

May 9, 1933.

L. V. CASTO ET AL

1,908,011

APPARATUS FOR DECORATING INSIDE SURFACES OF FRAMES AND THE LIKE

Filed July 17, 1930

6 Sheets-Sheet 1

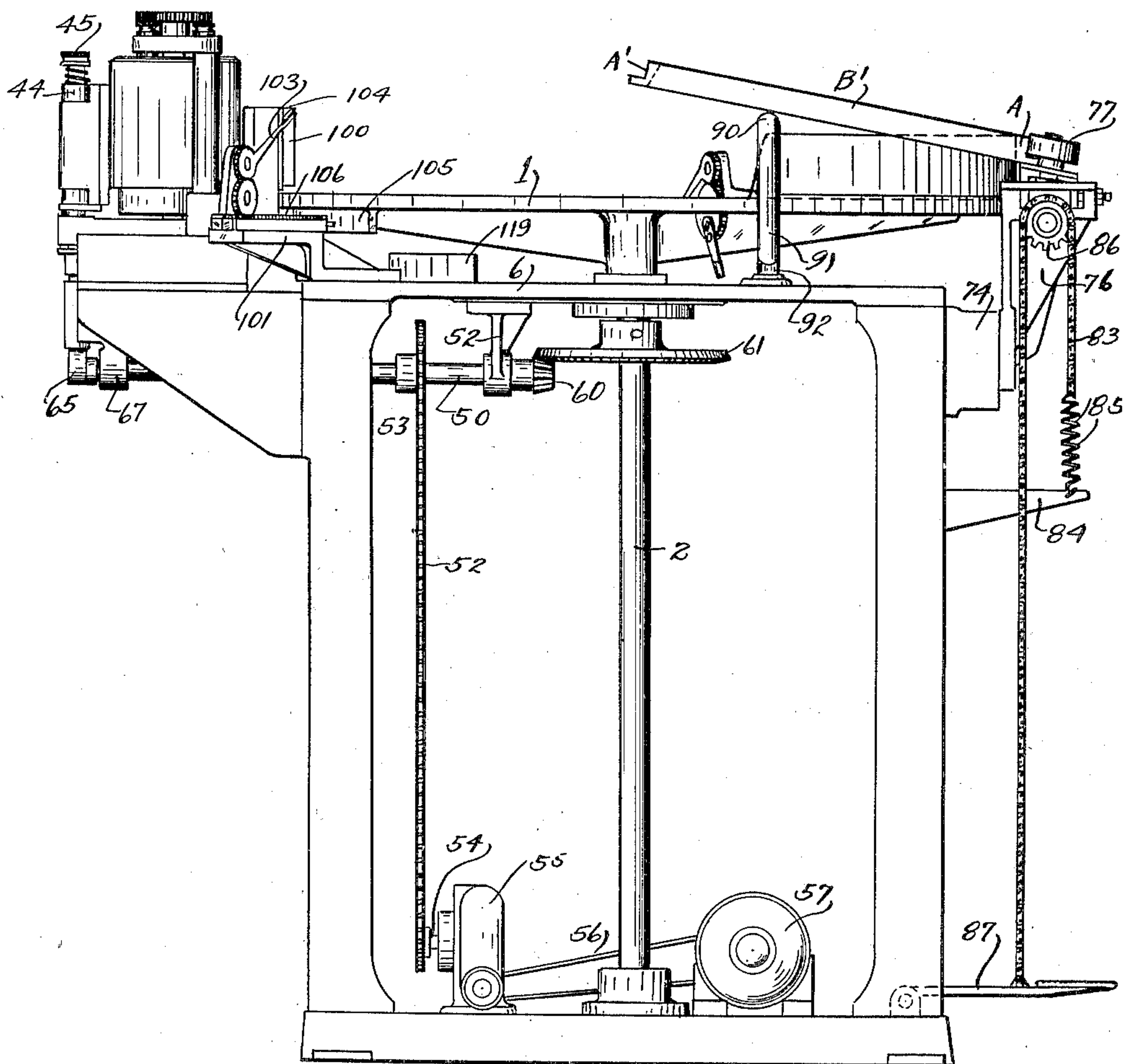


FIG. 1

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6 Sheets-Sheet 2

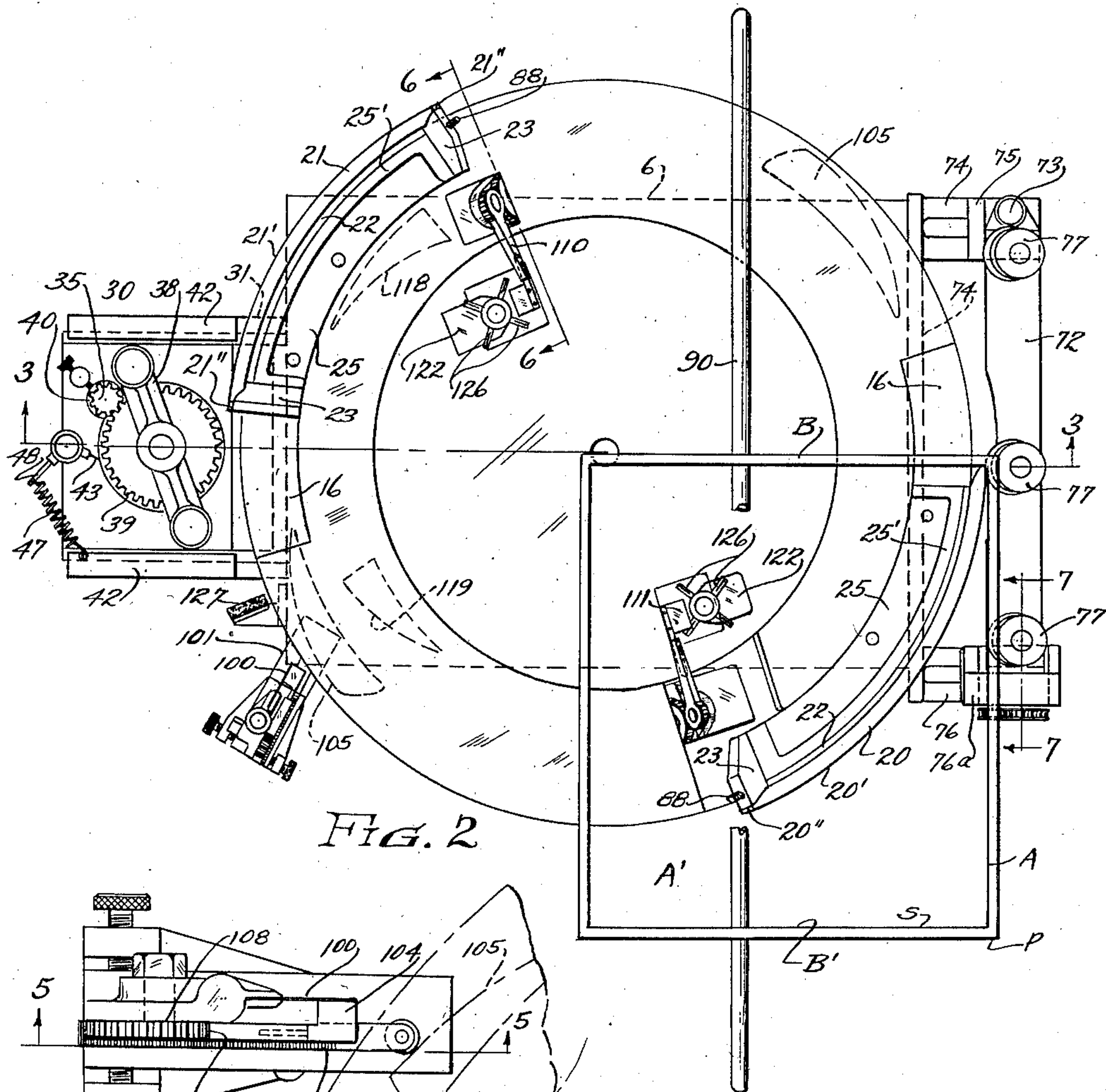


FIG. 2

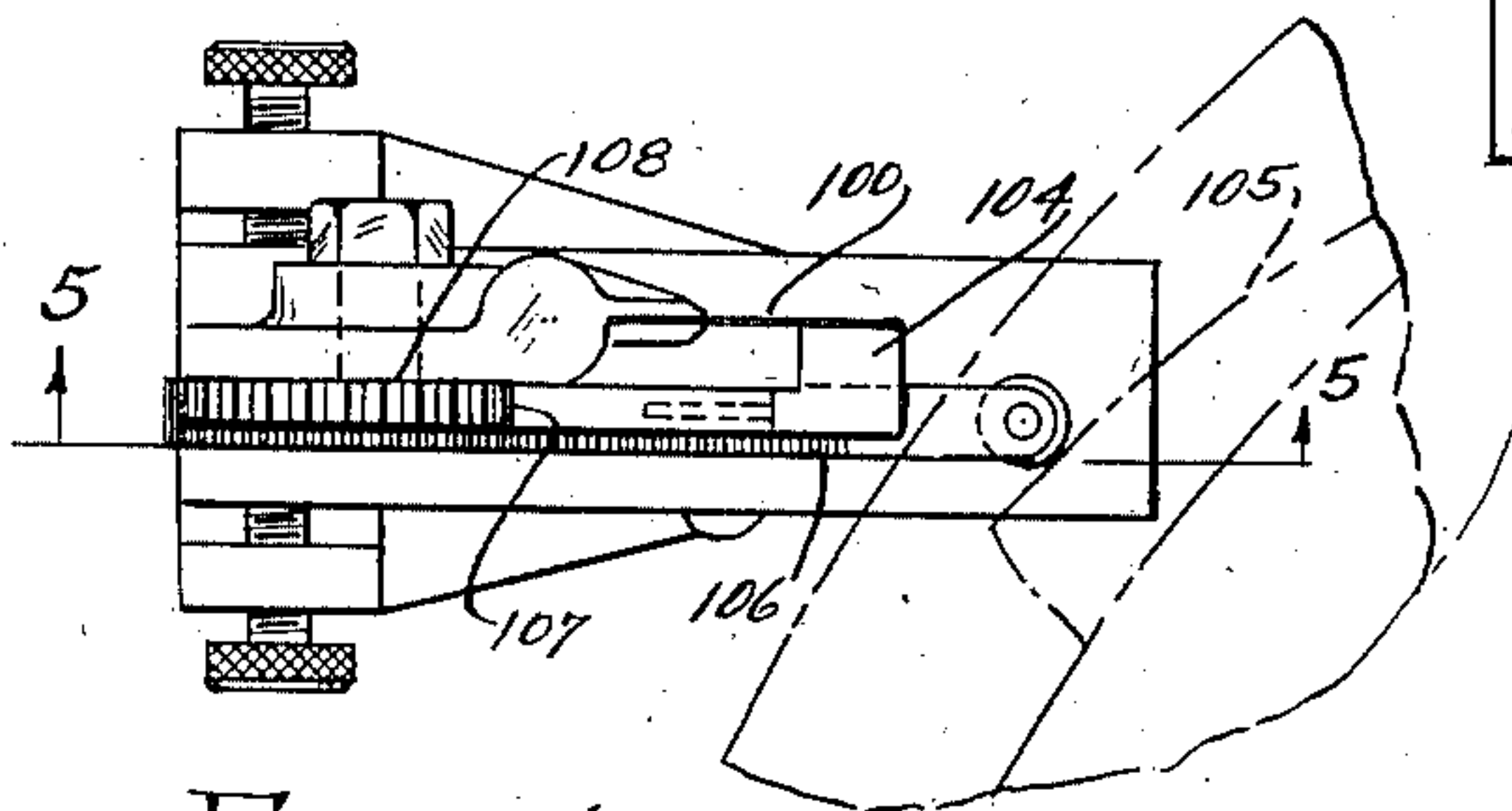


FIG. 4

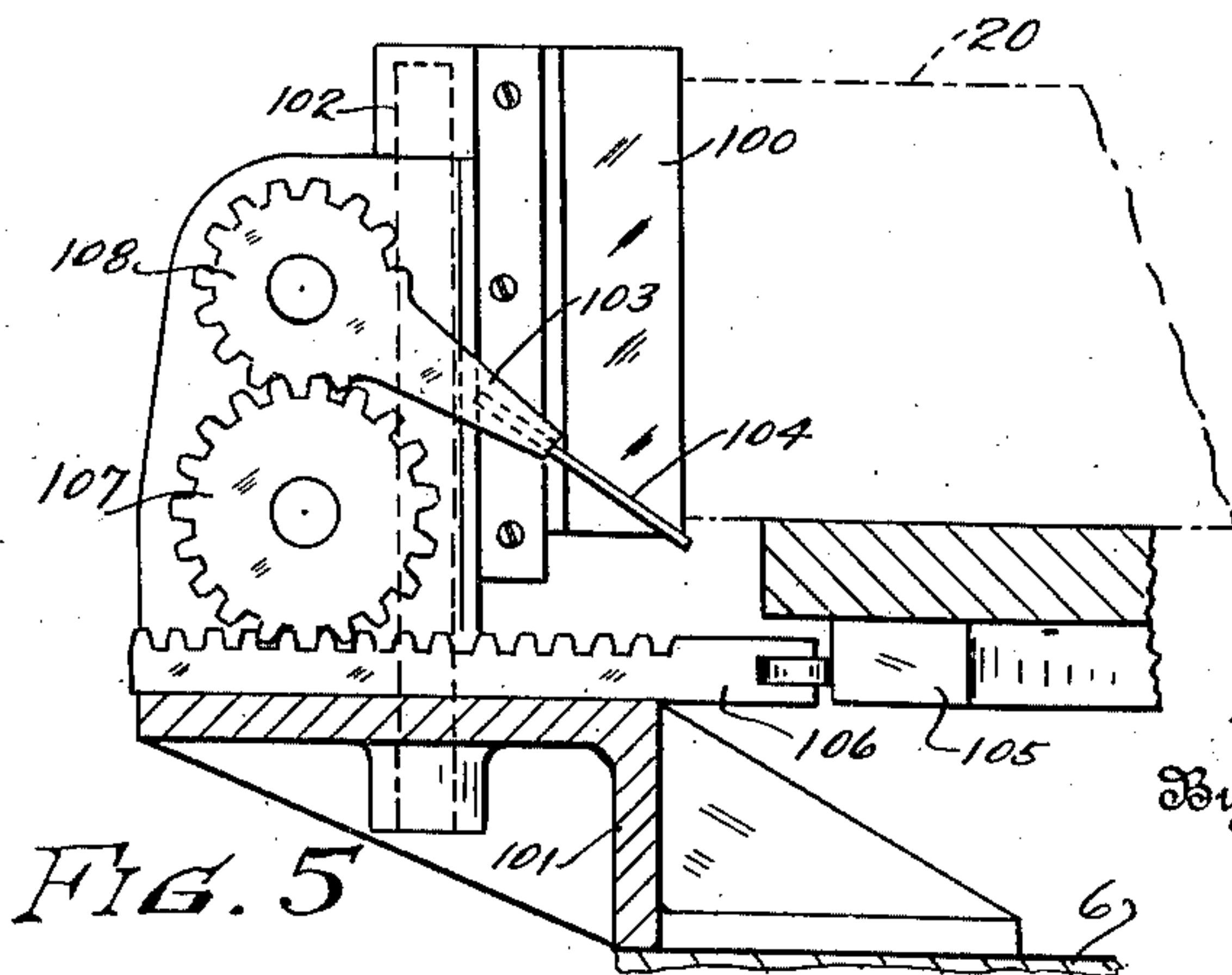


FIG. 5

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6 Sheets-Sheet 3

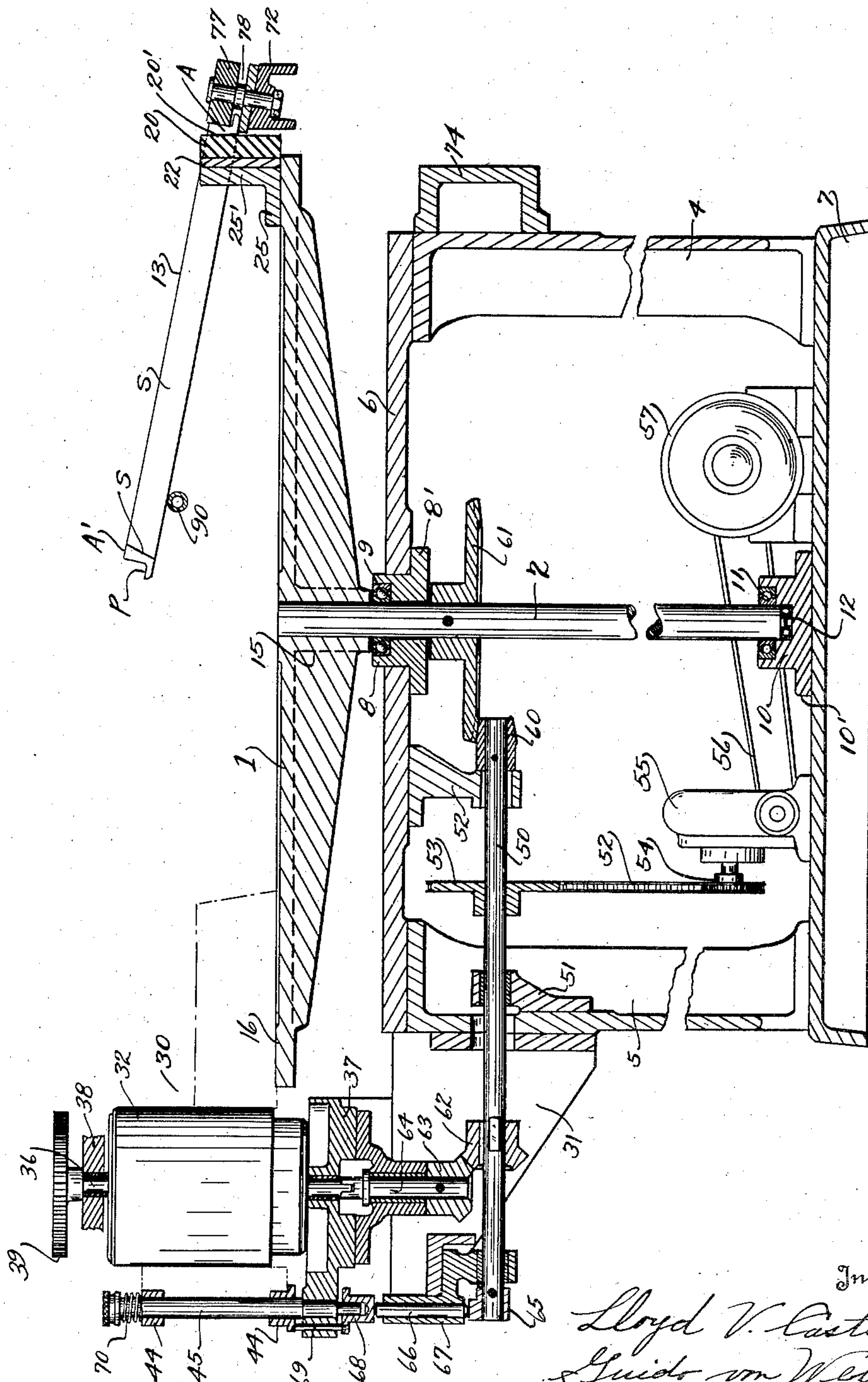


FIG. 3

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6 Sheets-Sheet 4

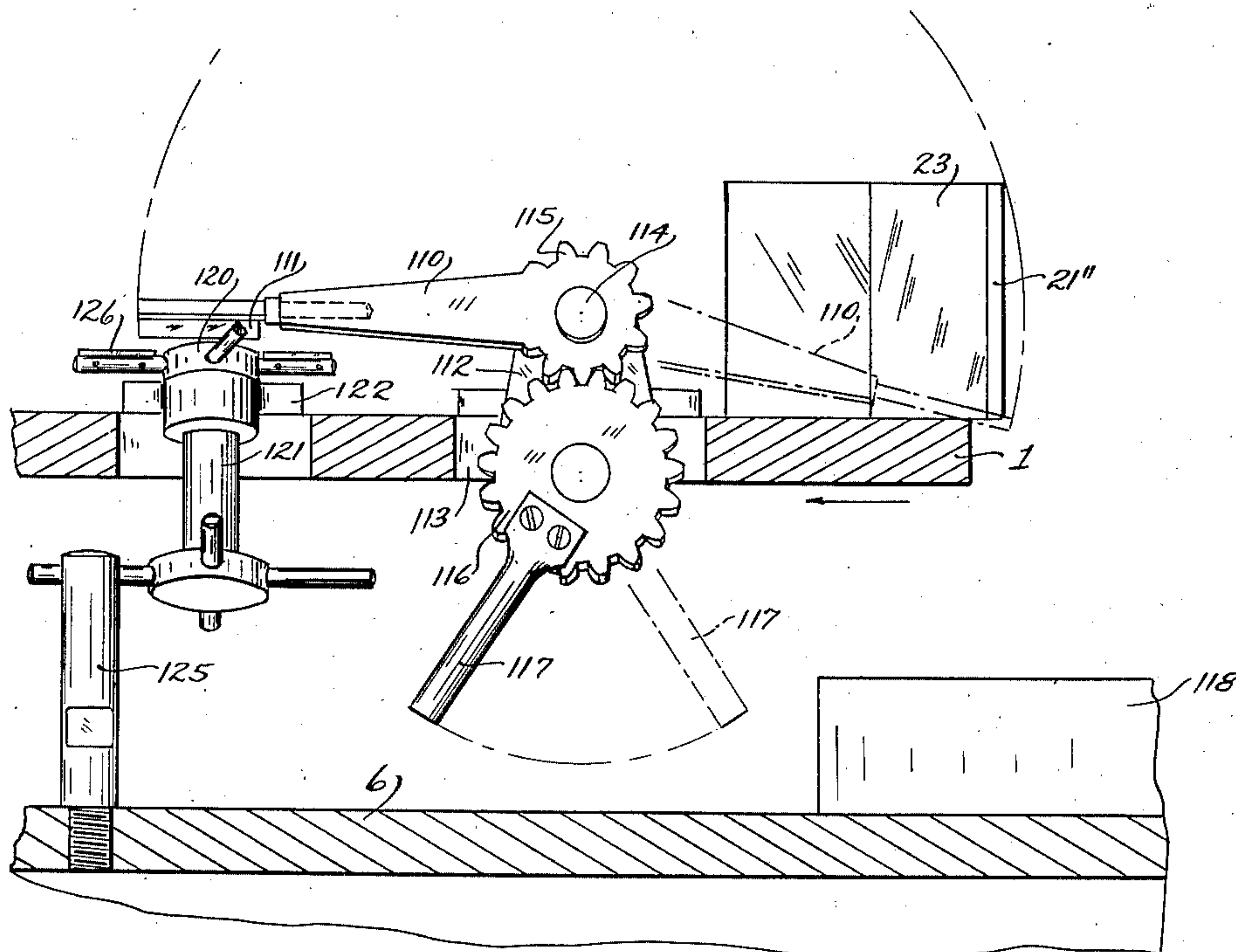
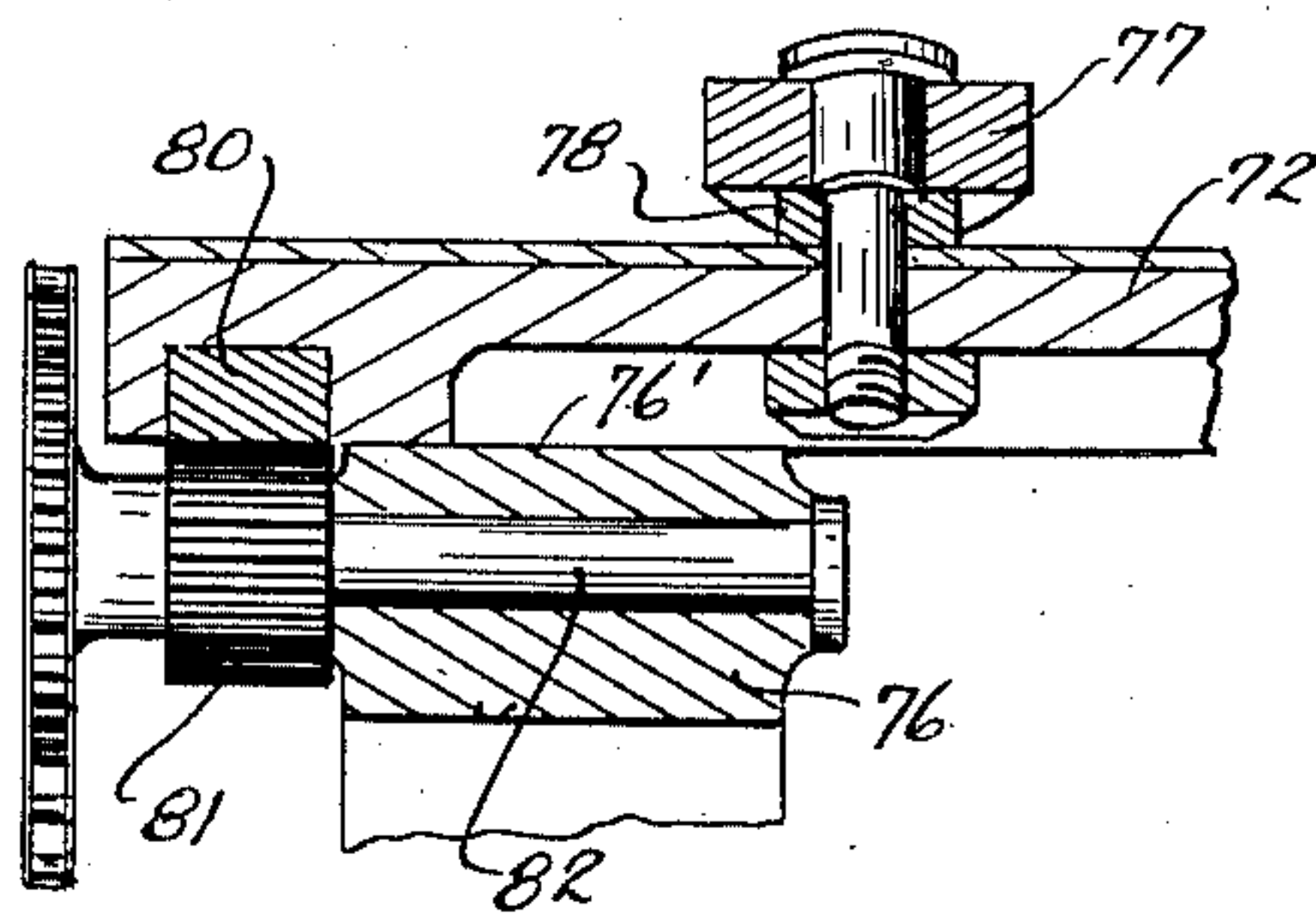


FIG. 6



**FIG. 7**

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6 Sheets-Sheet 5

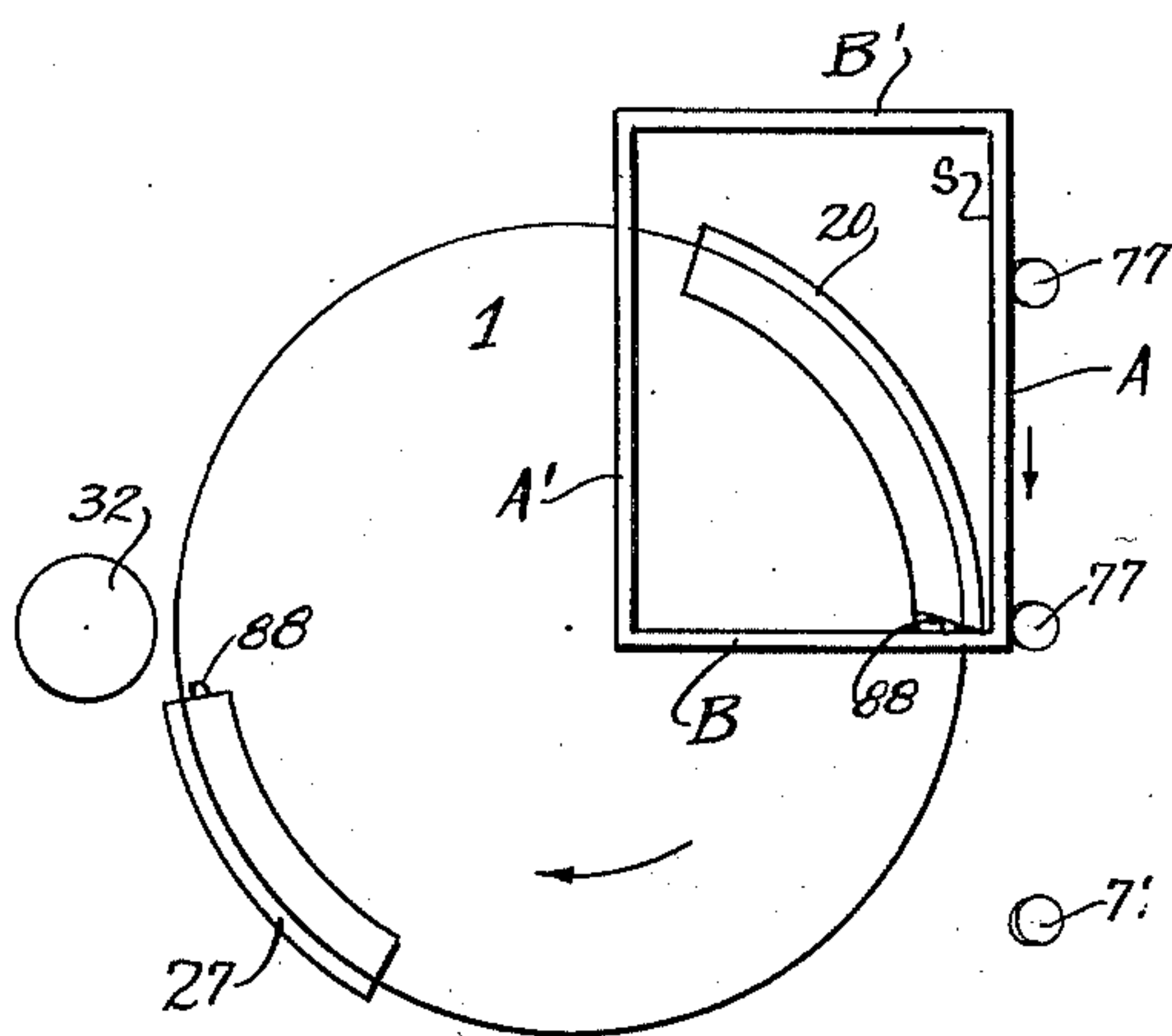


FIG. 8

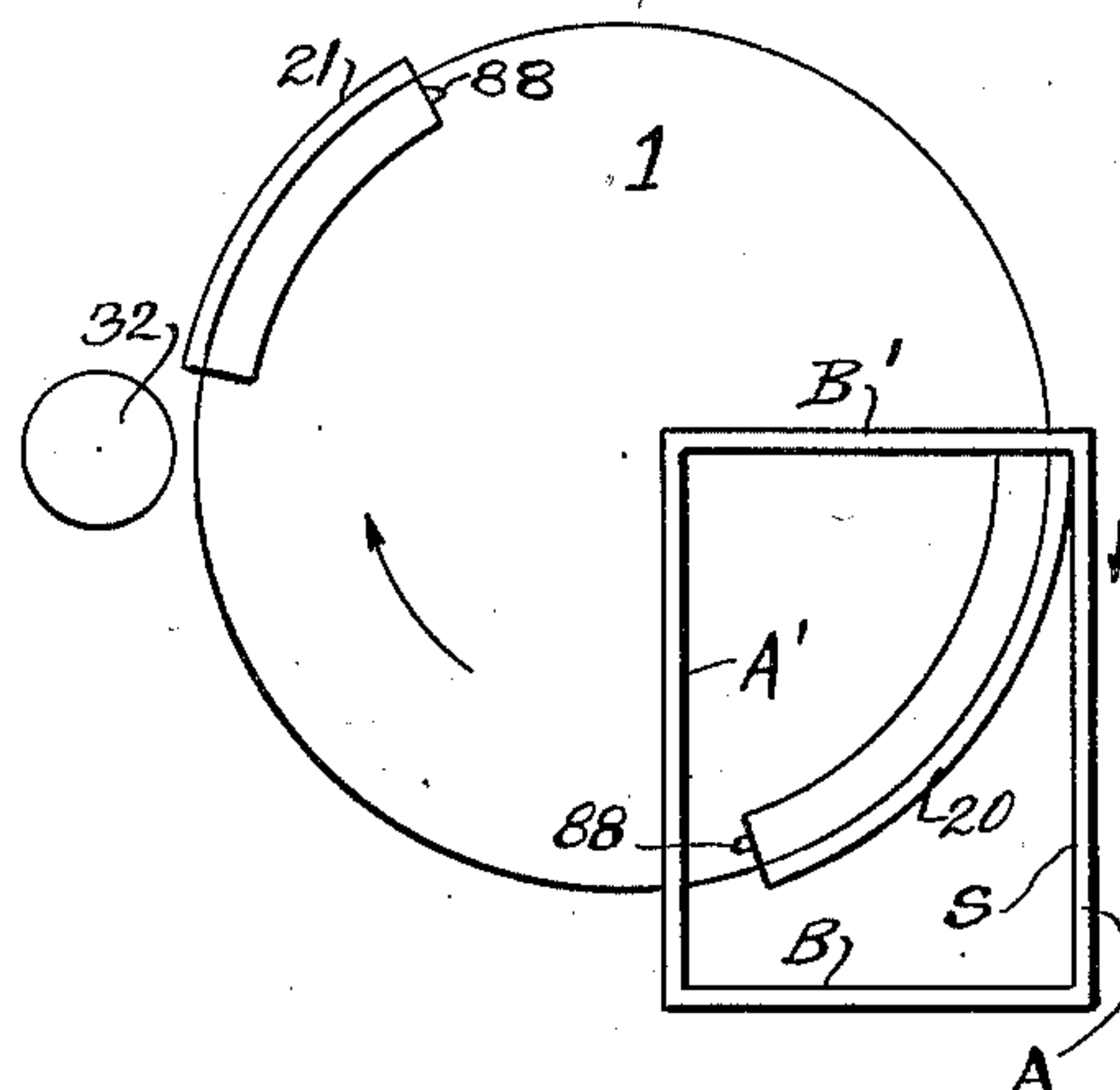


FIG. 9

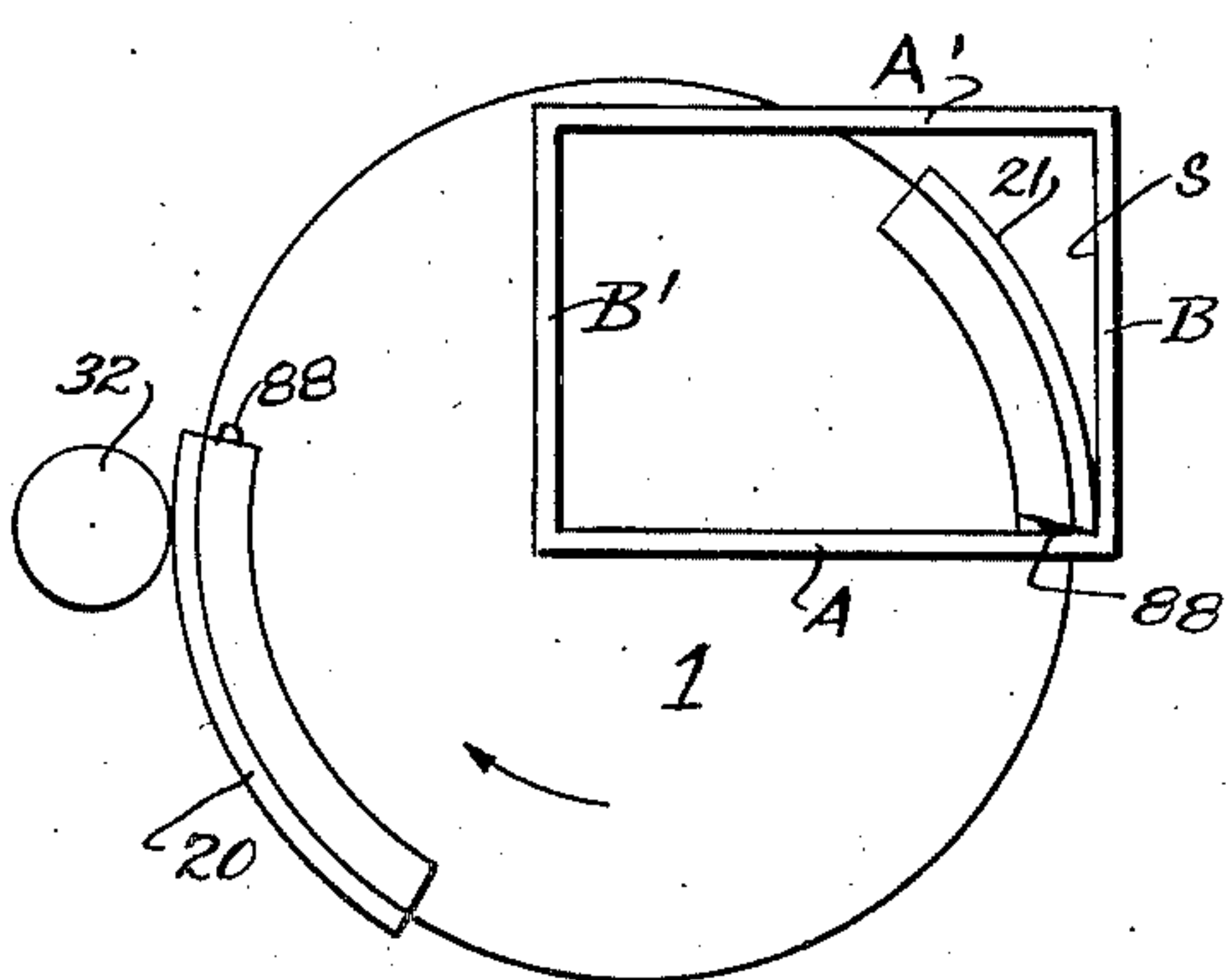


FIG. 10

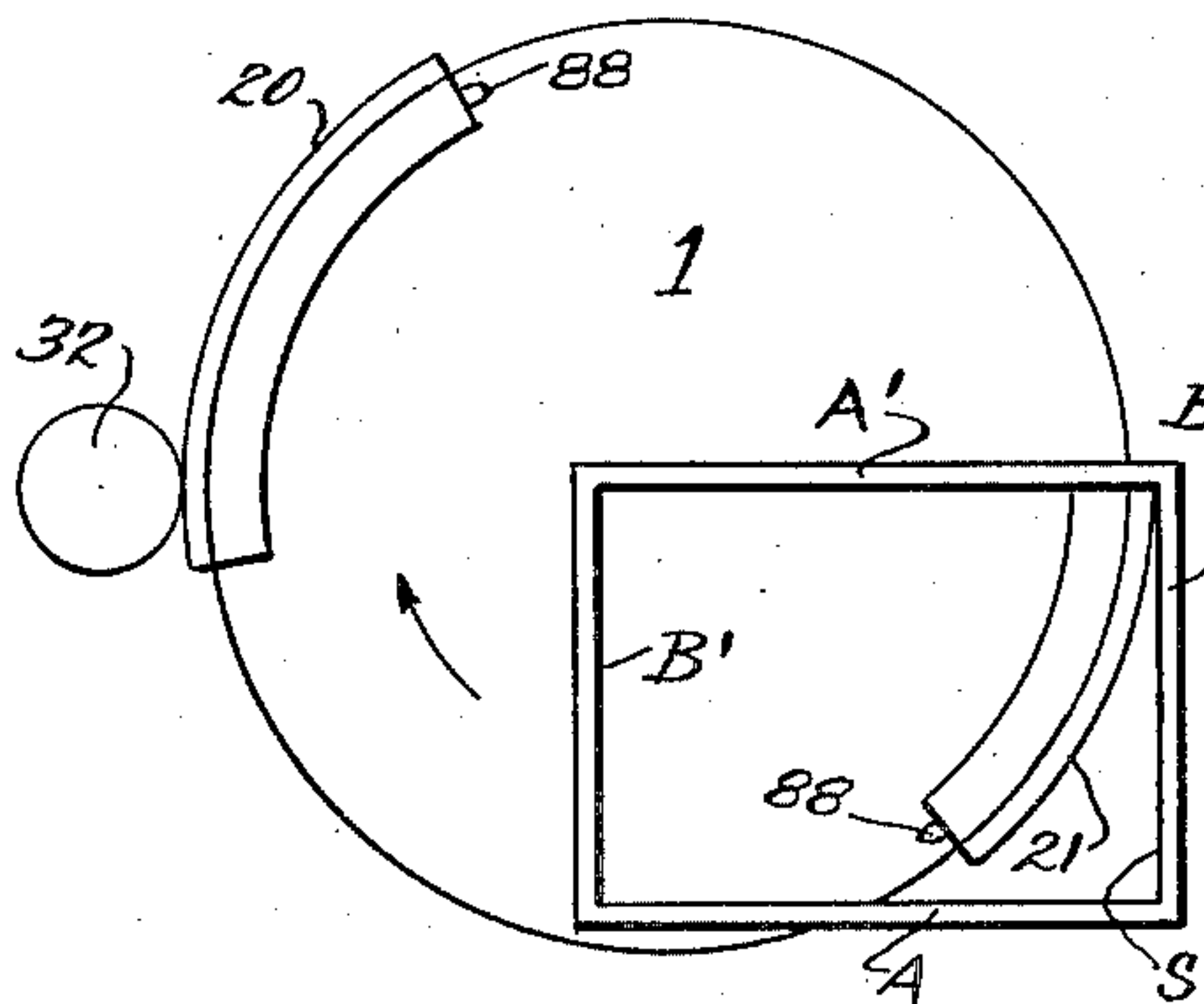


FIG. 11

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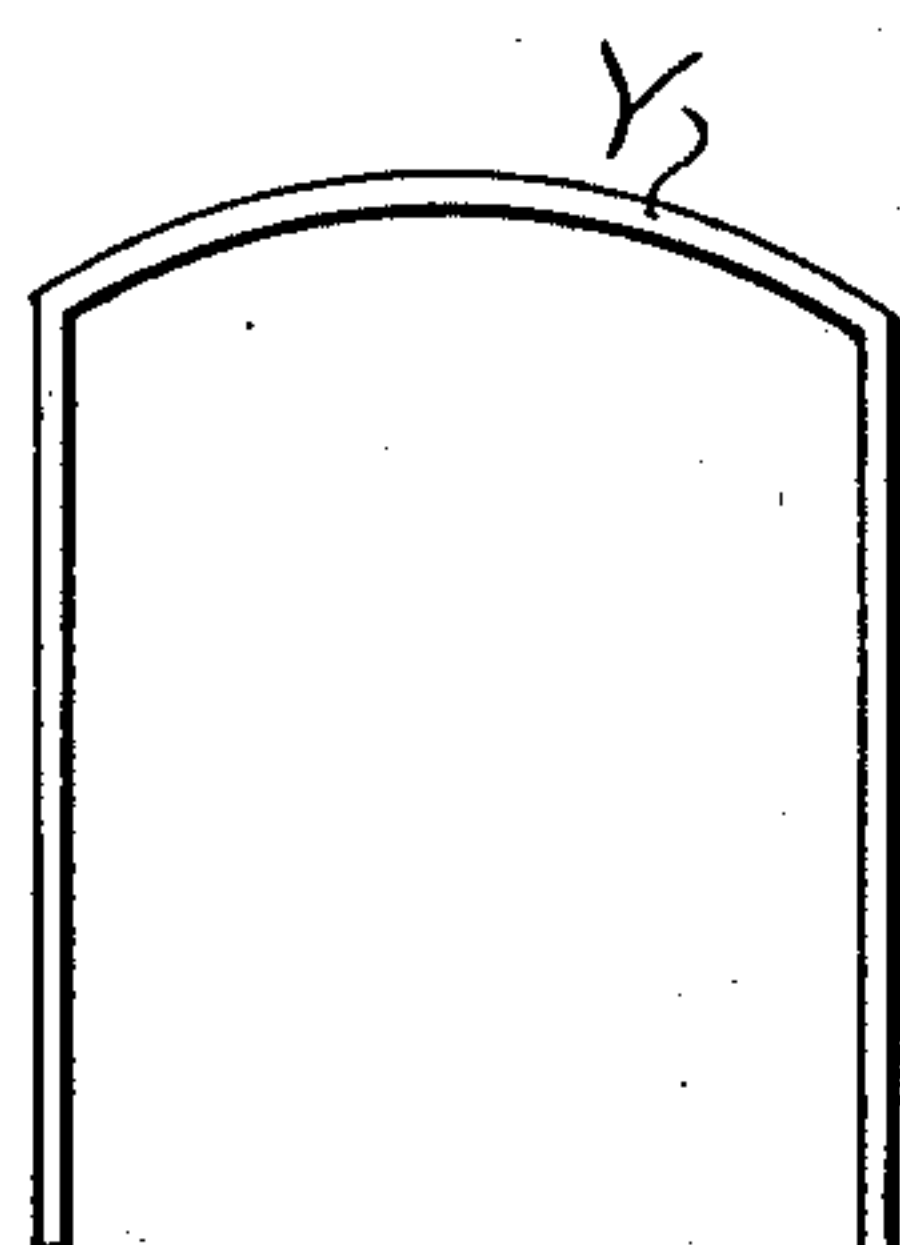
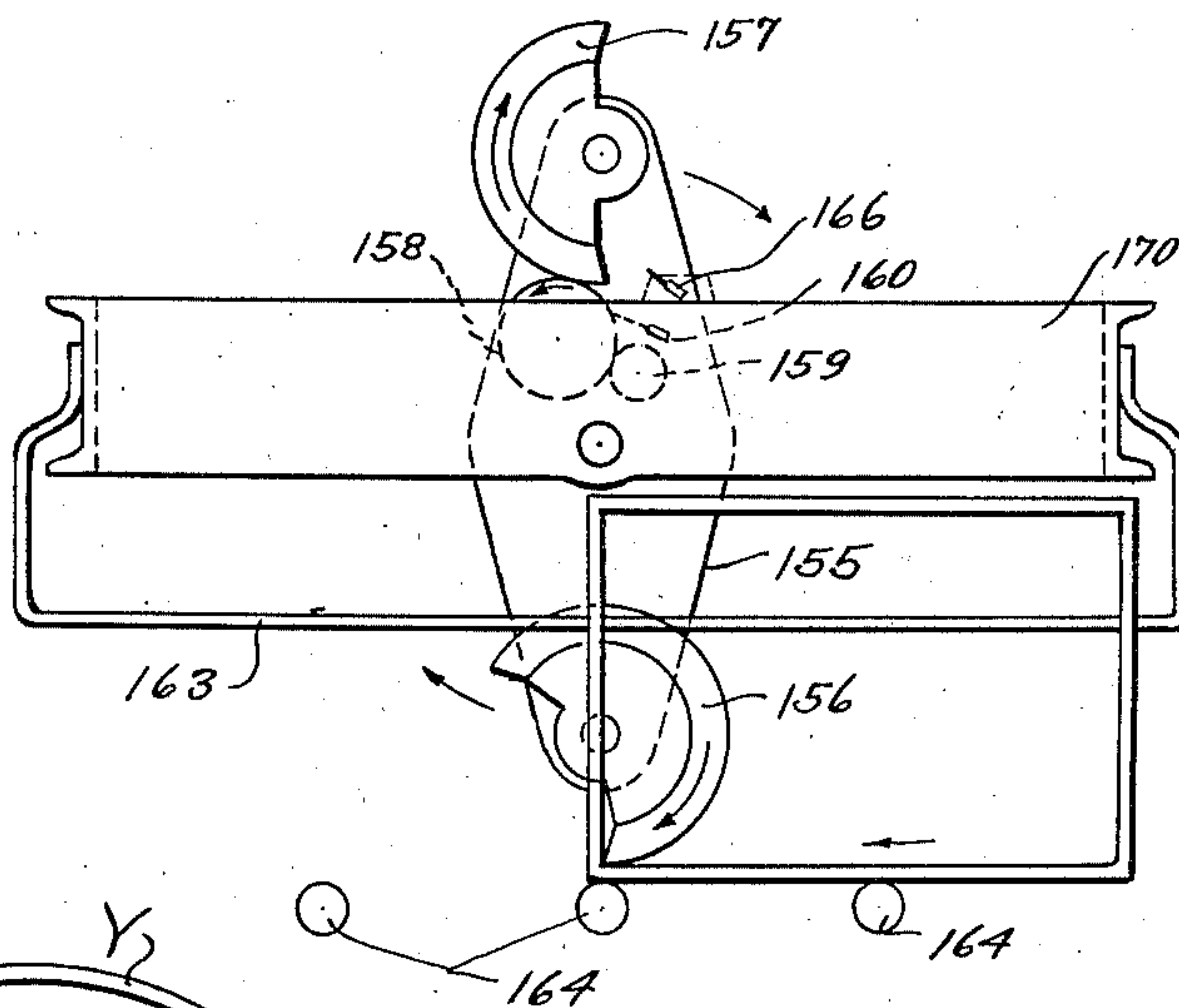
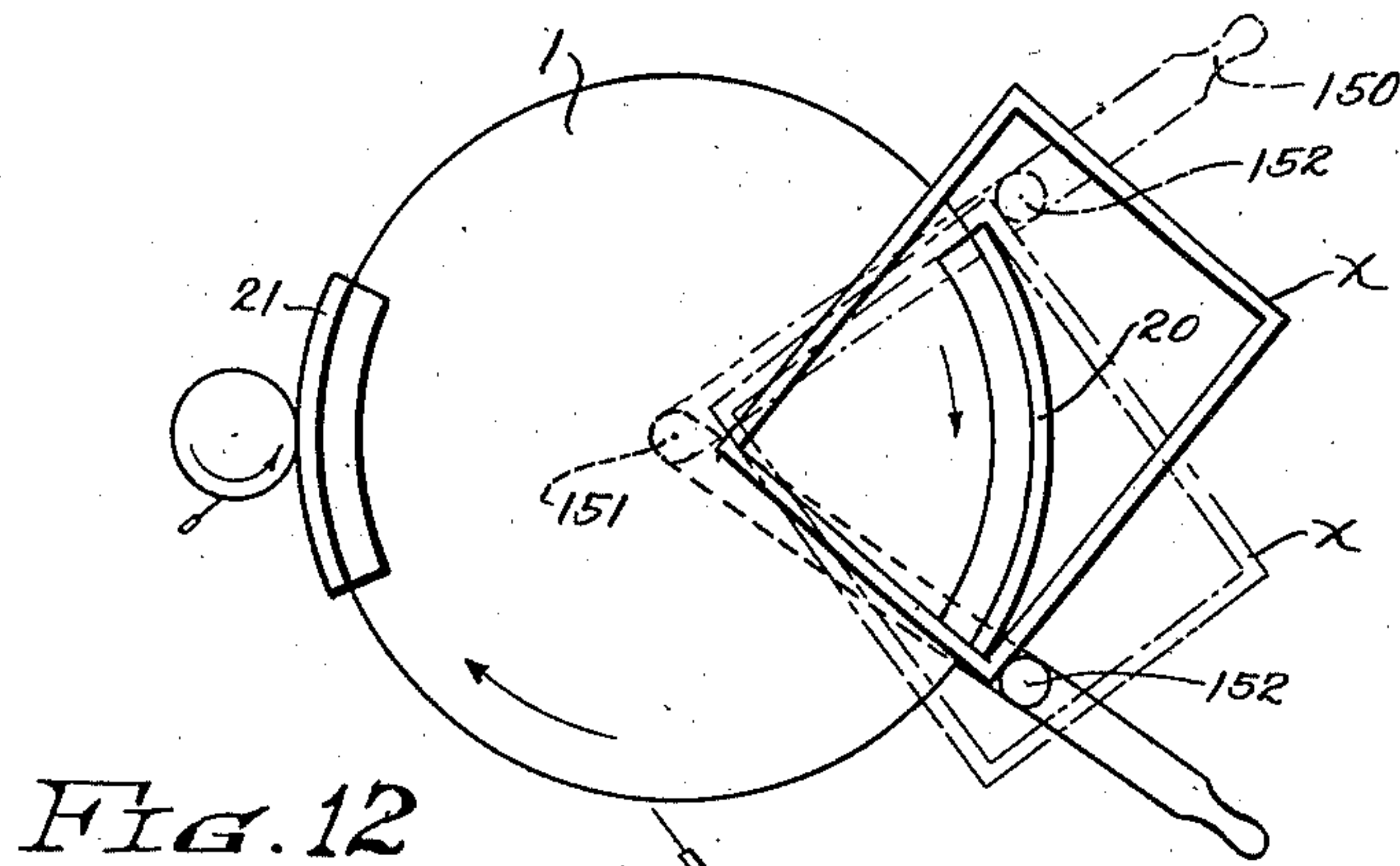
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6 Sheets-Sheet 6



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# UNITED STATES PATENT OFFICE

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## APPARATUS FOR DECORATING INSIDE SURFACES OF FRAMES AND THE LIKE

Application filed July 17, 1930. Serial No. 468,746.

This invention is concerned with an apparatus for decorating articles, such as hollow frames, on the interior surfaces thereof, an example of such work being sheet metal window frames for closed automobile bodies. These frames include substantially contiguous sides which, for the desired inside surface finish, may have imparted thereto a wood or other grained pattern effect. The hollow frame units are of various sizes and sometimes various shapes; usually they are rectangular and completely closed on all four sides, that is, all sides are contiguous with two adjacent sides. Frames of this sort have previously been grained on their inside surfaces by tedious hand methods with more or less success, but it has been found practically impossible to hand grain such frames on a high production basis.

An object of this invention is to provide an efficient apparatus for decorating the inside surfaces of generally hollow articles. By the terms "hollow" or "generally hollow" articles, as herein used, U-shapes, etc. are included.

Another object is to provide an efficient machine for decorating, specifically, grain- ing, the inside surfaces of metal frames having continuous or substantially continuous side members.

Other objects and features of the invention will become apparent from the following description relating to the accompanying drawings, showing the preferred forms of the apparatus and machine and illustrating the various steps of the method as preferably practiced. The essential characteristics are summarized in the claims.

In the drawings, Fig. 1 is a side elevation of a power-driven graining machine, adapted and arranged to carry out the present invention; Fig. 2 is a plan view of the machine showing a piece of work being decorated; Fig. 3 is a substantially central longitudinal sectional view in a vertical plane, showing substantially the entire mechanism, the section being taken generally along the line 3—3 on Fig. 2; Fig. 4 is a detail view of one of the scraper devices for the pattern transfer material used in the machine; Fig. 5

is a sectional detail view substantially according to the line 5—5 on Fig. 4; Fig. 6 is a detail view showing certain other scraper mechanisms, the section being taken substantially along the line 6—6 on Fig. 2; Fig. 7 is a detail view of a portion of the work support and guide arrangement in substantial accordance with the line 7—7 on Fig. 2; Figs. 8 to 11 are diagrammatic illustrations of the preferred sequence of steps in carrying out the method; Figs. 12 and 13 are diagrammatic plan views of still other forms of apparatus or machines by which the method may be carried into effect, and Fig. 14 is an exemplary plan view of a different form of frame, such as may be grained or decorated in accordance with the invention.

In general, the method of handling hollow frames, for example, to decorate their inside surfaces, comprises supporting the frames adjacent a table or the like, revolving adjacent the support and in such manner that blocks or segments of pattern transferring material carried on the table will engage the inside surface, to be decorated, with a rolling contact, which, as the decoration is effected, will move the frame from one position to another relative to the support and will finally free the frame, allowing the latter to be shifted to a different position on the support for subsequent engagement by rolling contact with, for example, another segment. In this manner, all the inside surfaces of the frames may be grained, notwithstanding the fact that some of the elements or sides of the frames are of different lengths, in fact, shapes.

The machine is arranged to adequately support the frames in easily handled position, and a feature of the machine is that all of the pattern transferring surfaces of the segments are effectively cleaned of excess pigment material and new pattern effects placed on the transfer surfaces in an expeditious manner. Further refinements include the provision of cleaning arrangements for the various scrapers, whereby the latter will operate with maximum efficiency to remove the excess pigment from the transfer material.

Referring in detail to the drawings, 1 indi-



cates a rotary table or head supported on a suitable axle 2 carried on a general frame which, as shown, comprises standards 4 and 5, a top plate 6 and a base 7. The table or head may, of course, be supported in any other position, rather than horizontally, as shown. The support for the axle 2 is best shown in Fig. 3 and comprises an upper bearing bracket 8 for a suitable bearing 9, the bracket being inserted into the top plate 6 from the bottom side thereof and secured in any suitable manner, as by means of flanges 8' on the bracket. The bottom end of the axle is support by a bracket 10 which, as shown, carries a radial thrust ball bearing at 11 and a vertical thrust ball bearing at 12. The bracket 10 may be secured in fixed position on the base plate 7 in any suitable manner, as by flanges 10'.

The table in the form shown in Figs. 1 to 7 has a central webbed body, including a hub 15 and machined pad surfaces, such as 16, for the transfer material supports and other devices, to be later described. As shown, the surfaces 16 support transfer segments at 20 and 21, these being arcuate in form, presenting outer cylindrically formed surfaces 20' and 21', the surfaces being generated on arcs radiating from the axle 2. At the opposite ends of the segments, there are downwardly diverging surfaces 20'' and 21'', respective to the segments 20 and 21. Any suitable means may be used to support these segments and the material of the segments is preferably the usual transfer material, such as congealed glue and glycerine. Such material may be cast in the form shown, that is, in arcuate segments, suitably finished to provide the surfaces 20', 20'', etc., or may comprise generally flat strips of suitable transfer material fastened to suitable rigid bases to cause the material to hold its shape. The segments preferably comprise cast sections or units of suitable lengths on individual cores, such as wood or the like, these being in the form of strips indicated at 22, there being end blocks for the strips suitably fastened thereto or integral therewith, the end blocks indicated at 23 in all figures. The end surfaces presented by the blocks 23 conform in general to the surfaces 20'' and 21'' of the respective segments.

For holding the segment units above described onto the table, there are provided flanged, arcuate attaching brackets 25 suitably bolted or otherwise secured to the machined surfaces 16 and arranged to rigidly support the transfer segment cores, as by upright flanges 25'. The brackets may have suitable adjustment and are interchangeable with other brackets of suitable length, as determined by the length of the sides of various frames or the like to be decorated. The pattern effect to be transferred to the frames may be carried directly by the transfer material at 20 or 21 if desired, but preferably the trans-

fer surfaces of the segments are smooth and separate pattern applying mechanism 30 is provided, at the rear of the table 1, as shown. This mechanism is carried on a rearwardly extending bracket 31, secured to the upright frame member 5 and carries a pattern roll at 32. The pattern roll may be of any suitable construction and carries on its outer surface the desired pattern; for example, it may comprise a continuous etched intaglio plate in cylindrical form. Such a roll may be made in accordance with the patent to J. P. Henry, No. 1,548,465, issued August 4, 1925; assigned to the assignee hereof.

In the operation of the machine, suitable liquid pigment material is spread onto the cylindrical surface of the roll 32, filling the depressions which form the pattern and this is afterward scraped off at high surface portions. The pigment left in the depressions is transferred by rolling contact to the transfer material surfaces 20' and 21', as the segments move past the roll.

Suitable means for spreading the pigment material onto the cylinder may comprise a suitable pump, not shown in detail but which may comprise a vertically disposed pigment lift screw, the position of which is indicated at 35, and which may be driven from the roll 32 by any suitable means. As shown, the roll is supported on a vertical shaft 36 in base and top plate members 37 and 38 respectively, and the shaft 36 carries a gear 39 meshing with a small spur pinion 40 (see Fig. 2) to drive the screw. The base plate 37 may be adjustably mounted, as in slideways 42 on the bracket 31, (see Fig. 2) to govern the pressure between the pattern roll and the transfer segments. This adjustment may be effected and the position maintained in any suitable manner, not shown.

For scraping the excess pigment from the intaglio plate on the pattern roll, there is shown a suitable scraper device, including a scraper blade 43 yieldingly mounted on a vertically slidable frame 44 carried on a suitable post 45, see Fig. 3. As shown, there is a spring 47 connected with an arm 48 which is in turn connected with the scraper mounting 44 for yieldingly urging the scraper blade into scraping contact with the roll.

Suitable means for driving all the above described mechanism is shown in Fig. 3 and may comprise a counter shaft 50 supported in suitable bearing brackets, such as 51 and 52, below the table and top plate. The shaft 50 may be driven in any suitable way, as by a sprocket chain 52 connecting sprockets 53 and 54, the former being carried rigidly on the shaft 50, and the latter being connected with the driven element of a suitable reduction gear unit 55, of known construction, which is in turn driven, as by means of a belt 56, from a suitable electric motor 57, the reduction gear unit and motor being mounted



on the base plate 7, as shown. To drive the table 1, we provide a bevel gear couple, including a driving pinion 60 on the shaft 50 and a cooperating gear 61 fast on the axle 2 of the table. To drive the pattern roll, there is provided a driving pinion 62 on the shaft 50 and a cooperating pinion 63 on a stub shaft 64 forming, in effect, a part of the shaft 36 for the pattern roll. The shaft 50 may also reciprocate the scraper blade 43 for the pattern roll through the agency of a cam 65 on the shaft 50 coacting with a follower 66 supported in a suitable bracket 67 below the shaft 45, previously mentioned. The follower 66 pushes upwardly under the action of the cam on a sliding cap 68 carried freely on the lower end of the shaft 45, and the cap may be connected as by a series of sliding pins 69 with the frame 44, which supports the blade. The blade may be returned toward the cam 65 by a suitable spring, such as shown in Fig. 3 at 70.

It will be seen that with the table and pattern roll thus positively driven, a suitable pigment pattern is placed on both the transfer surfaces 20' and 21' at each complete rotation of the table, and furthermore, both transfer segments are presented in their working position, at the front of the machine, on each rotation of the table.

The character of work shown in the machine is illustrated in detail only by way of example, and comprises a complete rectangular frame having parallel sides A and A' and relatively shorter sides B and B'. The interior surfaces to be decorated, as with the grain pattern of the pattern roll, are all indicated at *s* and are beveled in downwardly diverging arrangement as shown, see Fig. 3. The inclination of the surfaces *s* may be varied as well as the general shape of the surfaces; for example, these may be concave or convex in different frames. The frame referred to above, is for automobile windows and there are anchor prongs or lugs at the corners, indicated conventionally at *p*.

At the front of the machine (at the right in Figs. 1, 2 and 3), there is a work carrier comprising a bar 72 pivotally supported, as on a suitable pin 73, carried by a bracket member 75 adjustably secured to the front face of a main bracket 74. The latter is attached to the front face of the member 4. The bracket 74, at the end opposite the pivot pin, carries another bracket member, 76, which has its upper surface 76' (see Fig. 7) arranged to slidably carry the end of the bar 72 opposite the pivot.

To directly support and guide the work adjacent the segments 20 and 21, the bar 72 carries any suitable number of work guiding rollers 77. These may be substantially alike, and a detail of one is illustrated in Fig. 7. As shown, the rollers have an under-cut effect at 78 to clear the prongs *p* on the frames.

The manner in which the rollers support the work and present the successive inner surfaces *s* to the transfer material, is well illustrated in Fig. 3. The position of the rollers is inclined in conformity to the inclination of the inside surfaces *s* and these surfaces are presented substantially flatwise to the transfer material.

For controlling the printing pressure contact and for adjustment in case the sides of the frames vary in thickness, the bar 72 is mounted for movement toward and away from the axis of the table. As shown in Fig. 1, there is an adjustment device, including a short toothed rack 80 inset into the free end of the bar 72 at the bottom thereof and meshing with a pinion 81 on a stub shaft 82, carried by the bracket member 76. The pinion is arranged to be turned by means of a chain 83 which, as shown, is yieldingly anchored to a suitable arm 84 on the machine frame by means of a tension spring 85. The chain passes over a sprocket 86 on the outer end of the shaft 82, then downwardly to a suitable treadle 87 near the base of the machine. The spring 85 will normally pull the bar 72 outwardly so as to relieve pressure on the frame, whereby the operator may control the printing pressure with his foot on the treadle, leaving his hands free to manipulate the frame, as required. To place the work, the operator rests one edge, for example, the longer edge A as in Fig. 8, against two of the rollers 77, those nearest the pivot pin, as shown in Fig. 2; see also Fig. 8, as the segment 20 approaches the transferring position. Thereafter, by maintaining sufficient printing pressure, as by means of the treadle and associated mechanism, the segment will drive the frame along to the left (as the operator faces the machine) causing the transfer material to contact with the entire inner surface *s* of the side A, positioned between the rollers and the segment. The graining operation performed in this manner is strikingly accurate, even at the corners, and the entire surface *s* is fully decorated in this operation without requiring any touching up, assuming, of course, that the surface 20' is the required length. Actually this surface is of slightly less length than the length of the surface to be grained for the reason that the transfer material spreads slightly, due to the printing pressure, thus elongating the segment. During this operation, it is desirable to drive the frame forwardly at the start by means other than the transfer material. For this purpose, any suitable adjustable abutment may be provided in the foremost blocks 23; as illustrated, there are adjustable pins at 88 (screws for example) arranged to contact with the surface *s* of the frame member adjacent the one about to be grained. During the graining operation, the frame may be supported in the inclined position shown, by any suit-



able arrangement, such as an overhead bar 90, having its ends depending as at 91 and then extending inwardly as at 92 for attachment to the machine frame. The frames to be grained simply slide along the bar 90 from one position to another, as will be obvious.

The succession of steps necessary, with the mechanism described, to grain a complete frame is illustrated in Figs. 8 to 11. It will be seen that as the segment 20 moves from the position shown in Fig. 8 to the position shown in Fig. 9, the inside surface of the frame element A is completely grained. The operator now lifts the frame and turns it ninety degrees, presenting the frame element B to the segment 21, as shown in Fig. 10. Further, rotation of the table results in graining the surface s of the frame element B, this being shown as completed in Fig. 11. Next, the frame element A' is grained as in the case of the element A, and finally, the frame element B'.

The various scraping arrangements for the transfer material are preferably arranged as follows. After the segments 20 and 21 pass the graining position, at the front of the machine, they are rotated past and in contact with a fixed scraper blade 100 on a suitable bracket arrangement 101 (see particularly Figs. 4 and 5), which scraper 100 may be carried in fixed position on a suitable upright bar or pin 102 on the bracket. This cleans the graining surfaces 20' and 21'.

The scraper itself, after each segment has passed may also be cleaned as by an oscillating cleaner arm 103 having a blade 104 adapted to wipe across the front face of the blade 100. Any suitable arrangement for operating the cleaner arm may be used; for example, we have provided cams 105 on the bottom of the table 1 designed to push outwardly on a sliding rack 106, which through a spur idler 107, drives a gear segment 108, the latter carrying the cleaner arm. Preferably the action is to clean the blade 100 on the up-stroke of the arm 103 after the pattern transfer segment has passed the blade 100 and been cleaned thereby. The rack may be returned after operation by the cam 105 in any suitable manner as by any suitable return spring, not shown. There is, of course, one cam 105 provided for each segment in order that the cleaning action of the blade 104 will occur after each scraping action of the fixed blade 100. By the above arrangement each of the segments 20 and 21 after each graining operation thereof have their graining surfaces 20' and 21' effectively scraped to clean off the excess pigment, before the segments again encounter the pattern roll.

It has been found that in the operation of this machine, the front or advancing edges of the segments accumulate a quantity of pigment as these edges come into contact with the pattern roll. It is obvious that this

accumulation would normally be spread onto the frame being grained. For example, in the operation illustrated in Fig. 8, such as accumulation of pigment on the surface 20'' of the segment 20 would cause a smear of paint on the frame side B. To prevent this, we have provided swinging scrapers for the front edge of the segments, as illustrated in Figs. 1, 2 and 6.

Referring particularly to Fig. 2, there are scraper arms 110, one for each segment 20 and 21, carrying respective scraper blades 111. The arms are pivotally supported on inclined pivot axes, substantially in accordance with the inclination of the surfaces 20'' and 21'' of the transfer segments. Suitable brackets for carrying these arms may comprise upright members 112 adjacent openings 113 in the table. The members 112 have pins 114 supporting the arms 110, and gear segments 115 rigid therewith, the latter being in mesh with gears or segments 116 also carried on the bracket members 112. Suitably attached to the gears 116 are depending pins 117 and these are moved to and fro by oppositely acting face cams 118 and 119 on the table. For example, the cam 118 operates on the bar 117 when the arm 110 for the segment 21 is in the position shown in Fig. 2, to throw the bar to the left, as shown in Fig. 6, thus rotating the arm 110 in a counter-clockwise direction, from the dotted line position to the full line position. This, by the upward movement past the surface 21'', effectively cleans the surface. The scraper 111 is, in this last mentioned operation, carried into contact with a revolving wiper head 120 mounted on a suitable shaft 121 carried in a bracket 122 on the table. The scraper head is revolved periodically by a successive arrangement of pins 125 (one only being shown) located on the top plate 6 to move the wiper arms 126 past the scraper blade 111 to effectively clean the same. Suitable receptacle devices (not shown) may be provided in association with the scraper heads 120 to receive the pigment material cleaned off the scraper elements 111 by the wipers 126. After the scraper mechanism just described, for the segment 21, has been carried around to a point near the scraper 100, the cam 119 on the top plate may then, through the agency of the pin 117, return the scraper blade 111 for the segment 21 to its previously mentioned broken line position of Fig. 6, where it is in readiness to rescraper the surface 21'' after this surface has passed the pattern roll.

The operation of the scraper mechanism for the surface 20'' of the segment 20 is, of course, identical with that just described; the mechanism for both segments being identical as shown.

A further refinement of the machine is the provision of means to scrape off any pigment material which may lie on the lowermost sur-



faces of the scrapers 111 as the latter lie outwardly from the table, and may comprise a suitable brush arrangement, illustrated in Fig. 2 at 127, thus effecting a complete cleaning of the blade 111, which, as has been previously described, has been cleaned on its opposite surface by the scraper arms 126.

In Fig. 12 is illustrated diagrammatically a modified arrangement of mechanism or apparatus for carrying out the method above described. This differs from the previously described arrangement primarily in that the frames are not supported for rectilinear movement while being grained. Instead there is provided an arm 150 pivoted as at 151 about, for example, the axis of the table 1 and carrying a single pressure roller 152. With such an arrangement, the table may be continuously or intermittently driven, that is to say, the table may be stopped during the actual graining operation if desired. To grain a frame such as indicated at X, in broken lines, the frame is placed between the pressure roller and the segment 20 and the arm moved automatically or by the operator, manually, in a counter-clockwise direction, as shown, carrying it to the position shown in broken lines. In doing so, one complete side of the frame is grained on its inside surface, and this operation is completed when the arm and frame assume the broken line positions. The frame is now lifted and turned at right angles so as to present one of the shorter sides of the frame to the oncoming segment 21, as before. If the machine is intermittently driven, it is preferable to locate the pigment applying devices, that is to say, the pattern roll and its associated mechanism, in such manner that the roll will be out of contact with both segments when the piece of work is in contact with either.

In Fig. 13 is illustrated still another arrangement, particularly one in which the transfer segments are not fixed with relation to the table as in the previously described arrangements. In this modification, the table, indicated at 155, is in the nature of two oppositely extending arms, one of which carries a segment 156 for graining or decorating the longer side of a frame and the other, 157, being for graining the shorter side of the same frame. In such an arrangement, the pattern applying elements, for example a roll 158, pigment pump or like device 159, and a scraper 160, may be carried in fixed position, on, for example, an overhead frame work 170, or in any other suitable manner, and any suitable arrangement may be used to intermittently turn the table. Any convenient scraper arrangement for the transfer segments 156 and 157 may be used. Preferably there is a substantially fixed scraper 166 located in the general vicinity of the pigment applying mechanism and arranged to scrape the pattern transferring surfaces of the seg-

ments 156 and 157 just before the surface portions encounter the pattern roll 158. Such scraper 166 may be supported in any convenient manner by the frame work of a machine, for example, the frame member 170.

The work, in case this has beveled inside surfaces, may be supported in inclined position, as previously described, on a suitable guide bar 163. A series of pressure rollers are indicated at 164 for carrying the frames into contact with the segments. These may be adjustably and movably supported in any suitable manner. One advantage of an arrangement such as shown in Fig. 13, is that it enables the decoration of frames and the like on the inside surfaces, where these include arched effects on comparatively short radii, such, for example, as indicated at Y in Fig. 14. In the case of a curved frame member or a frame member having both curved and straight portions, only one pressure roll 164 would have to be used during the decorating operation on such frame member. In such case, the remaining pressure rollers could be moved out of the way, permitting the frame to swing as required, for example as suggested in Fig. 12.

It will be understood that with the arrangement shown in Fig. 13, it will be practically necessary to drive the segments 156 and 157 in such manner that they will be properly inked by the pattern roll with the desired pattern and in such manner that the advancing edge of each segment will be properly located with respect to the pressure rollers 164, at work starting position, for example, as illustrated in Fig. 13. No driving arrangement is illustrated, but any suitable gearing mechanism may be used. For example, one or more suitably driven gear wheels, may pick up and turn both segments 156 and 157, as required to carry out the necessary movements thereof, with the arm member 155 temporarily held in the position shown, as well as in the reversed position (156 in position to contact with the pattern roll).

We claim:

1. In a machine for decorating the inside surfaces of hollow members, means for supporting such hollow members for rectilinear movement, and a rotary impression member, a portion thereof being adapted to enter the hollow member and drive the same, and meanwhile effect an impression thereon with a rolling action.

2. In a machine for graining the inside surfaces of frames and the like, work guiding means for supporting the frames for movement relative to said means, and a grain-ing segment, adapted to enter the confines of the frame and engage an inside surface thereof with a rolling action, thereby driving the frame on the guiding means while transferring the grain pattern.

3. An inside surface decorating machine



for hollow members, such as frames, comprising means for supporting one of such hollow members for rectilinear movement, a rotary member and a plurality of impression segments, a portion of each being adapted to enter the hollow member in differently turned positions thereof and drive the same, meanwhile effecting respective impressions on different inside surfaces of such member with a rolling action.

4. In a surface decorating machine, a rotary support and a plurality of work decorating members projecting from the support out of the plane of rotation thereof, and means to support hollow work blanks in substantially embracing relation to said work decorating members and in rolling contact therewith.

5. In an inside surface decorating machine for hollow members, such as frames, an arcuate segmental work decorating member, and means to support one of such frames in substantially embracing relation to said decorating member, and means to guide the frame for movement with relation to the decorating member, as the latter moves past the support in rolling contact with the frame.

6. A graining machine, comprising, a table with a plurality of printing segments thereon, means to impart a pigment pattern to the segments for subsequent transfer to work in the machine and a device for guiding and supporting a hollow frame with the inside surfaces thereof in rolling contact with the segments.

7. In a machine for decorating the inside surfaces of hollow articles, a rotary head, a plurality of pattern transferring segments carried on the head, and an adjustable arm and a series of rollers thereon arranged to support such articles and present the interior surfaces thereof to the segments successively.

8. In a graining machine, a rotary carrier, means adjacent the carrier for supporting a hollow frame, means to move the support toward and away from the carrier, there being a pattern transferring segment on the carrier, projecting outwardly normal to the plane thereof and adapted to enter the frame and grain the inside surface of the frame opposite the supporting means.

9. In a surface decorating machine, a rotary support, a segment carried thereon, means for supplying a pigment pattern to the segment, a work support in fixed position at one side of the rotary support, a platen on said work support, and means under the control of the operator for moving the platen with reference to the rotary support to effect the desired printing pressure.

10. A graining machine, comprising a substantially horizontal table, a substantially vertical pattern roll, arranged adjacent the table, means supporting said table and roll, means drivingly interconnecting the table

and roll, a pattern transferring segment arranged to contact with the roll and receive a pattern therefrom, and means carried on said supporting means adjacent the table in spaced relation to the roll for supporting a hollow frame with its inside surface in position to receive the pattern from said segment.

11. In a work decorating machine, a revolvable support, a pattern carrying element at one side thereof, a transfer segment mounted on the support in cooperative relation to the pattern carrying element, means to support a hollow frame in substantially embracing relation to one of said segments, said means including a bar mounted above the said support to carry a portion of the frame and a series of rollers arranged to support the opposite portion of the frame, and means for causing the rollers to maintain printing pressure on the exterior surface of the frame opposite the segment.

12. In a surface decorating machine, a rotary head, means for driving the head, a plurality of pattern transferring members mounted on the head, means to support work in position to receive a pattern from said transferring members, said means being disposed at one side of the head, and means associated with the transferring members and common to both, for cleaning the operating surfaces of the transfer members.

13. In a graining machine, a rotary pattern transfer member adapted to transfer a pigment pattern to work in the machine, a scraper arranged to clean the surface of said member of excess pigment, and intermittently operable means to clean the scraper.

14. In a graining machine, a head, a transfer member carried thereby, comprising a segment of yielding material, means to support work at one side of the head in position to receive a pattern carried by the transfer material, pigment applying means, including a device for imparting a pigment pattern to the transfer material, a scraper, and means for supporting the same in fixed position between the printing position and pattern receiving position, and automatically operable means controlled by the rotation of the head to clean said scraper after each transfer material scraping operation thereof.

15. In a graining machine, a main frame, a table supported for rotation on the frame, pattern transferring segments carried on one face of the table, means to support work in coactive relation to said segments for graining the same successively in different portions thereof, by the segments, and scraping devices for the segments, including a scraper carried in fixed position at one side of the table for scraping similar surfaces of both segments, and automatically operating scraper devices carried on the table and respective to said segments for cleaning other surfaces of said segments.



16. In a graining machine, a pattern roll, means to supply pigment to said roll, a rotary member mounted adjacent the pattern roll and carrying circumferentially spaced transfer segments thereon adapted to contact with the roll to receive a pattern therefrom, means at substantially the opposite side of said member from the said roll for supporting hollow work blanks with their inside surfaces adjacent the segments, said last named means including a guide, whereby the rotation of segments will cause portions thereof to enter and advance the work from one position to another on the guide during the graining operation, and means for scraping the excess pigment from said segments between the graining position thereof and pattern receiving positions.

17. A mechanism for decorating the inside surfaces of hollow frames and the like, comprising arcuate pattern transferring members and means for successively presenting the inside surfaces of the frames to the arcuate pattern transferring members while revolving said transferring members toward and away from a definite impression position.

18. A machine for graining the inside surfaces of hollow frames, comprising a support, a graining member, and means for supporting the frames on successive sides for movement between the support and said graining member, the graining member being supported in such a manner that it can enter the confines of the frame and print a surface thereof opposite the support, with a rolling action.

19. In a machine for decorating the surfaces of frames and the like, a rotary printing head having a plurality of impression transferring elements thereon and a support for presenting the surfaces of the frames to be decorated to the transferring elements as one transferring element moves away from and another toward the supporting position.

20. A machine for graining the inside surfaces of hollow frames, comprising means for supporting one of such frames for substantially rectilinear movement, and means for graining the work opposite the support with a rolling action, whereby the frame will be advanced by the printing contact opposite said support.

21. A machine for decorating substantially rectangular frames on the interior surfaces thereof, comprising graining elements having surface elements corresponding substantially to the lengths of the surfaces to be decorated and means for successively supporting the frame sides for movement in rolling contact with said graining elements.

22. A machine for decorating the inside surfaces of hollow frames, having surfaces to be decorated which are inclined with reference to the general plane of the frames,

comprising a pattern transferring segment and means for supporting the frame in relatively inclined position adjacent the path of movement of said transferring segment, the transferring surface of said segment being generally cylindrical whereby such segment will enter and progress the work and simultaneously decorate a surface thereof.

In testimony whereof, we hereunto affix our signatures.

LLOYD V. CASTO.  
GUIDO VON WEBERN.

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