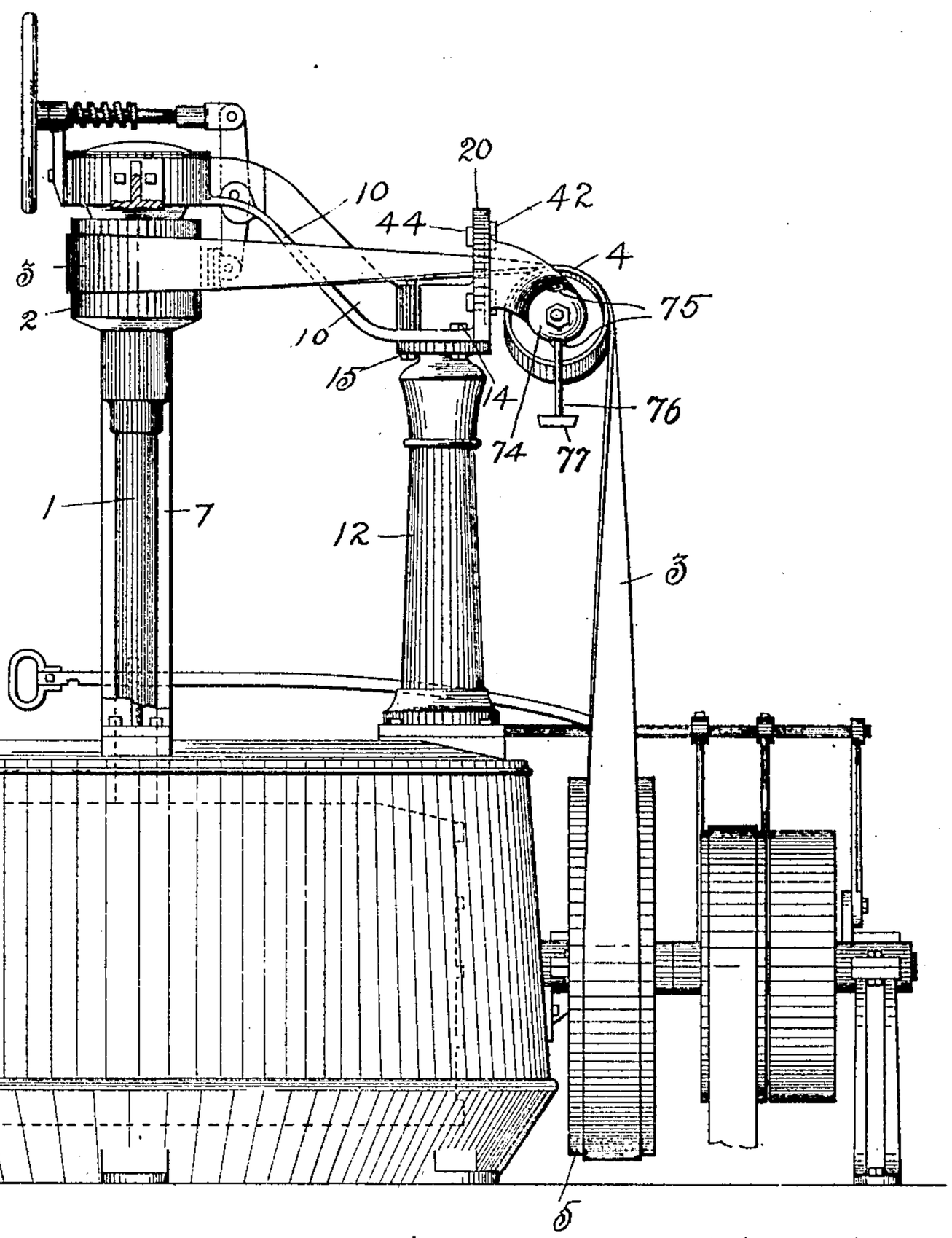
E. CROASDALE.

ADJUSTABLE GUIDE PULLEY.

APPLICATION FILED MAY 28, 1908.

904,757. Patented Nov. 24, 1908.

5 SHEETS—SHEET 1.



WITNESSES

J. Donsbach.

L. C. Kennedy.

FIG. 1

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5 SHEETS—SHEET 2.

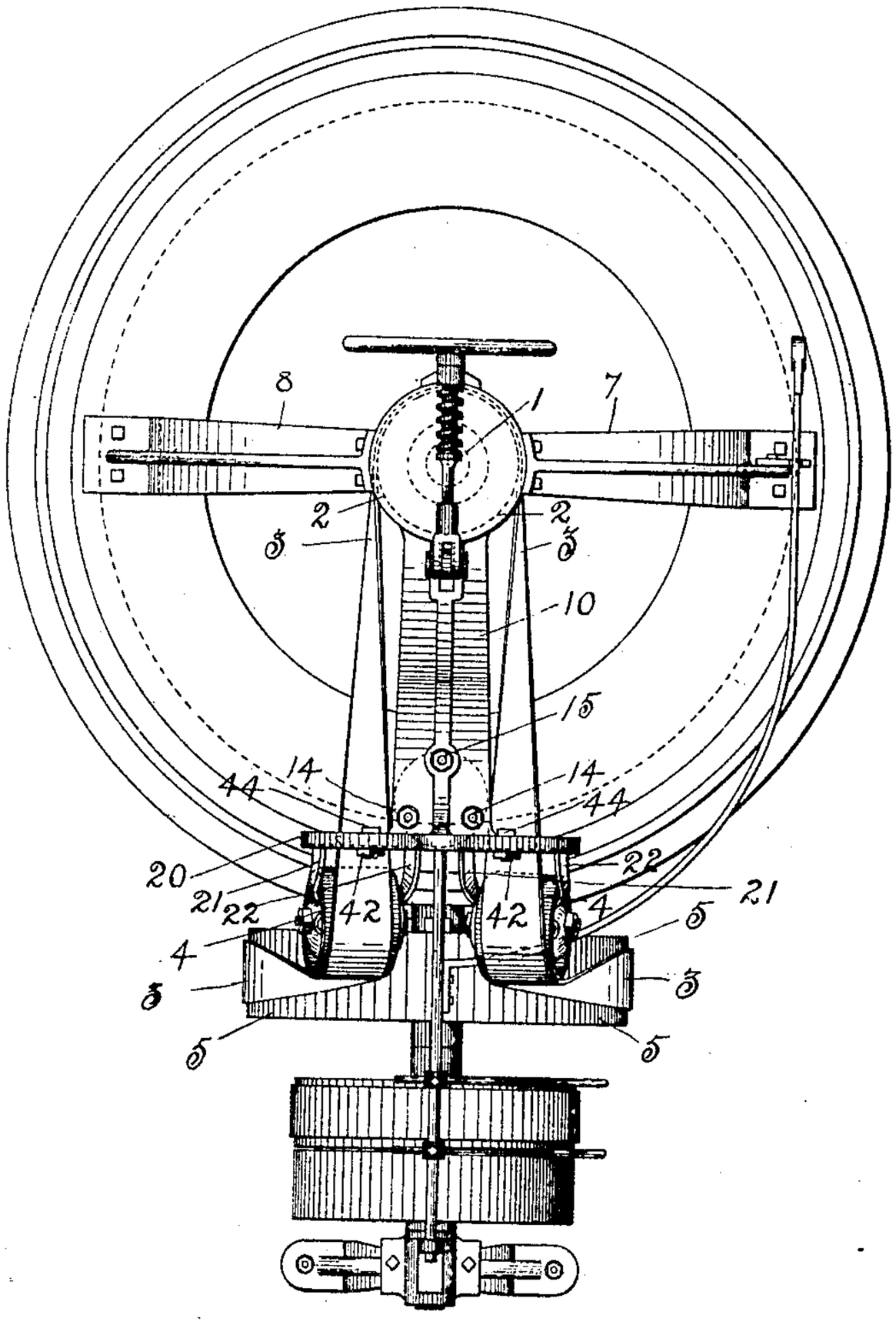

FIG. 2.

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6 SHEETS—SHEET 3.

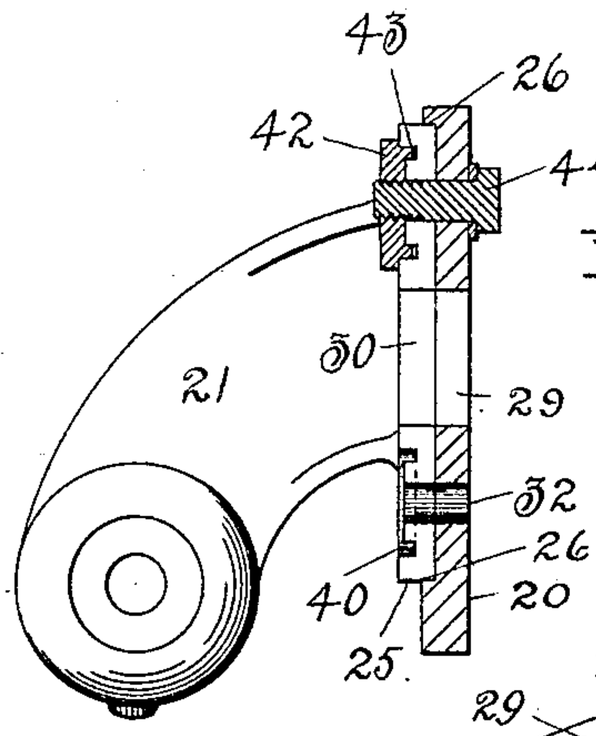

Fig. 4

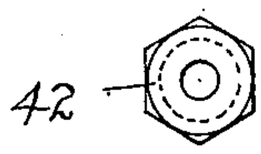

Fig. 5

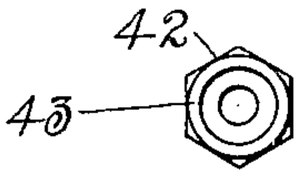

Fig. 6

Fig. 3

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5 SHEETS—SHEET 4.

Fig. 7.

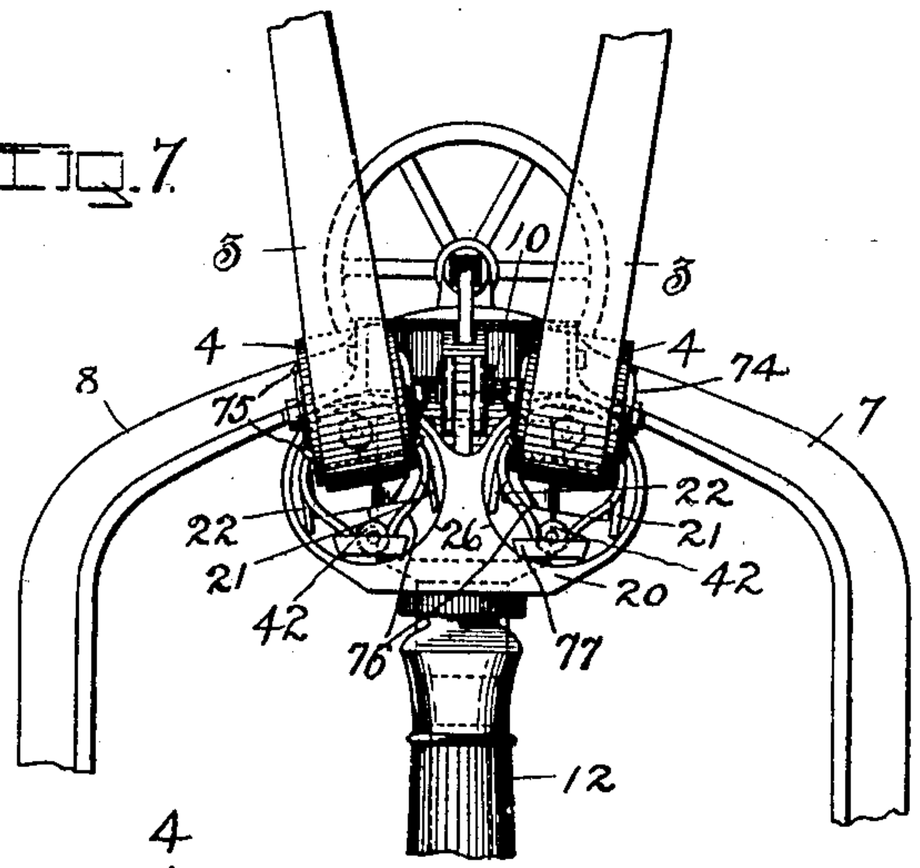


Fig. 8.

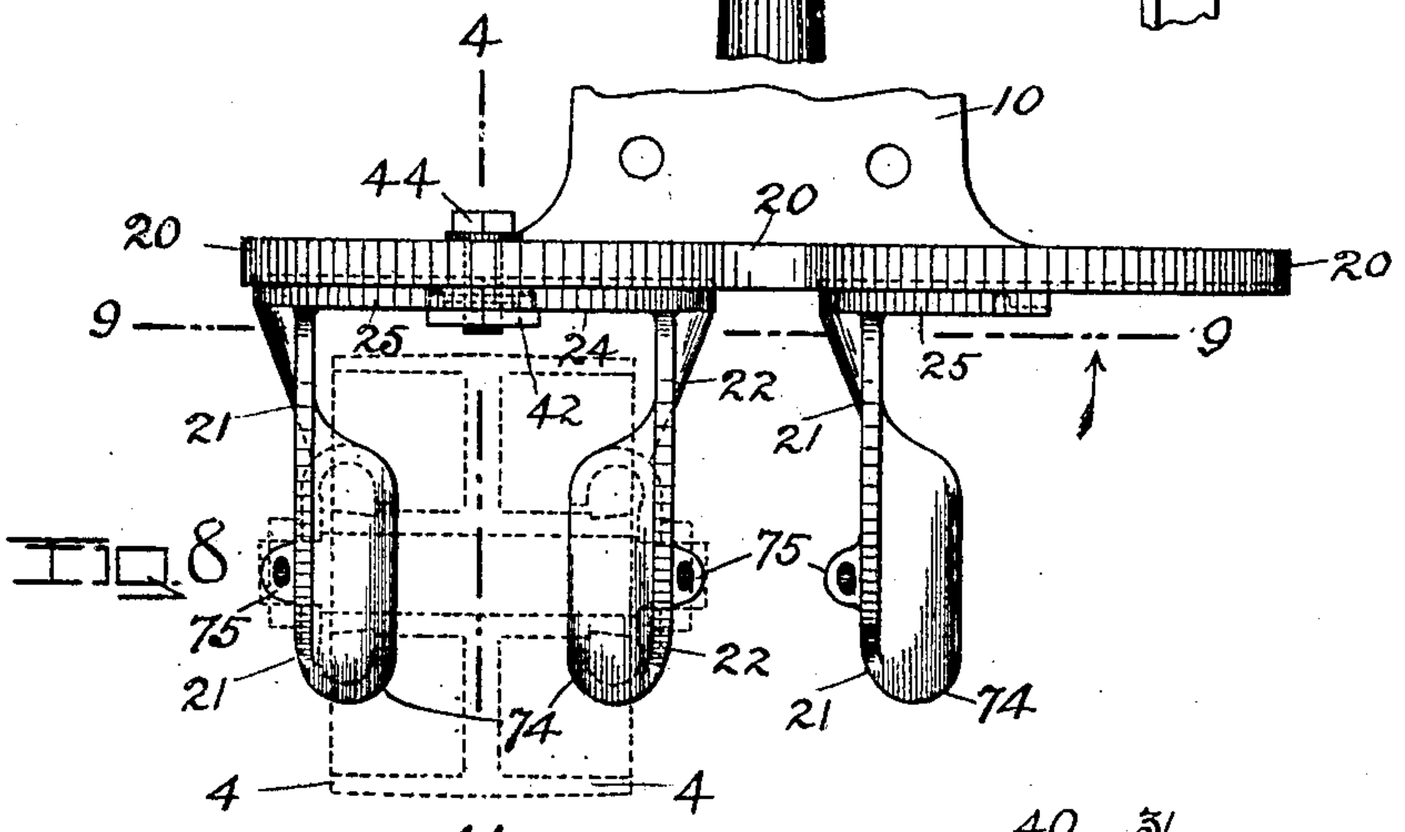
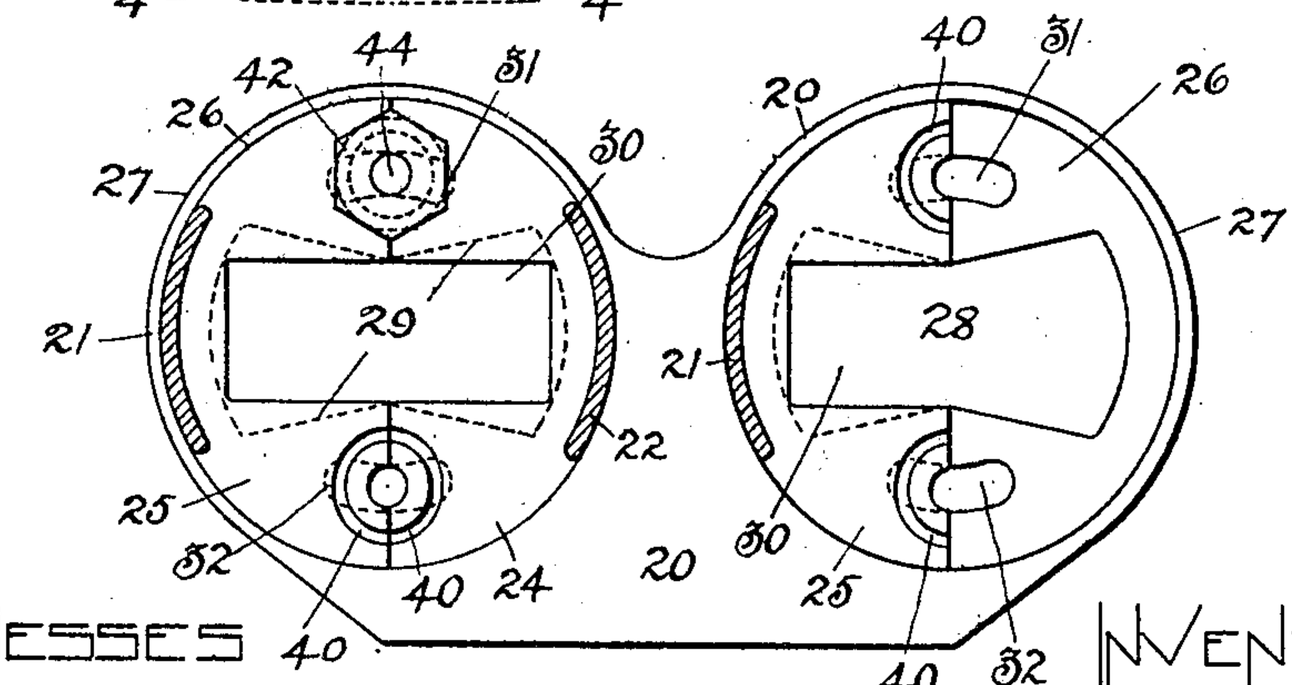


Fig. 9.



WITNESSES

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APPLICATION FILED MAY 28, 1908.

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5 SHEETS—SHEET 5.

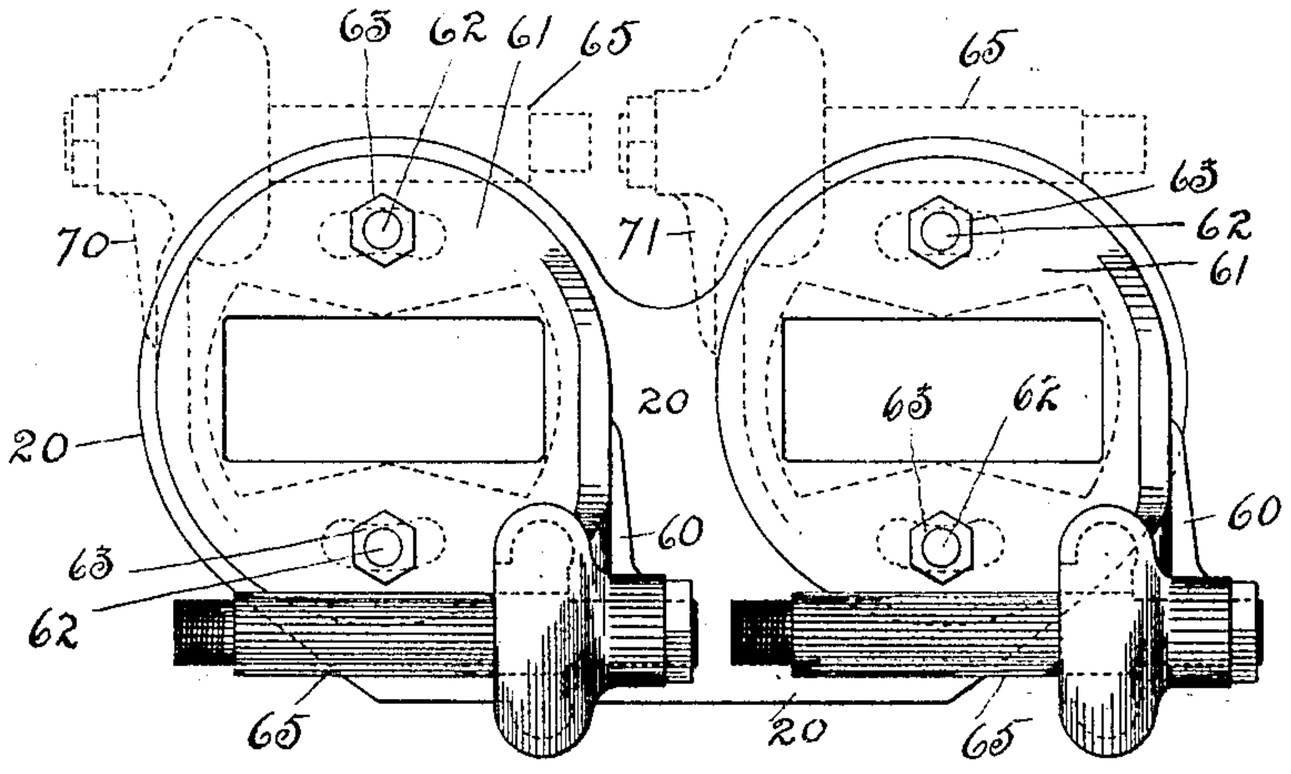

Fig. 10

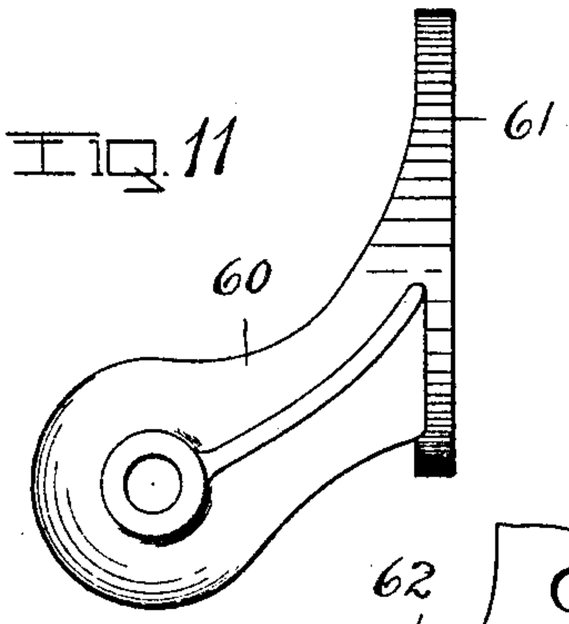

Fig. 11

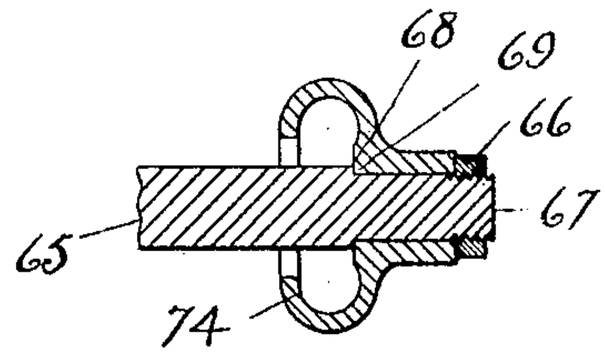

Fig. 13

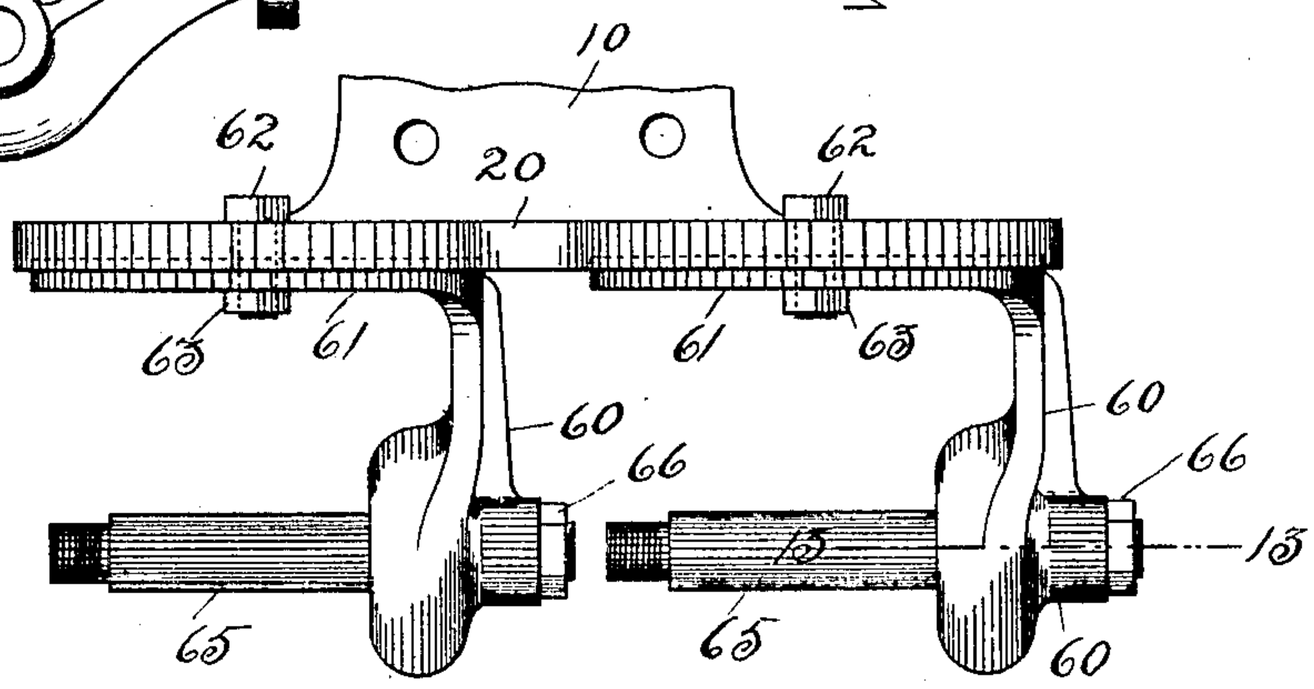

Fig. 12.

WITNESSES

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UNITED STATES PATENT OFFICE.

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ADJUSTABLE GUIDE-PULLEY.

No. 904,757. Specification of Letters Patent. Patented Nov. 24, 1908.

Application filed May 28, 1908. Serial No. 435,440.

To all whom it may concern:

Be it known that I, EDGAR CROASDALE, a citizen of the United States, residing at Troy, county of Rensselaer, and State of New York, have invented certain new and useful Improvements in Adjustable Guide-Pulleys, of which the following is a specification.

The invention relates to such improvements and consists of the novel construction and combination of parts hereinafter described and subsequently claimed.

Reference may be had to the accompanying drawings, and the reference characters marked thereon, which form a part of this specification.

Similar characters refer to similar parts in the several figures therein.

The object of the invention is to provide guide-pulleys by means of which the angle of the belt can be adjusted, and adapted to driving pulleys differing from each other in diameter, and to driving pulleys located in differing positions relatively to the plane of the driven pulley.

The invention consists of a guide-pulley having separable, invertible and oscillatory bearing supports, and means for securing such supports in differing positions of inversion and oscillation, as hereinafter more fully described and subsequently pointed out in the claims.

The invention is shown applied to a centrifugal extractor wherein a small vertical pulley is driven by a larger horizontal pulley, the belt passing from the driven pulley in a horizontal plane to the guide-pulleys, and from the guide-pulleys in a vertical plane to the driving pulley, whether the driving pulley is located below the guide-pulleys or above the same.

The invention is adapted for use in connection with belt-driven and driving pulleys in other machines, as, for example, in a drill press, or wherever it is desirable to change the relative size or location of the driving and driven pulleys, and connect the same by a belt having an angle therein maintained by a guide-pulley.

Referring to the drawings: Figure 1 is a view in side elevation of an extractor, showing the improved guide-pulleys in connection therewith. Fig. 2 is a top plan view of the same. Fig. 3 is an end elevation of the same. Fig. 4 is a vertical section taken on the broken line 4—4 in Fig. 8. Fig. 5 is a front elevation of the washer shown in Fig. 4 detached. Fig. 6 is a back elevation of said washer. Fig. 7 is a view in end elevation showing the upper portion of the parts illustrated in Fig. 3, with the guide-pulleys inverted, and the vertical portion of the belt passing above the horizontal portion to a driving pulley not shown. Fig. 8 is a fragmentary view showing, on the left, a pair of brackets or bearing-supports for a pulley to be secured to the bracket-supports, with the pulley detached, and on the right, a bearing-support, its supplementary bearing-support being detached. Fig. 9 is a horizontal section taken on the broken line 9—9 in Fig. 8, showing the means for securing the bearing-supports to the bracket-support in differing positions of inversion and oscillation. Fig. 10 is a front elevation of the pulley-supports with the pulleys detached, showing a modified form of construction. Fig. 11 is a side view of one of the brackets shown in Fig. 10 detached. Fig. 12 is a plan view of the part shown in Fig. 10. Fig. 13 is a longitudinal section taken on the broken line 13—13 in Fig. 12. Figs. 4, 5, 6, 8, 9, 10, 11, 12 and 13, are drawn upon an enlarged scale.

Referring to the drawings, the extractor shown is of the ordinary well known type in which the basket-supporting vertical spindle, 1, is provided with a comparatively small pulley, 2, driven by a belt, 3, passing over guide-pulleys, 4, and around the drive-wheel 5. The bearing for the upper end of the basket-spindle is supported by the uprights, 7 and 8, secured to the screen-supporting frame of the machine, and by the arm, 10, secured to the upper end of upright-post, 12, as by bolts, 14 and 15. Projecting upwardly from the outer end of arm, 10, is a bracket-supporting plate, 20, which serves to support the guide-pulleys. The means by which the guide-pulleys are adjustably supported are shown on an enlarged scale in Figs. 4, 5, 6, 8, 9, 10, 11, 12 and 13. The guide-pulleys may be secured to the bearing-brackets, 21 and 22, in any known manner. One method is indicated by dotted lines in Fig. 8. Two pair of separable bearing-brackets project from semicircular plates, 24 and 25, which are adapted

to fit into the circular recesses, 26, in the support-plate, 20, inclosed by the peripheral flange 27. The support-plate is provided with the central openings, 28 and 29, and with the elongated bolt-holes, 31 and 32, in each circular recess, and the semicircular plates are provided with the slots or openings, 30, and with the semicircular groove 40. In Fig. 9, the separable bracket-plates are both shown attached in the lefthand recess of the supporting plate. In the right-hand recess only one bracket-plate is shown in place, the other plate being removed.

As a means for securing the bracket-plates in position, a screw-threaded nut, 42, having an annular projecting flange, 43, is placed upon the plates, with the flange resting in the semicircular grooves, 40, and a screw-threaded bolt, 44, inserted through the elongated bolt-aperture, 31, in the support-plate, and screwed into the nut, as seen in cross-section in Fig. 4, and in the upper lefthand part of Figs. 8 and 9. Another bolt is similarly secured in bolt-aperture 32. The four bracket-plates are secured in this manner within the two circular recesses, 26, contained in the supporting plate 20. It will be seen that by loosening the bolts, 44, the bearing-bracket plates can be given a rotatory movement limited only by the length of the elongated bolt-holes, 31 and 32, in the supporting plate, 20, and the semicircular plates secured in any such desired position by again tightening the bolts and nuts. Such a movement of the semicircular plates gives to the bearing-brackets an oscillatory movement upon an axial line located at the center of the circular recess, and of the semicircular bracket-supporting plates.

It will be seen in Fig. 4 that the bearing-brackets, 21, project not only outwardly but downwardly from their semicircular supporting plates. The semicircular supporting plate, 25, is shown in Fig. 4. Fig. 4 being a section taken on the broken line 4—4 in Fig. 8, the semicircular plate, 25, is not cut, but its plane straight edge is shown in elevation. The outward and downward direction in which the bearing-brackets project causes the pulley to be supported at one side of the central opening, 29, in the supporting plate, and the opening, 30, in the semicircular plate as seen in Fig. 3, so that the middle line of a belt supported by such pulley would be intersected by the axial line about which such semicircular bracket-supporting plates are oscillatory in whatever position the pulleys may be made to assume by reason of the oscillatory movement of their supports. It follows, therefore, that when the supporting plate, 20, is so located that the axial line of oscillation of the pulley-bearings also intersects the middle line of the belt on the driven pulley, the oscillatory movements of the pulley bearings will not interfere with the running of the belt from the driven pulley to such oscillatory guide-pulley. Such relative position of the parts is shown in Fig. 3, where it will be seen that the axial line of oscillation of the pulley-bearings, located at the centers of the circular spaces, 26, coincides with the middle of the belt on both the guide-pulleys, and also on the driven pulley, 2, seen through the openings, 28 and 29, in Figs. 3 and 7. It is obvious, therefore, that the guide-pulleys may be adjusted and secured in differing oscillatory positions, and thereby be adapted for use in connection with driving-pulleys of differing diameters, it only being necessary to oscillate the bearings of the pulleys in the desired direction until a line projected tangentially from the middle of one pulley will pass by one side of the desired driving-pulley, in close proximity to its driving face, and a similar line projected from the other guide-pulley will pass by the opposite side of the driving pulley, in close proximity to its driving face.

When it is desired to adapt the guide-pulleys for use in connection with a drive-pulley located above the plane of the belt connecting the guide-pulleys to the driven wheel, the same relation of parts may be secured by inverting the position of the bearing-brackets which support the guide-pulleys. The pulleys are shown in such position of inversion in Fig. 7. To change the pulleys from the position shown in Fig. 3 to that shown in Fig. 7, it is only necessary to remove the bolts, 44, which secure the semicircular bracket-supporting plates to the supporting plate, 20, and impart to the bracket-plates a rotative movement of approximately 180 degrees, or until the bolt-holes in the oscillatory plates correspond with the elongated bolt-holes in the stationary supporting plate; the bolts are then inserted in the registering bolt-holes, and the oscillatory plates secured in the desired adjustable position as before described. It will thus be seen that the same guide-pulleys with the same bearing-supports can not only be easily and quickly changed to differing positions of oscillation, adapting such pulleys for use with driving pulleys of differing sizes, but such pulleys can be easily and quickly changed to the position of inversion, in which position they can be adjusted as readily and quickly, and in the same manner as in their former position, to accommodate them to driving pulleys of differing sizes.

When the various pulleys are comparatively small, and the driving belt comparatively narrow, the guide-pulleys may be conveniently supported by a single bearing-bracket, as shown in Figs. 10, 11, 12 and 13. In such cases a bearing-bracket, 60, projects from a circular plate, 61, which plate is made in one integral piece instead of two

semicircular plates. The circular plate, 61, is secured in a circular recess or opening in the support-plate, 20, in the same manner that the semicircular plates are secured, except that it does not have the circular groove adapted to receive a circular flange on the clamping nut, as shown in connection with the semicircular plates. The circular plates having the single drive-pulley are secured to the supporting plate by means of a small bolt, 62, and clamping nut, 63, as shown in Figs. 10 and 12. Each bracket is provided with a pulley-supporting stud, 65, secured in the bracket, 60, by means of a nut, 66, screwed on to the screw-threaded stem, 67, whereby the shoulder, 68, of the spindle is drawn tightly against an abutment, 69, on the bracket, as shown in Fig. 13 by solid lines, and in Fig. 10 by dotted lines.

By comparing Figs. 10, 12 and 13 with Fig. 8, it will be readily understood that the stud is secured at one end to its supporting bracket in the same manner that each end of the pulley-axle used in connection with a pair of supporting brackets is secured at each of its ends to a supporting bracket. When a single pulley-supporting bracket is employed, as shown in the last four figures, the oscillatory adjustment of the pulley-support is obtained precisely in the same manner as in the case before described where the guide-pulley axles are severally supported at each end by a bracket, by loosening the clamping bolt, 62, and nut, 63, and imparting to the circular bracket-supporting plate the desired rotatory movement, and then clamping the parts in the desired position by means of the bolt-nut. When it is desired to invert the pulleys and their bearing supports, the bearing-brackets are transposed from the position shown by the solid lines in Fig. 10, to the position shown by dotted lines in the same figure. The bearing-brackets and their supporting circular plates are not "rights" and "lefts", and when the pulley-supporting brackets are inverted from the position shown by solid lines in Fig. 10, the bracket on the right-hand side of Fig. 10 is transferred to the position shown by dotted lines, 70, in the upper lefthand side of such figure, and the other bracket shown by solid lines on the lefthand side of Fig. 10, is transferred to the position shown by dotted lines, 71, in the upper part of such figure.

The part shown in the different figures of the drawings, and marked, 74, in Fig. 13, is simply a drip-catcher to catch any waste lubricant which may be dropped from the axle or stud. When desired the single bearing-brackets, 60, can be made "rights" and "lefts." The oil-catchers are provided with oppositely-disposed outlets, 75, adapted to permit the oil which is caught therein, as it leaves a pulley-hub, to be carried away in suitable pipes, 76, connected with said outlets, to drip-pans, 77. See Fig. 1. The use of oil-catchers provided with a single bottom outlet leading to a drip-pan is well known. I am not aware that drip-catchers have been provided with oppositely-disposed outlets, whereby the pulley-bracket, with a drip-catcher attached, can be inverted, as shown, and the drip discharged therefrom through a bottom outlet. The use of two oppositely-disposed outlets permits of the inversion of the brackets and drip-catchers without interfering with their usual functions. It is practically necessary to have such drip-catchers project inwardly so as to inclose the ends of the pulley-hubs, in which position they will catch any particles of oil which are thrown by centrifugal force from the rapidly rotating pulley-hubs.

If the bearing-brackets which afford end-supports for a pulley-axle were fixed to an attaching plate common to both, they would be inseparable, and it would be impossible to insert the pulley-hub between such inwardly projecting brackets. By having the bearing-brackets separable from each other, and each provided with a semicircular attaching plate, as shown, the pulley can be inserted between such bearing-brackets before they are attached to their support, and the attaching plate afterwards secured to such support, as shown, or in any known manner. When the pulley-axle is provided with shoulders, 68, Fig. 13, against which the bearing-brackets are clamped by means of a nut screwed on to the screw-threaded reduced end-portions of the axle, such axle can be inserted in the bearing-brackets only by separating such brackets from each other. For these reasons it is necessary to have the bearing-brackets separable from each other. By such a form of construction the pulley-supporting mechanism can be made exceedingly compact, and various parts, such as the drip-catchers, can be most advantageously positioned to perform their functions.

What I claim as new and desire to secure by Letters Patent is

1. An adjustable guide-pulley comprising a stationary support having a belt-aperture, separable end-bearings, means for adjustably securing the end-bearings to the support, an idle pulley and a pulley-axle having end-shoulders and means for clamping the shoulders between such end-bearings, respectively.

2. In an adjustable guide-pulley, the combination with a stationary bracket-support having a belt-aperture; of a pair of separable apertured bearing-brackets; means for adjustably securing the bearing-brackets to the support; an idle-pulley; a pulley-axle having end-shoulders adapted to engage the sides of the brackets, and reduced screw-threaded end-projections projected through

the bearing-apertures in the bearing-brackets; and clamping nuts on the projecting screw-threaded ends, respectively.

3. The combination with an idle pulley; a pulley-axle having end-shoulders; and a supporting plate having a belt-aperture therein; of a pair of separable pulley-supporting apertured brackets; and means for adjustably securing such brackets upon such plate, respectively, upon opposite sides of said belt-aperture, and in clamping contact with the axle-shoulders.

4. The combination with an idle pulley; and a supporting plate having an elongated belt-aperture therein; of a pair of separable pulley-supporting brackets; and means for adjustably securing such brackets upon such plate, respectively, near the ends of the belt-aperture, with the brackets projecting laterally on one side of such aperture, and parts of the brackets projecting inwardly of the edge of the peripheral flange of the pulley.

5. The combination with an idle pulley; and a supporting plate having a belt-aperture therein; of a pair of separable and invertible pulley-supporting brackets; and means for adjustably securing such brackets upon such plate, with the brackets projecting laterally on either side of such aperture, and parts of the brackets projecting inwardly of the edge of the peripheral flange of the pulley.

6. The combination with an idle pulley; and a supporting plate having a belt-aperture therein and a peripheral flange; of a pair of pulley-supporting brackets, each having a separate attaching plate slotted to provide an aperture adapted to register with one end of the belt-aperture in the supporting plate and both adapted to rest upon the supporting plate and fit against its peripheral flange; and means for adjustably securing such brackets upon such plate with the attaching bracket-plates located within such peripheral flange, and some part of the bracket arms within the peripheral flange of the pulley.

7. The combination with an idle pulley; and a supporting plate having a belt-aperture therein and a circular peripheral flange; of a pair of separable pulley-supporting brackets, each having a semicircular attaching plate slotted to provide an aperture adapted to register with one end of the belt-aperture in the supporting plate, and together adapted to rest upon the supporting plate and engage the peripheral flange on all sides of the plate; and means for adjustably securing such brackets upon such plate with the attaching bracket-plates located within such peripheral flange, and some part of the bracket arms within the peripheral flange of the pulley.

8. The combination with an idle pulley; and a supporting plate having a belt-aperture therein, and an elongated bolt-hole on opposite sides of such aperture; of a pair of separable pulley-supporting brackets, each provided with an attaching plate adapted to rest upon the supporting plate, and having apertures adapted to register with the belt-aperture in the supporting plate; semiannular grooves in each attaching plate on opposite sides of the belt-aperture concentric with the middle point of the elongated bolt-hole; screw-threaded nuts having annular flanges adapted to enter such annular grooves; and screw-threaded bolts adapted to pass one through each of the elongated bolt-holes and hold each flanged nut tightly within its appropriate groove.

9. A guide-pulley, separable, invertible and oscillatory bearing-supports therefor; and means for securing such supports in differing positions of inversion and oscillation, with some part of the bearing-supports located within the peripheral flange of the pulley.

10. A guide-pulley, a bearing-support therefor, oscillatory and invertible in concentric arcs of a circle, a drip-catcher on such support having oppositely-disposed-outlets, and means for adjustably securing such support in differing positions of oscillation and inversion.

11. A guide-pulley, separable bearing-supports therefor, oscillatory in concentric arcs of a circle, a drip-catcher on each of such supports located within the peripheral flange of the pulley, and means for adjustably securing such supports in differing positions of oscillation and inversion.

12. A guide-pulley, separable oscillatory bearing-supports therefor, a drip-catcher on such supports located within the peripheral flange of the pulley, and means for adjustably securing such supports in differing oscillatory positions.

In testimony whereof, I have hereunto set my hand this 22nd day of May, 1908.

EDGAR CROASDALE.

Witnesses:
GEO. A. MOSHER,
J. DONSBACH.