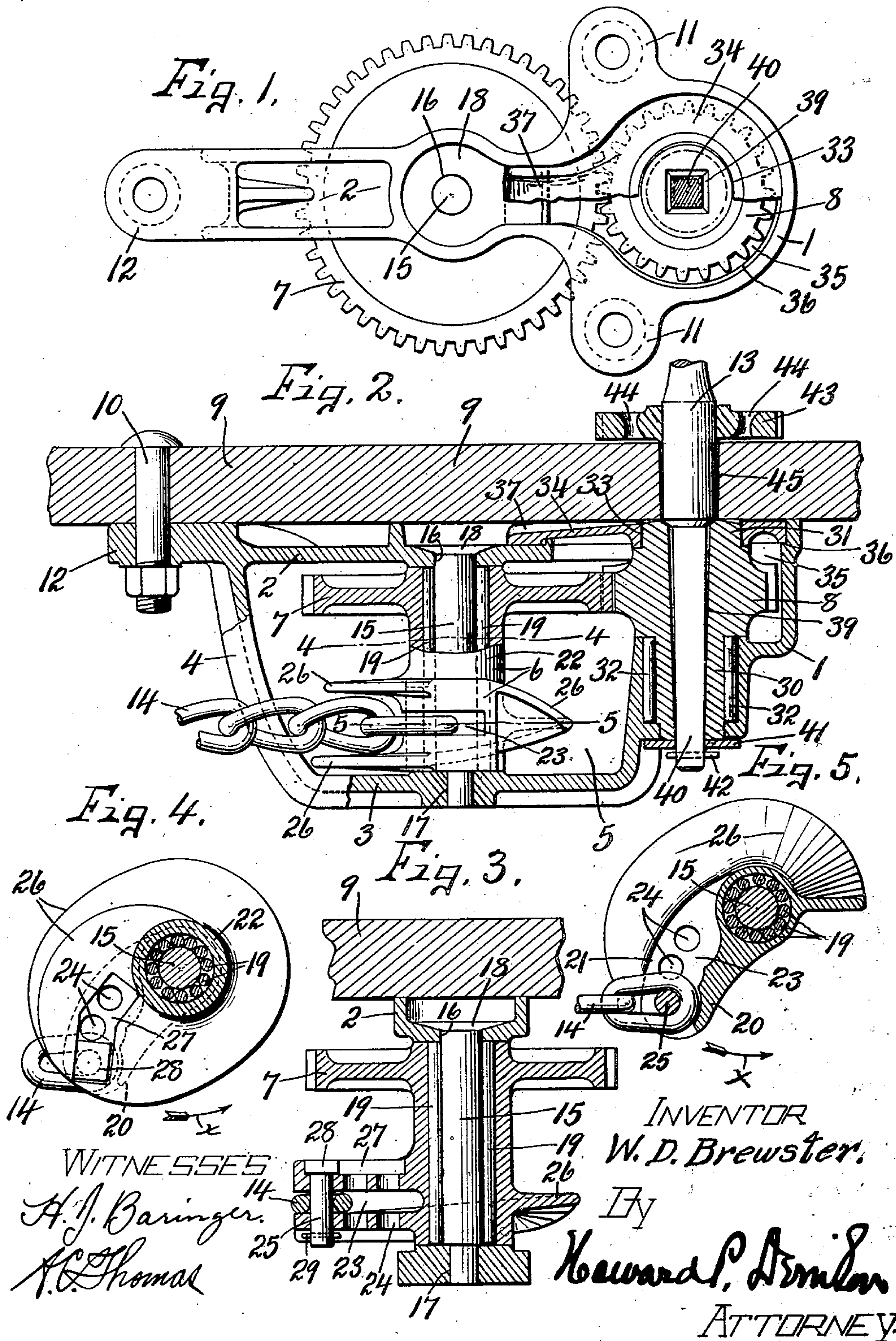


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MECHANISM FOR OPERATING CAR BRAKES.
APPLICATION FILED AUG. 6, 1909.

955,450.

Patented Apr. 19, 1910.



UNITED STATES PATENT OFFICE.

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MECHANISM FOR OPERATING CAR-BRAKES.

955,450.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM D. BREWSTER, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Mechanism for Operating Car-Brakes, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to certain improvements in mechanism for operating car brakes, involving the use of a chain and a variable leverage winding drum therefor adapted to be operated through the medium of suitable gears by an upright brake-staff or crank shaft. These brake operating mechanisms are adapted to be installed on cars in use to replace other more or less antiquated or less efficient mechanisms for the same purpose, and one of the main objects of my present invention is to construct the entire mechanism as a unit in such manner that it may be easily and quickly installed in operative position with the brake-staff in front or at the rear of the dash without mutilating or weakening any part of the car to which it is attached, and at the same time permitting the use of the usual brake-staff with but slight and comparatively inexpensive alteration.

Another important object is to construct the variable leverage drum with its concentric portion of shortest radius above the eccentric portion of longer radius to which the chain is attached so as to not only provide for a quick tightening or take-up of the slack of the chain from long to short radius under a minimum degree of rotation of the brake-staff, but also to bring the chain in more nearly a straight line of draft when under greatest tension.

Another object is to enable the chain to be adjustably connected to the eccentric portion of the drum at different distances from its axis of rotation without removing the drum from the frame.

A further object is to provide for the effective distribution of oil from a single source of supply to the various bearings and teeth of the intermeshing gears.

Other objects and uses will be brought out in the following description.

In the drawings—Figure 1 is a top plan of the detached brake operating mechanism

showing the angular portion of the brake-staff in section and also showing a portion of the cover for the pinion as partly broken away. Fig. 2 is a side elevation, mostly in section, of the same brake operating mechanism showing a portion of the platform of the floor in section, the brake-holding ratchet wheel on the brake-staff being also shown in section. Fig. 3 is a transverse sectional view through the drum supporting frame shown in Figs. 1 and 2. Figs. 4 and 5 are sectional views taken respectively on lines 4—4 and 5—5, Fig. 2.

In carrying out the object stated, I provide a skeleton supporting frame, preferably of cast metal, and consisting of a hollow head —1— having comparatively narrow rearwardly projecting arms or plates —2— and —3— united at their rear ends by an upright bar —4— forming an intervening opening —5— for the reception of a drum —6— and gear —7—, the head —1— serving to receive and retain a suitable pinion —8— which meshes with and constitutes the driving means for the gear —7— and drum —6—. The upper and lower bars —2— and —3— extend rearwardly in nearly a straight line from the center of the head —1—, and together with the rear upright bar —4— and head —1— constitute a rigid one-piece metal frame which is secured to the under side of a car platform —9— by suitable fastening means, as bolts —10—. The bolts —10— are passed through a series of, in this instance three, apertured lugs or ears —11— and —12— which are preferably integral with the frame and are disposed in substantially the same plane as the upper horizontal bar —2—, the upper faces of said ears lying in the same horizontal plane and are substantially flat so as to fit snugly against the inner side of the platform —9—. Two of these lugs or ears, as —11—, are formed integral with the head —1— but are located some distance at the rear of the axis of the pinion —8— at opposite sides of the head so as to enable the frame to be placed in operative position and adjusted to varying structural conditions as they may exist on the under side of the platform without material alteration of this portion of the car, and at the same time permitting the adjustment of the frame and brake operating mechanism therein to al-

low the brake-staff, as —13—, to be used either in front or at the rear of the dash, not shown.

The bars —2—, —3— and —4— of the frame at the rear of the head —1— are comparatively narrow to allow free movement of the chain, as —14—, back and forth at one side of the bar —4—, or adjacent portion of the frame, without friction therewith; that is, the chain which is attached at one end to the eccentric portion of the drum is allowed to ride from the long to the short radius and vice versa of the drum without friction with the frame.

The drum —6— and gear —7— are preferably made in a single piece of case metal and are mounted in the opening —5— between the bars —2— and —3— upon an upright supporting shaft or spindle —15— which is journaled in suitable bearings —16— and —17— in the upper and lower bars —2— and —3—, the lower end of the shaft or spindle being reduced and fitted in the correspondingly reduced aperture in the lower bar —3—, thereby forming a shoulder on the adjacent end of the shaft to hold it against downward movement through the opening —17—. The upper end of the shaft or spindle —15— is shown as terminating a short distance below the upper face of the bar —2— leaving an oil pocket —18— in the top face of said bar for concentrating the lubricating oil to the shaft or spindle and thereby lubricating the bearings for the drum —6— and gear —7—.

Interposed between the shaft —15— and drum —6— are suitable roller bearings —19— which extend the full length of the drum between the bars —2— and —3— for reducing friction between the drum and its supporting shaft —15—.

The drum —6— is formed at its lower end with a radial arm or eccentric —20— having an eccentric bearing —21— gradually inclining upwardly and inwardly toward its axis and terminating at its upper end in a concentric portion —22— upon which the chain —14— is wound when under greatest tension. The arm or eccentric —20— is provided on its rear side with a lengthwise slot —23—, the lower and upper sides of which are formed with a plurality of, in this instance three, sets of registering apertures or bolt openings —24— at different distances from the axis of the drum for the reception of an anchor bolt —25— which receives and retains one of the links of the chain —14— thereby fastening one end of the chain to the arm or eccentric —20—. The opposite end of the chain is adapted to be connected in any well known manner to the system of levers on the under side of the floor of the car for operating the brakes, it being unnecessary to show or describe such levers or brakes, as their opera-

tion is well understood by those skilled in this art. The object in providing a plurality of registering apertures —24— is to permit the adjacent end of the chain —14— to be fastened to the arm or eccentric —20— at different distances from the axis of the drum so as to impart greater or less rapidity of motion to the chain in the initial movement of the brake-staff —13— in the operation of setting the brakes.

The lower end of the drum —6— is provided with a spiral rib or flange —26— projecting some distance beyond the eccentric bearing —21— and concentric bearing —22— and extending from the outer end of the arm —20— below the slot —23— spirally and upwardly around the concentric bearing —22— and above the slot —23— where it terminates against the concentric portion —22—, thereby guiding and moving this portion of the chain as the drum is rotated in the direction indicated by arrow "X", Figs. 4 and 5, upwardly and inwardly from the extreme outer end of the eccentric portion —21— of the arm —20— to the concentric portion —22— which is of considerably smaller radius than the extreme radius of the arm —20— at its point of attachment of the chain —14— therewith. By this winding the chain around the eccentric and concentric portions of the drum from the bottom upward, I am enabled to tighten or take up the slack of such chain with a minimum degree of rotation of the staff —13—, and at the same time this end of the chain is elevated to more nearly the plane of its rear end, thereby pulling in substantially a straight line upon the brake mechanism when under its greatest tension or nearest the axis of the drum, which is an important feature of my invention owing to the fact that it relieves the drum and chain from excessive friction when under greatest tension.

The upper side of the eccentric arm —20— above the slot —23— is provided with an elongated recess —27— following the line of the bolt holes —24— for receiving the head —28— of the bolt —25—. It will be observed upon reference to Fig. 4 that one side of the recess —27— is nearer to the bolt holes than the opposite side, and that the head —28— is nearly square but of substantially the same width as the recess in which it is seated, so that one side of the head —28— projects farther beyond the bolt than the opposite side, the object of which is to assure the insertion of the bolt in the same or either one of the other openings in the same position, and at the same time to prevent the turning of the bolt when adjusted for use, said bolt being held in place by a cotter key or pin —29— arranged lengthwise of the arm —20— in a recess in the lower side thereof.

The gear —7— and pinion —8— meshing therewith are located in the same horizontal plane above the drum —6—, or that portion of said drum upon which the chain —14— is adapted to be wound, sufficient clearance being left between the gear and upper portion of the flange —26— to allow free play of the chain therein when wound upon the small or concentric portion of the drum.

The pinion —8— is journaled wholly within the head —1— of the main supporting frame irrespective of and wholly below the platform —9—, and for this purpose is provided at its lower and upper ends respectively with a reduced hub —30— and —31—. The lower reduced portion —30— is journaled in suitable roller bearings —32— in the lower portion of the head —1—, while the upper reduced portion —31— is journaled in a suitable opening —33— in a removable cap or cover —34—, which extends across an opening —35— in the top of the head —1—. The opening —35— is of sufficient size to permit the pinion —8— to be readily inserted or removed there-through before the frame is placed in operative position on the car. The cap or cover —34— is coextensive with said opening and normally rests upon a shoulder —36— surrounding the greater portion of the openings, the upper face of said cap engaging the under side of the platform to hold it in place. This cap extends rearwardly some distance beyond the opening —35— where it rests upon the upper face of the bar —2— of the main supporting frame and is provided in its upper side with one or more depressions or channels —37— for conducting oil from a suitable opening in the platform —9— directly over the pinion to the bearings for the shaft —15— and drum —6—.

The pinion —8— is provided with a central angular opening —39— therethrough from top to bottom in which is seated an angular extension —40— of the brake-staff —13—, said opening —39— and angular extension —40— being annular in cross section and tapering from the top downwardly. A washer —41— is fitted upon the lower end of the extension —40— and extends across the under side of the opening through which the reduced portion —30— of the pinion projects so as to engage the under side of the head and hold said pinion and brake-staff against upward displacement aided by the cotter pin —42— in the extreme lower end of the extension —40— and just below the washer.

Secured to the brake-staff —13— just above the platform —9— is the usual ratchet wheel —43— adapted to be engaged by the usual foot-pawl, not shown, for holding and releasing the brake-staff. This ratchet wheel is usually provided with apertures —44— close to the hub thereof and through

which oil may be injected from the nozzle of the can into the opening, as —45—, in the platform —9— through which the brake-staff is passed. The oil which is thus injected against the brake-staff follows down such staff until it encounters the upper face of the pinion where it is deflected into the channel —37— and thence into the pocket —18— for lubricating the bearings of the shaft —15— and drum —6—, some of the oil finding its way through the joint between the cap —34— and pinion and to the teeth of said pinion and gear, thereby lubricating the latter. It is also apparent that some of the oil which enters the pinion pocket will find its way to the bearings —32— thereby lubricating the entire system of movable parts.

As previously stated, these brake operating mechanisms are in the majority of instances installed on cars which have been in use for some time, and in some instances the settling of the platform and other distorted conditions of the framework of the car make it practically impossible to install the framework of the brake operating mechanism and brake staff in planes at substantially right angles to each other without special blocking, and in order to overcome the disadvantages of installation arising from such conditions, the taper of the opening —39— through the pinion —8— is somewhat greater than that of the corresponding portion of the brake-staff, which allows a limited lateral relative movement or adjustment of the frame and staff to conform to the conditions mentioned.

What I claim is—

1. In a car brake operating mechanism, an upright drum having an eccentric portion and a concentric portion, a chain and means for attaching it to said eccentric portion at different distances from the axis of the drum, and means for rotating the drum.

2. In a car brake operating mechanism, an upright drum having an eccentric portion inclining upwardly and inwardly from the bottom and provided with a lengthwise slot and a plurality of bolt openings arranged at different distances from the axis of the drum, a chain having one of its links inserted in said slot, and a bolt passed through one of the bolt openings and said link, and means for rotating the drum.

3. In a car brake operating mechanism, a supporting frame comprising a head and horizontal arms projecting from one side of the head and spaced some distance apart, a pinion having reduced ends journaled in the lower and upper sides of the head, an upright shaft supported at its ends in said arms, a drum journaled on the shaft and provided with eccentric and concentric bearings, a gear on the drum and meshing with the pinion, a chain attached to the drum and

riding against said bearings as the drum is rotated, and means for rotating the pinion.

4. In a car brake operating mechanism, a supporting frame comprising a head and
5 arms projecting from one side of the head, said head having an upright journal bearing and attaching ears projecting from opposite sides thereof in a plane at the rear of
10 the axis of said bearing, a pinion journaled in the bearing, an upright shaft supported in said arms, a drum journaled on the shaft, a gear secured to the drum and meshing with the pinion and provided with an eccentric portion and a concentric portion, the
15 eccentric portion inclining upwardly and inwardly from the bottom and merging with the concentric portion, a chain attached to the eccentric portion of the drum, and means for rotating the pinion.

20 5. In a car brake operating mechanism, a frame comprising a head and arms projecting rearwardly from the head, said head being provided with a journal bearing and an opening in its top, a pinion journaled in the
25 bearing, means for rotating the pinion, a drum revolubly mounted in the frame be-

tween said arms, a gear secured to the drum and meshing with the pinion, and a cap covering the opening in the head of the frame and having a journal bearing for the adjacent end of the pinion, said cap being provided with inclined oil channels in its top face.

6. In a car brake mechanism, a frame having a cylindrical head and attaching lugs
35 disposed in a plane wholly at the rear side of the axis of the head, a pinion journaled in the head, a brake staff operatively connected to the pinion, a drum journaled on the frame at the rear side of the head and
40 provided with a gear meshing with the pinion, said drum being also provided with an eccentric portion and a concentric portion, the concentric portion being nearest the gear, and a chain attached to the eccentric portion.
45

In witness whereof I have hereunto set my hand this 27th day of July, 1909.

WILLIAM D. BREWSTER.

Witnesses:

H. E. CHASE,
J. M. HOES.