

A. FORNANDER.
-APPARATUS FOR COLORING YARNS.

(Application filed Feb. 14, 1902.)

(No Model)

3 Sheets—Sheet 1.

Fig. 1.

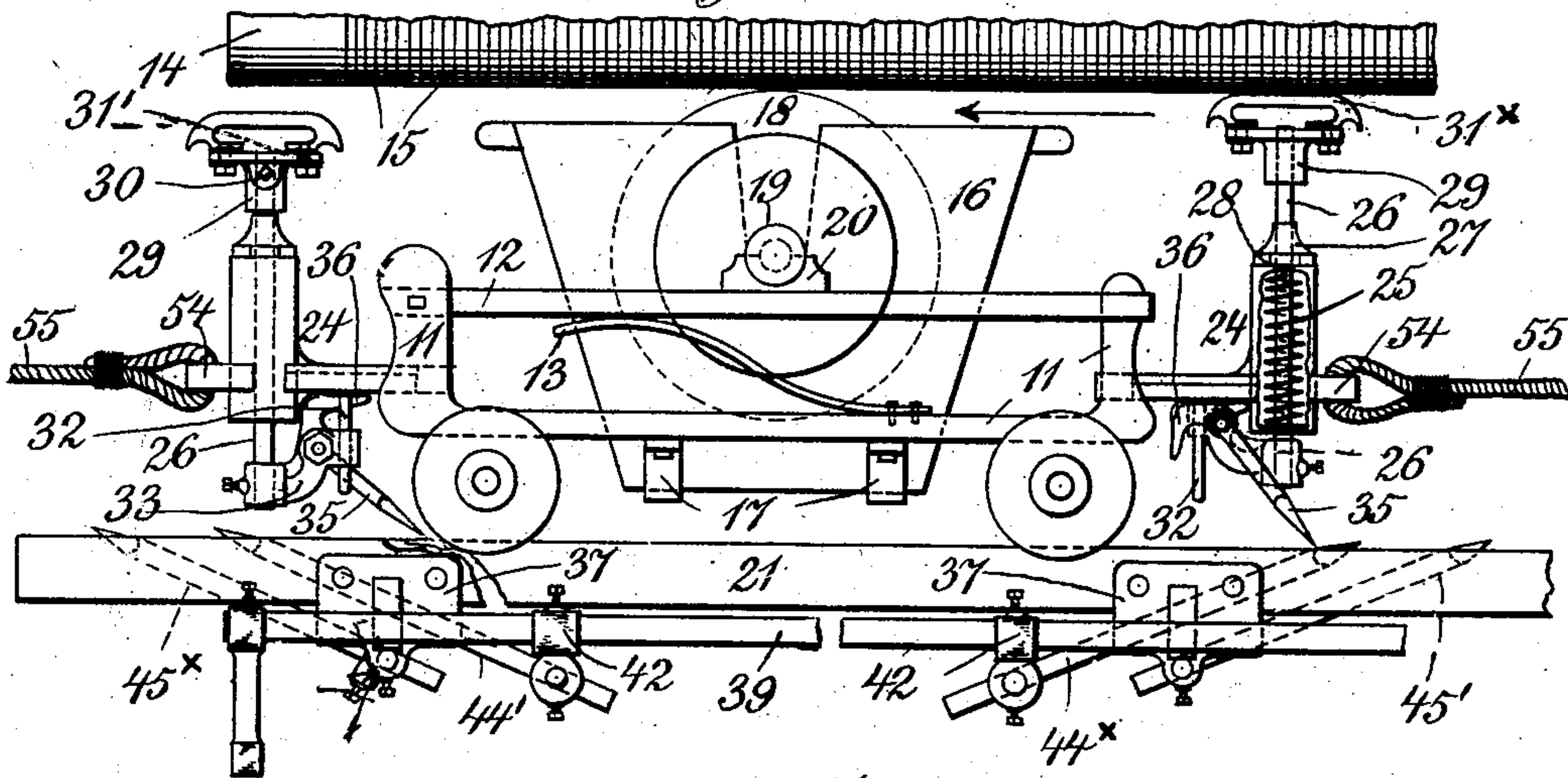


Fig. 2.

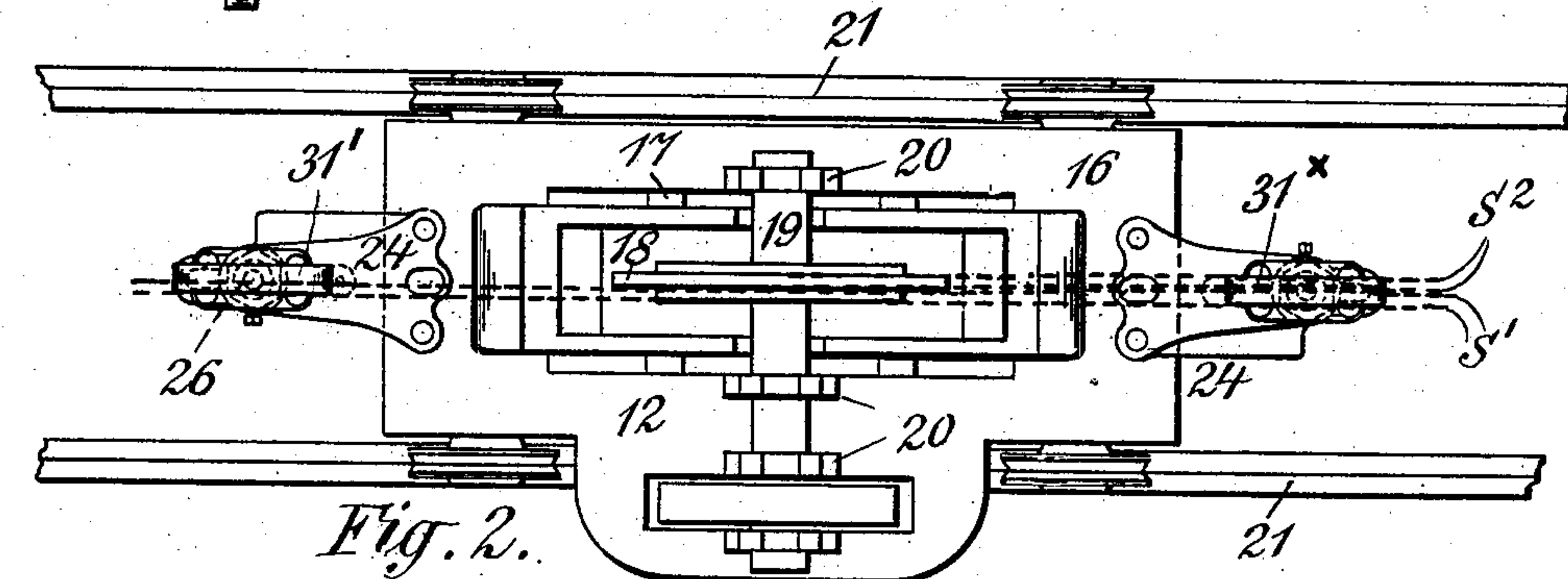
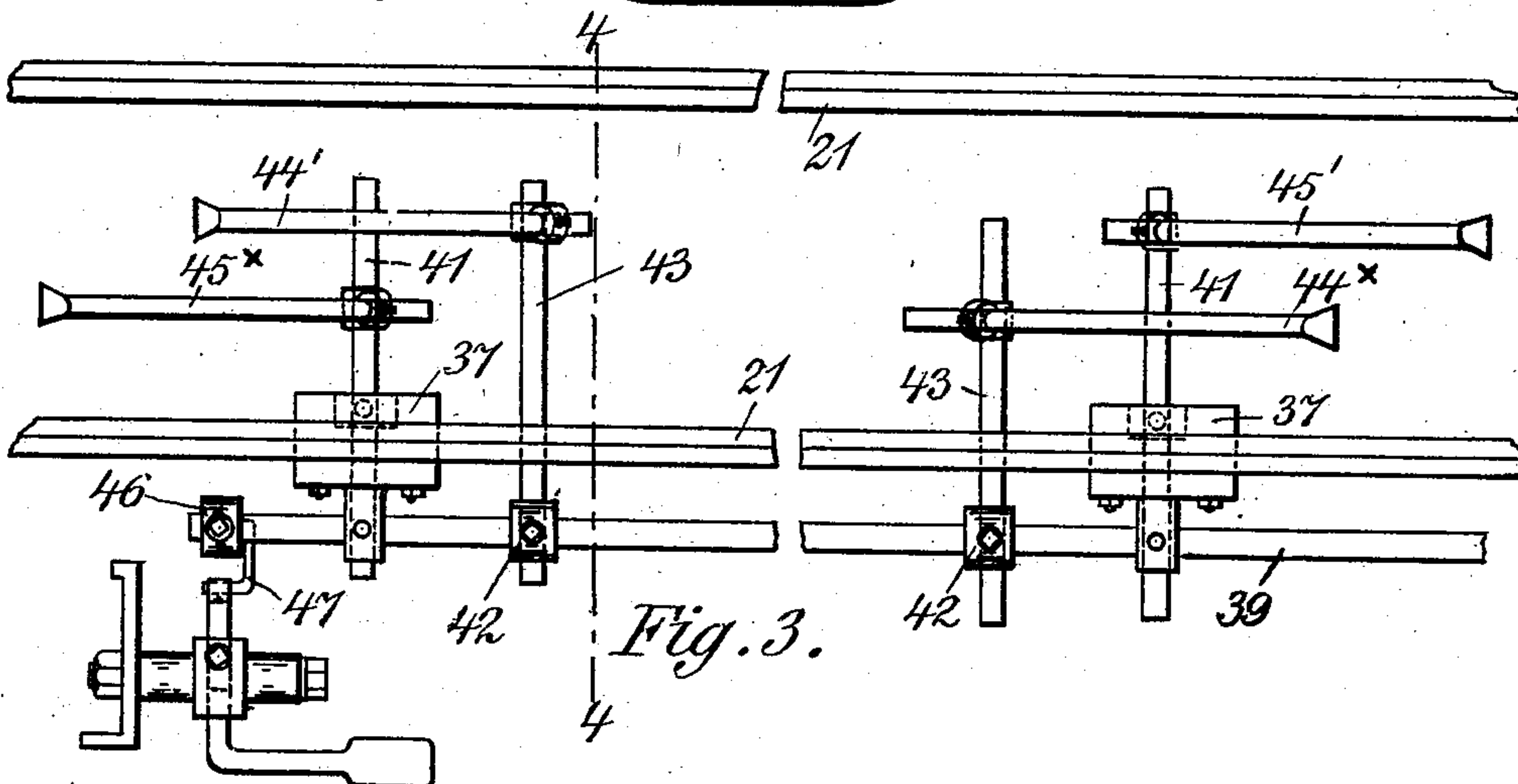


Fig. 3.



Witnesses
Wm. Shaw
James McLain

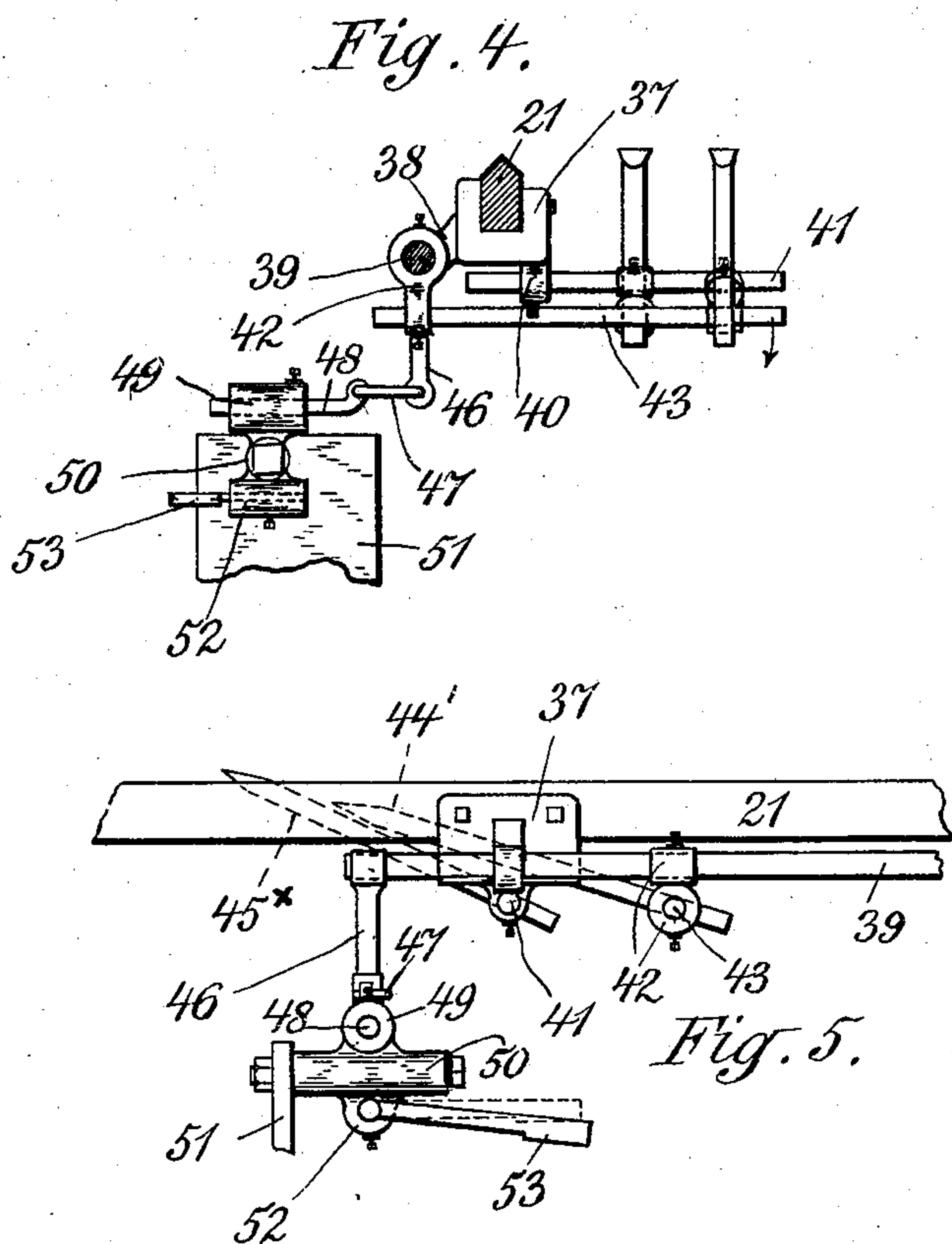
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A. FORNANDER.
APPARATUS FOR COLORING YARNS.

(Application filed Feb. 14, 1902.)

(No Model.)

3 Sheets—Sheet 2.



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No. 705,334.

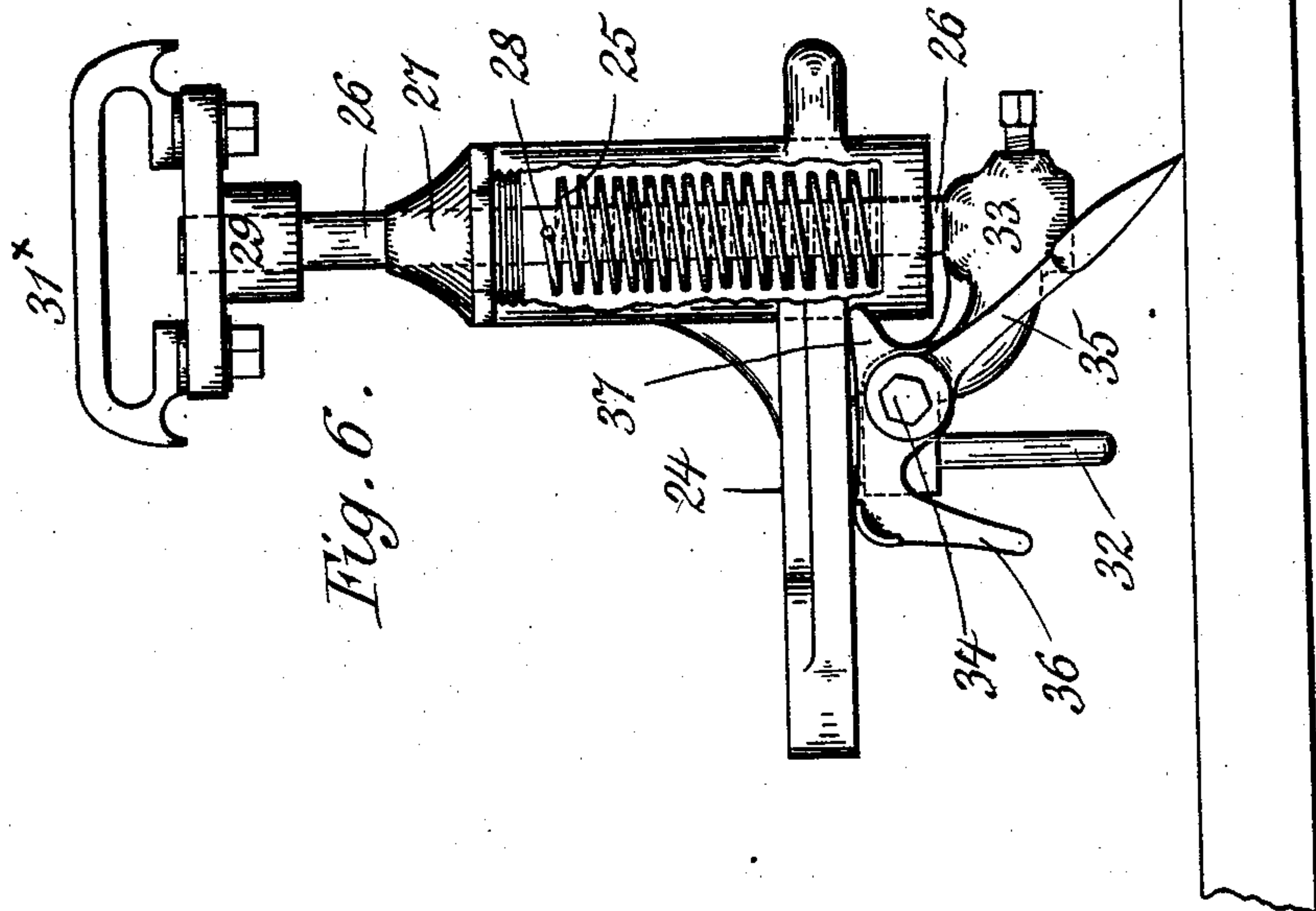
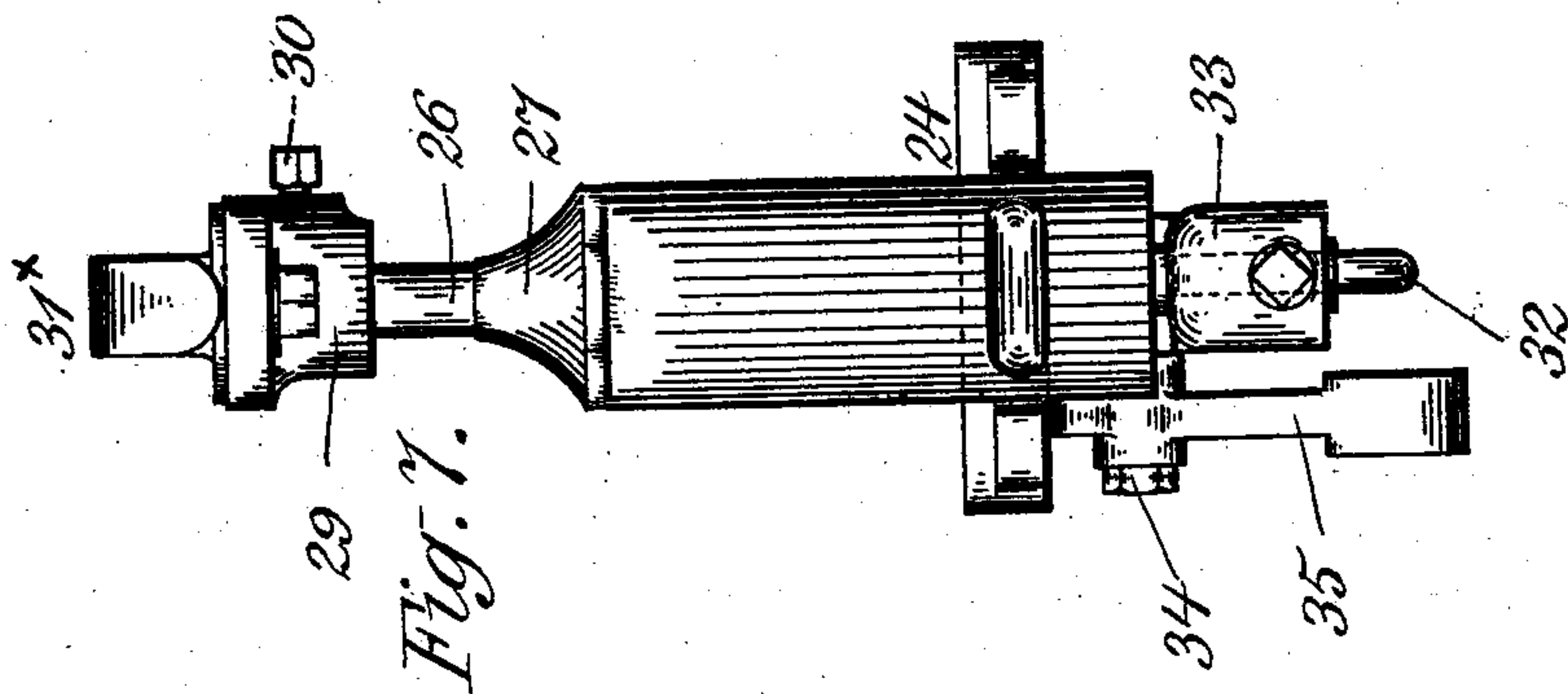
Patented July 22, 1902.

A. FORNANDER.
APPARATUS FOR COLORING YARNS.

(Application filed Feb. 14, 1902.)

(No Model.)

3 Sheets—Sheet 3.



Witnesses
Wm. Shaw
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UNITED STATES PATENT OFFICE.

ALFRED FORNANDER, OF NEW YORK, N. Y., ASSIGNOR TO THE CARPET
YARN PRINTING COMPANY, A CORPORATION OF NEW YORK.

APPARATUS FOR COLORING YARNS.

SPECIFICATION forming part of Letters Patent No. 705,334, dated July 22, 1902.

Application filed February 14, 1902. Serial No. 93,999. (No model.)

To all whom it may concern:

Be it known that I, ALFRED FORNANDER, a
subject of the King of Sweden and Norway, re-
siding at New York, county and State of New
York, have invented certain new and useful
Improvements in Apparatus for Coloring
Yarns, of which the following is a specification.

My invention refers to improvements in
apparatus for printing yarns, and more par-
ticularly yarns employed in the manufacture
of tapestry and velvet carpets.

The purposes of my invention are to pro-
vide simple and efficient means for distribut-
ing the coloring-matter properly over and
through the yarn after the same has been ap-
plied thereto in streaks and to provide, in
connection with printing appliances of usual
or other proper construction when equalizing
or spreading devices are placed in front as
well as in the rear of the distributing-wheel,
reliable means for putting and holding such
of said devices as temporarily precede the
distributing-wheel out of contact with the
yarn, to cause such spreading devices where
streaks of the same shade of coloring-matter
are placed side by side to pass over each of
said streaks twice in succession and in oppo-
site directions, and to also make provision in
case an isolated streak of a certain shade of
coloring-matter be applied to the yarn to leave
the same untouched by any spreading de-
vices, as is the common custom at present.

In the accompanying drawings, forming
part of this specification, and wherein corre-
sponding reference-figures refer to corre-
sponding parts, Figure 1 is a side elevation
of an apparatus embodying my improve-
ments, portions of the same being broken
away; Fig. 2, a ground plan of the improve-
ments attached to the carriage, and Fig. 3 a
ground plan of parts of the apparatus em-
ployed in shifting the scrapers or spreaders
into and out of their operative positions, while
Fig. 4 is a section along line 4 4 in Fig. 3
looking toward the left, and Fig. 5 a side ele-
vation of a portion of the appliances illus-
trated in Fig. 4. Figs. 6 and 7 are detail views
of one of the appliances supporting a scraper
or spreader, which appliance is attached to
the color-carriage, Fig. 6 being a side eleva-
tion of one of said appliances with parts broken

away, while Fig. 7 is an end view thereof.
Said Figs. 6 and 7 are drawn to an enlarged
scale.

11 is the main body of the color-carriage, 55
and 12 a lid hinged to one end of said car-
riage. On each side of the carriage a spring,
as 13, is fastened to the main body of the car-
riage, so as to support said lid and force it
upward toward drum 14, around which the 60
yarn 15 is wound in usual manner.

16 is the color-box containing the liquid
coloring-matter. The same is supported upon
iron straps 17, attached to the main body of
the color-carriage. 55

18 is the color-wheel, the shaft 19 of which
revolves in proper bearings 20, provided on
lid 12, and said wheel is so placed within the
color-box and so revolved by proper means
that as the carriage is moved along rails 21 21 70
it will revolve in contact with the yarn and
will bring up portions of the contents of the
color-box and will apply the same in form of
a streak to the yarn wound upon the drum in
a continuous uniform layer, and by giving to 75
the drum successive partial revolutions the
entire surface of the yarn on the drum will
be covered with adjoining streaks, a differ-
ent color-box with color-wheel being inserted
every time a new shade or color is to be ap- 80
plied, in accordance with the design which is
to be printed.

The appliances above described and the
mode of employing the same referred to are
not part of my invention, as they are now and 85
have been for many years in common use,
even before automatic scraping or equalizing
of the streaks of color was resorted to in gen-
eral, and my improvements will be equally
applicable and are intended to be used, as 90
hereinafter described, where modified means
for supporting the yarn and for applying
streaks of color to the same may be employed.

My improvements refer to the means for
equalizing the color which is contained in the 95
streaks on the yarn and comprise the follow-
ing features.

A bracket 24 is fastened to each end of the
carriage. The vertical arm of each such
bracket is hollowed out so as to form a socket, 100
within which a spiral compression-spring 25
is seated. Said spring surrounds a vertical

post 26, which extends through the bottom of said socket and also through a cap 27, screwed to the top of the bracket, and is fixedly secured to said post at 28. As shown more particularly in Figs. 1 and 6, the perforation in the bottom of bracket 24 and that in cap 27 jointly serve to guide post 26 in a vertical direction whenever the scraper is to be moved by the agencies hereinafter described into and out of its operative position. 29 is a T-shaped head adjustably secured to the upper end of said post by means of a set-screw 30, so as to permit of raising and lowering the head along the post, and the scraper 31 is screwed to such head. The post 26 is so guided on the bracket as to prevent it from revolving around its axis, whereby the alinement of a scraper mounted thereon might be changed. The two scrapers are indicated by 31' and 31^x.

32 is a vertical stud extending downward from the horizontal portion of bracket 24, and 33 an arm having one end fixedly but adjustably secured to the lower end of post 26, while its other perforated end surrounds stud 32. Said arm carries a horizontal pin 34, serving as fulcrum for a rocking-lever 35, the head 36 of which is adapted to so engage with a suitable bearing-plate on the under side of the horizontal arm of the bracket that when the lower arm of the lever is brought into a position sloping downward toward the color-carriage spring 25 is permitted to force post 26 upward, so as to hold the scraper under yielding pressure against the yarn on the under side of the drum, while when the lower end of said lever is brought into a position sloping downward and pointing toward the color-carriage and is held there, owing to the contact with said bearing-plate of a spur 37 on said lever, post 26 will thereby be lowered into and held in a position which will cause spring 25 to be further compressed and scraper 31 to assume a position some distance underneath the bottom of the drum and out of contact with the yarn. By raising or lowering head 29 along post 26 the tension under which spring 25 acts may be adjusted as desired. The widths and the alinements of the two scrapers are such as to make each of them capable of covering the streak of color which is in course of application (indicated in Fig. 2 by S²) and the streak directly adjoining and previously printed and indicated by S'. While printing streak S² the carriage moves in the direction of the arrow in Fig. 1. When a series of adjoining streaks of the same shade or color are being printed, it is desirable to have the scraper which follows after the color-wheel travel in contact with the yarn and to hold the other scraper out of contact with the yarn, while when a single streak only is being printed or the first one in a series of streaks it is necessary to keep both scrapers out of contact with the yarn, so as to avoid the rubbing of the color in said streak into an adjoining streak of different color, and I

employ the following devices for accomplishing these results.

37 37 are shoes securely fastened to one of the rails 21, from which shoes extend lateral lugs 38, upon which a longitudinal shaft 39 is revolubly mounted, and also depending lugs 40, to which cross-bars 41 are fixedly attached, which cross-bars reach into the space between rails 21.

42 represents lugs secured to bar 39 for the purpose of supporting cross-bars 43, also extending between rails 21.

44' and 44^x are trippers fixedly attached to cross-bars 43, and 45' and 45^x trippers so attached to stationary cross-bars 41. Trippers 44' and 45' are placed in line with the lever 35 underneath scraper 31', and trippers 44^x and 45^x in line with the lever 35 underneath scraper 31^x, and said trippers are so positioned with reference to the ends of the drum that as scraper 31^x passes underneath the drum and while it is in position sloping downward toward the color-carriage it will strike the under side of the upper end of tripper 44^x and will thereby be forced into a position sloping downward and away from the color-carriage, whereby scraper 31^x will be forced upward against the yarn nearest to the right-hand end of the drum in manner described above. Said lever 35 will remain in such position until it reaches the other end of the drum and scraper 31^x has passed beyond the yarn on the drum, when it will strike the upper side of stationary tripper 45^x and will pass it. When the color-carriage travels in the opposite direction, the lever 35 underneath said scraper 31^x will strike the under side of stationary tripper 45^x and will thereby be brought into a position sloping downward toward the color-carriage, whereby said scraper will be brought into its inoperative position. Scraper 31' is then brought into its operative position by having its lever 35 strike the under side of tripper 44' and will be held there until the direction of the carriage is again reversed. The function of spring 25 is twofold—viz., as set forth above, to force the scrapers against the yarn and also to impart such elastic tension to levers 35 as to permit the same to pass over the trippers in one direction and upon returning to enforce contact between said levers and the under side of said trippers. As the yarn does never entirely cover the ends of the drum an uncovered space of about half an inch or more being generally left there, and as the color-wheel deposits color on said ends it is important to prevent the scraper which follows after the color-wheel from moving such color forward upon the yarn, and this I accomplish in a very simple manner by placing the scraper which is ahead of the color-wheel while the latter is printing a streak in a position lower than and out of contact with the yarn on the drum and by maintaining it at such an elevation until on its return trip it reaches a position underneath the yarn on the drum. By doing so I also prevent striking of

said scraper against the edge of the drum as it passes underneath the latter, thus guarding against injury to the scraping device. In then raising said scraper and maintaining it in its elevated position until after it has passed entirely from underneath the drum I cause it to push off from that end of the drum with which it comes in contact last any surplus color deposited there by the color-wheel.

10 When a single streak or the first of a series of streaks is to be printed, I place both of the scrapers out of action by means of the following appliances:

15 46 is a crank fixedly mounted upon shaft 39. The same by means of a link 47 connects with a rod 48, fixedly inserted in a socket 49 integral with a sleeve 50, which is revolubly mounted upon a part 51 of the frame supporting the drum. 52 is another socket also integral with sleeve 50.

20 53 is a treadle which is firmly held in socket 52. When both scrapers are to be placed in their inoperative positions, treadle 53 is depressed, as shown in full lines in Fig. 5. This will cause the movement of link 47 toward the left in Fig. 4 and in consequence will revolve shaft 39 and will swing rod 43 downward in the direction of the arrow in Fig. 4, so as to bring tripper 44' into a depressed position, 25 (illustrated in Fig. 5,) in which position it is not capable of enforcing the upward movement of scraper 31'. In corresponding manner tripper 45' will also be depressed, owing to the revolving movement of shaft 39, above referred to, whereby the rod 43, carrying tripper 45', will have imparted to it movement corresponding with that of the other rod 43, above referred to. As soon as the carriage has passed completely underneath the drum 30 the treadle may be released. It will thus be seen that while trippers 44^x and 45^x remain stationary at all times the trippers 44' and 45', being made depressible or movable, may, by actuating treadle 53, be readily thrown into 45 positions which will cause both scrapers to remain out of contact with the yarn while the carriage is traveling underneath the drum.

50 54 54 are eyes on brackets 29, to which the rope 55 is attached, by means of which the carriage is drawn forward and backward.

It will readily be seen that many of the details and of the detail combinations herein set forth may be varied materially without departing from the spirit of my invention. Hence I do not wish to confine myself to the use of such details as herein set forth.

I claim—

60 1. In an apparatus for printing yarns, the combination with the yarn-drum, the color-carriage and the color-wheel, of a scraper, a spring having a seat stationary with reference to the color-carriage for forcing the scraper toward the drum, and means for withdrawing the scraper from the drum and thereby increasing the strain upon the spring.

2. In an apparatus for printing yarns, the combination with the yarn-drum, the color-carriage and the color-wheel, of a scraper, a spring having a seat stationary with reference to the color-carriage for confining the scraper in contact with the yarn on the drum, and means for holding the scraper at a distance from the yarn on the drum and for simultaneously holding said spring under greater strain than is imparted to it while confining the scraper in contact with the yarn.

3. In an apparatus for printing yarns, the combination with the yarn-drum, the color-carriage and the color-wheel, of a scraper, a spring having a seat stationary with reference to the color-carriage for forcing the scraper toward the drum, means for withdrawing the scraper from the drum and thereby increasing the strain upon the spring, and means for adjusting such strains upon the spring.

4. In an apparatus for printing yarns, the combination with the yarn-drum, the color-carriage and the color-wheel, of a scraper, a spring for forcing the scraper toward the drum, means for holding the scraper at a distance from the yarn on the drum and for simultaneously holding said spring under greater strain than is imparted to it while so confining the scraper in contact with the yarn, and appliances for releasing said spring from such increased strain after the scraper has passed underneath the drum.

5. In an apparatus for printing yarns, the combination with the yarn-drum, the color-carriage and the color-wheel, of a scraper, means for placing said scraper in a position lower than the yarn on the drum while said scraper is ahead of the color-wheel and for so maintaining it on its return trip until after it passes underneath said drum, and mechanism for forcing the scraper upward and against the yarn after it has passed underneath the drum.

6. In an apparatus for printing yarns, the combination with the yarn-drum, the color-carriage and the color-wheel, of a scraper, means for holding said scraper in an elevated position while it travels behind the color-wheel and underneath the drum and for afterward maintaining it in an elevated position until after the direction of the travel of the carriage has been reversed and said scraper has thereby been placed ahead of the color-wheel, and mechanism for lowering said scraper after such reversal.

7. In an apparatus for printing yarns, the combination with the yarn-drum, the color-carriage and the color-wheel, of a scraper, a post upon which it is mounted, a spring placed around said post and adapted to actuate the same, a casing surrounding said spring and a portion of said post, and a cap fitted around said post and tightly secured to the upper portion of said casing and serving as a guide for said post.

8. In an apparatus for printing yarns, the combination with the yarn-drum the color-

carriage and the color-wheel, of a bracket on the carriage, a scraper, a support for the same movably mounted upon said bracket, a lever for actuating said support, and means for
 5 confining said lever in contact with the under side of the bracket in two different positions corresponding with the operative and a non-operative position of the scraper.

9. In an apparatus for printing yarns, the
 10 combination with the yarn-drum, the color-carriage and the color-wheel, of a scraper, a support for the same, a guide along which said support slides, a rocking lever for raising and lowering the support, a tripper for
 15 actuating said lever, and a spring for enforcing operative contact between the lever and the tripper.

10. In an apparatus for printing yarns, the
 20 combination with the yarn-drum, the color-carriage and the color-wheel, of a scraper, a support for the same, a guide along which said support slides, a rocking lever for raising and lowering the support, a tripper for actuating said lever, and a spring for enforcing
 25 operative contact between the scraper and the yarn, and between the lever and the trippers.

11. In an apparatus for printing yarns, the
 30 combination with the yarn-drum, the color-carriage and the color-wheel, of bracket 24, a scraper, post 26 supporting the same, spring 25, stud 32, link 33, lever 35 and means for actuating said lever, substantially as specified.

35 12. In an apparatus for printing yarns, the combination with the yarn-drum the color-carriage and the color-wheel, of a scraper, a support for the same adapted to be raised and lowered, and a stationary tripping device,
 40 vice, and a movable tripping device, one for

raising the scraper and the other for lowering said scraper, and elastic means for permitting said support to engage with one of said tripping devices while moving in one direction without actuating the scraper, and
 45 for enforcing movement of the scraper as said support engages with said tripping device while moving in the opposite direction.

13. In an apparatus for printing yarns, the
 50 combination with the yarn-drum, the color-carriage and the color-wheel, of a scraper, a support for the same adapted to be raised and lowered, and a tripping device, and means for permitting said support to engage with
 55 said tripping device while moving in one direction without actuating the scraper and for enforcing movement of the scraper as said support engages with said tripping device while moving in the opposite direction.

14. In an apparatus for printing yarns, the
 60 combination with the yarn-drum, the color-carriage and the color-wheel, of a scraper, means mounted upon the carriage for raising and lowering the same, a shaft revolubly
 65 mounted placed along the track, a cross-bar attached to said shaft, and an inclined tripper for actuating the means for raising the scraper attached to said cross-bar, and treadle
 70 mechanism for revolving said shaft and for placing said actuating device in an inoperative position.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 11th day of February, 1902.

ALFRED FORNANDER.

Witnesses:

CHAS. L. HORACK,
 M. TURNER.