No. 766,013. PATENTED JULY 26, 1904.

C. K. BALDWIN.

BRUSHING APPARATUS FOR CONVEYER BELTS.

APPLICATION FILED MAR. 18, 1903.

NO MODEL. 5 SHEETS—SHEET 1.

Fig. 2.

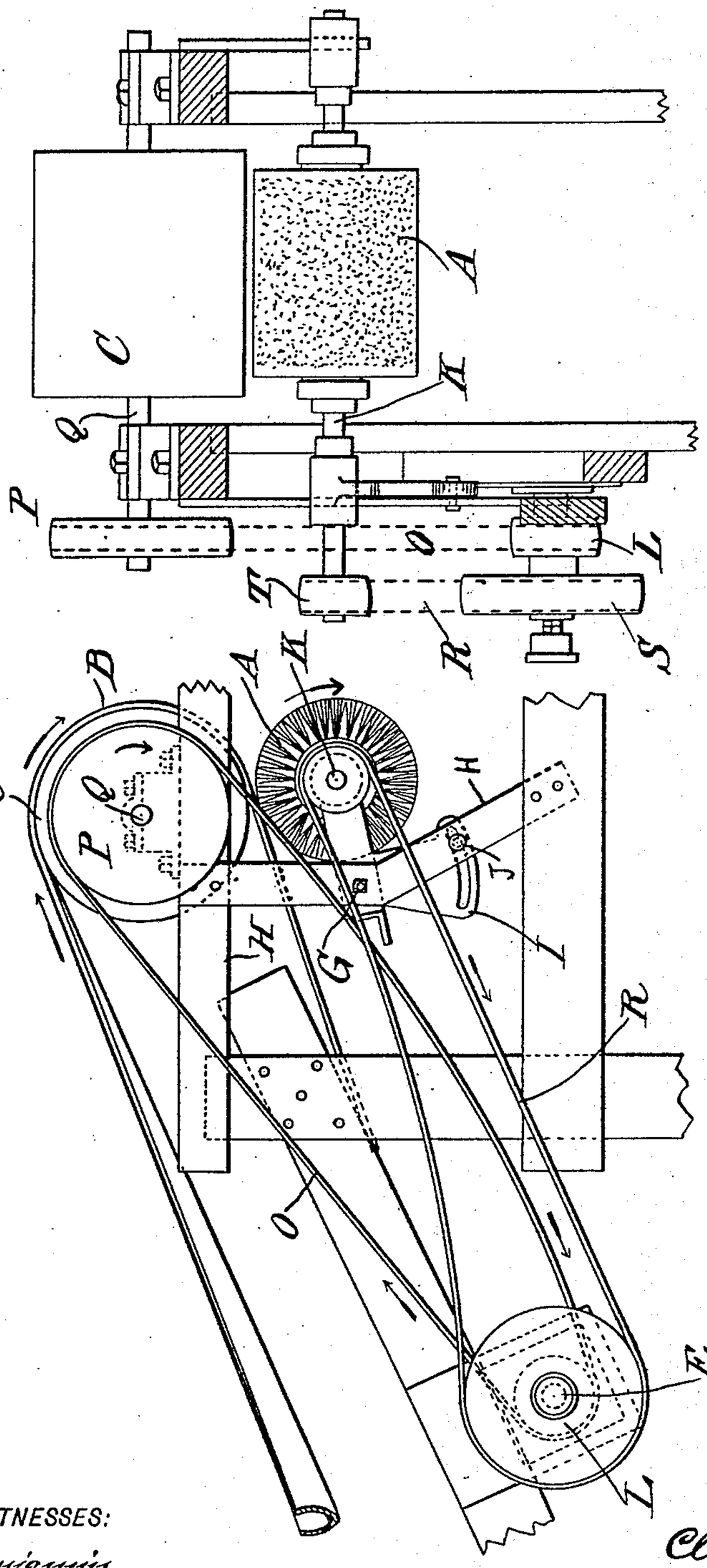

Fig. 1.

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N MODEL. 5 SHEETS—SHEET 2.

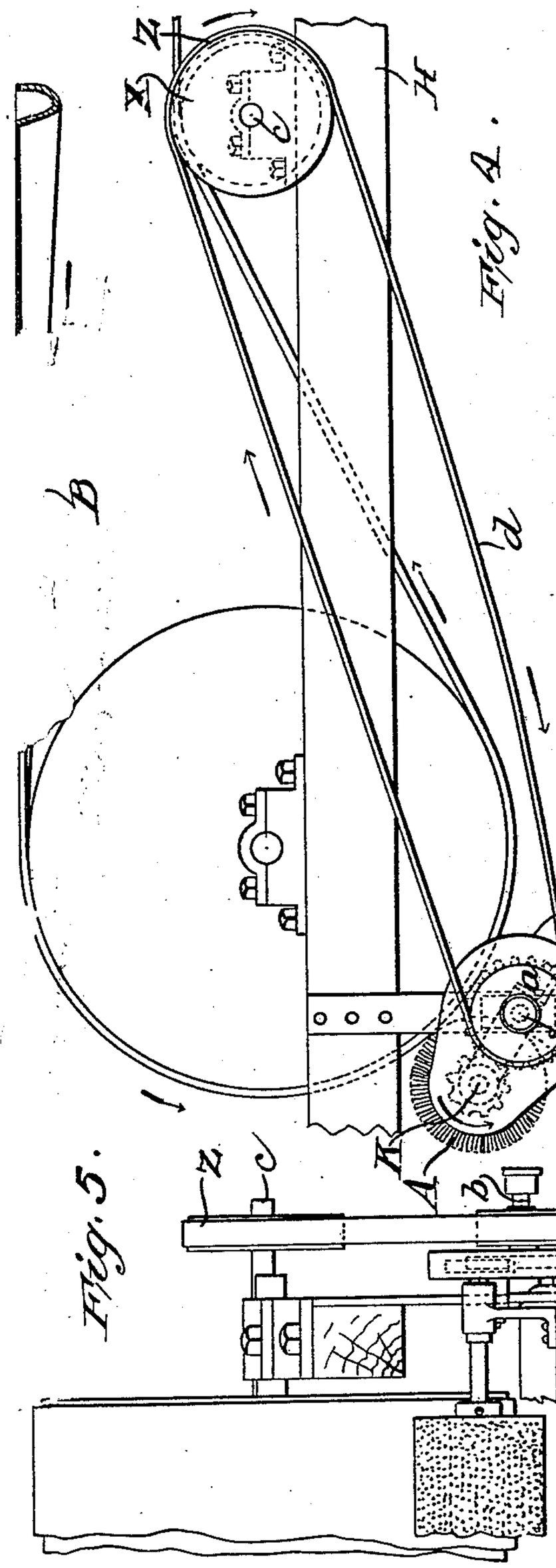

Fig. 4.

Fig. 5.

Fig. 6.

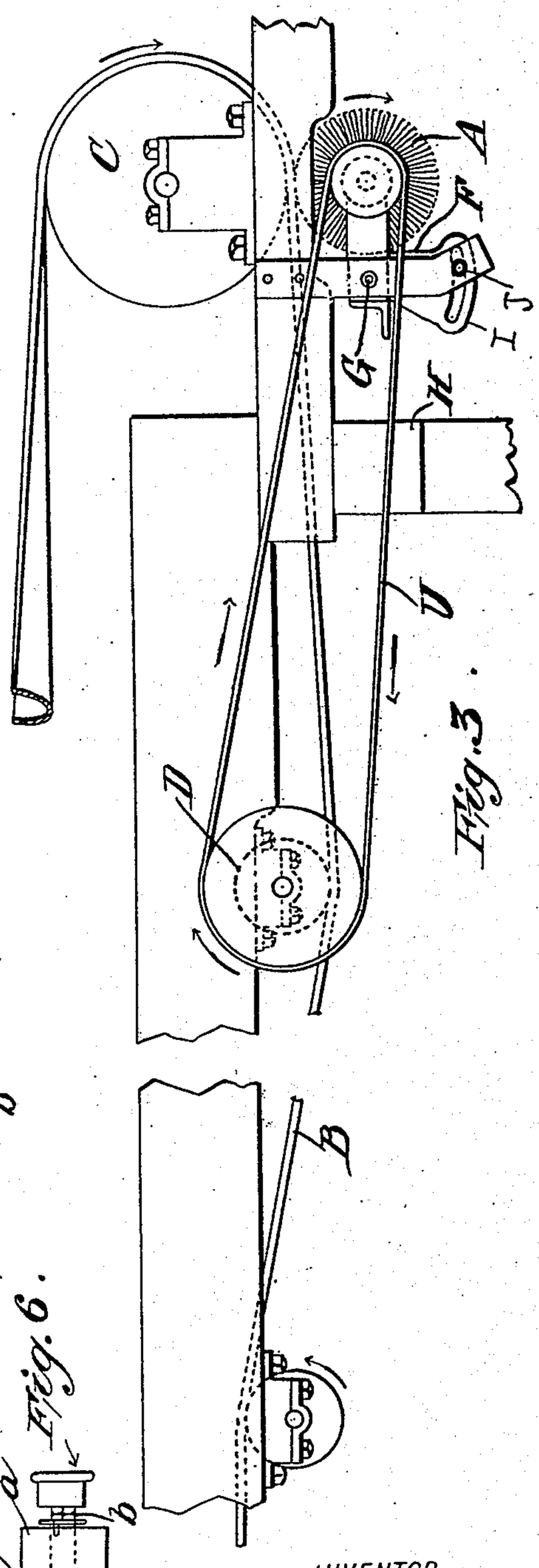

Fig. 3.

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NO MODEL. 5 SHEETS—SHEET 3.

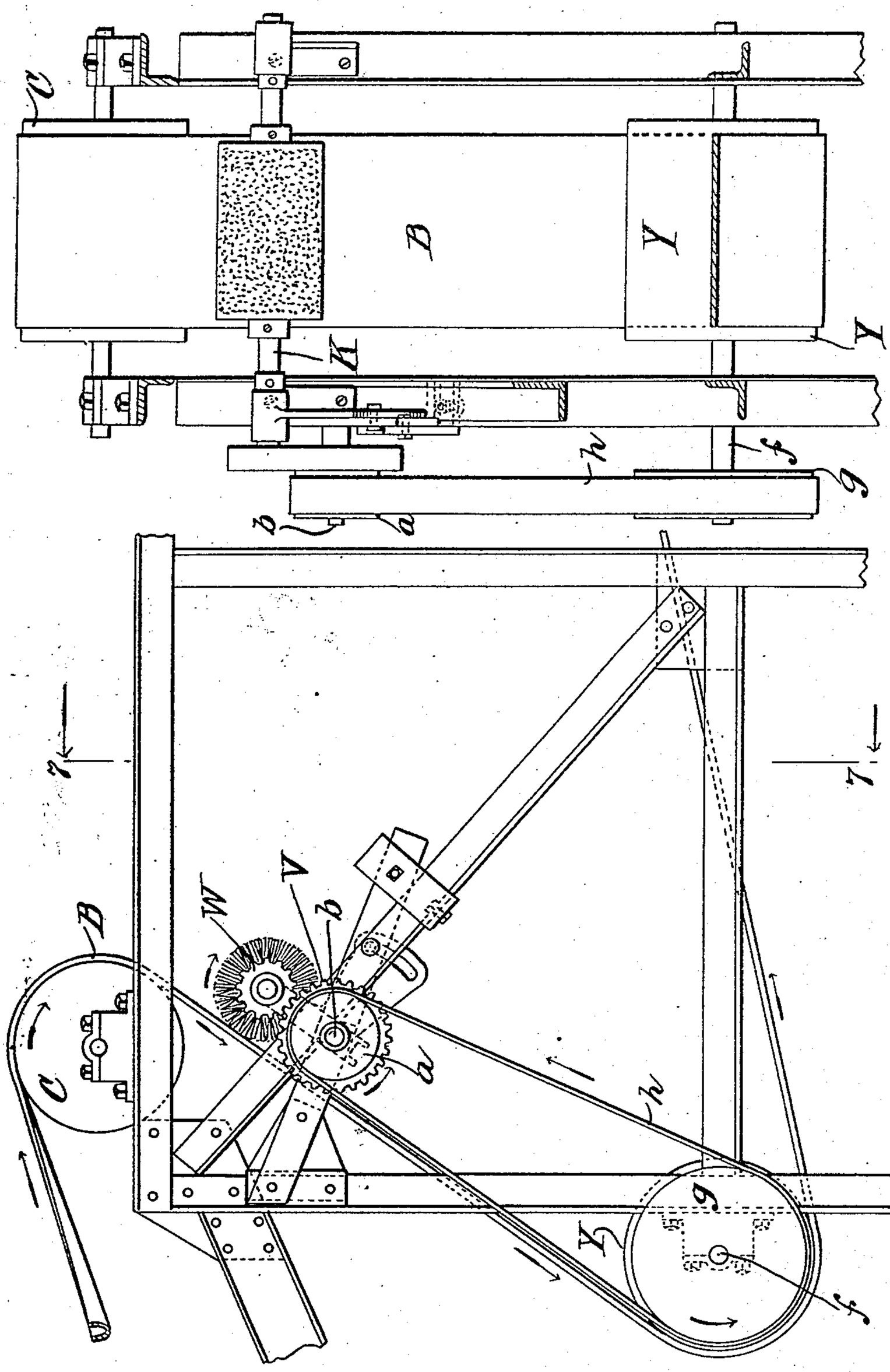

Fig. 8.

Fig. 7.

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NO MODEL. 5 SHEETS—SHEET 4.

Fig. 10.

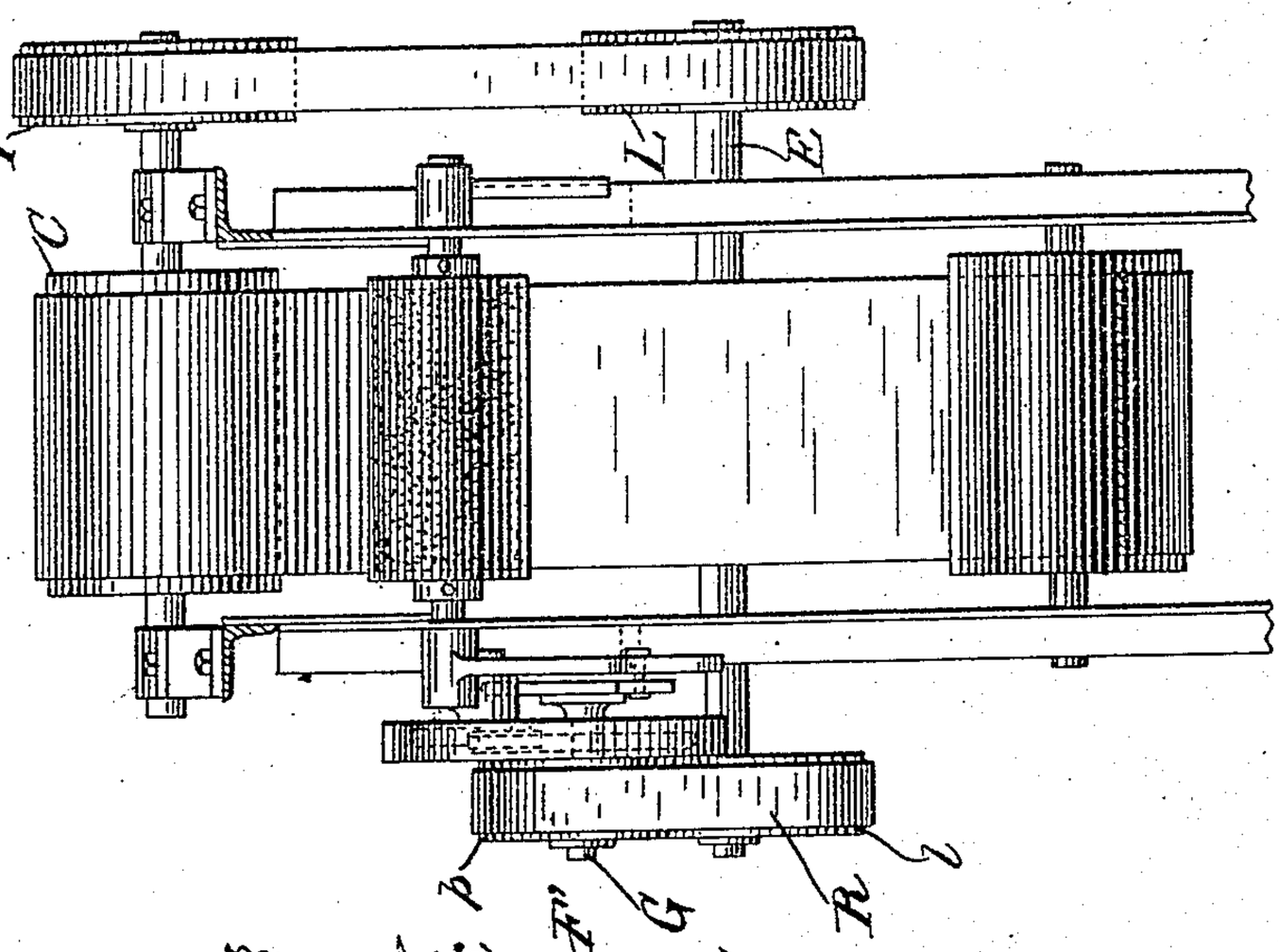

Fig. 9.

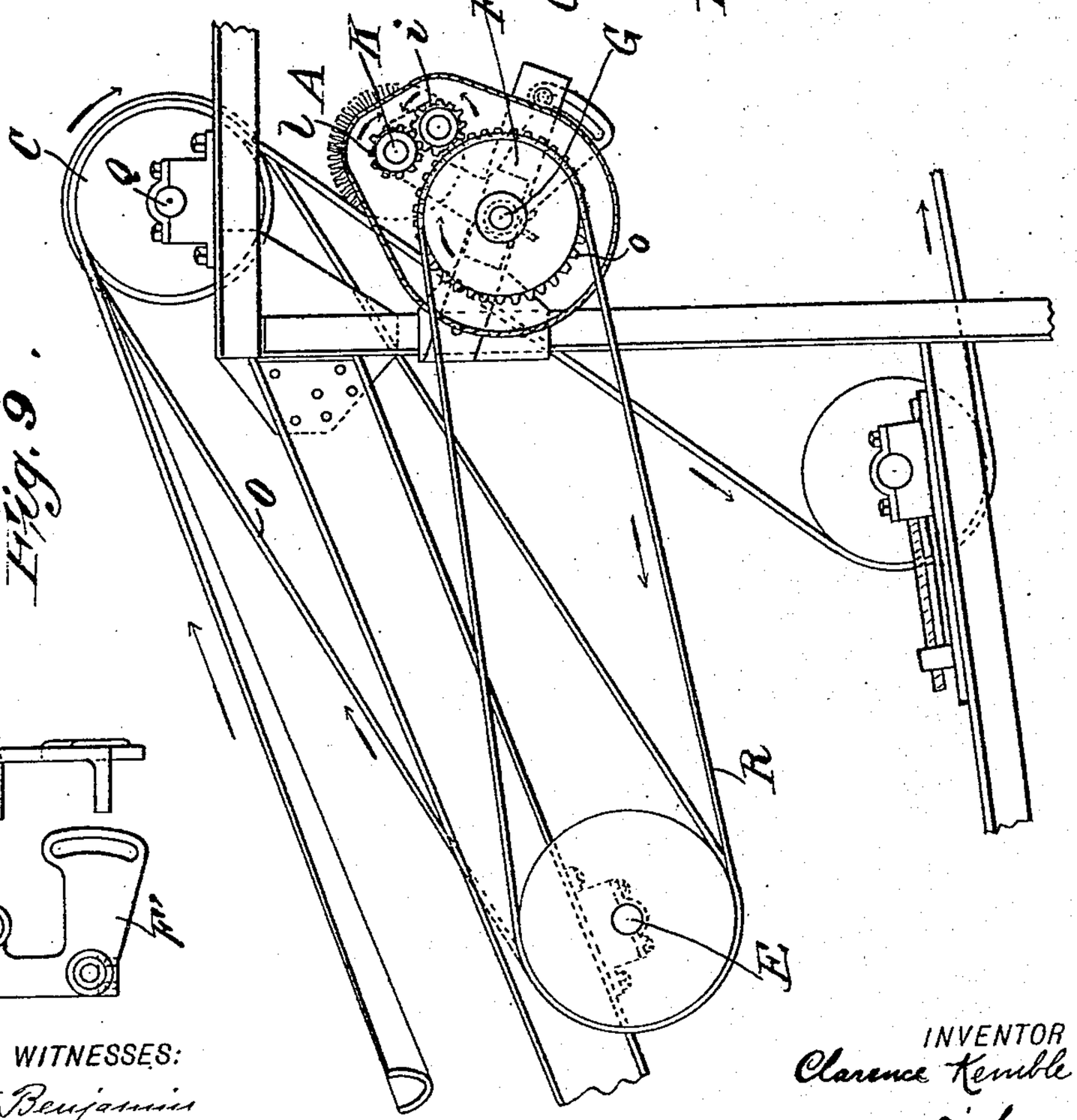

Fig. 11.

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APPLICATION FILED MAR. 18, 1903.

NO MODEL. 5 SHEETS—SHEET 5.

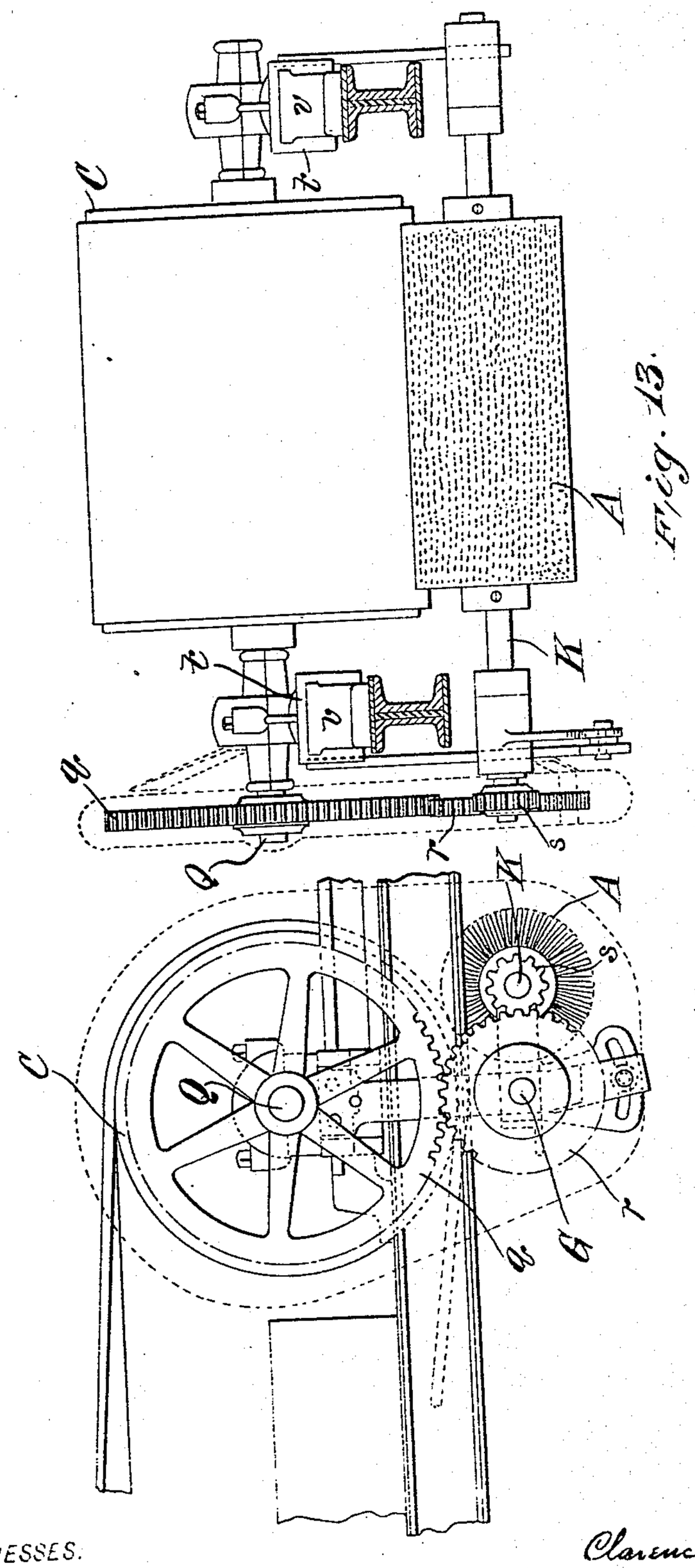

Fig. 13.

Fig. 12.

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No. 766,013. Patented July 26, 1904.

UNITED STATES PATENT OFFICE.

CLARENCE KEMBLE BALDWIN, OF NEW YORK, N. Y., ASSIGNOR TO THE ROBINS CONVEYING BELT CO., A CORPORATION OF NEW JERSEY.

BRUSHING APPARATUS FOR CONVEYER-BELTS.

SPECIFICATION forming part of Letters Patent No. 766,013, dated July 26, 1904.

Application filed March 18, 1903. Serial No. 148,354. (No model.)

To all whom it may concern:

Be it known that I, CLARENCE KEMBLE BALDWIN, a citizen of the United States, residing in the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Brushing Apparatus for Conveyer-Belts, of which the following is a specification, accompanied by drawings.

My invention relates to brushing apparatus for cleaning conveyer-belts and other uses; and its objects are to improve upon the construction of such apparatus and enable the requisite brush speed to be obtained without a separate source of power, while at the same time affording means for adjusting the brush to take up wear without interfering with the brush-driving mechanism and connections.

Further objects of my invention will hereinafter appear; and to these ends my invention consists of apparatus for carrying out the above objects embodying the features of construction, combinations of elements, and arrangement of parts substantially as hereinafter fully described and claimed in this specification and shown in the accompanying drawings, in which—

Figure 1 is a side elevation of apparatus embodying my invention, showing a brush driven by belting from a counter-shaft and without gears. Fig. 2 is an end view of the same, partly in section. Fig. 3 is a side elevation of a modification of the apparatus illustrated in Figs. 1 and 2 and showing the brush belted directly to a snub-pulley or idle pulley. Fig. 4 is a side elevation of a modified form of apparatus, showing a brush driven from a snub-pulley with the interposition of gears. Fig. 5 is an end view, partly broken away, of Fig. 4. Fig. 6 is an enlarged detail view of the gearing with the gear-case shown in dotted lines. Fig. 7 is a side elevation of a brush on a fixed dump and connected to be driven from the lower pulley with the interposition of gears. Fig. 8 is a transverse sectional view on the line 7 7 of Fig. 7. Fig. 9 is a side elevation of a brush driven from the upper pulley with the interposition of three gears, one of which is an idle gear. Fig. 10 is an end view of the same. Fig. 11 shows side and end views, respectively, of the brush-bracket when two gears are used. Fig. 12 is a side elevation of apparatus, showing the brush driven directly from the head-pulley by gearing. Fig. 13 is an end view of the same.

According to my invention the cleaning-brush A is driven in an opposite direction to the travel of the under side of the traveling belt B, which may be any suitable continuous conveyer-belt, and by this means the belt is continuously cleaned and the particles swept off and thrown into the stream of the belt. The brush A is driven in this instance by power derived from one of the rotating parts of the conveying apparatus, and suitable operative connections are provided for transmitting the motion of the belt to the brush to rotate the same, with or without interposition of gearing. In different instances different mechanism is provided; but provision is afforded in each instance for adjusting the brush relatively to the conveyer-belt in order to take up wear on the brush.

In Figs. 1, 2, and 3 the brush A is shown driven by suitable belting, in one instance from the head-pulley C through a counter-shaft E and in another instance from the idle pulley D. The brush is suitably supported in such manner that it may be moved to and from the conveyer B. According to the construction shown a bracket F is suitably pivoted at G to the frame H and provided with a slotted quadrant I at one end, coöperating with a tightening-pin J, mounted in the frame H, so that the bracket F may be swung about the pivots G to move the brush, pivotally mounted at K on the other end of the bracket, to and from the conveyer. The counter-shaft E, carrying the pulleys L and S, is provided in bearings upon the frame H in order to obtain the requisite distance between centers for suitably driving the brush A by belting. A belt O operatively connects a pulley P on the shaft Q of the head-pulley C with the belt L

on the counter-shaft E, while another belt R operatively connects the pulley S on the counter-shaft E with the pulley T, connected to the brush-shaft K. There is not the requisite distance between the head-pulley shaft Q and the brush-shaft K for suitable belt-driving, and one reason for providing the counter-shaft E, as stated, is to obtain the requisite distance between said shaft and the shafts Q and K for efficient driving by means of belts. By loosening the pin or bolt J at the quadrant I the brush A may be adjusted, and in order that this adjustment may not interfere with the belt-drive the counter-shaft E, brush-shaft K, and pivots G should be upon substantially the same straight line, as otherwise the distance between centers for the driving-belt R will be shortened when the brush A is adjusted for wear. In Fig. 3, as stated, the brush is driven from an idler-pulley D, over which the conveyer-belt B passes, and in this instance the requisite direction of rotation relative to the travel of the conveyer-belt is obtained with a single belt U. In the construction so far described the desired speed of the brush is obtained by properly proportioning the diameters of the pulleys P, L, S, and T.

In Figs. 4 to 8 gears V and W are employed to increase the speed of the brush, which is necessary, owing to the slow speed at which the conveyer-belts run. In Fig. 4 the power for driving the brush is shown derived from the snub-pulley X, over which the conveyer B passes. In this instance to the shaft *c* is connected the idle pulley Z, belted, by means of a suitable belt *d*, to a pulley *a* on the shaft *b*, journaled in the frame of the apparatus. Also connected to the shaft *b* is a gear V, meshing with the pinion W, connected to the brush-shaft K. As shown, the gearing is connected to speed up the brush, and the construction of the bracket F being as hereinbefore described the brush may be moved to and from the conveyer without interfering with the drive, for one gear rolls upon the other as the bracket is rocked upon the shaft *b*, which in this instance forms its pivot. The gears may be arranged within a suitable gear-case 50.

Fig. 7 shows substantially the same arrangement described in connection with Fig. 4, the brush being illustrated upon a fixed dump and deriving its source of power for driving from the lower pulley Y upon the shaft *f*, to which is connected a pulley *g*, connected by the belt *h* with the pulley *a* upon the shaft *b*, to which shaft is also connected the gear V, meshing with the pinion W upon the brush-shaft K. The brush is moved to and from the belt, as hereinbefore described, by means of the bracket F, pivoted to the shaft *b*.

In Fig. 9 the brush is shown on a fixed dump, and the power for driving is derived from the upper or head pulley C, which is an idle pulley, through the counter-shaft E. As shown, the lower pulley for the conveyer-belt is provided with a take-up mechanism for taking up the slack of the belt, and on account of this arrangement of take-up mechanism the lower pulley is not suitable for supplying power to drive the brush through belting, because if the brush were connected to the lower pulley, for instance, by belting, as shown in the drawings, the adjustment of the pulley for taking up the slack of the conveyer-belt would vary the distance between the center of the lower pulley and the axis of the brush, which would interfere with the driving-pulley for the brush. In this instance a gear and two pinions are used, one of which is an idle pinion *i*, to give the proper direction of rotation to the brush A. In this instance the bracket F′ is provided with two bearings *j* and *k* for the pinion *l*, connected to the brush-shaft *k* and the idle pinion *i*. The gear *o* is mounted on the shaft *g*, upon which the bracket F′ is pivoted, and the belt O, as in Fig. 1, connects the pulley P with the pulley L on the counter-shaft E. Another belt R connects the pulley *l* with the pulley *p* upon the stud G, and by means of these operative connections described the required direction of rotation and speed of the brush A are obtained.

In Figs. 12 and 13 the brush A is geared directly to the head-pulley C by means of the gears *q r* and pinion *s*, the gear *q* being upon the shaft Q and meshing with the gear *r* upon the stud G. The gear *r* then meshes with the pinion *s* on the brush-shaft K. In this modification the head-pulley C is mounted, in connection with a take-up mechanism for taking up the slack of the belt, upon the slides *t*, slidable upon the tracks or rails *v*, by means of which construction the slack in the conveyer-belt B may be taken up. According to the construction shown the entire brush mechanism is attached to the slides *t* of the take-ups, so that as the pulley and take-ups are moved the entire brush mechanism moves with it; but this arrangement of direct gearing may of course be used with a stationary head with pillow-blocks substituted for take-ups.

Obviously some features of my invention may be used without others, and my invention may be embodied in widely-varying forms.

Therefore, without limiting myself to the construction shown and described nor enumerating equivalents, I claim, and desire to obtain by Letters Patent, the following:

1. The combination with a continuous traveling conveyer-belt, of a rotary brush for cleaning the conveyer-belt, a belt and gearing operatively connected to drive said brush by

derived from the conveyer-belt, and s for adjusting said brush to take up wear, ubstantially the purposes set forth.

The combination with a continuous trav- nveyer-belt and the head and tail pul- refor, of an idle pulley over which the so passes, and a rotary brush for clean- ne conveyer-belt and connected to be en from said idle pulley, for substantially purposes set forth.

3. The combination with a continuous traveling conveyer-belt, of an idle pulley over which the same passes, a rotary brush for cleaning the conveyer-belt and connected to be driven from said idle pulley, and means for adjusting said brush to take up wear, for substantially the purposes set forth.

4. The combination with a continuous traveling conveyer-belt and its head and tail pulleys, of a shaft and an idle pulley thereon over which the conveyer-belt also passes, and a rotary brush belted to the idle-pulley shaft for cleaning the conveyer-belt, for substantially the purposes set forth.

5. The combination with a continuous traveling conveyer-belt and its head and tail pulleys, of a shaft and an idle pulley thereon over which the conveyer-belt also passes, a rotary brush for cleaning the conveyer-belt provided with a pinion, and a gear meshing with said pinion and belted to the shaft of the said idle pulley, for substantially the purposes set forth.

6. The combination with a continuous traveling conveyer-belt, of a shaft and an idle pulley thereon over which the conveyer-belt passes, a rotary brush for cleaning the conveyer-belt provided with a pinion, a gear meshing with said pinion and belted to the shaft of the said idle pulley, and means for adjusting said brush to take up wear, for substantially the purposes set forth.

7. The combination with the head-pulley and a continuous traveling conveyer-belt passing over the same, of a counter-shaft connected to be driven by power derived from the head-pulley, a rotary brush for cleaning the conveyer-belt connected to be driven from the said counter-shaft, and means for adjusting said brush to take up wear, for substantially the purposes set forth.

8. The combination with the head-pulley and its shaft, of a continuous traveling conveyer-belt passing over said pulley, a counter-shaft belted to the head-pulley shaft, a rotary brush belted to the said counter-shaft for cleaning the conveyer-belt, and means for adjusting said brush to take up wear, for substantially the purposes set forth.

9. The combination with the head-pulley and its shaft, of a continuous traveling conveyer-belt passing over said pulley, a counter-shaft belted to the head-pulley shaft, a gear belted to the said counter-shaft, and a rotary brush for cleaning the conveyer-belt provided with a pinion connected to be driven from said gear, for substantially the purposes set forth.

10. The combination with the head-pulley and its shaft, of a continuous traveling conveyer-belt passing over said pulley, a counter-shaft belted to the head-pulley shaft, a gear belted to the said counter-shaft, a rotary brush for cleaning the conveyer-belt provided with a pinion connected to be driven from said gear, and means for adjusting said brush to take up wear, for substantially the purposes set forth.

11. The combination with the head-pulley and its shaft, of a continuous traveling conveyer-belt passing over said pulley, a counter-shaft belted to the head-pulley shaft, a gear belted to the said counter-shaft, and a rotary brush for cleaning the conveyer-belt provided with a pinion and an idle pinion meshing with said gear and the first-named pinion, for substantially the purposes set forth.

12. The combination with the head-pulley and a continuous traveling conveyer-belt passing over the same, of a rotary brush for cleaning the conveyer-belt geared directly to be driven from the head-pulley, and means for adjusting said brush to take up wear, for substantially the purposes set forth.

13. The combination with a continuous traveling conveyer-belt, of a take-up mechanism for compensating for the slack of the belt, and a rotary cleaning-brush deriving its power from the belt and movable with the said take-up mechanism, for substantially the purposes set forth.

14. The combination with a continuous traveling conveyer-belt, of means for compensating for the slack of the belt, a rotary cleaning-brush mounted for movement with said compensating means, and means for adjusting said brush to take up wear, for substantially the purposes set forth.

15. The combination with a continuous traveling conveyer-belt, of a shaft and pulley, mechanism for transmitting the motion of the belt to said shaft to drive the pulley, a bracket pivoted for movement to and from the belt, a brush mounted upon said bracket for cleaning the belt, and belt connections between the brush and said pulley, the shaft of said pulley, the pivot of the bracket, and the axis of the brush being in substantially the same plane, whereby the brush may be moved to and from the conveyer-belt to take up wear without causing substantial slack in said belt connection between the brush and the pulley, for substantially the purposes set forth.

16. The combination with a continuous traveling conveyer-belt, of a shaft and pulley mechanism for transmitting the motion of the belt to said shaft to drive the pulley, a bracket

pivoted for movement to and from the belt, a brush mounted upon said bracket for cleaning the belt, and belt connections between the brush and said pulley, the pivot of the bracket being arranged between the shaft and the axis of the brush and in substantially the same plane with the same, whereby the brush may be moved to and from the conveyer-belt to take up wear without causing substantial slack in said belt connection between the brush and the pulley, for substantially the purpose forth.

In testimony whereof I have signed specification in the presence of two subscribing witnesses.

CLARENCE KEMBLE BALD

Witnesses:
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EMIL CHAS. EGER.