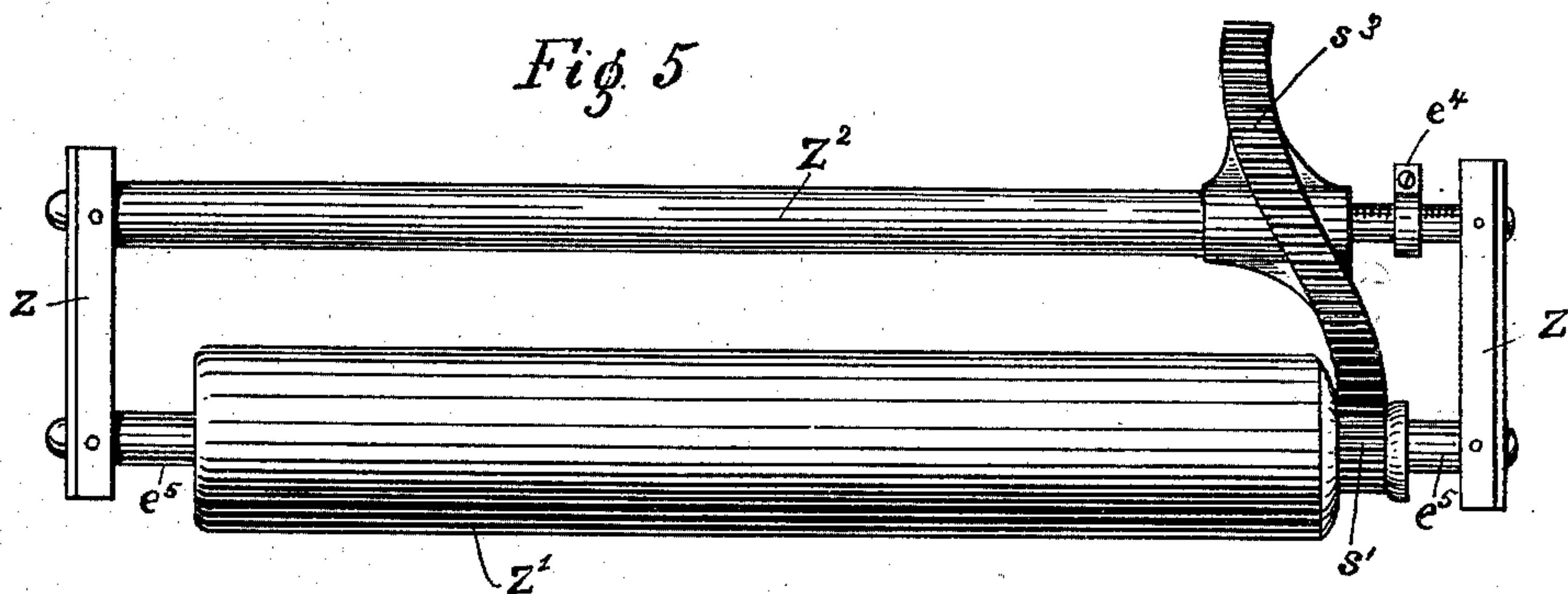
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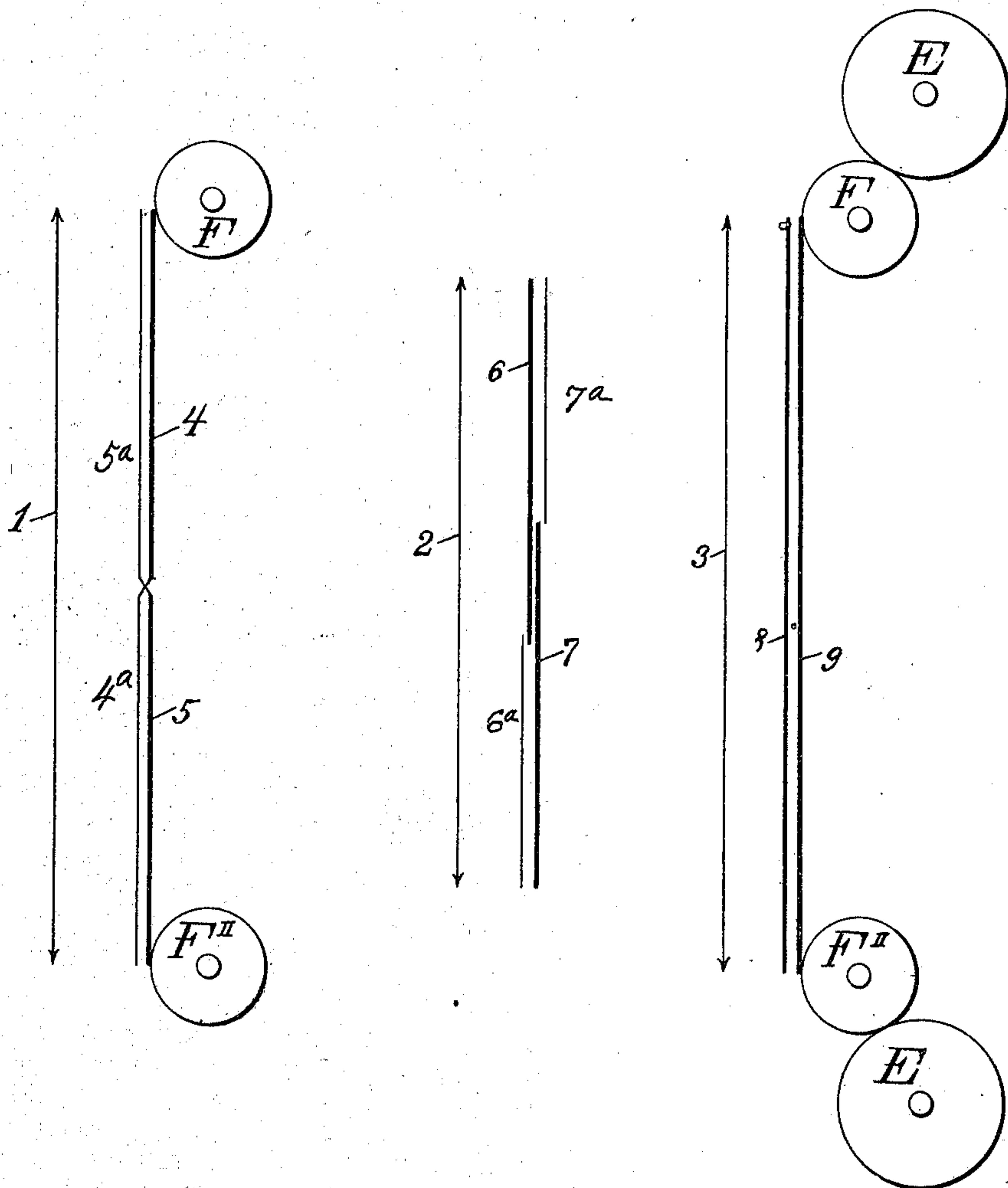


Fig. 7.

Witnesses
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UNITED STATES PATENT OFFICE.

MERRITT GALLY, OF BROOKLYN, NEW YORK.

INKING APPARATUS FOR PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 733,023, dated July 7, 1903.

Application filed November 17, 1902. Serial No. 131,722. (No model.)

To all whom it may concern:

Be it known that I, MERRITT GALLY, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Inking Apparatus for Printing-Presses, of which the following is a specification.

In the accompanying drawings, Figure 1 is a side view of a part of the roller carriage-ways of a printing-press, one end of the roller-carriage, with form-inking rollers, rider-rolls, change-distributors, and tripping device. Fig. 1^a shows a modified form of the stop-bar for the roller journal-box. Fig. 2 is a side view of the upper end of the carriage-way, with tripping-cam and form-roller trucks. Fig. 3 shows the form-roller changer-riders. Fig. 3^a is an enlarged view of the crescent and hollow screw for holding the crescent in place between the changer-sleeve and the screw-shaft. Fig. 4 is an end view at side of press of the form and distributing rollers in distributing position. Fig. 5 shows the adjustable staggered-gear changer. Fig. 5^a shows a modification of setting device for adjusting the changer. Fig. 6 shows the twin lateral changers, and Fig. 7 is a diagram for explaining the principle of distribution.

My invention relates to the ink-distributing and form-inking apparatus of a printing-press. Its principal object is to secure an even inking of a form the face of which is too large to be covered by a single turn of the form-rollers, and also to secure a thorough inking of very heavy or very uneven or broken-face forms at each impression movement of the press without skipping impressions for extra distribution of ink or rerolling of the form.

In printing-presses form-inking rolls are necessarily small in diameter and circumference as compared with the face of a large form to be inked. This is necessitated, especially on job-presses, which are usually of the class of "jaw-presses," and this on account of the limited space for the rollers to pass between the face of the form and lower edge of the platen. Form-rollers are purposely made of a soft rubber-like composition, which freely give off their ink to the form rolled and must return after the printing of

each sheet to the distributing disk or cylinders to receive a fresh supply of distributed ink. As the surface of the small inking-roller is not equal to the surface of a large form, the roller often parts with too much of its ink in passing over a part of the form to be able to sufficiently ink the remainder of the form.

Referring to the first diagram of Fig. 7 of the drawings, the line 1 represents the width of an upright form over which the roller F is to pass. The circumference of roller F is equal to only about one-half the width of the form, and it therefore will give off a large portion of its ink on this part of the form and have only a meager supply to complete its work. Unless it has too much ink to secure good work on the upper part of the form it cannot give sufficient to the bottom. This results in defective printing. No additional number of rollers following this one, and in the same manner, can possibly cure this defect, but will only multiply it. By supplying a larger number of form-rollers with a less amount of ink the bottom may be supplied with enough from the increased number of rolls, but the top of the form will still have too much. Now if roller F' be tripped going down, to commence its rolling going up, if each of the two rollers F and F' were in circumference exactly "to a hair" equal to just one-half the width of the form and the joining line at the center could be prevented from showing on the print, the rolling would be all right; but this can seldom if ever happen. Forms for printing are of all sizes. Now consider a smaller form, as in the second diagram, Fig. 7. Here the circumference of either roller is greater than half the width of the form, and the lines of heavy application lap, giving double the amount of ink on a strip through the central part of the form.

The gist of my present invention rests on the fact that soft-composition form-inking rollers give off largely their ink in their first revolution on the form and that metal distributing-rollers retain their ink, carrying more than the form-rollers require for a single rolling, and give off their ink to form-rollers as required without a fresh supply of ink to themselves, recharging the form-rollers with ink. For example, consider the distributing-disk of the ordinary "Gordon"

press or the large distributing-cylinder of a "Gally Universal," and a single application of ink when thoroughly distributed will suffice for supplying the form-rollers for printing more than one sheet without showing a diminution of "color," the disk or cylinder retaining a portion of its ink, while the composition form-rollers have largely given off nearly their entire supply of ink for each sheet and have required a new supply for every additional sheet printed. Now returning to the first diagram of Fig. 7, the rolling is well done by roller F for a distance of half the surface of the form with the ink that roller F had received from the distributing disk or cylinder, but having made an entire revolution the roller has yielded up the larger portion of its ink and cannot sufficiently ink the remaining portion of the form. Now if the large distributing disk or cylinder could be made to travel with the form-roller over the form and keep the roller constantly charged with new ink the roller would not lose its supply and would in a better manner ink the lower portion of the form. Such results and still better are practically what I aim to secure with this present invention.

In the third diagram of Fig. 7 I show a thin light hollow repeating cylinder E in contact with and traveling with roller F. This cylinder E must be as large or larger than roller F, so that when roller F has once given off its ink the repeater E will give it in a single turn another full supply. This repeating cylinder E is shown in Fig. 1 as connected to and traveling with the roller-carriage and is always in contact with roller F. When the roller-carriage returns with its form-rollers to receive ink from the distributing-cylinders R' V, Fig. 4, the traveling cylinder E is freely supplied with distributed ink taken from the distributing-cylinder by roller F. This it gives off only as required to the form-roller when applying ink to the form. The two rollers L L', Fig. 1, are small "rider-rolls." They are shown in the figure proportionately much larger than they can be actually used in the ordinary space allowed in "job-presses," and are therefore too small to answer at all the purpose for which the traveling cylinders E and E' are provided. They perform mostly the office of lateral change-distributors for evening the ink on the rolls. It will be seen that the cylinders or repeaters E E' are placed in the roller-carriage as nearly in line with the form-rollers as possible and clear the face of the form, so that although comparatively large they have as much or more room to clear the platen in their movement as the small riders. This is one of the important features of the invention. The repeaters E and E' rest in inclined bearings H and H' and seek by gravity their contact with the form-rollers.

In the distributing apparatus of the press proper "change-distributors" with a short throw, as shown in Fig. 3, are ordinarily used

for lateral distribution of ink, their position being at T T', Fig. 4. For the general change distribution I use two changers, as shown in Figs. 4 and 6, T T'. Both of these changers, which I call "half-lap" changers, are constructed to move about one-half the length of the changer-shaft and pass each other from side to side of the press as they operate, carrying the ink in opposite directions of the opposite halves of the length of the distributing-cylinders from side to side of the press at each movement. The relative sizes of the distributing-rollers S and S', Fig. 4, and changers T and T' may be constructed when desired so as to make the revolutions of the changers to differ one from the other as to time of revolution, and thus cause a desirable breaking up of the lines of distribution.

$x x'$, $m m'$, and $y y'$, Figs. 4 and 6, represent adjustable hangers for the half-lap changer-rolls and are made necessary by their construction for the long throw of the changers. These adjustable hangers are not for securing any adjustment of pressure of the changers on the distributing-rolls and must not be understood as such. The changers with their sleeves at one end of the shaft, as shown in Fig. 6, would sag out of line with the surface of their distributing-rollers S S, Fig. 4, on account of the leverage of their long projecting screw-shafts were it not for the hangers at the end of the screw-shaft holding up in line the screw-shaft and supporting its weight; so with the opposite end of each shaft when the changers have changed ends. The thumb-screws, X X', Fig. 4, are used to adjust in hanging position the screw-shaft to exact line with the distributing-rolls S S', Fig. 4, with changer-sleeves T T' in distributing contact with the distributing-rolls. With the combination of distributing apparatus shown it is necessary to use also a changer of short throw to fully cross and break up the lines of distribution. These I call "short-throw" changers. In fact, a short-throw changer is positively necessary to perfect the work of the two half-lap changers, which of necessity leave at the center of the distributing-cylinder a narrow band of surplus ink where the ends of the two changers commence and end their movement. The excess of ink at this line is quickly spread out and the defect obliterated by the short-throw changer. The half-lap changers T and T' operate through their distributors S S' on large cylinder R, and while the form-rollers F' F'' are in contact with cylinder R they act as intermediate distributors between cylinder R and the short-throw changers L L', the changers, T and T' operating, through cylinder R in combination with changers L and L', to perfect the distribution. So in similar manner the changers T T' operate in combination with the short-throw changer Z', perfecting the distribution of ink on cylinder R' for supplying form-roller F and repeater E. The short-throw changers L L' are shown as partly sectional in Figs. 3 and 3^a. As shown,

there is nothing specially new in their construction, except being of shorter throw they are like my "Universal press" changer in use for many years, consisting of a shaft having a cross-thread screw and a metallic sleeve with a crescent and hollow screw. The crescent v operates in the screw g to move the sleeve L back and forth on the shaft. The crescent (shown enlarged in Fig. 3^a) is held in position in the sleeve by means of the hollow screw s , the stem of the crescent fitting loosely into the bore of the screw.

In my United States Patent No. 430,281, of June 17, 1890, I describe and claim a staggered-gear changer similar to that I show in Figs. 4, 5, and 5^a of the present drawings, with the exception that the changer of the present case is made adjustable as to the distance of its throw. To have one or more of the short-throw changers adjustable is very desirable for some kinds of work, and as the staggered-gear changer is most simply made adjustable I choose it for this purpose. In Fig. 5 is shown the staggered-gear changer. The staggered gear-wheel s turns loosely on the fixed shaft Z^2 and acquires its movement from the pinion s' , which is attached to the lateral change-roller Z' , which slides on the shaft e^5 . In my original staggered-gear changer of the patent mentioned the gear s has a permanent position on its shaft, and therefore always drives the changer-roll Z' its full sweep during each revolution of the gear. In the present case the gear-wheel is loose on its shaft and is allowed to travel more or less with lost motion on the shaft without affecting the position of the changer-roll Z' only as the gear is checked in the length of its lateral slide by the check-nut e^4 . On the shaft of the gear is shown a gaged scale for setting the check-nut to any desired degree, thus determining the exact throw of the changer as required. The check is here shown as a grip-nut, although it may be otherwise made to accomplish the purpose. This adjustable changer is not only very desirable in the combination of distributing apparatus as so far described, but is also valuable to use alone to limit to any set degree its change distribution for certain classes of presswork requiring it.

Fig. 5^a shows a modification of the setting device, the shaft of the changer-roll being fast in the roll and a check-nut placed thereon with scale, as e^4 e^5 .

The adjusting device may be otherwise modified by leaving the staggered gear-wheel fast to its shaft and having the pinion loose to be set to a limited throw.

In Fig. 1 and Fig. 1^a is shown an improved "form-roller-tripping device." This is somewhat similar to that for which Letters Patent of the United States was issued to me on August 26, 1902.

In the present case, as shown in Fig. 1, the lever-latch P is pivoted in a similar manner to the body of the roller-carriage; but in-

stead of the latch projecting forward, as in my former patent, it reaches backward out of the way of the pressman in handling or adjusting the rollers, and is in form of a hook instead of a "stop-catch." The hook of the latch is shown at p' and hooks onto the end of a rod or bar projecting backward from the journal-box D'' instead of acting as a stop, as in the former patent. This is shown in Fig. 1 as a short rod driven fast into the body of the journal-box and in modified form in Fig. 1^a as a light bar made fast to the face of the journal-box. The present construction also differs from that of my former patent in that the operating-bar N is pivoted to the latch P between the hook of the latch and the pivot attaching the latch to the roller-carriage and is a simpler and more compact construction. The bar N is pivoted to the hook-latch at o and to a tripping-lever M at n . The stop O at the bottom of the carriage-way trips the latch P by forcing upward the operating-bar N . This stop being placed on and attached to the carriage-way instead of the body of the press constitutes a further improvement. As the entire device in such case is connected only with the roller-carriage and carriage-ways, it can, together with these parts only, be supplied for presses already in use and be applied by the printer without the aid of a machinist.

In Fig. 1 two repeating cylinders are shown, E and E' . These rest in yoke-bearings H and H' . The bearings are inclined, so that the repeating cylinder will seek contact with the face of its form-roller, but rest lightly on it. The office of each repeating cylinder is not to distribute ink, but to carry in reserve distributed ink for a repetition of ink to recover the form-roller. Either one or both of the repeating cylinders may be used as the case demands. Distribution of ink under pressure on form-rollers is objectionable, as it tends to abrade the tender skin of the soft composition roller and unfit it for its work. The repeating rollers do not have this objection.

The two changer rider-rollers L and L' (shown in Fig. 1) are made of light sheet metal and rest lightly on the form-rollers F' F'' and are used for evening laterally the ink on the form-rollers F' F'' , especially in the center where left too heavy by the joining of the half-lap changers. The short-throw changers are held in inclined yokes G G' , which are adjusted to proper position by means of their rocker-bearings g g' with the screws n in connection with the form-roller journal-boxes on which they are carried.

In Fig. 4, Y represents a part of the bed of the printing-press. W is the fountain ductor-roll. R is the large distributing-cylinder, and R' is the small distributing-cylinder. E is the traveling repeating cylinder. F F' F^2 are the form-inking rollers. f f' f'' are the journals of the form-inking rollers, and L L' are changer rider-rolls.

In Fig. 1 the ordinary parts of the roller-carriage which are shown requiring no particular description are the journal-box bearings $C C' C^2$, the journal-box springs $b b' b^2$,
 5 nuts and pins $a a' a^2$, roller-carriage-connecting rod e and its pivot c , finger-sockets $d d' d^2$, arm of lever M for spring attachment 20, spring t , bearing for spring t' , spring set-screw T , set-screw support t^3 , cross-rod for
 10 connecting the two ends of roller-carriage B' , face of form-roller bearer $k k$, and part of bed of press $A A$.

In Fig. 3, $q q'$ are the cross-threaded screws of the changer-shafts. $l l' l''$ are the ends of
 15 the shafts squared to prevent turning, and $L L'$ the sleeves sliding loosely on the shafts $j j'$.

In Fig. 3^a, v is the operating crescent of the changer, V' is the stem of the crescent, and
 20 s is the hollow screw for holding the crescent in place in the changer-sleeve. This is a long-used construction.

The different devices of all the apparatus that have been so far described may be used
 25 in different combinations for different kinds of printed work as the case may demand; but at times and for some classes of work all of the devices are necessary in one combination. Some classes of work that have heretofore
 30 required two or three rollings of the form for the proper printing of a single sheet can be and are now being done in the very best manner with this apparatus with a single rolling and with a saving of one-half to two-thirds of the time of ordinary operation.
 35 With this point alone in view the importance of the invention is plainly apparent.

It is sometimes very desirable that the last roller going over the form have with it a repeating cylinder and that it ink the form
 40 while traveling only in one direction. For such purpose I supply the lower or end roller of the carriage with both a repeating cylinder and a tripping device, as shown.

What I claim as my invention, and desire
 45 to secure by Letters Patent, is—

1. In the inking apparatus of a printing-press a roller-carriage carrying form-rollers; and a repeating cylinder mounted in the carriage, in touch with one of the form-rollers,
 50 and equal to or greater than the form-roller in diameter.

2. In the inking apparatus of a printing-press, a roller-carriage carrying form-rollers; and a repeating cylinder mounted in the carriage in touch with one of the form-rollers;
 55 the sum of the circumferences of the form-roller and the repeating cylinder being equal to or greater than the length of a full form, in the line of direction of the travel of the
 60 rollers.

3. In the inking apparatus of a printing-press; the stationary distributing cylinder or cylinders; the composition roller or rollers in contact with the cylinder or cylinders; the
 65 traveling form-roller carriage carrying a repeating cylinder in contact with one of the form-inking rollers, the sum of the circum-

ferences of the form-roller and the repeating cylinder being equal to or greater than the length of a full form, on the line of direction
 70 of the travel of the rollers.

4. In the inking apparatus of a printing-press; a roller-carriage carrying form-rollers, and a plurality of ink repeating cylinders, the sum of the circumference of either cylinder
 75 and its form-roller being equal to or greater than the length of a full form, on the line of direction of the travel of the rollers.

5. In the inking apparatus of a printing-press; a roller-carriage carrying form-rollers, and substantially in line therewith a plurality
 80 of ink repeating cylinders, one at each end of the roller-carriage.

6. The roller-carriage carrying form-inking rollers; one or more ink repeating cylinders
 85 equal to or greater in diameter than the form-rollers; and one or more "short-throw" lateral changer rider-rollers.

7. In the inking apparatus of a printing-press; the roller-carriage carrying form-inking rollers; the stationary ink-distributing
 90 cylinders of the press; the twin "half-lap" changers; arranged to carry the ink from one half the length of the inked surface of the distributing-cylinders to the other half of their
 95 length and vice versa, and the "short-throw" change-distributor, for correcting the defective distribution at the center of the distributing-cylinder caused by the shifting of the
 100 "half-lap" changers.

8. In a change-distributor, the roller of the distributor made approximately in length
 105 equal to one-half the width of the distributing-surface; and means for moving the roller one-half the width of the distributing-surface and return; to secure one entire lap of the ink of the distributing-surface from side to side, by each reciprocating movement of the roller; and the "short-throw" changer operating
 110 therewith.

9. The twin change-distributors, comprising two changer-rollers having reciprocating motion in line with each other; means for giving to each roller a throw equal to one-half
 115 the width of the distributing-surface; each roller in length somewhat longer than to cover its throw; the two rollers lapping each other somewhat when at their extremes of movement, to prevent a break at the central line distribution; and a "short-throw" changer
 120 for spreading the excess of ink at the central lap.

10. In the inking apparatus of a printing-press, the staggered-gear-change distributor, comprising a distributing-roller with pinion;
 125 a staggered gear-wheel, turned on its shaft by the pinion, and having a sliding movement on its shaft; and adjusting means for limiting the sliding movement of the staggered wheel.

11. In the inking apparatus of a printing-press, the form-roller-tripping mechanism, comprising a stop-bar attached to and projecting
 130 backward from the form-roller journal-

box; a latch for articulating with the stop-bar; and an operating-bar pivoted to the latch.

12. In the inking apparatus of a printing-press, a form-roller-tripping mechanism, comprising a stop-bar attached to and projecting backward from the form-roller journal-box; a hook-latch pivoted to the roller-carriage, and projecting backward from its pivot to hook onto the back end of the bar; and an operating-bar for operating the hook-latch.

13. In the inking apparatus of a printing-press, a form-roller-tripping mechanism, comprising a form-roller journal-box; a stop-bar attached thereto and projecting backward from the journal-box; and an operating-bar, for stopping the stop-bar.

14. In the inking apparatus of a printing-press the stationary ink-distributing cylinder or cylinders; the composition distributing roller or rollers; the half-lap changer; the form-inking rollers; and the repeating cylinder mounted in the traveling roller-carriage and in touch with one of the form-rollers, and equal to or greater in diameter than the form-roller.

15. In the inking apparatus of a printing-press; the stationary ink-distributing cylinder or cylinders; the composition distributing roller or rollers; the half-lap changers, one or more; and the short-throw changer operating therewith.

16. In the inking apparatus of a printing-press; the stationary ink-distributing cylinder or cylinders; the composition distributing roller or rollers; the half-lap changers, one or

more; and the short-throw changer operating therewith; the roller-carriage carrying a form roller or rollers; and the repeating cylinder mounted in the roller-carriage.

17. In the inking apparatus of a printing-press the form-roller carriage; the carriage ways or tracks; a roller-tripping mechanism comprising a stop-bar, attached to and projecting backward from the form-roller journal-box; a latch for articulating with the stop-bar; an operating-bar; and a stop attached to the carriage-way for operating the tripping mechanism.

18. In the inking apparatus of a printing-press; the stationary ink-distributing cylinder or cylinders; the composition distributing roller or rollers; the half-lap changer or changers; and the repeating cylinder, mounted in the traveling roller-carriage, and in touch with one of the form-rollers; the sum of the circumferences of the form-roller and its repeating cylinder, being equal to or greater than the length of a full form on the line of the direction of the travel of the rollers.

19. In the inking apparatus of a printing-press; a roller-carriage carrying form-rollers; a repeating cylinder mounted in the carriage and in touch with one of the form-rollers; and a roller-tripping device for tripping the roller.

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