

No. 732,001.

PATENTED JUNE 23, 1903.

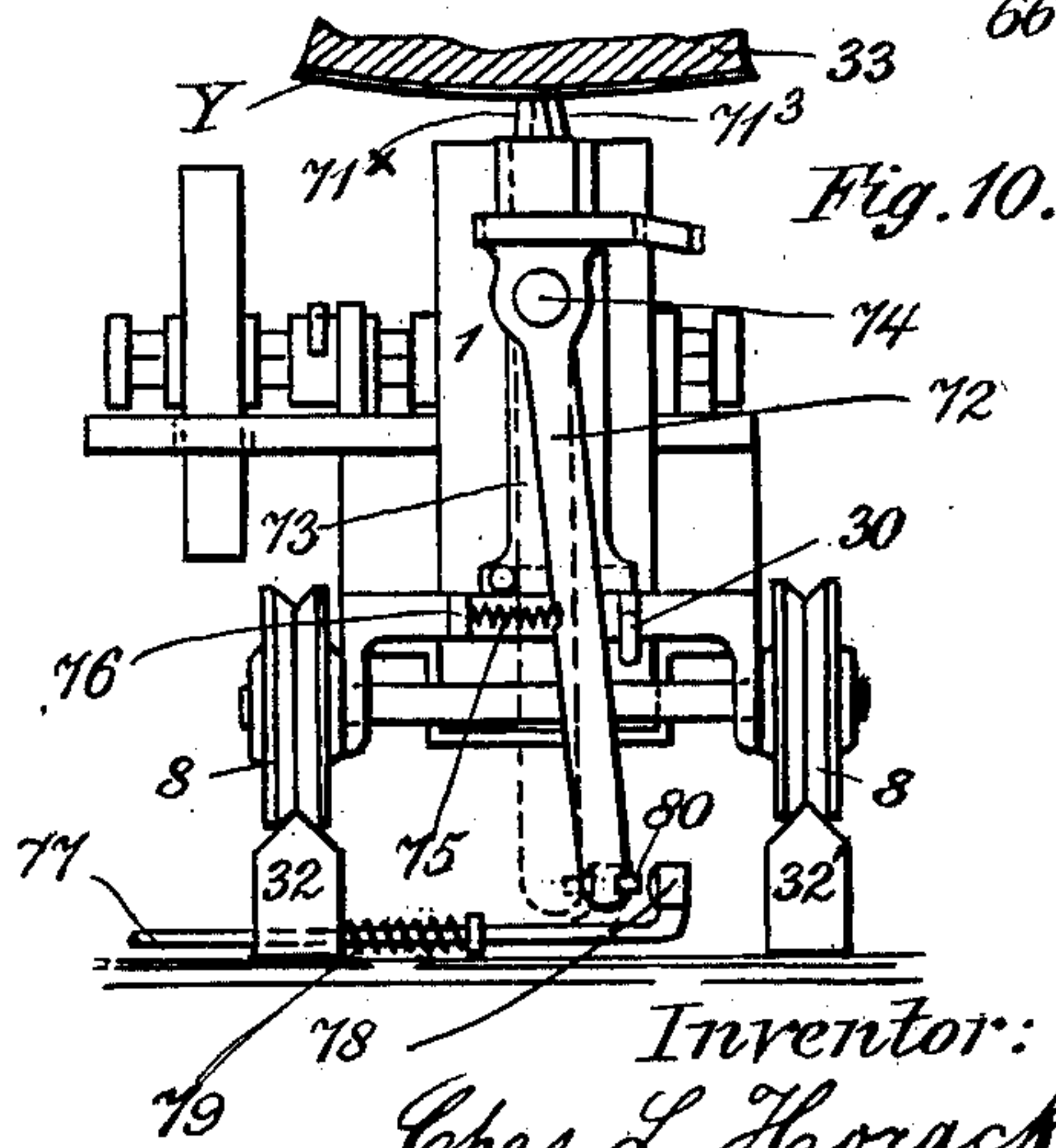
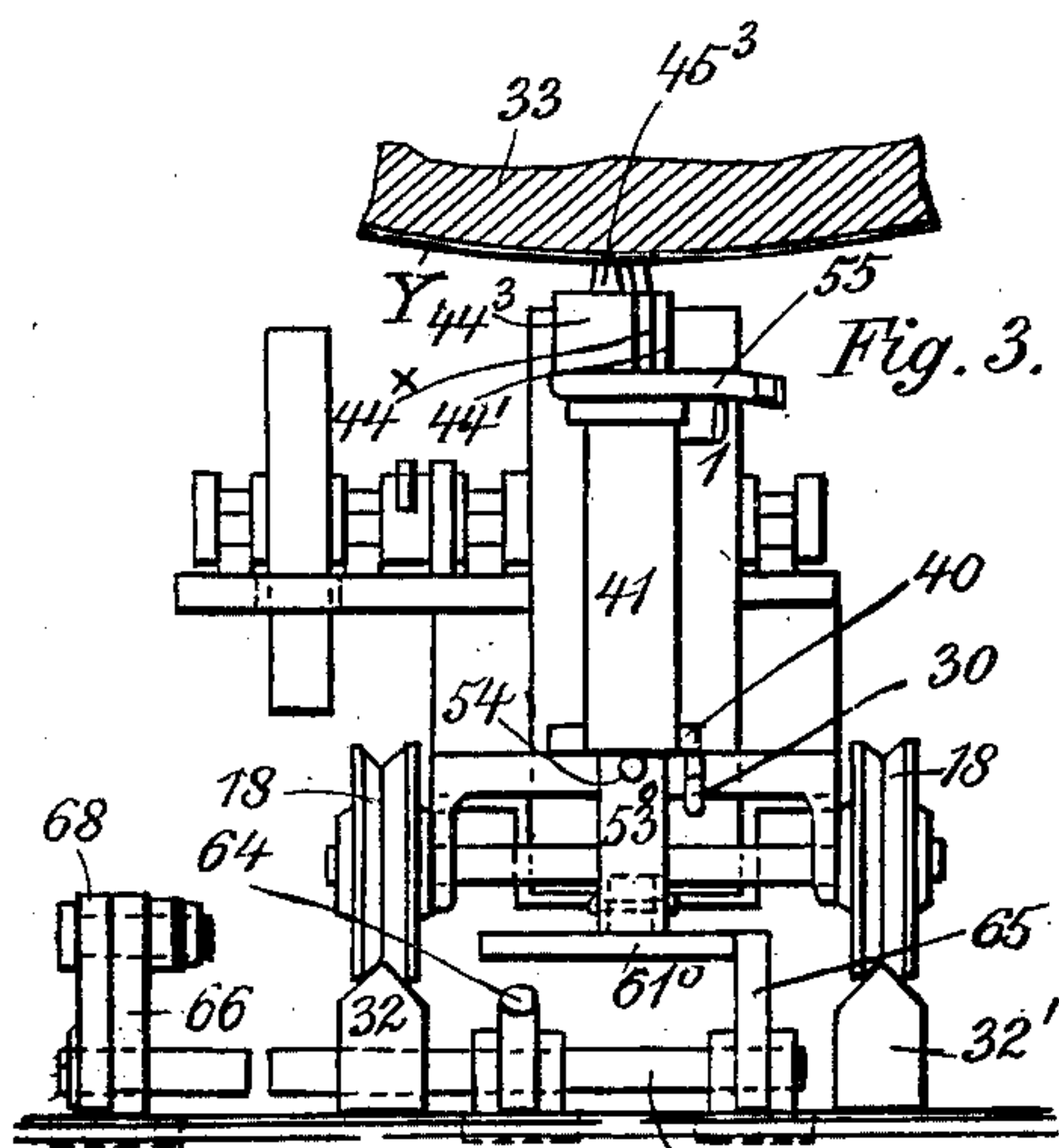
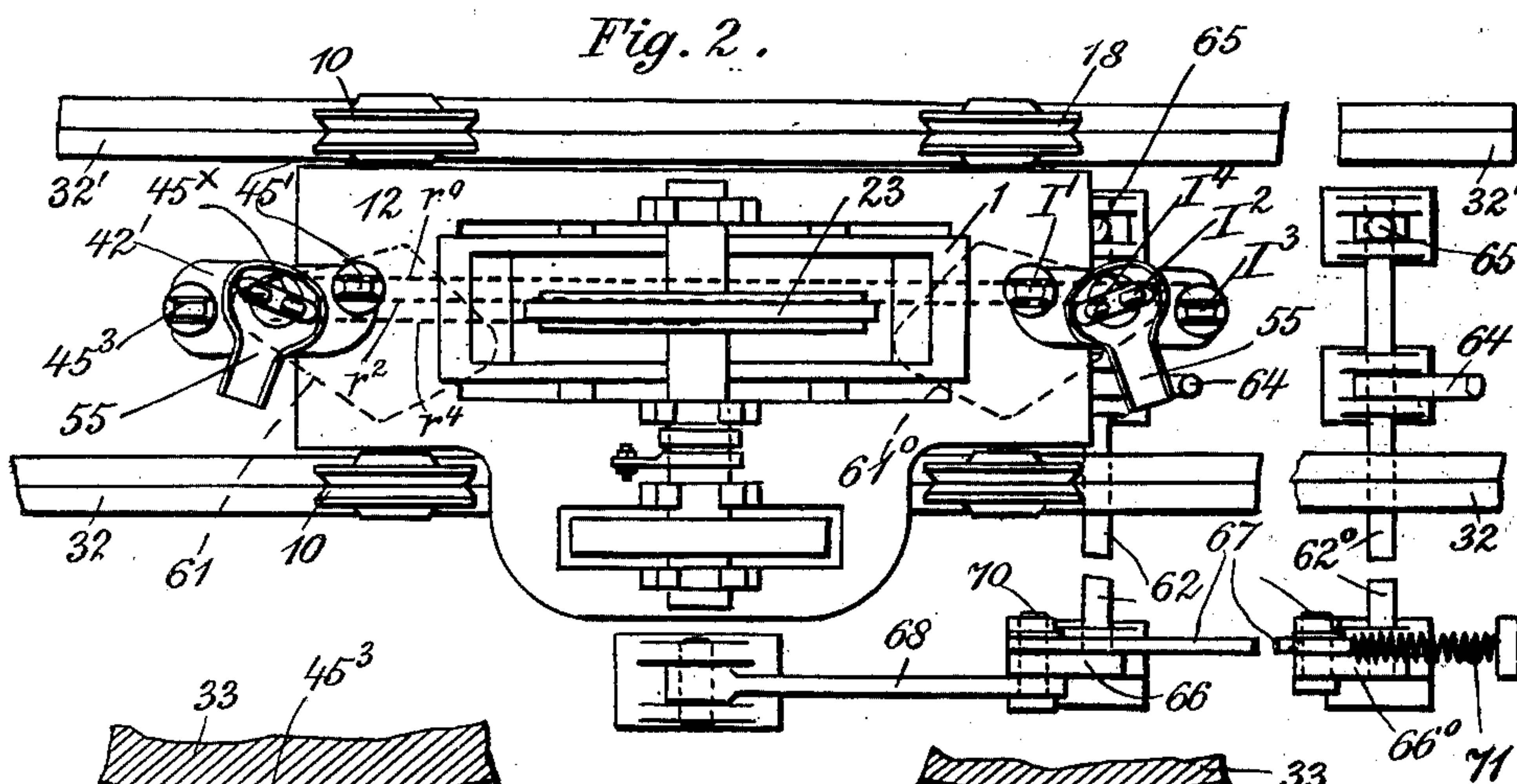
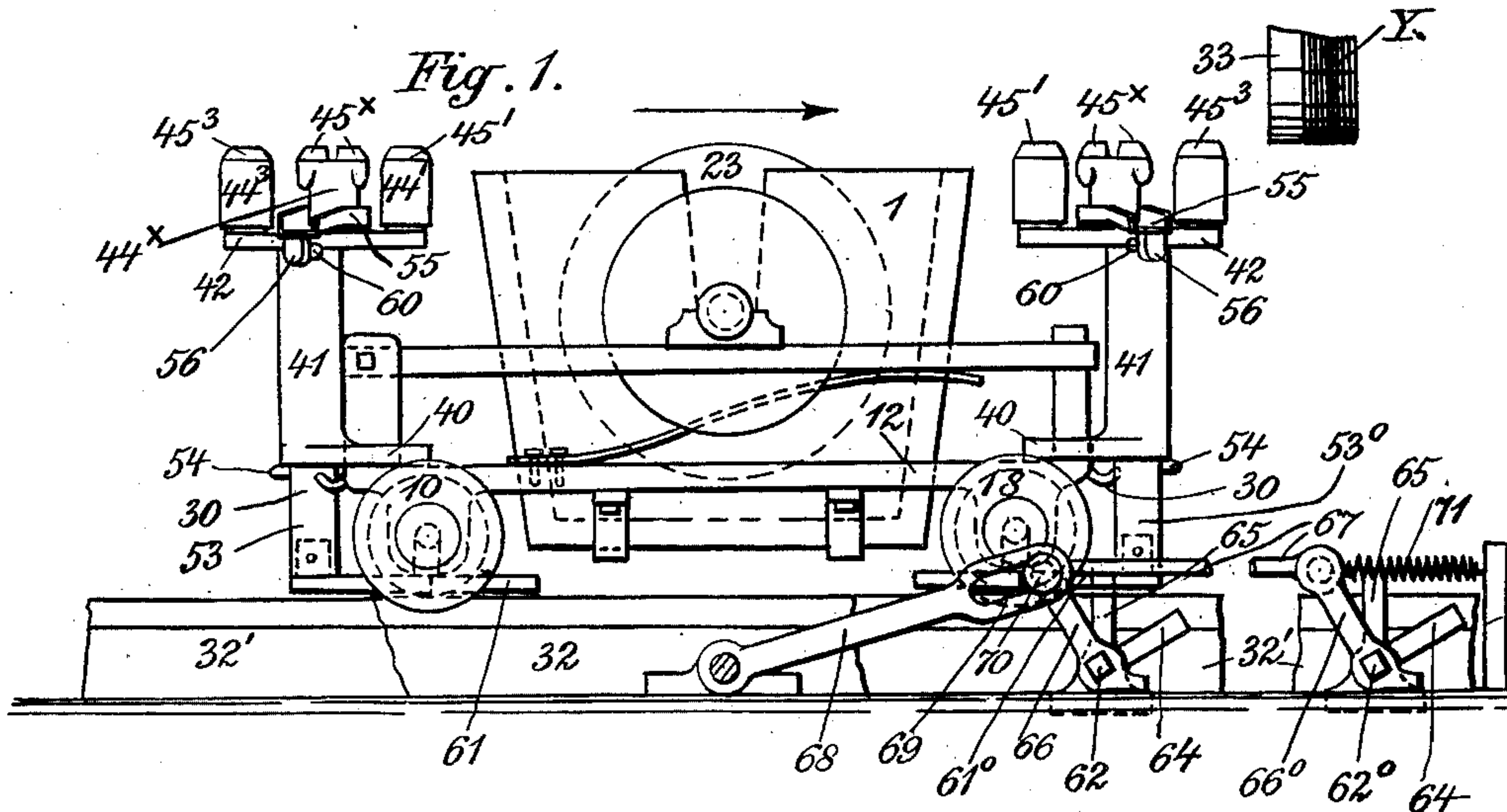
C. L. HORACK.

APPARATUS FOR PRINTING YARNS.

APPLICATION FILED JULY 11, 1898.

NO MODEL.

2 SHEETS--SHEET 1.



Witnesses: 62

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No. 732,001.

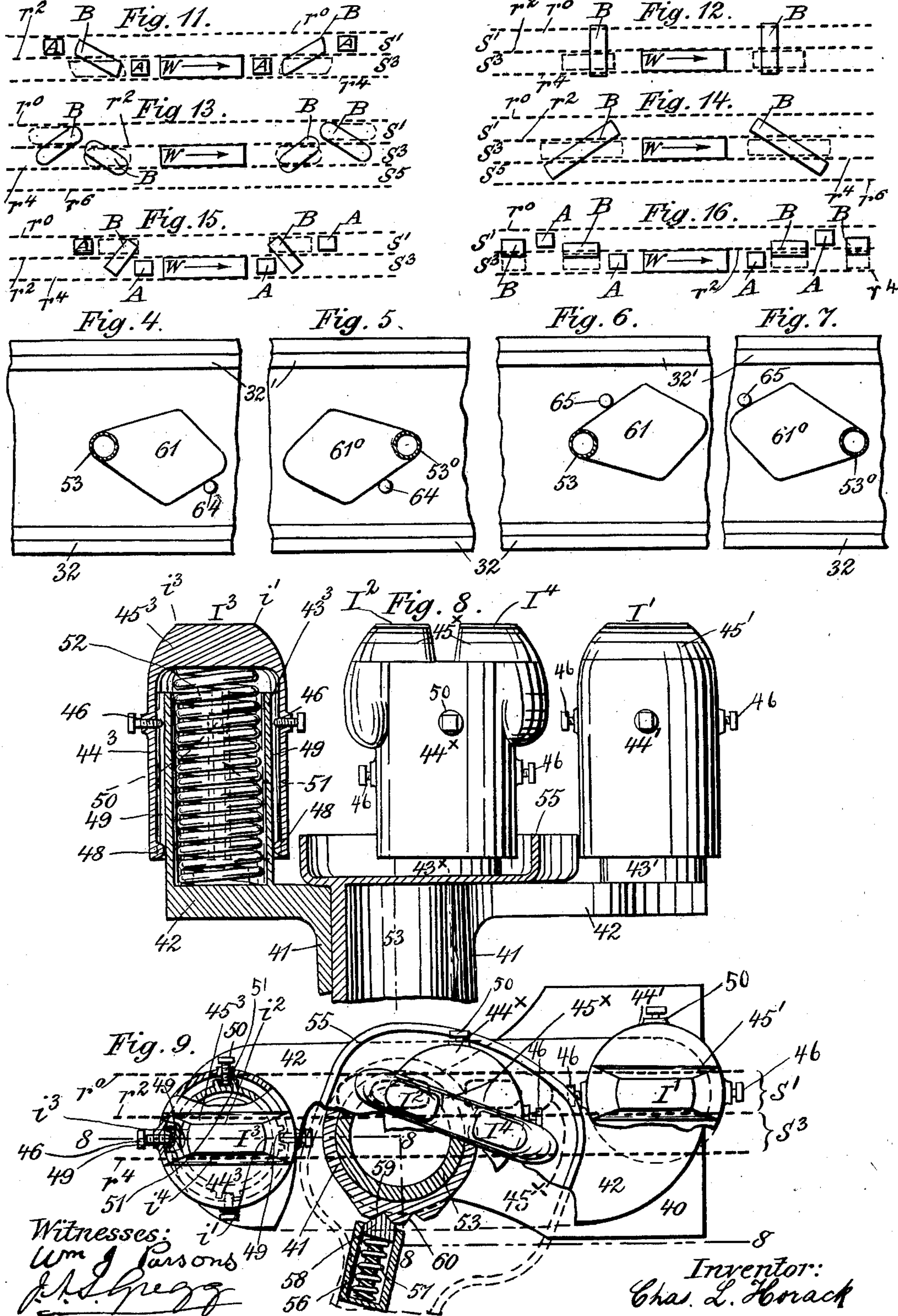
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APPARATUS FOR PRINTING YARNS.

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2 SHEETS—SHEET 2.

NO MODEL.



UNITED STATES PATENT OFFICE.

CHARLES L. HORACK, OF NEW YORK, N. Y., ASSIGNOR TO FABRIC COLORING COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

APPARATUS FOR PRINTING YARNS.

SPECIFICATION forming part of Letters Patent No. 732,001, dated June 23, 1903.

Application filed July 11, 1898. Serial No. 685,611. (No model.)

To all whom it may concern:

Be it known that I, CHARLES L. HORACK, a citizen of the United States, and a resident of New York, in the county of Kings and State
5 of New York, have invented certain new and useful Improvements in Apparatus for Printing Yarns, of which the following is a specification.

My invention refers to apparatus for coloring or printing yarns, and more particularly
10 yarns used in the manufacture of tapestry and velvet carpets. In combination with my improvements I prefer to employ an apparatus as now commonly used in printing
15 such carpet-yarns, which consists of a drum around which the yarn is wound and a color-carriage with color-wheel adapted to apply streaks of color to the yarn side by side while traveling underneath the drum and to
20 apply thereto the structural improvements above referred to.

The objects of my invention are to provide suitable spreading, rubbing, or scraping devices in such relations with the color-wheel as
25 to properly spread coloring-matter previously applied to yarn on a drum along, into, and through the yarn, and to thereby distribute such coloring-matter in approximately uniform manner or to approximately equalize
30 the same, whereby particularly also after the yarn shall have been subjected to the usual steaming or scouring process and after having been woven into a fabric portions of threads of the same shade may be made to
35 appear substantially uniform.

Further objects are to suitably shape said spreading means and to provide proper means for varying the positions of some or all of such spreading means without causing there-
40 by injury to the yarn on the drum, and particularly means to so locate such spreading means as to be able to maintain the same in such relative positions with reference to each other and to the color-wheel as will per-
45 mit not only of their jointly covering adjoining portions of successive streaks in a series of streaks of the same color, but of also covering by means of some or all of said spreading means single streaks, and preferably
50 their interior portions between their outside ridges only, so as to guard against color form-

ing portion of a streak of one shade being forced into an adjoining streak of a different shade and to preserve the alinement of such streaks.

A further object is to so shape and arrange
55 the supports of such spreading devices that the operative surfaces of the latter will readily adapt themselves to any irregularities in the surface of the yarn-drum and the yarn
60 covering it.

I accomplish these and other useful objects by the means hereinafter described, and set forth more particularly in the claims.

Having in my United States Letters Pat-
65 ent No. 590,547 set forth the general advantages of automatic scraping of the yarn performed substantially simultaneous with the printing operation proper by the color-wheel and how the yarn is affected thereby, I will
70 not repeat this statement here.

In the accompanying drawings, forming part of this specification, and wherein like letters and numerals of reference refer to corresponding parts, Figure 1 is a side eleva-
75 tion, partly in section, of an apparatus constructed according to my invention, the color-carriage being placed in a position near the end of the drum where the shifting of the spreaders is accomplished when required, 80
Fig. 2 being a ground plan of Fig. 1, the drum being omitted. Fig. 3 is an end view of the apparatus looking toward the left in Fig. 1. Figs. 4, 5, 6, and 7 are ground plans,
85 partly in section, of portions of the track and of shoes attached to the supports of the spreaders placed in various operative positions. Fig. 8 is a side elevation, partly in section, of my preferred form of spreading device; and Fig. 9 is a ground plan of the
90 same, partly in section, Fig. 8 representing a section and view along line 8 8 in Fig. 9. Fig. 10 is a view corresponding with Fig. 3, but showing a modified shifting device for the movable spreader. Figs. 11 to 16, inclusive,
95 are diagrammatic representations in plan views of different relative positions in which the color-wheel and the spreaders may be placed in apparatus of this character embody-
100 ing features of my invention. Figs. 8 and 9 are drawn to an enlarged scale.

Like letters and numerals of reference

throughout the different views refer to corresponding parts.

In carrying out my invention I prefer to employ a color-carriage 12, mounted on wheels 18 18 and 10 10, on which carriage color-box 1 and color-wheel 23 are supported and which is drawn, by means of a cord attached to hooks 30, forward and backward along rails 32 and 32', placed underneath and parallel with drum 33, carrying the yarn Y, all in usual manner and as, for instance, described in William Shaw's United States Patent No. 543,512, for the purpose of thus causing the periphery of the color-wheel to apply to the yarn on the drum streaks of color side by side, the arrangement of such streaks with reference to each other as to color and shade being in accordance with the design or pattern to be produced in a tapestry or velvet carpet.

The color-wheel in traveling forward and backward along the drum successively applies streaks of coloring-matter to the yarn, the drum being partially revolved after the production of each streak, so as to bring the yarn in proper position to receive the next streak, successive streaks being indicated by S' S^3 S^5 , streaks S' and S^3 in Fig. 2 being shown only to indicate the relative position of such streaks after the color-carriage shall have traveled toward the left sufficiently to assume a position underneath the yarn on the drum, the wheel in making each streak producing ridges of coloring-matter along its path, while at the same time forcing the coloring-matter into and through the yarn between said ridges. Where at each step the periphery of the drum is swung to a sufficiently greater extent than the width of the operative edge of the color-wheel amounts to, two separate ridges will be formed between adjoining streaks, while where the peripheral throw of the drum at each step is but slightly in excess of or substantially corresponds with such width of the color-wheel, as is now commonly the case, such ridges between adjoining streaks will be consolidated into single ridges, as r^0 r^2 r^4 r^6 , &c. It is the coloring-matter forming these ridges which particularly requires to be distributed laterally and to be forced into the yarn, the comparatively small amount of color between the ridges generally entering into the yarn more thoroughly under the heavy pressure exerted by the color-wheel. I prefer to employ for such purpose appliances constructed as follows:

Referring first to Figs. 1 to 9, inclusive, and more particularly to the mechanism attached to the left-hand end of the carriage illustrated therein, 40 is a bracket secured to the carriage and provided with an upright tubular branch 41, carrying at its upper end an elongated platform 42, all made in one piece. 43³ is a vertical tube firmly secured to said platform, and 44³ a cap surrounding said tube and carrying at its upper end a spreader 45³, which is integral therewith. The rubbing-surface I^3 of said spreader is

made to cover the interior portion only of streak S^3 , which is the streak in course of application, the longitudinal edges i^2 i^4 of said rubbing-surface extending along parallel with and inside of but preferably close to ridges r^2 and r^4 , the front edge i' and rear edge i^3 of said contact-surface I^3 being made rounding outward, as shown, so as to make the outline of said surface convex in front and rear. Cap 44³ telescopes with tube 43³, and the latter is provided exteriorly with two vertical grooves 49, one along the front face and the other along the rear face of said tube 43³, said grooves being formed by longitudinal projections provided on such faces 48 48, rounding projections on the interior surface of the lower portion of said cap loosely fitting into and guided by such corresponding grooves. 46 46 are screws passing through cap 44³ and having their rounding ends extending into aforesaid grooves, whereby the desired limit of play forward and backward of the spreader may be adjusted. There are also provided one or more screws 50, passing through each side of said cap and fitting into vertical grooves 51, so as to freely guide cap 44³ along tube 43³ without permitting excessive lateral displacement. 52 is a spiral spring inserted within tube 43 and yieldingly supporting spreader 45³. By these means the spreader while being held in proper alinement will nevertheless be permitted to accommodate itself to any unevenness of the yarn on the drum and in doing so to assume a slightly-undulating motion. A like spreader 45' on a cap 44', telescoping with a tube 43', is mounted on the forward part of the platform 42 in corresponding manner, but so as to have its contact-surface I' occupy the same position with reference to streak S' previously made and which adjoins streak S^3 as contact-surface I^3 occupies with reference to said streak S^3 . Each of the two spreaders described will in traveling over its corresponding streak have a tendency to draw inward some of the coloring-matter forming the inner portions of its ridges and to rub the color into the central portion of such streak, while leaving the heavier central portions of such ridges undisturbed, and it would thus be possible if only said two spreaders were employed in positions as indicated to simultaneously rub streaks S' and S^3 without disturbing their alinement even if they were of a different shade and color.

For the purpose of distributing laterally the central portions of the ridges between streaks of the same shade and color and of equalizing in general the color on the yarn I employ spreading means, as follows: 53 is a shaft revolubly mounted within tube 41 and secured against vertical displacement therein by a stud 54. 55 is a pan having a suitable lateral outlet fixedly attached to the upper end of shaft 53. To said pan a tube 43^x is firmly attached, which tube telescopes with a spring supported cap 44^x, carrying on its

top a rubbing device 45^x, all in manner substantially as described above. Said rubbing device carries two independent rubbing-surfaces I² and I⁴, the former normally covering the interior portion of streak S', as well as reaching across ridge r² into streak S³, while rubbing-surface I³ covers the interior portion of streak S³ and reaches across ridge r² into the body of streak S², whereby all parts of said streaks, with the exception of their extreme outer ridges, will be subjected to two independent rubbing actions as said spreaders travel behind the color-wheel. Said outer ridges, however, might also be covered by said spreaders, and, besides, surfaces I² and I⁴ might be made continuous.

The front and rear end of spreading device 45^x where they are liable to strike against the end of the drum while passing underneath the same are made sloping downward the same as the corresponding ends of spreaders 45' and 45³, so as to gradually guide said spreaders underneath the drum. Caps 44' and 44^x are guided along their respective telescoping tubes 43' and 43^x in similar manner as described above with reference to parts 44³ and 43³.

The spreading devices at the right-hand end of the drum are arranged correspondingly, as indicated more particularly in Fig. 2, and as the spreaders in front as well as in the rear of the printing-wheel are constantly held against the yarn while traveling along the same streak S' and that portion of ridge r² forming part of streak S' will receive rubbing action from right-hand rubbing-surfaces I¹, I², and I⁴, while right-hand rubbing-surface I³ is traveling in alinement with wheel 23, but ahead of it, and therefore over unprinted yarn, and additional distribution of the color and rubbing of it laterally into the yarn will thus be produced. Of course after the drum has been swung to the extent of the width of one streak streaks S³ and S⁵ and ridge r⁴ will receive corresponding rubbing.

When a single streak or the first one of a series of streaks is to be printed, it becomes necessary to disengage rubbing-surfaces I² and I⁴ from contact with any ridge of color, as otherwise proper alinement of the streak could not be maintained, and my preferred means for accomplishing this end are constructed as hereinafter described. 56 is a casing rigidly secured to the under side of the laterally-projecting portion of pan 55 and inclosing spiral spring 57, which actuates spring-catch 58. When spreader 45^x occupies the position shown in full lines in Fig. 9, said catch engages with a recess 59 on tube 41, and thereby locks the same in such position.

When a single streak or the first one in a series of streaks is to be rubbed, I swing said spreader into the position in alinement with spreader 45', (shown in dotted lines in Fig. 9,) so as to keep its outer longitudinal edges between ridges r⁰ and r³, and lock it in such position

by causing spring-catch 58 to enter recess 60, adjoining recess 59. It would, however, answer my purpose as well to swing spreader 45^x into alinement with spreader 45³.

The vertical revolving shaft at the right-hand end of the carriage which carries spreader 45^x there is indicated by 53⁰.

61 and 61⁰ are shoes extending laterally from the lower ends of shafts 53 and 53⁰, respectively, and by their coaction with suitable adjustable shifting blocks said vertical shafts are placed alternately into the two positions corresponding with the two positions of spreading devices 45^x above referred to.

62 and 62⁰ are horizontal shafts independent of the carriage and extending crosswise with reference to the track, shaft 62 being placed near the left and shaft 62⁰ near the right hand end of the drum. Each of said shafts carries near rail 32 an arm 64, adapted to occupy an upright position when another arm 65 on said shaft near rail 32' occupies an inclined position, so as to then bring such arm 65 into a position lower than the under side of shoe 61, and vice versa. While the carriage is traveling in either direction, the spreaders 45^x being placed and to be maintained in their normal oblique positions, as described, arms 64 must be held in their slanting and depressed positions, whereby arms 65 being then placed in their upright positions will be made to just clear the corners of shoes 61 and 61⁰ nearest the rail 32', and said shoes will then while occupying positions indicated in Figs. 2, 4, and 5 pass over arms 64 and will not be affected by the same. When spreaders 45^x are to be swung into alinement with spreaders 45', which should be accomplished before the carriage passes underneath either end of the drum, so as to guard against disturbing the yarn by such swinging movement, shoes 61 and 61⁰ must be swung into the positions indicated in Figs. 6 and 7 by raising arms or shifting blocks 64 into their operative vertical positions (indicated in Figs. 4 and 5,) in which positions they will so contact with the sides of said shoes nearest to rails 32 as to deflect said shoes toward rail 32' as the same are being drawn past said arms and will thereby disengage catch 58 from notch 59 and cause it to engage with notch 60. On the other hand, when said spreaders 45^x are to be returned into their normal positions blocks 65 must be elevated to contact with said shoes in the manner indicated in Figs. 6 and 7, when said shoes will be swung back into the positions illustrated in Figs. 2, 4, and 5, and corresponding revolution of shaft 53, pan 55, tube 43^x, and cap 44^x, with spreading device 45^x, will take place.

Shafts 62 and 62⁰ carry levers 66 and 66⁰, respectively, so rigidly connected thereto and so joined together by a connecting-rod 67 that when a treadle 68, having an elongated eye 69, coacting with a pin 70 on lever 66, is forced downward shifting blocks 64 will be elevated into their operative vertical position.

tions, so as to thereby bring spreaders 45^x and 45^y into relative alinement, while upon releasing said treadle a spiral spring 71 will draw said connecting-rod backward, so as to bring shifting blocks 65 into their operative vertical positions, and thereby return spreaders 45^x to their normal oblique positions.

By the construction above described the movable spreaders may be shifted and revolved to a slight extent (as is required where the streaks to be equalized are narrow) readily and accurately, and owing to the slight widths of the spreaders that may be employed the spreading appliances can be held against all portions of the yarn on the drum in their proper relative positions notwithstanding that considerable irregularities frequently are found on the surfaces of drums, and by placing a spreader obliquely with reference to the path of the color-wheel a narrow spreader may be made to cover a distance in direction of the streak much greater than the width of said spreader.

I prefer to place the different spreaders at varying distances from the color-wheel, so that the rear end of the operative surface of one will be in advance of the forward end of the succeeding one, as this will prevent color from lodging between spreaders intended to cover adjoining paths or streaks, and thus causing smearing of the yarn and defeating proper alinement of the streaks.

Pan 55 serves particularly to keep coloring-matter dripping down from spreading device 45^x from entering into the joint between shaft 53 and its bearing 41 and clogging and obstructing the same.

In my United States Patent No. 603,992 I have shown an apparatus wherein spreaders may be shifted laterally, said spreaders being, however, in all their varying positions placed parallel with the axis of the drum and the streaks produced upon the yarn, so that no matter what operative positions a spreader in said apparatus may occupy it will at all times cover a width of yarn corresponding with its own width. In employing the apparatus forming the subject of this application, wherein I provide spreaders capable of being partly revolved laterally, I am not only enabled to employ such spreaders alternately in varying positions relative to the color-wheel, but I gain the further advantage of being able to apply the same spreader to greater or smaller widths on the yarn, as may be desired.

In the device illustrated in Fig. 10 a spreader 71³, fixedly secured in alinement with the color-wheel, is employed in combination with a spreader 71^x, which is adapted to be shifted laterally and by a parallel movement, so as to be placed normally across the ridge between the streak in course of application and the adjoining previous streak and to be shifted into alinement with spreader 71³ when a single streak or the first of a series of streaks is being printed. Said spreader is mounted for such purpose on a lever 72, fulcrumed at

74 to a bracket 73 on the carriage and held in its normal position by a spiral spring 75, interposed between the lower portion of said lever and a suitable abutment 76 on the carriage. When the two spreaders are to be placed into alinement, this can be done by drawing rod 77, and with it longitudinal bar 78, toward the left until lever 72 is thereby forced into and held in the position indicated in dotted lines and caused to travel along said bar. When the sideward stress on said bar ceases, a spiral spring 79 will force rod 77 and bar 78 back into their original positions, while spiral spring 75 will return lever 72 to its normal position.

80 is a friction-roller at the end of lever 72, adapted to reduce the friction between said lever and said bar while the former is traveling along the latter. The spreaders are mounted upon springs in usual manner.

In Figs. 11 to 16, inclusive, the color-wheel is indicated by W and the direction of its travel by an arrow, while stationary spreaders are indicated by A and movable spreaders by B, the positions of the latter when a single streak or the first of a series of streaks is to be made being shown in dotted lines. In all said figures the movable spreaders may either be swung or revolved into the positions indicated in the dotted lines by mechanism corresponding with that as described above with reference to Figs. 1 to 9, or, as far as Fig. 16 is concerned, they may be shifted by a parallel movement, as described with reference to Fig. 10, or else the spreaders which are normally placed crosswise with reference to ridges may be lowered away from contact with the yarn when single streaks are to be rubbed in manner as described in my United States Patent No. 590,547.

The movable spreaders (indicated by B in Figs. 11 to 15, inclusive) may be actuated and alternately placed into the positions shown in full lines and in dotted lines by shifting appliances, as illustrated in Figs. 1 to 9, inclusive, the widths of shoes 61 and 61⁰ in each case being so proportioned as to impart to the spreaders lateral swinging motions to the extent called for in each case, while notches 59 and 60 would be so positioned on tube 41 as to serve to alternately hold the spreaders in the positions into which they would have been forced by shoes 61 and 61⁰ being brought in contact with studs 64 and 65.

In apparatus constructed according to Figs. 13 and 14 the spreaders would have to be moved from their normal oblique positions both during the printing of the first and of the last streak in a series of streaks.

It will readily be seen that many features referred to above might be varied without departing from the spirit of my invention, and that while employing my improvements any other suitable yarn-holding frame might be substituted for the yarn-drum, and that the streaks might also be applied to the yarn by any other proper printing means in place of

the printing or distributing wheel above referred to.

I claim—

1. The combination with the yarn-drum, carriage, and color-wheel, of a fulcrumed spreader adapted to be swung in a horizontal plane and to alternately cover different widths of yarn on the drum.
2. The combination with the yarn-drum, carriage and color-wheel, of an upright shaft, a spreader having a rubbing-surface greater in one direction than in another direction mounted thereon, and means for partly revolving said shaft.
3. The combination with the yarn-drum, carriage and color-wheel, of a spreader having a rubbing-surface greater in one direction than in another direction, a support for the same, means for partly revolving said support laterally, and a locking device for confining it in position.
4. The combination with the yarn-drum, carriage and color-wheel, of a spreader having a rubbing-surface greater in one direction than in another direction, mechanism for partly revolving said spreader laterally into varying operative positions, and means for enforcing contact between said spreader and the yarn on the drum in said varying positions.
5. The combination with the yarn-drum, carriage and color-wheel, of a spreading device having a rubbing-surface greater in one direction than in another direction, mechanism for partly revolving the same laterally, and a spring adapted to revolve with said spreading device.
6. The combination with the yarn-drum, carriage and color-wheel, of a spreader having a rubbing-surface greater in one direction than in another direction, means for partly revolving said spreader laterally, and a spring-actuated catch for arresting it in its movements.
7. The combination with the yarn-drum, carriage and color-wheel, of a spreader of less width than the width of the color-wheel and having its entire rubbing-surface mounted in the path of the rubbing-surface of the color-wheel.
8. The combination with the yarn-drum, carriage and color-wheel, of a spreader mounted in the path of said wheel and having its outer operative edges placed inside of the ridges of the streak in course of application.
9. The combination with the yarn-drum, carriage and color-wheel, of a spreader mounted in the path of said wheel and having its outer operative edges placed inside of the ridges of the streak in course of application, and means for placing said spreader across one of said ridges.
10. The combination with the yarn-drum, carriage and color-wheel, of a spreader having one of its sides extending parallel with the edges of the streaks produced by the color-

wheel, and means for placing said side cross-wise with reference to one of said edges.

11. The combination with the yarn-drum, carriage and color-wheel, of a spreader having its outer operative edges placed inside of the streak in course of application and a second spreader extending across one of said ridges.

12. The combination with the yarn-drum, carriage and color-wheel, of a spreader having its operative edge nearest to the adjoining streak previously printed placed between the two ridges of the streak in course of application, a second spreader having its operative edge nearest to the streak in course of application between the ridges of said previous streak, and a third spreader covering the ridges between aforesaid two streaks and extending into the paths of aforesaid spreaders.

13. The combination with the yarn-drum, carriage and color-wheel, of two spreaders, one confined in contact with the yarn on one side of a ridge between the bodies of two streaks, the other confined in contact with the yarn on the other side of said ridge, and a third spreader adapted to cover portions of the paths of aforesaid spreaders.

14. The combination with the yarn-drum, carriage and color-wheel, of two spreaders adapted to simultaneously operate upon adjoining streaks, each spreader being confined to yarn on one side of the intermediate ridge and a third spreader covering said ridge.

15. The combination with the yarn-drum, carriage and color-wheel, of two spreaders adapted to simultaneously operate upon adjoining streaks, each spreader being confined to yarn on one side of the intermediate ridge, the forward edge of one of said spreaders being placed in the rear of the rear edge of the other spreader.

16. The combination with the yarn-drum, carriage and color-wheel, of two spreaders having rubbing-surfaces with edges placed parallel with the path of the color-wheel, and an intermediate spreader placed diagonal with reference to aforesaid edges.

17. The combination with the yarn-drum, carriage and color-wheel, of two spreaders on the same side of the color-wheel and placed out of alinement with each other, each spreader being provided with a supporting-spring placed out of alinement laterally with reference to the supporting-spring of the other spreader.

18. The combination with the yarn-drum, carriage and color-wheel, of two spreaders each having a rubbing-surface greater in one direction than in another direction placed out of alinement with each other and means for partly revolving one of said spreaders laterally into alinement with the other spreader.

19. The combination with the yarn-drum, carriage and color-wheel, of two spreaders placed in contact with different portions of the yarn laterally, a third spreader adapted to overlap aforesaid two spreaders, and means

for placing it into and out of such overlapping position.

20. The combination with the yarn-drum, carriage and color-wheel, of a spreader located only on one side of a ridge between the bodies of two streaks, a second spreader located only on the other side of said ridge and a third spreader adapted to be placed in contact with the yarn and across said ridge, and means for placing it into and out of such position.

21. The combination with the yarn-drum, carriage and color-wheel, of a spreader having its outer operative edges alined between the outer operative edges of the color-wheel, a second spreader, and means adapted to place the second spreader alternately into a corresponding position with aforesaid spreader or into an overlapping position.

22. The combination with the yarn-drum, carriage and color-wheel, of two spreaders, a common support on which they are mounted, and means for partly revolving said support laterally.

23. The combination with the yarn-drum, carriage and color-wheel, of spreading means jointly covering a continuous aggregate width of yarn substantially the width of two streaks, and means for withdrawing the spreading means covering the ridges from contact with the yarn while maintaining operative contact with the spreading means covering interior portions of such streaks.

24. The combination with the yarn-drum, carriage and color-wheel, of a stationary spreader and a movable spreader both mounted upon the carriage, means for automatically shifting the movable spreader, and an independent supporting-spring for each of said spreaders.

25. The combination with the yarn-drum, carriage and color-wheel, of a stationary spreader and a movable spreader, both mounted upon said carriage, and means for automatically shifting the movable spreader.

26. The combination with the yarn-drum, carriage and color-wheel, of a spreader, and an upright shaft upon which it is mounted eccentrically.

27. The combination with the yarn-drum, carriage and color-wheel, of a spreader stationary with reference to the alinement of the color-wheel, a bracket supporting said spreader, and a second spreader adapted to be partly revolved laterally, and mounted upon the same bracket.

28. The combination with the yarn-drum, carriage and color-wheel, of a spreader stationary with reference to the alinement of the color-wheel, a bracket supporting said spreader, and a second spreader adapted to be moved laterally and mounted upon the same bracket.

29. The combination with the yarn-drum, carriage and color-wheel, of a spreader having a rubbing-surface greater in one direction than in another direction, means for partly

revolving the same laterally, and a drip-pan adapted to move with said spreader.

30. The combination with the yarn-drum, carriage and color-wheel, of a bracket on the carriage, a spreader having a rubbing-surface greater in one direction than in another direction mounted upon the bracket and adapted to be partly revolved laterally, and a drip-pan interposed between spreader and bracket.

31. The combination with the yarn-drum, carriage and color-wheel, of a spreader mounted in proper relation with said wheel and adapted to play forward and backward, and means for adjusting such play.

32. The combination with the yarn-drum, carriage and color-wheel, of a spreader mounted in proper relation with said wheel and adapted to play sidewise, and means for adjusting such play.

33. The combination with the yarn-drum, carriage and color-wheel, of a spreader having a rubbing-surface greater in one direction than in another direction adapted to be partly revolved laterally and having its sides sloping downward and outward from its contact-surface.

34. The combination with the yarn-drum, carriage and color-wheel, of a movable spreader, a supporting device for the same comprising a lever and an upright fulcrum for the same, and means for actuating said lever.

35. The combination with the yarn-drum, carriage and color-wheel, of a spreader, a support for the same adapted to be moved laterally, a shifting-block for actuating said support, and means for raising and lowering said shifting-block.

36. The combination with the yarn-drum, carriage and color-wheel, of a spreader having a rubbing-surface greater in one direction than in another direction, a support for the same adapted to be partly revolved laterally, and a shifting-block for actuating said support.

37. The combination with the yarn-drum, carriage and color-wheel, of a spreader having a rubbing-surface greater in one direction than in another direction, a support for the same adapted to be partly revolved laterally, and a fulcrumed shifting-block for actuating said support.

38. The combination with the yarn-drum, carriage and color-wheel, of a spreader having a rubbing-surface greater in one direction than in another direction, a support for the same adapted to be partly revolved laterally and two shifting-blocks adapted to actuate said support alternately in opposite directions.

39. The combination with the yarn-drum, carriage and color-wheel, of a spreader in front and another spreader in the rear of the distributing-wheel, a support for each of said spreaders, and a joint-shifting block for displacing both of said supports laterally at one end of the drum.

40. The combination with the yarn-drum, carriage and color-wheel, of a spreader in front and another spreader in the rear of the distributing-wheel each having a rubbing-surface greater in one direction than in another direction, a support for each of said spreaders, and a shifting-block adapted to partly revolve said supports laterally in opposite directions.

41. The combination with the yarn-drum, carriage and color-wheel, of a spreader having a rubbing-surface greater in one direction than in another direction, an upright bearing upon the carriage, a support revolvably mounted therein, a shoe on said support adapted to be deflected laterally, and means for deflecting it in opposite directions.

42. The combination with the yarn-drum, carriage and color-wheel, of a spreader, a sup-

port for the same mounted upon said carriage and adapted to be displaced laterally, and two shifting-blocks pivotally mounted upon the same shaft and adapted to produce such displacements in opposite directions.

43. The combination with the yarn-drum, carriage and color-wheel, of a spreader having a rubbing-surface greater in one direction than in another direction, a support for the same, mechanism for partly revolving said support laterally, and a spring adapted to yieldingly resist such movement.

Signed at New York, in the county of New York and State of New York, this 9th day of July, A. D. 1898.

CHARLES L. HORACK.

Witnesses:

WM. J. PARSONS,
J. A. RYAN.