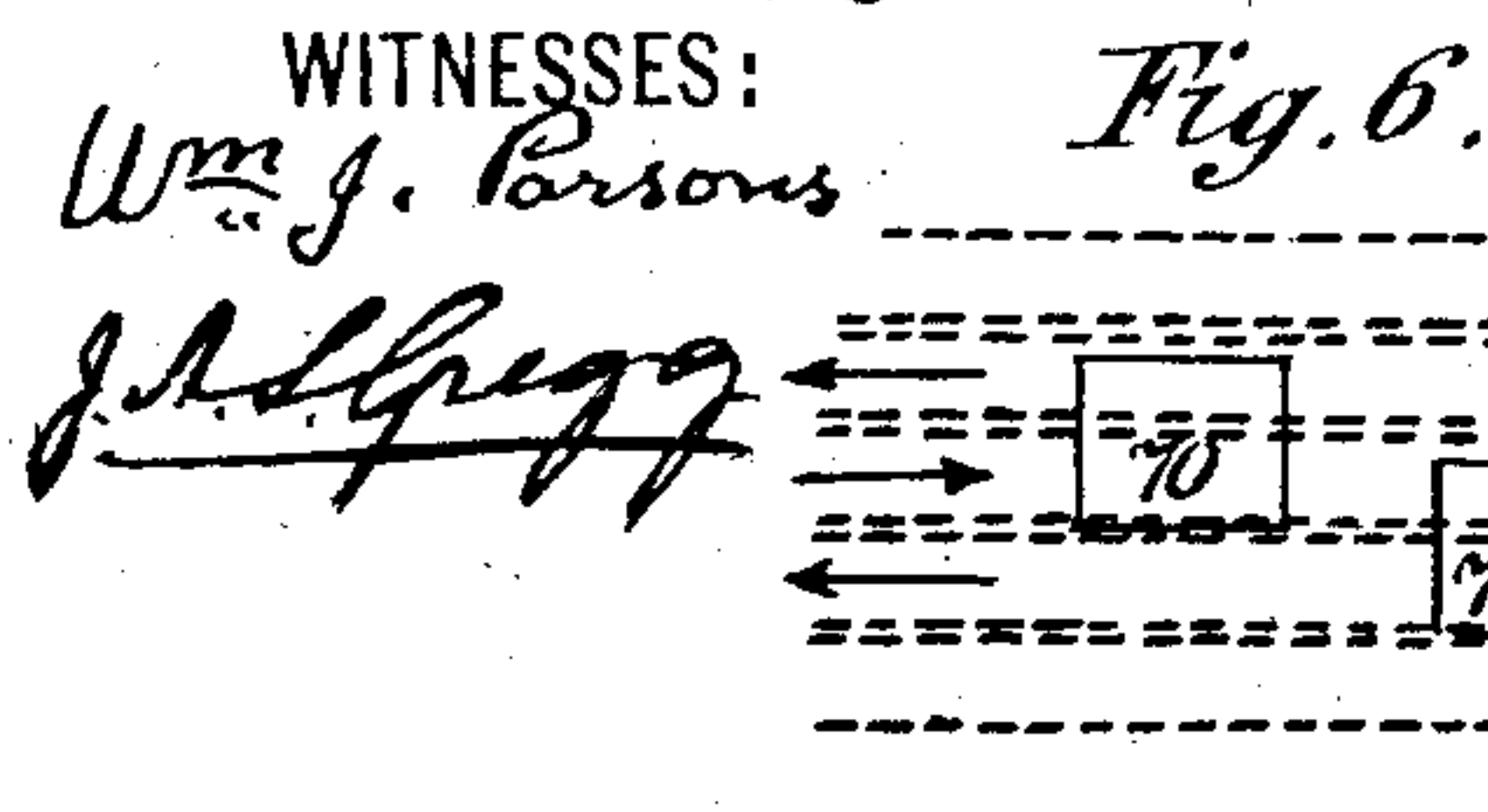
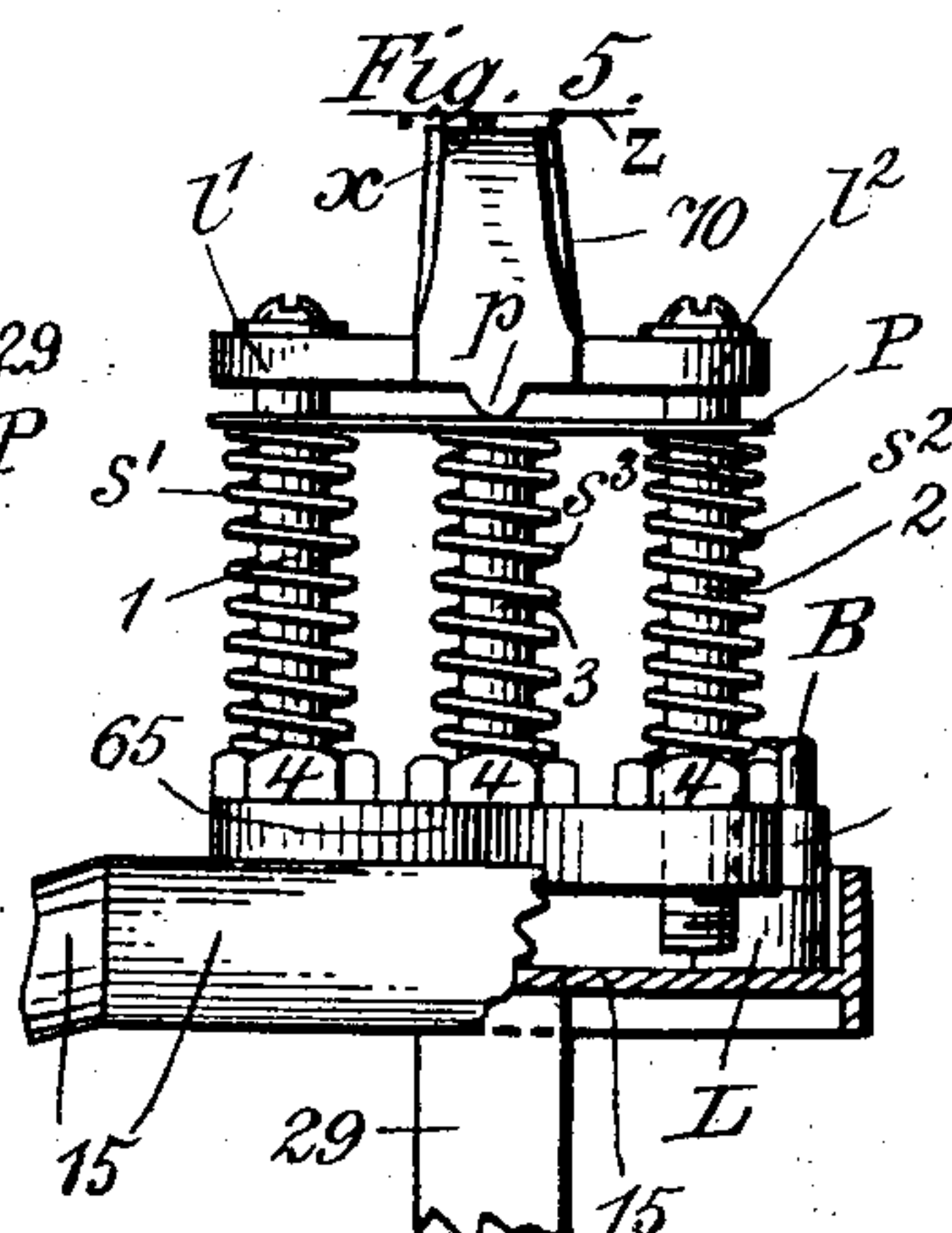
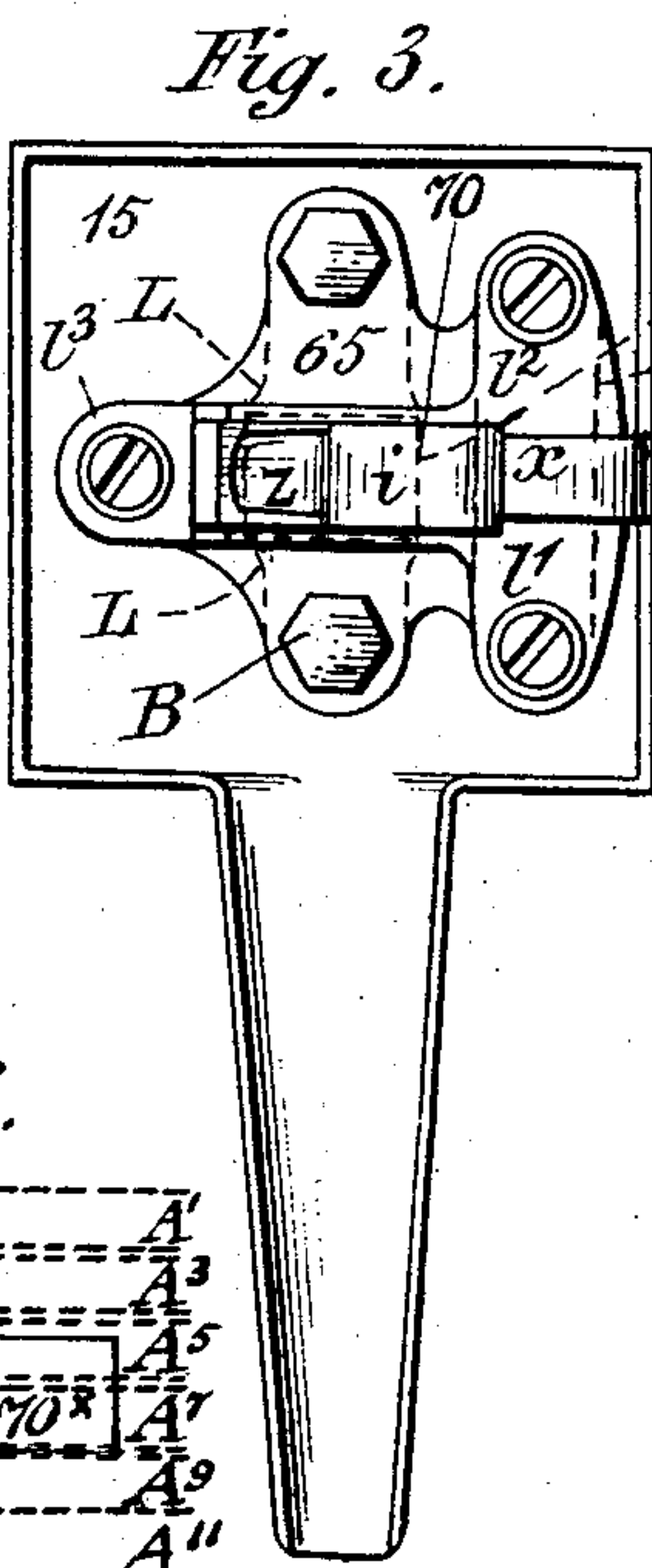
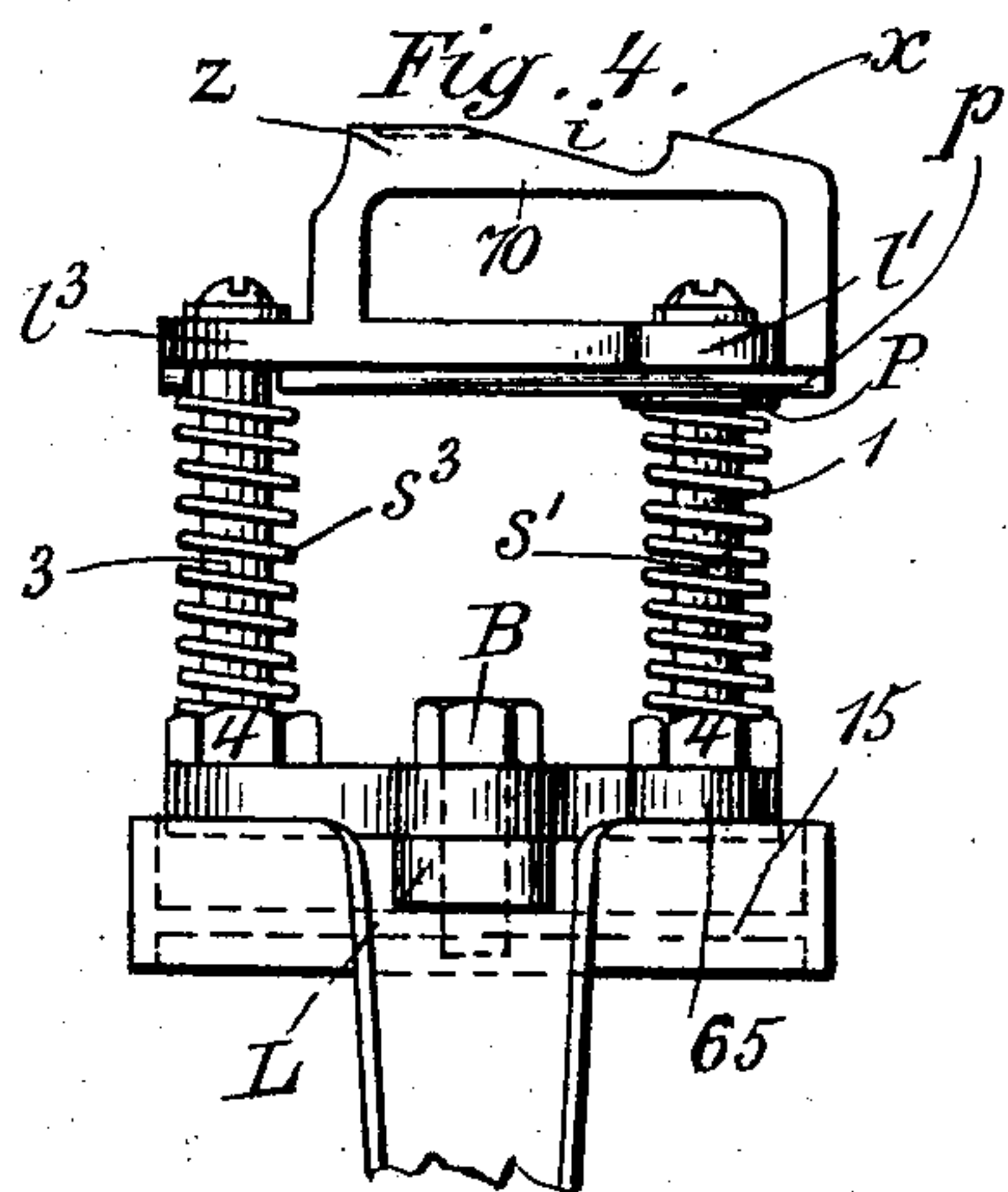
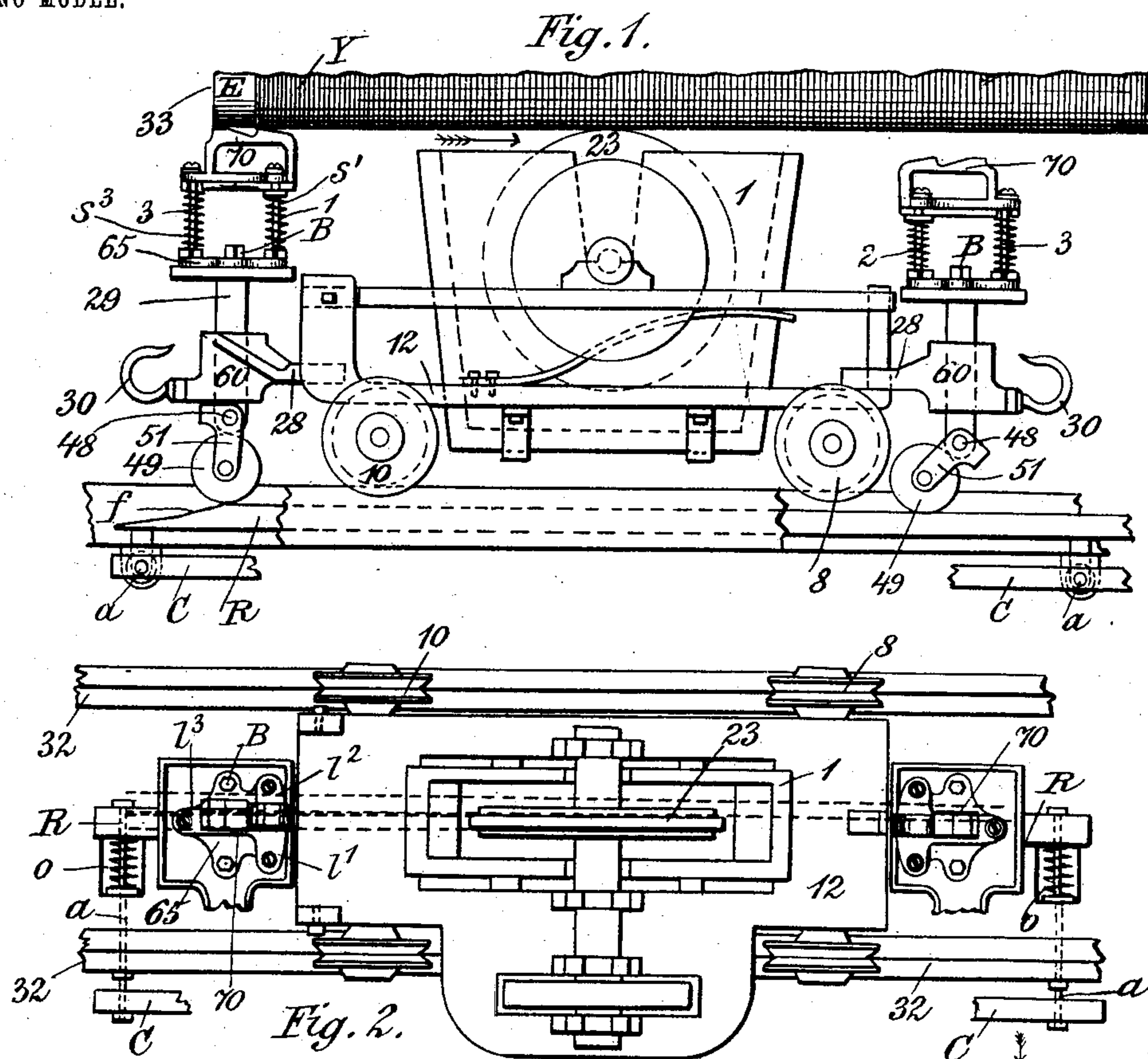


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APPARATUS FOR PRINTING YARNS.

APPLICATION FILED MAY 25, 1898.

NO MODEL.



WITNESSES:

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APPARATUS FOR PRINTING YARNS.

SPECIFICATION forming part of Letters Patent No. 765,326, dated July 19, 1904.

Application filed May 25, 1898. Serial No. 681,696. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM SHAW, a citizen of the United States, and a resident of New York, borough of Brooklyn, in the county of Kings and State 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 improvements in apparatus for printing yarns, and more particularly yarns used in the manufacture of tapestry and velvet carpets.

The objects of my invention are to provide suitable means for partially equalizing color printed upon yarn in streaks and to guard against the spreading of color from one streak into an adjoining streak of different shade or color, including a suitable form of automatic spreading device adapted to thoroughly rub the color deposited by a color-wheel or corresponding device into the yarn and to equalize the same sufficiently so that the subsequent steaming process commonly employed may produce approximately uniform appearances of the different shades of the yarns, also to prevent over saturation with color of the threads of the yarn nearest to the end of the drum, to provide for free up-and-down movement of the spreader, so that the same may best accommodate itself to the surface of the yarn on the drum, and to provide simple means for alternately attaching spreaders of different widths together with proper supporting-springs to the main supports for the spreaders.

In the accompanying drawings, forming part of this specification, Figure 1 is a side elevation of a color-carriage and part of the yarn-drum fitted up according to my invention, while Fig. 2 is a ground plan of Fig. 1, the drum, however, not being shown therein. Fig. 3 is a ground plan, Fig. 4 a side elevation, and Fig. 5 an end elevation, of one of the spreading devices, all drawn to an enlarged scale. Fig. 6 is a diagram illustrating relative positions of streaks of color printed by the color-wheel and a spreader employed in partly equalizing the same.

12 is the color-carriage, mounted on wheels 8 8 and 10 10, on which 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, placed underneath and parallel with drum 33, carrying the yarn Y. 28 28 are brackets attached to the main body of the carriage, which form a bearing within which a post 29, made of rectangular cross-section, is made to slide. 48 48 are pivots passing through the lower extremities of posts 29, to which are hinged levers 51, carrying at their lower ends rollers 49 49, posts 29, together with levers 51 and pivots 48, forming a toggle-jointed support for the spreading appliances, more fully referred to hereinafter. All these parts substantially correspond in their construction and in their mutual relations and functions with the parts bearing corresponding letters of reference in my Letters Patent of the United States No. 543,512.

60 represents vertical arms forming parts of brackets 28 and serving to guide posts 29.

L L are two lugs extending laterally from the top of each post 29, to which is secured, by means of screw-bolts B, a platform 65, carrying studs 1, 2, and 3, screwed into said platform, and jam-nuts 4 for holding said studs in position.

70 is the spreader or rubber provided with a base having lugs l' , l'' , and l''' , adapted to play along the upper portions of studs 1, 2, and 3, respectively. s' , s'' , and s''' are springs placed around said studs and yieldingly supporting the lugs of the spreader. The upper surface of spreader 70 is provided with two contact portions, the one nearest to the color-wheel (indicated by x) being very short and substantially forming an edge, from which a slight slope extends toward wheel 23, while the rear contact-surface Z is made flat and much longer than portion x , an intermediate slope i connecting the two contact portions. The rubber is preferably made of such width and so positioned as to cover not only the path of the color-wheel, but also the adjoining streak previously printed, and appliances are used for throwing both spreaders out of action when a single streak or the first one of a series of streaks is being printed, all in manner substantially as set forth in my Letters

Patent of the United States No. 543,512.
For such purpose rollers 49 are adapted to travel on rail R, placed between track-rails 32 32, and said rail is withdrawn laterally
5 when desired for the purpose of keeping both spreaders out of action while underneath the drum by moving beam C, and with it bolts *a*, attached to it and to said rail, in the direction of the arrow in Fig. 2, springs *o* serving to
10 replace the rail in its normal position when sideward thrust on beam C ceases.

It is desirable to guard against smearing the yarn by the carrying of color from the ends of the drum not covered with yarn and
15 indicated by E to the yarn itself, and for such purpose slopes *f* are provided on rail R in such positions that as the carriage travels toward the drum the lever 51 first approaching the drum will be tripped and, together with the
20 spreading appliances above it, will assume the positions illustrated in the right-hand portion of Fig. 1, while rear lever 51 will be brought into a substantially vertical position as it passes over such slope, said slope being preferably so
25 located that contact-surface *x*, which is placed forward of the bottom of roller 49, is brought in contact with the end threads of the yarn on the drum when roller 49 reaches the upper end of the slope, while contact-surface Z is brought
30 up against the extreme end of the drum and is made to pass over the corresponding part E, which does not contain any yarn, and in doing so partly removes and partly spreads out color deposited there by the wheel and
35 prevents its flow along the edges of the drum, which would be apt to oversaturate the end threads of the yarn. The two ends of rail R being arranged symmetrically with reference to the ends of the drum and to the yarn
40 thereon, it will be seen that as the left-hand roller 49 reaches the top of the slope at the right-hand end of the drum the contact portion *x* of the rubber will about reach the extreme end of the drum, the said contact portion
45 therefore being made to pass over the right-hand portion E of the drum containing the oil-cloth free from yarn and to thereby remove from it coloring-matter that may have been deposited thereon by the color-wheel.
50 Thus and particularly where the spreader is made to extend over the ridge between the streak in course of application and the streak previously made, so as to dispose of and remove the coloring-matter in such ridge, the
55 oil-cloth at the ends of the drum can be kept clean. Upon the return of the wheel from the right to the left the left-hand spreader is put out of action, and the right-hand spreader is put into action in corresponding manner.

60 In printing streaks of color side by side by means of a color-wheel ridges are formed on both sides of said streaks, and it becomes necessary to spread the coloring substances forming the same laterally over the adjoining
65 streaks except where said ridges are placed

between adjoining streaks of different shade or color, when the rubbing of color of one shade into an adjoining streak of different shade must be carefully guarded against in order to secure a true reproduction of the pat- 70 tern. At the same time it is desirable to subject the larger portion of the surface of the yarn on the drum to two rubbing actions, so as to thoroughly rub the color into the yarn. This is accomplished by placing the rubbers 75 in alinement with reference to the color-wheel, as shown more particularly in Figs. 2, 5, and 6. In Fig. 6 A' A³, &c., represent adjoining streaks, the arrows indicating the direction in which the color-wheel travels in printing such 80 streaks. Assuming A' and A⁹ to be blue streaks previously printed and A³, A⁵, and A⁷ a series of three red streaks, filling out the space between streaks A' and A⁹, A³ having been printed first without rubbing it and A⁵ 85 being in course of application, I so proportion and aline the extreme outer edges of the spreader 70, which follows after the color-wheel, that during such printing operation it will cover the whole surface of streak A⁵ and 90 more than half and less than the whole surface of streak A³ in such manner as to bring one of its edges substantially in alinement with that edge of streak A⁵ which adjoins streak A⁷ and with the corresponding edge of the color- 95 wheel and to bring its other edge into that half of streak A³ which is nearest to streak A', while when the color-wheel is printing streak A⁷ the spreader 70^x then following in the path of the color-wheel will in correspond- 100 ing manner cover the whole surface of streak A⁷ and the adjoining half of the surface of streak A⁵ and will extend into the other half of said streak A⁵ without reaching or covering that one of its ridges which is nearest to 105 streak A'. It will therefore be seen that in streak A³ nearest to A' there will be a bank or ridge of color left untouched while the greater portion of said streak, together with streak A⁵, is being rubbed, which will guard 110 against color from streak A³ being forced into streak A', while all the other ridges in the series of streaks A³ A⁵ A⁷ will receive thorough rubbings, including that ridge of streak A⁷ which is nearest to A⁹. The ad- 115 joining ridge of A⁹ nearest to A⁷ having remained untouched during the printing of streaks A⁹ and A¹¹, it will be seen that while perfect alinement is preserved between streaks of different shade, as A' and A³, as well as A⁷ 120 and A⁹, and rerubbing in opposite directions of the greater portion of the surface of the yarn is accomplished, the forcing of color at these points from one streak into the other is guarded against, as shown in Fig. 3. 125

By making the spreading means extend only over printed portions of the yarn and by making the same cover the entire width of one printed streak and an adjoining portion of a printed streak, which portion extends over 130

more than half and less than the whole of the width of the same, it becomes possible to give to all the streaks in a series of adjoining streaks of the same color except the two end streaks two rubbings over the larger parts of their widths and to rub one of the end streaks of such a series over its entire width without causing the banking up against each other of ridges of different colors, owing to the action of the spreaders.

I prefer to make the rubbing-surface Z slightly wider on both sides than surface X, so as to have surface Z rub out such ridges as might be produced by the edges of surface X, and also to provide the upper face of surface Z with a suitable depression in known manner, so as to carry along and reapply surplus coloring-matter previously removed by it from the yarn.

I have found in practice that by making the combined spring-pressure exerted upon short contact portion x smaller than that exerted upon contact portion z I obtain the best results, as thereby I enable said portion x to readily pass over the yarn and to equalize the coloring-matter thereon without catching with and displacing such yarn, while the heavier pressure applied to the wider contact-surface z will thoroughly force such coloring-matter through the yarn.

For the purpose of promoting perfectly free action and movement of the spreader laterally I mount a bridge-piece P, preferably made elastic, upon the springs s' and s'' , causing the central portion only of said bridge-piece to support a ridge or projection p on the under side of the base of the spreader, thus preventing binding of lugs Z' and Z'' on the studs along which they are designed to travel as the spreader moves up and down.

15 is a pan for catching and discharging side-

wise color dripping down from the spreader. The same is placed around post 29 and secured to the under side of lugs L L.

When a spreader of different width is to be substituted for spreader 70, the latter, together with its platform 65 and supporting-springs, is detached from post 29 by unscrewing screw-bolts B, when the new spreader, with its platform studs and springs, may be substituted and secured by means of such bolts.

I claim—

1. In an apparatus for coloring yarns, the combination with a drum which carries the yarn, of a color-wheel, a spreading device comprising a rubbing portion x and a longer rubbing portion z following it both mounted upon the same spring-supported base, and means for holding said rubbing portions in sliding contact with the yarn.

2. In an apparatus for coloring yarns, the combination with a drum which carries the yarn, of a color-wheel, and a spreading device comprising a rubbing portion x and a longer rubbing portion z in the rear thereof, both mounted upon the same spring-supported base, the spring-pressure upon portion x being lighter than that upon portion z .

3. In an apparatus for coloring yarns, the combination with a drum which carries the yarn, of a color-wheel, a spreader supporting springs on each side of the spreader, and a bridge-piece mounted upon said springs and centrally supporting the spreader.

Signed at New York, in the county of New York and State of New York, this 17th day of May, A. D. 1898.

WILLIAM SHAW.

Witnesses:

CHAS. L. HORACK,
J. A. S. GREGG.