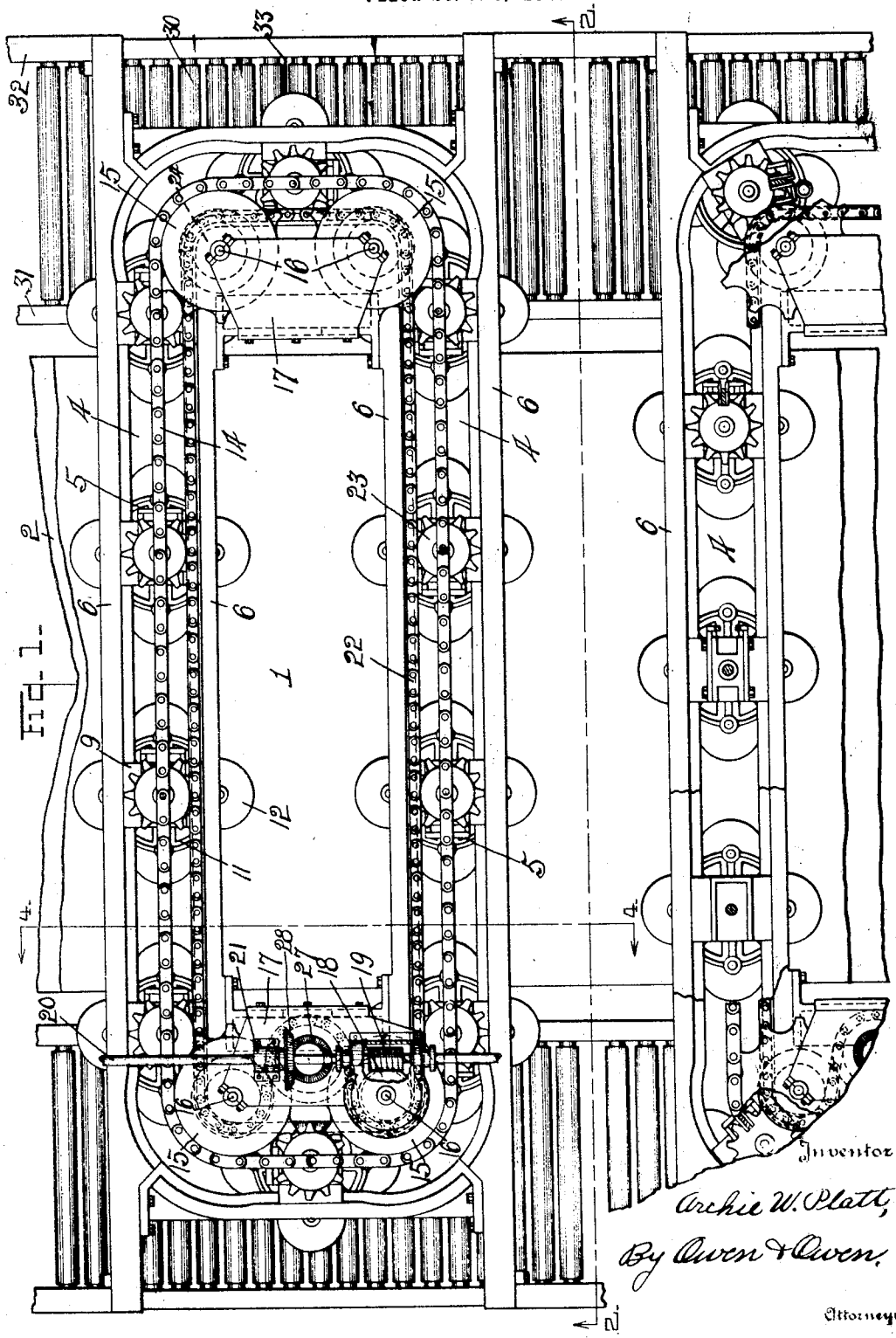
April 17, 1928. 1,666,347

A. W. PLATT

CONTINUOUS GLASS POLISHING MEANS

Filed Sept. 3, 1926 3 Sheets-Sheet 1



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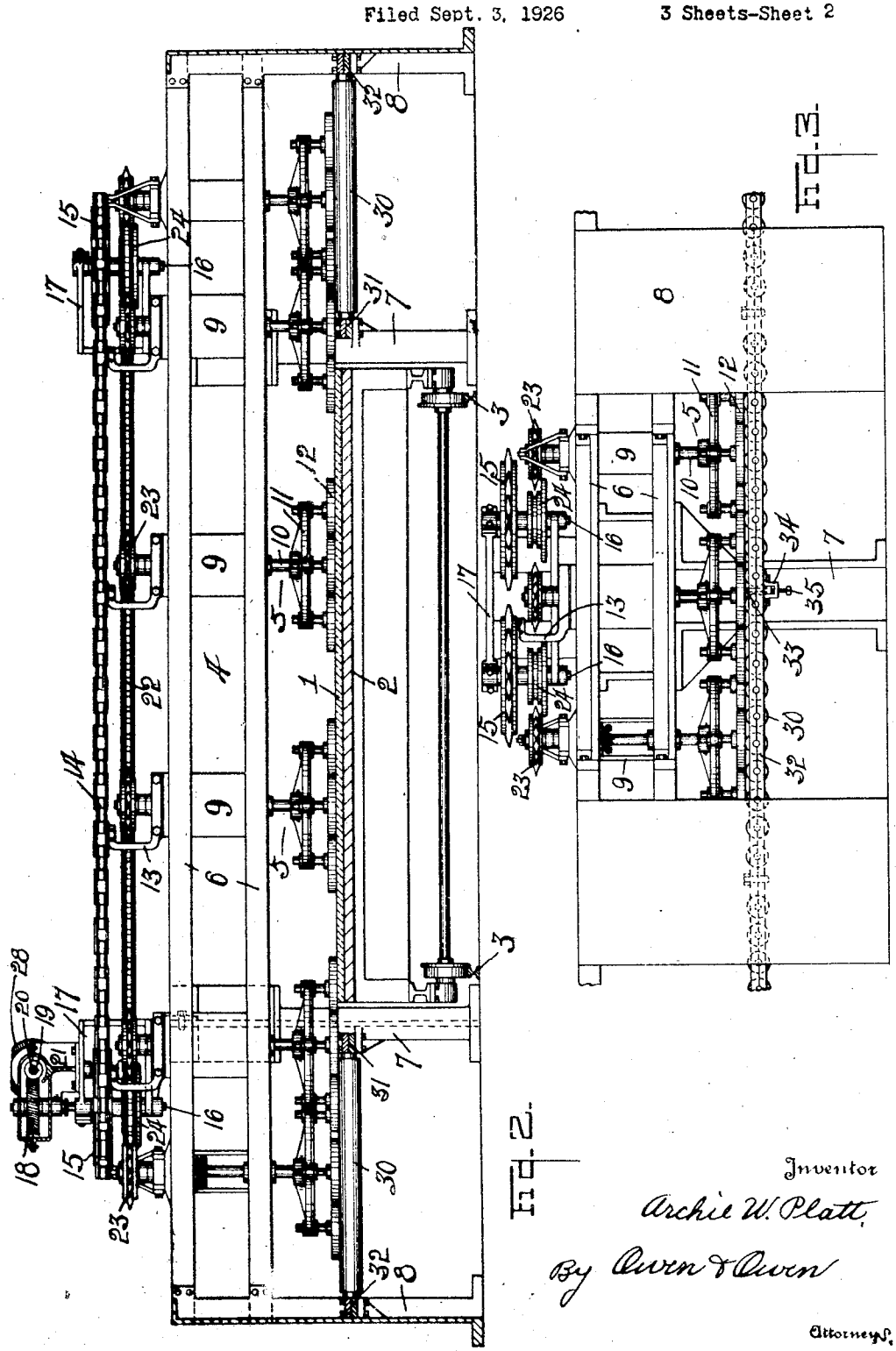

Fig. 2.

Fig. 3.

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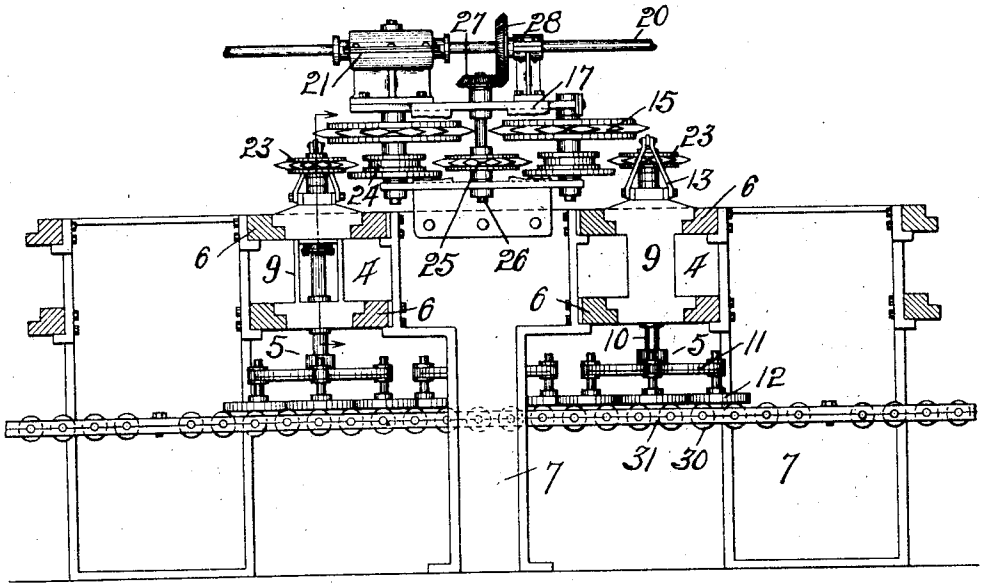

Fig. 4.

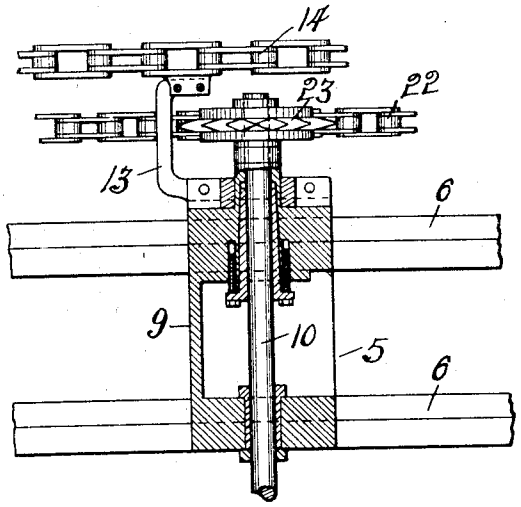

Fig. 5.

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UNITED STATES PATENT OFFICE.

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CONTINUOUS GLASS-POLISHING MEANS.

Application filed September 3, 1926. Serial No. 133,338.

This invention relates to apparatus particularly intended for grinding or polishing plate glass in a continuous manner.

An object of the invention is the provision of a simple, efficient and practical machine of the character described, which is entirely automatic in its action and is adapted to effect a continuous polishing or grinding of the exposed top surface of plate or sheet glass as it is moved either intermittently or continuously at a slow speed under the polishing means.

A further object of the invention is the provision of means for automatically, at predetermined intervals, cleaning or reconditioning the felt covered working surfaces of the polishing members so they will continue to effectively polish the glass and will not scratch or otherwise injure the same by reason of the accumulation of the polishing or abrading material thereon.

Further objects and advantages of the invention will be apparent from the following detailed description thereof.

While the invention in its broader aspect is capable of embodiment in numerous forms, a preferred embodiment thereof is illustrated in the accompanying drawings, in which,—

Figure 1 is a top plan view of an apparatus embodying the invention with parts broken away. Fig. 2 is a cross-section on the line 2—2 in Fig. 1. Fig. 3 is a fragmentary side elevation of the machine with parts removed. Fig. 4 is a section on the line 4—4 in Fig. 1, and Fig. 5 is an enlarged fragmentary detail of one of the polishing units and of portions of the associated drive and guiding means.

Referring to the drawings, 1 designates the plate or sheet glass to be surfaced or polished, which is mounted on one or more polishing tables 2 of truck form. These tables are preferably arranged in train or tandem form in end abutting relation to provide a prolonged substantially unbroken top surface lengthwise of the train, and they travel over guide rails 3.

The tables 2 pass under one or more endless guides 4 arranged in spaced relation lengthwise of the movement of the tables and adapted to guide the successive backward and forward movements across the tables of respective sets of glass surfacing units 5, which for convenience may hereinafter be referred to as polishing units.

Each guide 4, in the present instance, is composed of four parallel guide bars 6 arranged transversely in rectangular form to provide a pair of upper opposed bars and a pair of lower opposed bars. Each guide 4 has two runs, preferably in parallel relation, across the table runway transversely thereof and the adjacent ends of the runs are connected by looped portions of the guides disposed without the table runway at opposite sides thereof. The guides 4 are supported at each side of the table runway by a respective set of standards 7 arranged alongside of the tables in close relation thereto, and are also supported at the looped ends thereof in outwardly spaced relation to the standards 7 by respective sets of standards 8.

Each polishing unit 5 has a carriage or cross-head member 9 that is mounted in and guided for movements by the respective guide 4, and a vertical shaft 10 is journaled in each carriage. A rotary head 11 is carried by each shaft 10 at its lower end and a plurality of runners or polishing blocks 12 (in the present instance four in number) are carried by each head 11 for turning movements therewith and for rotary movements relative thereto, as well understood in the art. The blocks 12 usually have their working surfaces covered with felt and are adapted to have polishing coaction with the surface of the glass 1 as they move across the same.

Each polishing unit 5 has an upstanding arm 13 swiveled on the upper end of its carriage 9 for free horizontal turning movements relative thereto, and the upper end of the arm is connected to a drive chain 14 so that the associated unit is caused to move with the chain. This connection of the several units with the chain also maintains the units in proper spaced relation, the spacing being such that a plurality of successive units are preferably in polishing coaction at the same time with the glass being surfaced. The chain 14 is disposed over the associated

guide 4 and is guided by sprocket wheels 15 at the corners to follow a course of movement paralleling the guide 4 over and entirely around the same. The sprocket wheels 15 are mounted on respective shafts 16 journaled in brackets 17 carried by respective standards 7 and one of the shafts 16 carries a worm wheel 18 in mesh with a drive work 19 on a drive shaft 20 mounted in bearings 21 lengthwise of the frame and at one side of the table runway. The speed of movement of the chain 14 is preferably such that the polishing units will have a slow movement across the glass being polished.

The rotary heads 11 of the polishing units are rotated at the desired speed by the engagement of a drive chain 22 with a sprocket wheel 23 on the upper end of the shaft 10 of each unit of a set. The chain 22, in the present instance, is disposed below the plane of the chain 14 and within the path of movement thereof in substantial parallelism therewith, being guided at the corners of its movement by idler rolls 24 loosely mounted on the shafts 16 so that such rolls and the sprocket wheels 15 may have movements according to the speed of movements of the respective chains 14 and 22. The chain 22 at one side of the table runway is looped inwardly around a drive sprocket wheel 25 that is mounted on a shaft 26 intermediate the pair of guide rolls 24 at that end of the guide. The shaft 26 is journaled in the associated bracket 17 and carries a beveled pinion 27 at its upper end in mesh with a companion pinion 28 on the drive shaft 20. A rotary movement is imparted to the polishing heads of the several units throughout the entire course of their travel in the guide 4, except at the points where the chain 22 is looped inwardly around the drive sprocket 25.

A set of rollers 30 is disposed at each side of the table runway to support the units 5 while traveling the looped portions of the guide 4 or while passing from one cross run to the other of a guide. The rollers 30 of each set are journaled at their inner and outer ends in rails 31 and 32, respectively, the rail 31 being carried by the standards 7 and the rail 32 by the standards 8, and both extending in parallel relation lengthwise of the table runway.

In order to clean or re-condition the felt covered working surfaces of the polishing blocks 12 at a predetermined point in each cycle of movement of the units, a scraper blade 33 is disposed between two of the rollers 30 of one set substantially centrally of the associated end loop of the guide 4 and is elevated sufficiently to have scraping coaction with the working faces of the blocks as they pass thereover. The scraper 33 is preferably disposed below the end of the guide at which the unit sprocket wheels 23 remain in engagement with the chain 22 so that the polishing heads of the units will be rotated as they pass over the scraper. The scraper 33 is mounted at its ends in vertical guides 34 secured to the undersides of the associated rails 31 and 32 and is vertically adjusted in the guides by screws 35 (see Fig. 3).

In the use of the machine, the glass 1 to be polished or ground, which may be in continuous sheet form or in sectional form, is mounted on or supported by the tables 2 and fed lengthwise of the machine and under the polishing units by the movement of the tables. Any number of sets of polishing units may be employed to suit the work to be performed and each set has its polishing units moving continuously and in successive order first in one direction and then another across the glass, this being accomplished by the driving action of the chain 14. At the same time the polishing members of the units are given the desired rotary movements by the driving connection of the chain 22 therewith. The working surfaces of the polishing units are cleaned and re-conditioned after leaving the glass at one side thereof by coaction with a scraper blade 33 which is vertically adjustable to compensate for wear and to vary the pressure intended to be exerted thereby against the under-surfaces of the polishing blocks.

I wish it understood that the references herein to plate glass applies to and includes all kinds of sheet glass which is adapted to be ground or polished and is not restricted to that kind of glass which is commonly referred to in the trade as "plate glass"; also that the term "polishing" as used herein is intended to include any abrasive action applied to the glass, whether the same be for grinding or for polishing the same, and that while the machine described herein is intended primarily for polishing, strictly speaking, glass plates or sheets, it may also be used for the grinding of the surfaces of such sheets.

I wish it understood that my invention is not limited to any specific construction, arrangement or form of the parts, as it is capable of numerous modifications and changes without departing from the spirit of the claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a machine of the class described, a conveyor for supporting plate glass and having a defined path of movement, a polishing unit having an endless path of movement forward and backward across the conveyor transverse to the conveyor movement with portions of its movement at the sides of the conveyor, means for causing said unit to traverse its path of movement, and means

disposed at one side of the path of movement of the conveyor for re-conditioning the polishing surface of the unit as it passes thereover.

2. In a machine of the class described, a conveyor for supporting plate glass and having a defined path of movement, a plurality of successive polishing units having an endless path of movement with runs across the conveyor transverse to its movement and a run beyond a side of the conveyor, means for causing said units to traverse the path of movement provided therefor, and means at a side of the conveyor for re-conditioning the polishing surface of each unit as it passes thereover during its run at a side of the conveyor.

3. In a machine of the class described, a conveyor for supporting plate glass and having a defined path of movement, means forming an endless guideway having spaced guide portions extending entirely across the conveyor transversely of its movement and connected at their ends beyond the respective sides of the conveyor, a polishing unit guided for movements by the conveyor and adapted to have polishing coaction with glass on the conveyor as it crosses the same, means causing the unit to traverse the guideway, and means at a side of the conveyor in the path of movement of the polishing unit for coaction with the polishing surface of the unit as it passes thereover to effect a re-conditioning of such surface.

4. In a machine of the class described, a conveyor for supporting plate glass and having a defined path of movement, means forming an endless guideway with spaced portions extending across the conveyor and connected beyond the conveyor at the respective sides thereof, a polishing unit guided for movements by said means and having a rotatable polishing part, means for causing the conveyor to traverse the guideway throughout its length, means for rotating the polishing portion of the unit as it crosses over the conveyor, and separate and independently operable means for supporting the polishing unit when beyond the sides of the conveyor and transferring it from one spaced portion of the guide-way to the other.

5. In a machine of the class described, a conveyor for supporting plate glass and having a defined path of movement, means forming an endless guideway having portions extending entirely across the conveyor transversely thereof and portions beyond the sides of the conveyor, polishing units guided in successive order by said guide means, and means at each side of the conveyor providing an anti-friction support for the units while passing from one to the other of the transversely extending portions of the guide means.

6. In a machine of the class described, a conveyor for supporting plate glass and having a defined path of movement, means forming an endless guideway having portions extending entirely across the conveyor transversely thereof and portions beyond the sides of the conveyor, polishing units guided in successive order by said guide means, and means at each side of the conveyor providing an antifriction support for the units while passing from one to the other of the transversely extending portions of the guide means, and means associated with one of said supporting means for coaction with the polishing surfaces of the units as they pass over the supporting means.

7. In a machine of the class described, a conveyor for supporting plate glass and having a defined path of movement, means forming an endless guideway and having spaced portions extending across the conveyor transversely thereof, a plurality of polishing units guided for movements by said guide means and having rotary polishing members for coaction with the glass supported by the conveyors as the units pass thereover, a chain having a path of movement corresponding to the path of movement of the polishing units and in driving connection with each unit, means for driving the rotary polishing parts of the units and including a drive chain and driving connection between the rotary part of each unit and the chain, and means for imparting movement to each of said chains.

8. In a machine of the class described, a conveyor for supporting material for grinding or polishing and having a defined path of movement, means forming an endless guideway having spaced guide portions extending entirely across the material supporting portion of the conveyor transversely of its movement and connected at their ends beyond the respective sides of the material supporting portion of the conveyor, a carriage guided by the guideway for movements entirely around the same, a vertical shaft carried by the carriage, an abrading means carried by the shaft at its lower end for rotation therewith, a sprocket wheel carried by the shaft, a drive chain having a course of movement corresponding substantially to the course of movement of the carriage and meshing with said sprocket wheel, draft means connected to the carriage and operable to move it around the guideway, and means for driving said chain to impart movement to it relative to the movement of the carriage to rotate the sprocket wheel and shaft.

9. In a machine of the class described, a conveyor for supporting material to be abraded, means forming an endless guideway having spaced portions extending across the conveyor and portions at the sides of the conveyor connecting the adjacent ends of said spaced portions, a carriage guided for

movement by said guide means, a shaft carried by the carriage, abrading means carried by the shaft, a wheel carried by the shaft, an endless flexible member connected to the carriage and operable to move the carriage throughout the length of the guide means, a second flexible member connected to said wheel and operable to rotate the wheel and shaft, and means operable to drive both said flexible members at relative speeds.

In testimony whereof I have hereunto signed my name to this specification.

ARCHIE W. PLATT.