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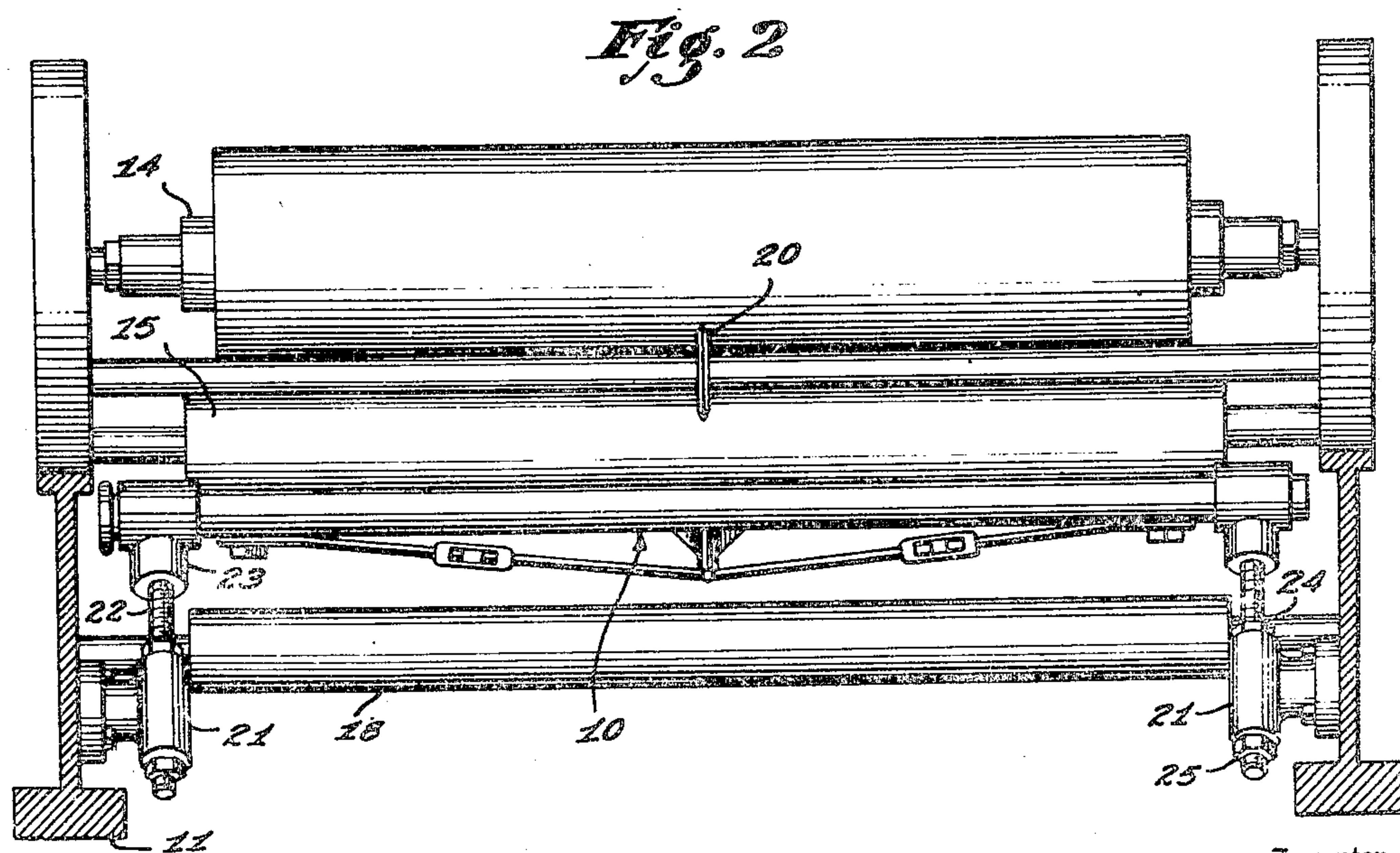
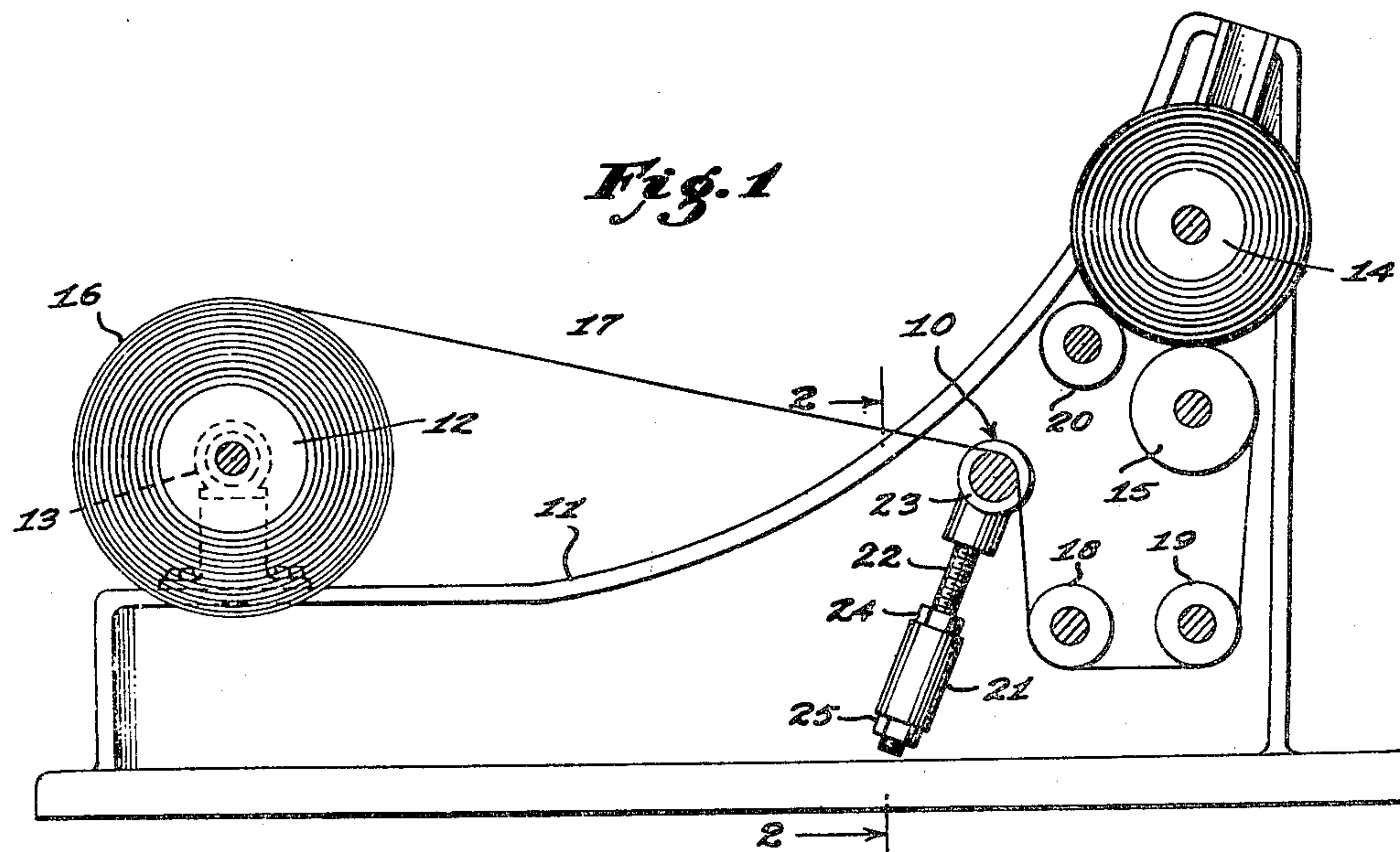
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2,486,121

WEB SPREADING DEVICE

Filed Jan. 24, 1947

2 Sheets-Sheet 1



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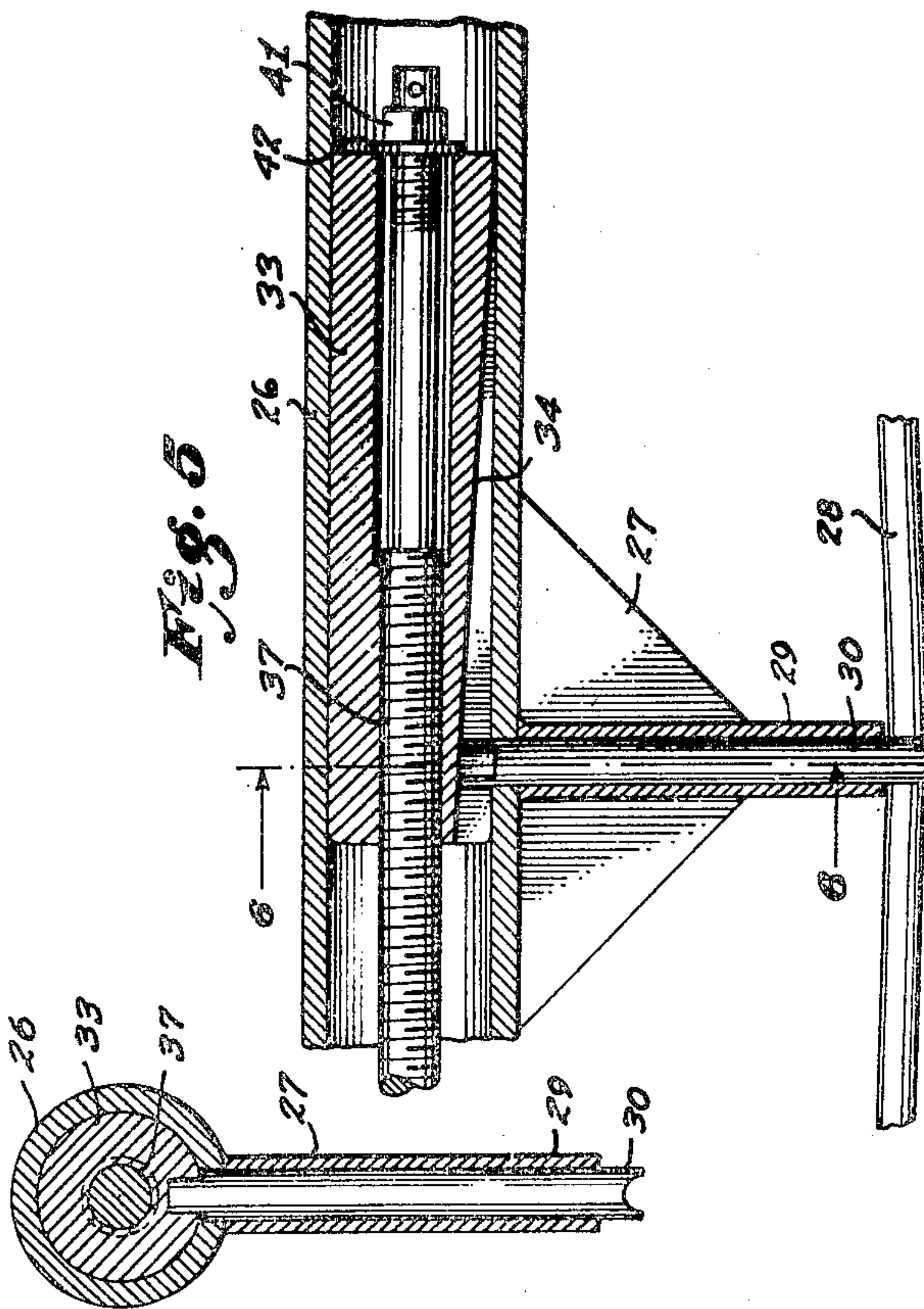
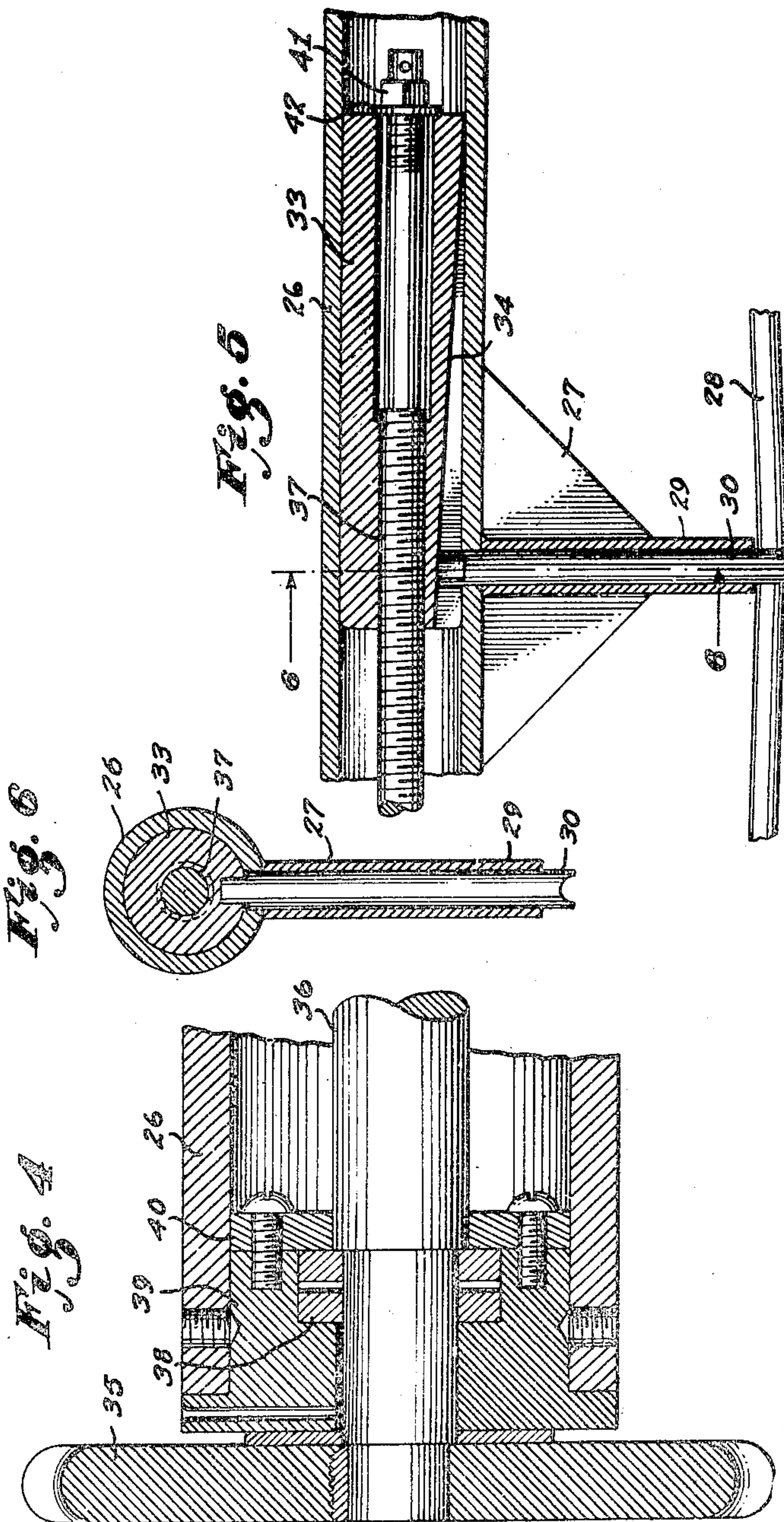
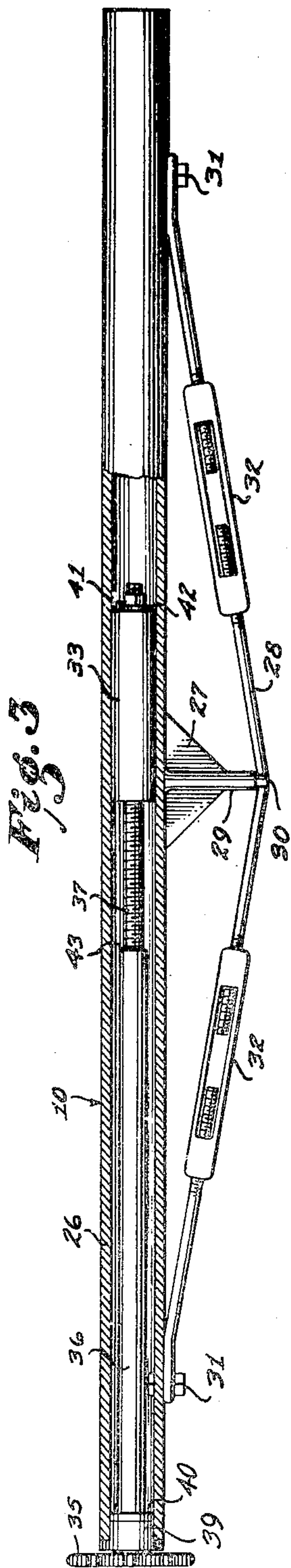
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WEB SPREADING DEVICE

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2 Sheets-Sheet 2



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WEB SPREADING DEVICE

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5 Claims. (Cl. 271—2.1)

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This invention relates to machines for winding or rewinding continuous web material, and more particularly to an improved spreading device for avoiding wrinkles in a traveling web trained through such machines.

A common difficulty in handling a traveling web in machines of this type is that wrinkles are easily developed in the extended web as it is trained through the machine, which wrinkles if not removed will be pressed into folds as the web is rewound and thus produces defective material. In view of this difficulty, various types of spreading devices are employed to spread the traveling web transversely to smooth out the wrinkles. One usual type of spreading device comprises a roll formed with spiral grooves arranged from the center toward each end. Another type of spreading device consists of a bar over which the traveling web may be trained, and which is bowed so as to tension the web to a greater extent at its center and thus force any wrinkles toward the edges of the web.

These prior types of spreading devices, however, have not been adapted for adjustment to varying characteristics of the traveling web being handled. This is an important factor in many instances, such as when a high quality paper like cigarette paper is being handled. In such a case the wrinkling tendency of the traveling web may vary from roll to roll due to differences in moisture content of the paper, for example; and this difference may even be pronounced as between outer and inner windings of the same roll. And as it is correspondingly more important to avoid the defects resulting from wrinkles in high quality material, the lack of any means for adjusting the prior spreading devices to varying characteristics of the web material being handled has been a troublesome deficiency.

The improved spreading device of the present invention incorporates means for adjustment which avoids the above described difficulty entirely. Generally described, this spreading device comprises a spreader member, such as a bar or the like, over which a traveling web may be trained, an extending strut element positioned substantially midway of this spreader member, a tie structure fixed on the spreader member adjacent the ends thereof and tensioned over the

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strut element to bow the spreader member, and means for adjusting the extending position of the strut element to vary the force exerted through the tie structure and thereby adjust the degree of bow in said spreader bar. The adjusting means is arranged with a manipulating member positioned at one end of the spreader member so that it is readily accessible for adjustment during rewinding operations. This arrangement provides a simple and handy adjustable construction which may be easily and quickly adjusted to the characteristics of a particular web material under actual production conditions.

The spreading device of the present invention is described more in detail below in connection with the accompanying drawing, in which:

Fig. 1 is a side view in section of a rewinding machine incorporating a spreading device arranged according to the present invention;

Fig. 2 is a transverse section view oriented substantially on the line 2—2 in Fig. 1;

Fig. 3 is a detail, partly in section, of the spreading device;

Fig. 4 is a further detail in section of the manipulating screw mechanism for adjusting the spreading device;

Fig. 5 is a sectional detail of the manner of assembling the screw mechanism with the support member for the strut element; and

Fig. 6 is a section taken substantially on the line 6—6 in Fig. 5.

With reference first to Figs. 1 and 2 of the drawing, a spreading device 10 constructed according to the present invention is shown incorporated in a conventional type of rewinding machine. The rewinding machine comprises a suitable supporting base 11, a supply roll 12 journaled in bearings 13 disposed on the supporting base 11, and a rewind roll 14, arranged in the usual manner to rest on a driving roll 15.

The supply roll 12 is adapted for supporting a roll of paper or the like 16 for rewinding. A web 17 withdrawn from this roll 16 is extended over the spreading device 10 by training it under idler rolls 18 and 19, and is then led to the driving roll 15 to be taken up on the rewind roll 14. A slitting device, such as a disc knife as indicated at 20 in Figs. 1 and 2, may be provided if desired to slit the web 17 as it is rewound.

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The spreading device 10 is carried on the supporting base 11 of the machine in brackets 21. These brackets 21 are formed with an internal bore adapted to receive stud members 22 extending from assembly collars 23 arranged adjacent each end of the spreading device 10. Suitable nuts 24 and 25 are associated with the stud members 22 so that they may be positioned in the brackets 21, and may be adjusted relative to the brackets 21 to obtain a desired extending position for the spreading device 10.

The spreading device 10 is illustrated more in detail in Fig. 3 of the drawing. As shown in Fig. 3, the spreading device 10 comprises an outer shell 26 which serves as a spreader member. This outer shell 26 has a generally tubular form, and is provided in a length sufficient to accommodate the width of web material it is desired to process on the machine. A strut element 27 is arranged with an extending disposition about midway of this outer shell 26, and a tie structure 28 is fixed on the outer shell 26 adjacent its ends and tensioned over the strut element 27.

The strut element 27 is formed with a sleeve 29 arranged on the outer shell 26 to position a rod member 30 which is grooved at its extending end to receive the tie structure 28, and which is supported inside the outer shell 26 against the tension of tie structure 28 as described more in detail below. The tie structure 28 conveniently comprises a tie rod as shown attached to the other shell 26 by bolts or the like, as indicated at 31 in Fig. 3, and fitted with turn buckles 32 for assembling it with a suitable degree of tension over the strut element 27.

The rod member 30 is supported inside the outer shell 26 by a supporting member 33 comprising a cylindrical block or the like fitted slidably to the internal diameter of the outer shell 26, and slotted to provide an inclined face, as best shown at 34 in Fig. 5, forming a bearing surface for rod member 30. And it will be evident that the point of support on this inclined face 34 will determine the extending position of rod member 30 in sleeve 29; and that lateral translation of supporting member 33 in outer shell 26 will effect adjustment of this extending position, which will in turn adjust the force exerted through the tie structure 28 and the resulting bow imposed on the outer shell 26.

As previously mentioned, a manipulating mechanism is provided according to the present invention for effecting this adjustment. As shown in the drawing, this mechanism comprises a manipulating handle 35 positioned at one end of the outer shell 26, and fixed on a shaft 36 extending to the above described supporting member 33 associated with the strut element 27. The shaft 36 is formed with a threaded portion 37 of reduced diameter adapted to engage a correspondingly threaded bore in the supporting member 33 (see Fig. 5), so that rotation of the shaft 36 by manipulating handle 35 will cause the supporting member 33 to shift on the threaded portion 37.

In order to anchor the shaft 36 so that this shifting of supporting member 33 on threaded portion 37 will amount to lateral translation in the outer shell 26 and thus effect the above noted adjustment of strut element 27, the shaft 36 is fitted with a positioning collar 38, and a spacer block 39 and thrust plate 40, assembled as a housing for the collar 38, are secured in the end of the outer shell 26 adjacent the manipulating handle 35. To restrict longitudinal

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movement of the supporting member 33 in outer shell 26 so that it will not be translated at any time beyond the rod member 30, the shaft 36 is adapted at its extending end to receive a nut 41 or other suitable fastening means for securing a retaining washer 42 in place as a limiting stop in one direction, and is formed with a shoulder 43 by the reduction in diameter for the threaded portion 37 providing a stop in the other direction.

By this arrangement, the strut element 27 is easily adjusted to vary the tension in tie structure 28 and consequently the bow in the outer shell or spreader member 26. Also, this adjustment may be regulated solely from the manipulating handle 35 which is arranged for convenient disposition at one side of the machine so that it is readily accessible by the machine operator for adjustment of the spreading action as necessary or desired during the rewinding operation.

I claim:

1. A spreading device for avoiding wrinkles in a traveling web comprising a spreader member over which the traveling web may be trained, an extending strut element positioned substantially midway of said spreader member, a tie structure fixed on said spreader member adjacent the ends thereof and tensioned over said strut element to bow said spreader member, and means operable at one end of said spreader member for adjusting the extending position of said strut element to vary the force exerted through said tie structure and thereby adjust the degree of bow in said spreader member.

2. A spreading device for avoiding wrinkles in a traveling web comprising a spreader member over which the traveling web may be trained, a strut element slidably associated with said spreader member and positioned in extending relation substantially midway of the length thereof, a tie structure fixed on said spreader member adjacent the ends thereof and tensioned over said strut element to bow said spreader member, and means operable at one end of said spreader member for adjusting the extending position of said strut element to vary the force exerted through said tie structure and thereby adjust the degree of bow in said spreader member.

3. A spreading device as defined in claim 2 further characterized in that the means for adjusting the extending position of said strut element includes a supporting member having an inclined face forming a bearing surface for said strut element whereby lateral translation of said support member effects adjustment of the extending position of said strut element.

4. A spreading device as defined in claim 2 further characterized in that the means for adjusting the extending position of said strut element comprises a support member associated with said spreader member for lateral translation with respect to said strut element and having an inclined face forming a bearing surface for said strut element, and an adjusting screw mechanism extending from an end of said spreader member and engaging said support member for lateral adjustment thereof.

5. In a rewinding machine for continuous web material comprising a supply roll and a rewind roll, the combination therewith of a spreading device for avoiding wrinkles in a traveling web trained through said machine from said supply roll to said rewind roll comprising a spreader

member over which the traveling web may be trained, an extending strut element positioned substantially midway of said spreader member, a tie structure fixed on said spreader member adjacent the ends thereof and tensioned over said strut element to bow said spreader member, and means operable at one end of said spreader member for adjusting the extending position of said strut element to vary the force exerted through said tie structure and thereby adjust the degree of bow in said spreader member.

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