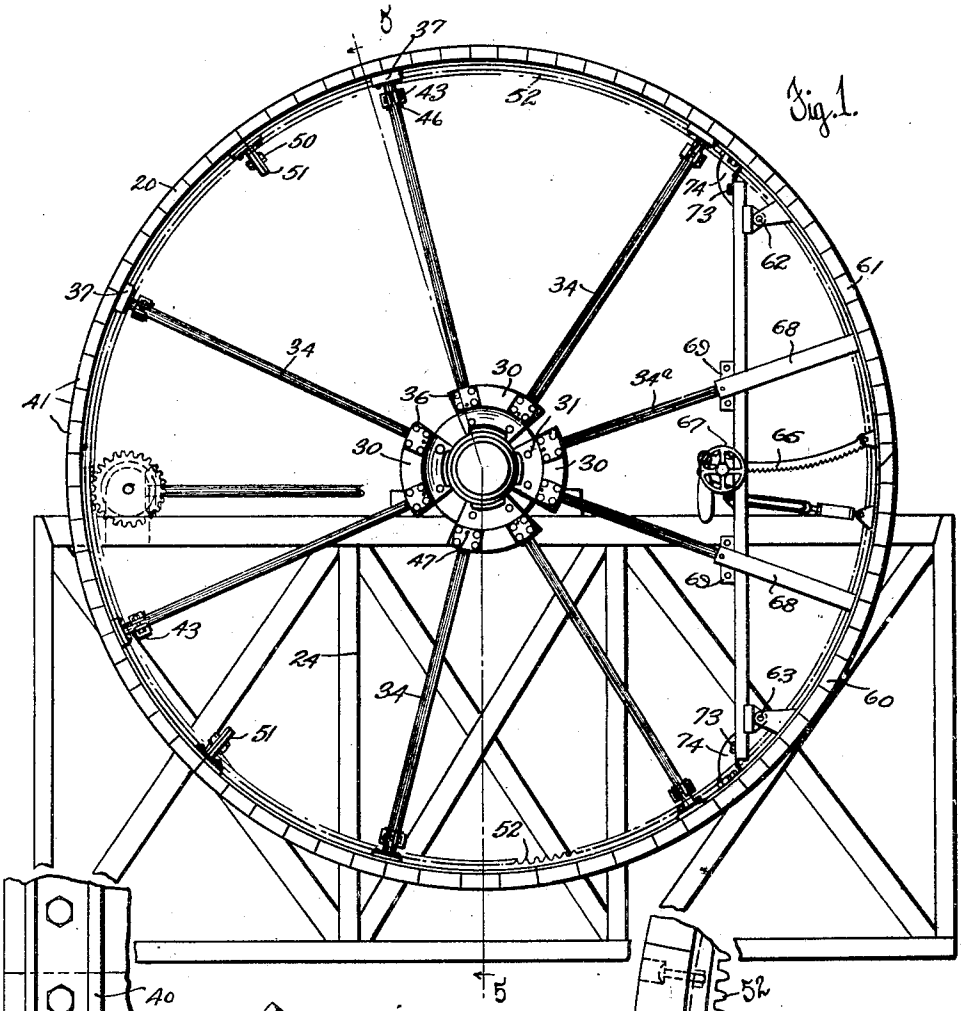
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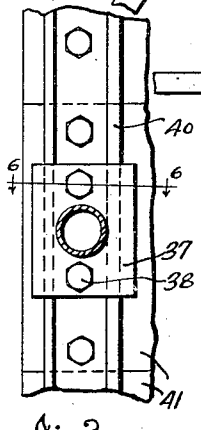


Fig. 3.

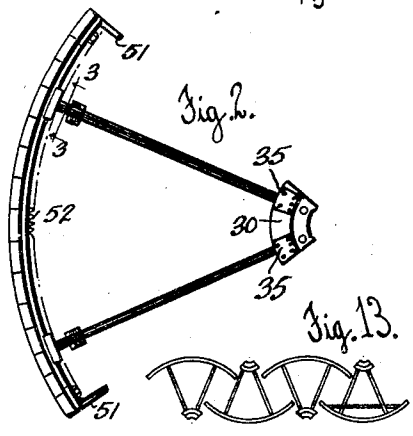


Fig. 2.

Fig. 13.

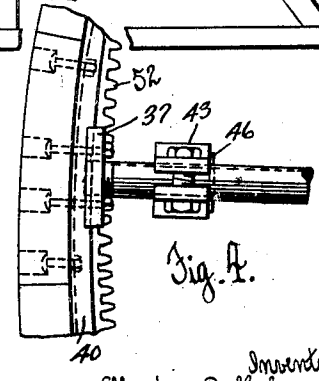


Fig. 4.

Inventors
Elbridge R. Holmes,
Walter Y. Robb and
Charles R. Howard
Southgate & Southgate
Attorneys

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Fig. 5.

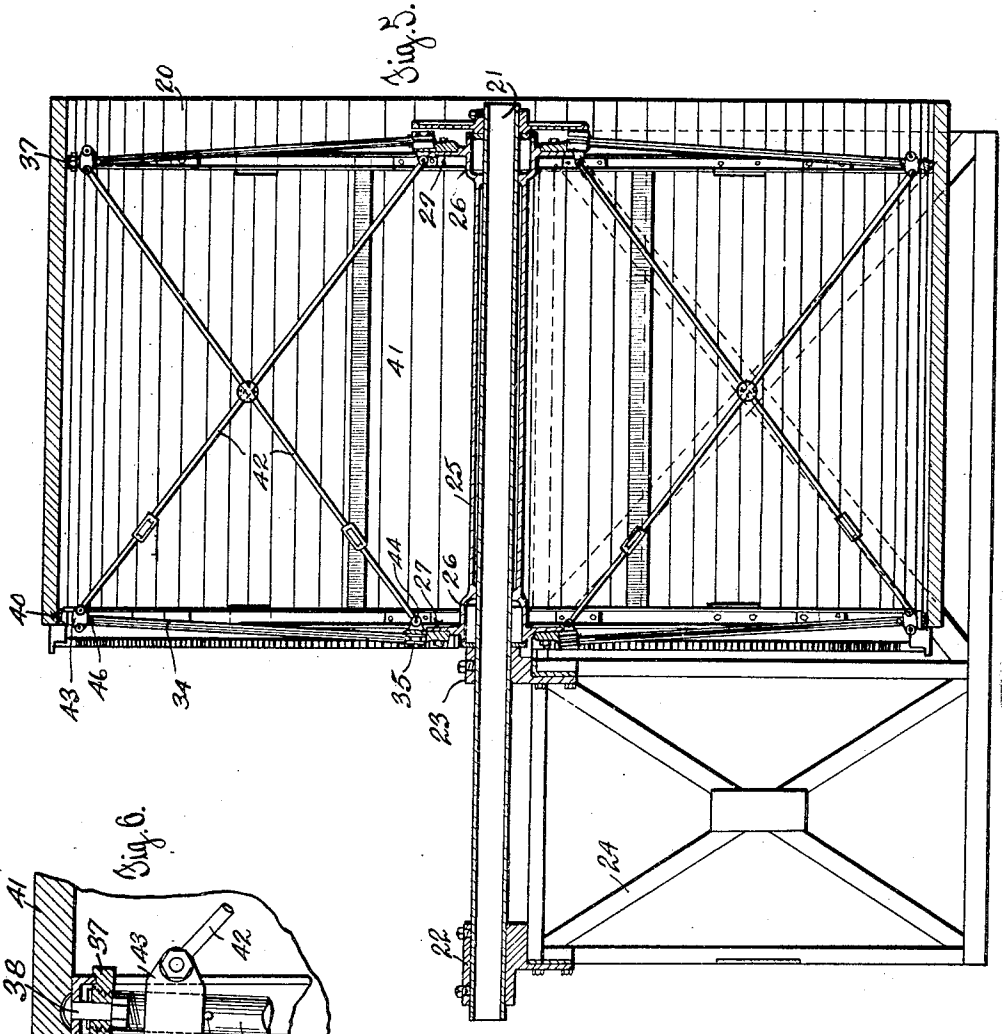


Fig. 6.

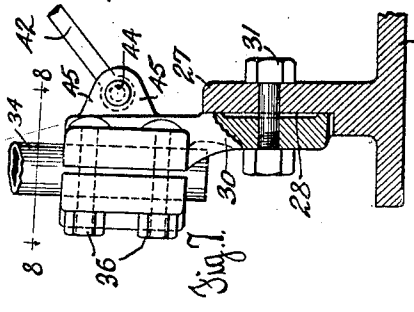


Fig. 7.

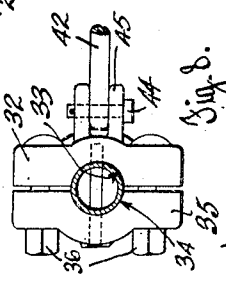


Fig. 8.

Inventors,
Elbridge R. Holmes
Walter Y. Robb and
Charles R. Howard
Southgate & Southgate
Attorneys.

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Fig. 9.

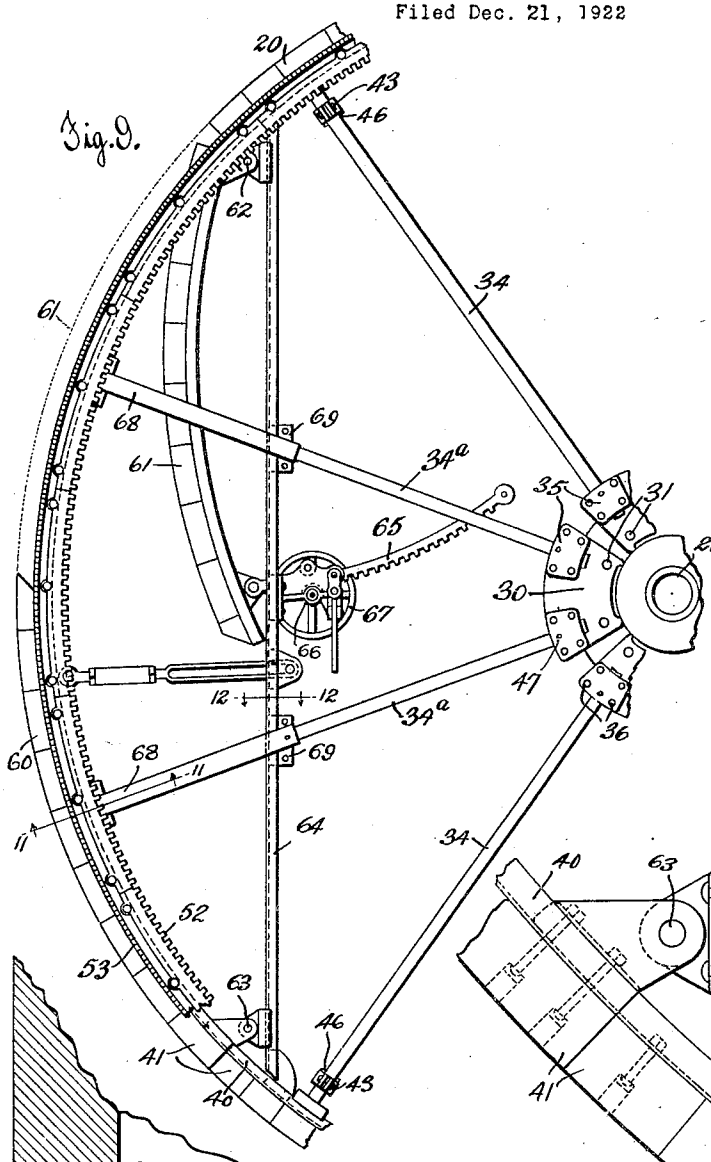


Fig. 12.

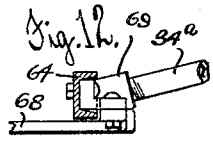


Fig. 10.

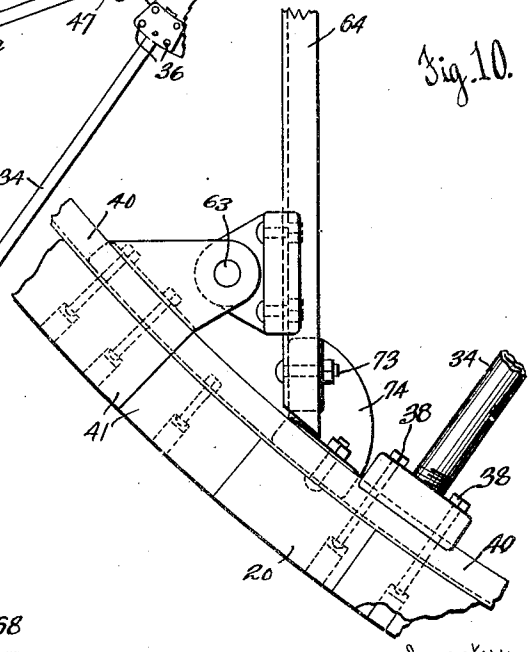
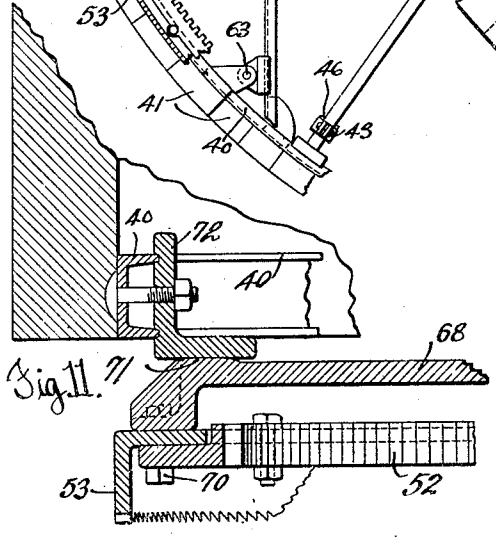


Fig. 11.



Inventors
Elbridge R. Holmes
Walter Y. Robb and
Charles R. Howard
Townsend & Townsend
Attorneys

Patented Aug. 26, 1924. 1,506,343

UNITED STATES PATENT OFFICE.

ELBRIDGE R. HOLMES, WALTER Y. ROBB, AND CHARLES R. HOWARD, OF WORCESTER, MASSACHUSETTS, ASSIGNORS TO CROMPTON & KNOWLES LOOM WORKS, OF WORCESTER, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

PRINTING DRUM.

Application filed December 21, 1922. Serial No. 608,298.

To all whom it may concern:

Be it known that we, ELBRIDGE R. HOLMES, WALTER Y. ROBB, and CHARLES R. HOWARD, all citizens of the United States, all residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Printing Drum, of which the following is a specification.

This invention relates to improvements in the large drums used in the textile industry for printing warp threads for tapestry carpets and other similar fabrics. Such drums are commonly of very large diameter and wide face and cannot be shipped in complete assembled condition.

It is one object of our invention to provide a construction by which a drum of this type may be easily separated into unitary sections for shipment and may be thereafter readily re-assembled with a small expenditure of labor and without disturbing the cylindrical contour of the drum sectors.

A further object of our invention is to provide an improved construction by which the driving gear and index of the drum may be laterally supported adjacent the inwardly movable parts of the drum surface.

Our invention further relates to arrangements and combinations of parts which will be hereinafter described and more particularly pointed out in the appended claims.

A preferred form of the invention is shown in the drawings in which

Fig. 1 is a front elevation of our improved printing drum;

Fig. 2 is a front elevation of a separated drum sector;

Fig. 3 is a detail sectional view, taken along the line 3—3 in Fig. 2;

Fig. 4 is an enlarged detail front elevation, showing the connection between one of the supporting rods or spokes and a drum rim;

Fig. 5 is a sectional side elevation, taken along the line 5—5 in Fig. 1;

Fig. 6 is a detail sectional elevation, taken along the line 6—6 in Fig. 3;

Fig. 7 is an enlarged sectional detail view, also taken along the line 5—5 in Fig. 1;

Fig. 8 is a sectional plan view, taken along the line 8—8 in Fig. 7;

Fig. 9 is an enlarged front elevation of a portion of the drum, showing the mechanism for inwardly retracting portions of the drum surface;

Fig. 10 is a detail front elevation of certain parts shown in Fig. 9, still further enlarged;

Fig. 11 is a detail sectional view, taken along the line 11—11 in Fig. 9;

Fig. 12 is a detail sectional view, taken along the line 12—12 in Fig. 9; and

Fig. 13 is a diagrammatic view, showing the manner in which the drum sectors may be placed for shipment.

Referring to the drawings, we have shown a printing drum 20 rotatably mounted upon a fixed tubular member 21 which is secured in brackets 22 and 23 supported on a strongly braced frame work 24. A hollow shaft 25 (Fig. 5) is rotatably mounted on the tubular member 21 and is preferably formed as a casting having an enlarged hub 26 at each end provided with outwardly extending flanges 27 (Fig. 7). Each of these flanges is formed with an annular recess 28 having finished surfaces both at the back and at the bottom of the recess.

Segment plates 30 (Figs. 7 and 9) are secured to the flanges 27 by bolts 31. The outwardly extending portion 32 of each segment plate 30 is formed with substantially semi-circular recesses 33 to receive the inner ends of rods or spokes 34 which support the drum 20. These rods 34 are clamped in the recesses 33 by similarly recessed caps 35 secured by bolts 36. The outer end of each rod or spoke 34 is threaded to receive a block 37 (Fig. 6) which is secured by bolts 38 (Fig. 10) to the channel iron 40 which forms one of the rims of the drum.

Thick wooden planks or lags 41 are bolted to the outer faces of the rims 40 and after being placed in position are carefully turned to provide an accurate cylindrical surface. The spokes or rods 34 are commonly disposed at a slight angle to the planes of the rims 40 and each block 37 is consequently grooved to different depths along the two edges thereof to receive the edges of the rim 40, this arrangement permitting angular disposition of the spokes, as clearly shown in Fig. 6.

Cross rods or braces 42 (Fig. 5) are secured at their outer ends to collars 43

clamped to the spokes 34, and at their inner ends they are pivotally connected by studs 44 to flanges 45 formed on the portion 32 of each segment plate 30. A cross pin 46 (Fig. 6) may be provided to prevent movement of the collar 43 toward the axis of the drum and the spokes 34 may also be secured in the plates 30 by cross pins 47 (Fig. 9), if so desired. These latter pins are commonly inserted after final adjustment and alignment of the drum has been secured. Turn buckles in the rods 45 assist in aligning the parts.

The rims 40 are formed in sections which are secured together by bolts 50 (Fig. 1) which bind together adjacent brackets 51 secured to the ends of the rim sections. The usual internal driving gear 52 and index rack 53 (Fig. 11) are secured to the side of one of the rims 40. The gear 52 is formed in a plurality of sections and is separable on substantially the same lines as the rims 40. The index plate 53, however, is commonly formed in longer sections and is preferably removed before the drum is dismantled for shipment.

With the construction thus described, it is possible to completely assemble and accurately adjust the printing drum and to thereafter separate it into sector-shaped sections such as are shown in Fig. 2. This is accomplished by removing the bolts 51 securing the rim sections together, and the bolts 31 which secure the plates 30 to the hub flanges 27. The drum is thus easily separated into a number of sectors, each one of which may be handled in a reasonable space. The different sectors may be conveniently disposed for shipment as shown in Fig. 13.

One of the sectors will contain the movably mounted drum portions 60 and 61 shown in Fig. 9. These drum portions are hinged at 62 and 63 to the opposite ends of bars 64, each clamped to a pair of short spokes or rods 34[a] which extend outward only as far as the bars 64. A rack 65, pinion 66 and hand wheel 67 are provided for swinging the drum portion 61 inward to the position shown in full lines in Fig. 9, after which the portion 60 may be moved inward, relieving the tension on the warp so that the warp may be easily removed from the drum.

The movable drum portions 60 and 61 and the mechanism for moving the same is old and well known and in itself forms no part of our present invention. The drum sector having the movable portions 60 and 61 may be removed as a unit by taking out certain bolts 73 (Fig. 10) which secure the ends of the bars 64 to brackets 74 bolted to the adjacent ends of the rim 40.

It will be noted that the gear 52 and index 53 are not secured to the rim 40 in its movable portions, but are supported beyond the pivots thereof on the adjacent fixed portions of the rim 40. Guide plates or braces 68 (Figs. 9, 11 and 12) are secured to the ends of the spokes 34[a] and to the bars 64 by castings 69 (Fig. 12). At their outer ends the plates or supports 68 are secured by bolts 70 (Fig. 11) to the gear 52 and index plate 53 and support the same radially.

A slight projection 71 is formed on the inner face of each plate 68 near its outer end, as shown in Fig. 11, and this projection 71 is engaged by a bracket 72 bolted to the movable portion of the rim 40, as the drum portions 60 and 61 are returned to their outer operative positions. These brackets thus firmly support the gear and index plate against lateral movement while at the same time they permit the drum portions to be moved freely inward when desired.

Having described the construction of our improved printing drum, the advantages thereof will be apparent. As previously explained, the drum may be very easily separated into sections of sector shape which may be economically packed and shipped and which may be handled without difficulty. At the same time, each sector is strongly framed as a unit and retains the exact form to which it has been adjusted and turned. The drum may be quickly and easily re-assembled after shipment and the different sectors commonly require no further adjustment.

Having indicated a preferred construction of our invention, we do not wish to be limited to the details herein disclosed otherwise than as set forth in the claims, but what we claim is:—

1. In a textile printing machine, a drum made in unitary sections, a supporting shaft for said drum, connections between said sections, and means to separately support each section on said shaft, each section and its supporting means being removable as a unit from said machine.

2. In a textile printing machine, a shaft having flanged hubs thereon, a drum made in separate sections, segment plates for each section, frame members connecting said segment plates to said drum sections, means to secure said sections to each other, and means to secure said segment plates to said hubs.

3. In a textile printing machine, a shaft having flanged hubs, a drum made in separate sections, segment plates for each section, a pair of rods connecting each segment plate to its associated drum section, cross braces connecting each segment plate to the opposite edge portion of said drum, means to detachably secure said sections together, and means to detachably secure said segment plates to said flanged hubs.

4. In a textile printing machine, a drum, a shaft, and means to mount said drum on said shaft, said means comprising flanged hubs on said shaft each having a finished annular recessed surface, a plurality of segment plates detachably secured to said hubs against said surface, clamping devices on said plates, and rods connecting said drum to said plates and secured in said clamping devices.

5. In a textile printing machine, a drum having a fixed frame and having drum portions inwardly movable to release the warp, an annular gear and index mounted on the fixed frame of said drum, and co-operating parts on said fixed frame and movable drum portions effective to laterally align and support said gear and index by engagement as said drum portions approach operative position.

6. In a textile printing machine, a drum having a fixed frame and having drum portions inwardly movable to release the warp, an annular gear and index mounted on the fixed frame of said drum, supporting plates on said fixed frame for aligning said gear and index, and devices on said movable drum portions engaging said plates when said drum portions approach operative position and holding said gear and index from movement out of lateral alignment.

In testimony whereof we have hereunto affixed our signatures.

ELBRIDGE R. HOLMES.
WALTER Y. ROBB.
CHARLES R. HOWARD.