

(No Model.)

3 Sheets—Sheet 1.

J. M. GOODWIN.
DUMPING CAR.

No. 454,863.

Patented June 30, 1891.

Fig 1.

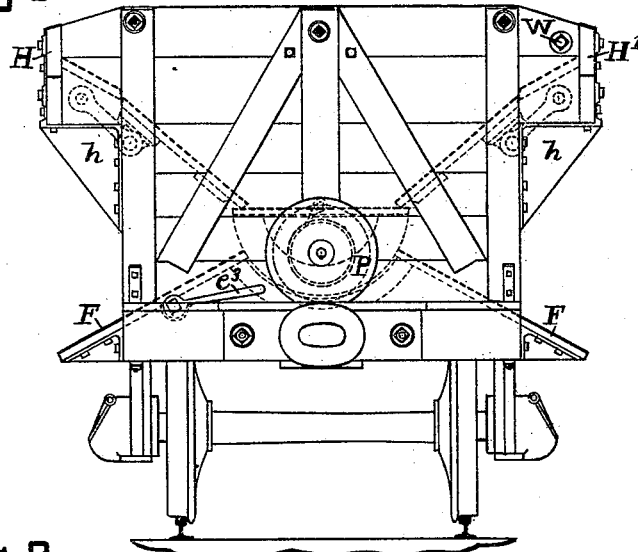
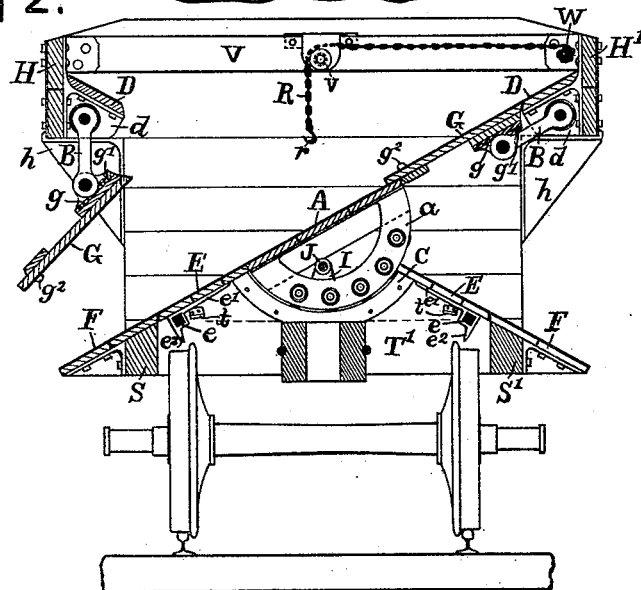


Fig 2.



WITNESSES.

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Fig 4.

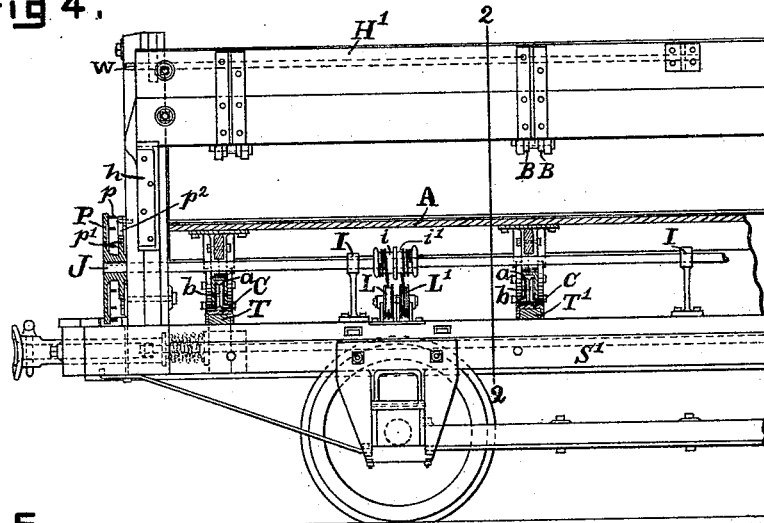


Fig 5.

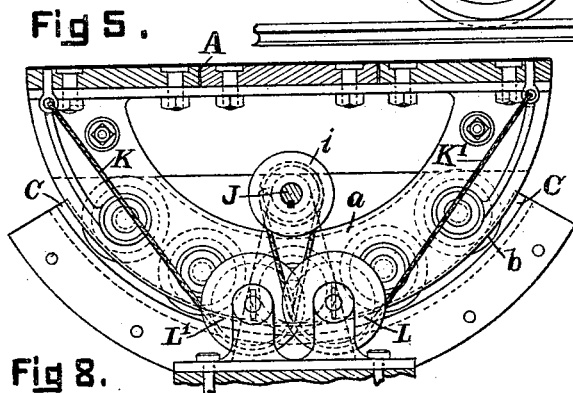


Fig 6.

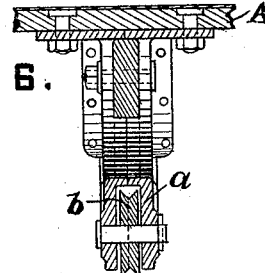


Fig 8.

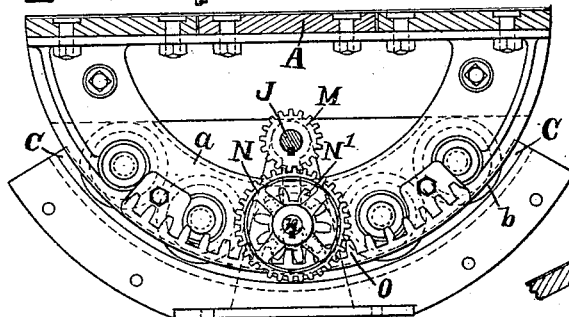
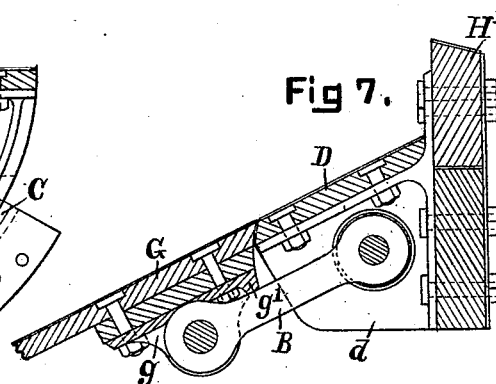


Fig 7.



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Fig 3.

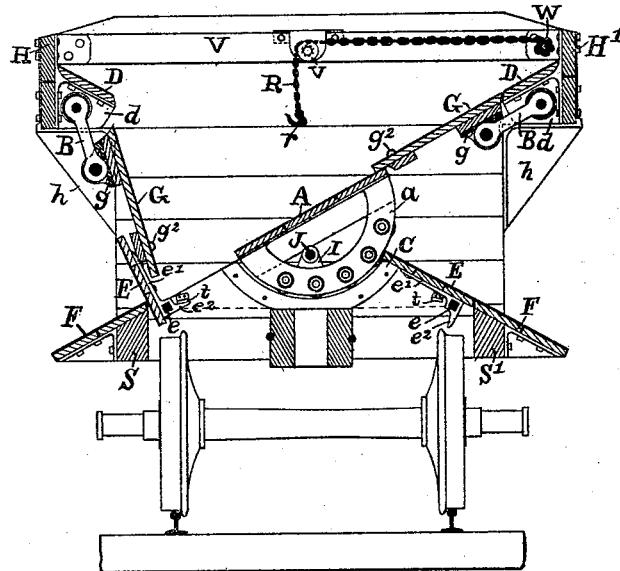
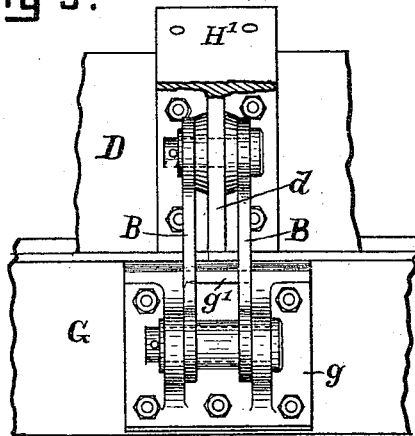


Fig 9.



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UNITED STATES PATENT OFFICE.

JOHN M. GOODWIN, OF SHARPSVILLE, PENNSYLVANIA.

DUMPING-CAR.

SPECIFICATION forming part of Letters Patent No. 454,863, dated June 30, 1891.

Application filed November 8, 1890. Serial No. 370,761. (No model.)

To all whom it may concern:

Be it known that I, JOHN M. GOODWIN, a citizen of the United States, residing at Sharpsville, in the county of Mercer and State of Pennsylvania, have invented certain new and useful Improvements in Dumping-Cars, of which the following is a specification, reference being had to the drawings accompanying the same and forming a part thereof.

My invention relates to dumping-cars of that species in which the load is discharged or dumped without any careening or tipping of the car-body.

The objects of my present invention are to provide a car which, without any careening or tipping of the car-body and without any interference of the dumping apparatus with the running-gear of the car or with the track on which the car travels, will discharge its entire load of dumpable material, first, outward from the car, outside the running-gear and on either side of the car, or, second, downward and inside the lower frame of the car, and thence between the track-rails.

My invention consists in the combination, in a non-careening dumping-car, of fixed sides, a tilting floor, and valves hinged to the fixed sides and adapted to be supported at their lower ends upon said tilting floor.

It also consists in the combination, in a non-careening dumping-car, of fixed sides, valves hinged thereto, and a tilting floor having segment-shaped brackets secured to its under side, with concave curved tracks secured to the car-frame, which support said tilting floor, and mechanism for tilting said floor.

It also consists in the combination, in a non-careening dumping-car, of fixed inclined upper floor-sections, valves hinged thereto, and suitable means for supporting the lower ends of said valves, with fixed inclined discharge-floors pitching outward, hinged discharge-floor sections, and devices adapted to hold said hinged discharge-floor sections in positions where they will direct the load either outward over said fixed discharge-floors or downward between the sill of the car.

It also consists in the details of construction of the various parts and the combinations and sub-combinations thereof, which are hereinafter described, and definitely pointed out in the claims.

Referring now to the drawings, Figure 1 is an end view of the car embodying my invention. Fig. 2 is a vertical sectional view on the line 2 2 of Fig. 4, the view being from the end of the car which is shown in Fig. 4. This view is intended to show the position of the parts when the car is dumping its load at one side. Fig. 3 is a similar view of the car, designed to show the position of the parts when the car is dumping its load downward between the sills of the car and thence between the track-rails. Fig. 4 is a side view of one end of the car, the tilting floor and its supporting-tracks being shown in vertical sections. Fig. 5 is a transverse sectional view of the tilting table at the point indicated on the line 2 2, the view being from the opposite end of the car to that which is shown in Fig. 2. Fig. 6 is a central vertical section through a part of the tilting table and one of the segment-shaped brackets secured to the under side thereof. Fig. 7 is a vertical sectional view of one of the fixed inclined upper floor-sections, the valve hinged thereto, and the hinging devices. Fig. 8 is a similar view to that shown in Fig. 5, showing another form of mechanism for operating the tilting floor. Fig. 9 is a side view showing the connection between the hinged valve and the fixed part of the car.

So far as dumping mechanism is concerned, the ends of the cars are preferably substantially alike, whereby the tilting floor, the valves, and hinged discharge-floor sections may be operated equally well from either end of the car.

Referring now to the parts by letters, S S' represent the main sills, and T T' represent trusses extending across the car between the main sills. Upon these trusses are secured the concave curved tracks, which support the tilting floor, and the trusses on both sides of said track pitch downward and outward, substantially as shown.

The tilting floor A extends lengthwise of the car, and when the car is in condition to retain the load the upper side is substantially horizontal. To its under side are secured the segment-shaped brackets *a*. In a four-wheel car four of these brackets are sufficient to afford the floor A a firm support.

Extending transversely of the car and se-

cured to the trusses T T' are the concave curved tracks C C. Friction-wheels *b*, mounted in the brackets *a*, having each a V-shaped groove in its rim, rest upon said tracks, whereby the tilting floor is made to move easily and is guided in its tilting movements.

H H' represent the top sides of the car. In the construction shown in the drawings each end of each top side is supported by a metal bracket, as *h*, which is fixed to the corresponding corner part of the car.

Upon the inboard face of each top side brackets *d d* are planted. The plates of these brackets extend entirely or almost entirely across the inboard face of the top side, and, being bolted to the top side, serve to combine the members thereof and to stiffen the top side. On the top flanges of the brackets *d d* an upper inclined floor D, extending the entire length of the car, is fixed. The vertical web of each bracket *d*, appropriately re-enforced locally by a boss, is perforated to admit the pivot of each pair of hinging-links B B. In the construction illustrated in the drawings it is intended to employ on each side of the car four pairs of these hinging-links. The lower ends of these hinging-links are connected by pivot-pins with a bracket *g*, secured to the under side of the upper edge of the associated valve G. These valves G G extend the entire length of the car, and they may be made of planks lying edge to edge and combined as a valve by cleats, and they may be faced with metal or made wholly of metal. The lower edges of the valves are supported on the tilting floor A when the several parts of the car are in place to retain the load in the car. The upper edge of each valve G is prevented from swinging down while its lower edge is resting on the tilting floor A by the flange *g'* on the bracket *g*, which lies above the links B B and engages with them when said links and valve have moved to the position indicated by the dotted lines in Fig. 1. Each of the main sills S S' is beveled from near its upper inner edge downward and outward, as shown. Supported by each sill thus beveled and by several brackets secured thereto and having the same pitch is a fixed inclined discharge-floor F.

Secured to the several trusses T T' on each side of the car are brackets, in which are the bearings of a rock-shaft *e*.

E E represent movable discharge-floor sections extending the entire length of the car, one on each side thereof, which are rigidly connected with the rock-shaft *e* by the wrought-iron straps *e'*. The location of the rock-shaft, the proportionate width of these movable discharge-floor sections, the proportions of the straps, and the manner in which they are connected with the discharge-floor sections are substantially such as the drawings show, whereby when the discharge-floor sections are swung inward they will be supported by the inclined upper sides of the trusses T T' and in position where they will

form a continuation of the tilting floor when the car is discharging its load at the side, as shown in Fig. 2. When swung outward, they are stopped and held by their engagement with the fixed discharge-floors F. The engagement of the lugs *e²* of the strap *e'* with small brackets *t*, secured to the trusses T, also contributes to preventing the said discharge-floor sections from falling outward beyond the position shown at the left in Fig. 3. The ends of the rock-shaft *e* extend through the ends of the car, and a lever *e³* is secured to each end of said rock-shaft, whereby the same may be rocked to move the discharge-floor sections to either of their two operative positions, as shown.

Secured to the intermediate sills of the car are the pedestal-brackets I I, arranged at suitable intervals. A shaft J, extending preferably the entire length of the car and through both ends thereof, so that it can be operated from either or both ends, is mounted in these brackets, and suitable connecting mechanism between this shaft and the tilting floor is provided, whereby the floor may be tilted by the revolution of the shaft.

The preferred connecting mechanism between the shaft and tilting floor is shown in Figs. 4 and 5, wherein two spools *i i'* are shown keyed to said shaft J. Secured to these spools and oppositely wound upon them are the two cables or chains K K', which pass each under one of the loosely-mounted sheaves L L' and thence to points near the outer edges of the tilting floor, to which said cables are attached, as shown clearly in Fig. 5. The sheaves L L' are mounted on pedestal-brackets secured to the intermediate sills.

The mechanism shown in Fig. 7 includes a pinion M, keyed to the shaft J, and two pinions N N', secured to an independent short shaft *n*, which is mounted in a pedestal-bracket secured to the intermediate sills. The pinion N meshes with the pinion M, and the pinion N' meshes with a concave segment-rack O, which is rigidly secured to one of the curved brackets *a*.

Secured to each end of the shaft J, outside of the end bulk-head of the car, are the means provided for revolving said shaft. The means shown consist of the wheel P, keyed to the shaft and having at intervals near its edge the pins *p*. This wheel, and consequently the shaft J, to which it is attached, may be revolved by means of any sort of a lever which may be inserted between the pins *p*. A ratchet-wheel *p'*, keyed to the shaft J or secured to or made a part of the wheel P, is adapted to be engaged by a pawl *p²*, pivoted to the end bulk-head. The ratchet-wheel teeth are of like pitch on both sides, so that the pawl may be swung around in such manner that it will permit the shaft J to be revolved in either direction desired, but will prevent the revolution in the opposite direction. There being one of these ratchet-and-pawl connections at each end of the shaft J,

one pawl may be swung around so that by engaging with its ratchet it will prevent the revolution of the shaft in one direction, while the other pawl may be arranged to prevent the revolution of the shaft in the opposite direction. Consequently the tilting floor is held in its horizontal position. This will be the position of the parts and their mode of operation when the car is in a position to be loaded.

All parts of the car being in a position substantially as shown in Fig. 1 by the dotted lines, the car is in readiness to be loaded. Now when it is desired to dump the contained load upon either side—say, for example, upon the left side of the car, as it is shown in Figs. 1 and 2—the movable discharge-floor section E is swung to the position shown in Fig. 2—that is to say, resting upon the trusses T, (if it was not previously in that position.) The shaft J is then revolved by a suitable lever engaging with the pins in the wheel P until the floor A, moving in its concave curved supporting-track, reaches the position shown in Fig. 2. In assuming this position it is withdrawn from beneath the edge of the hinged valve G on the left side of the car, which valve swings outward by gravity to substantially the position shown in Fig. 2. The fixed inclined floor D and the hinged valve G on one side of the car and the tilting floor and the movable discharge-floor section E and the fixed inclined discharge-floor section F on the opposite side of the car will thus form a substantially continuous inclined surface extending across the car and throughout the whole length of the same, along which the load will slide, following the valve outward, and be discharged outside of the car and without touching the running-gear.

Assuming the parts again in the position shown in Fig. 1 and the car to be loaded, if it is desired to discharge the contents between the track-rails one of the movable floor-sections E, as that shown at the left of Fig. 3, is thrown outward to the position shown. The tilting floor is then moved, as before described, to the position shown in Fig. 3. In reaching this position the hinged valve on the side on which the tilting floor is depressed is released and swings outward until it engages with the movable discharge-floor section, as shown. The load in the car will be discharged through the space between the lower edge of the tilting floor and the partition formed by the floor-section E and valve G, and thence between the track-rails, or both movable floor-sections E may primarily be thrown outward, and after the valve G has been, as aforesaid, released the tilting floor may be reversely tilted and the other valve G' also released, whereupon a part of the load will be discharged downward between the tilting floor and the movable floor E.

When it is desired to return the hinged valve to the position where the car may be loaded, as shown in Fig. 1, a hook r upon the

end of the chain R is drawn downward until said hook is hooked into a staple g^2 , secured to the lower inner side of the valve G. The other end of the chain R is secured to the shaft W, extending lengthwise of the car and mounted in suitable bearings secured to the top side of the car. An iron tie-plate V extends across the car midway between the ends, and it is appropriately secured to the top sides. Mounted on this cross-tie plate and near the transverse center of the car is a sheave v , over which the chain R passes. The ends of the shaft W extend through the end bulk-heads and are made with square ends, upon which may be fitted a crank-key for the purpose of revolving the shaft and thus winding the chain thereon and drawing the valve to substantially the position in which it is shown in Fig. 1. The tilting floor is then allowed to return to its horizontal position and the car is again ready to be loaded.

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

1. In a dumping-car, in combination, fixed top sides, side valves hinged thereto, and a central tilting floor adapted to support the lower edges of the hinged valves, substantially as and for the purpose specified.

2. In a dumping-car, in combination, fixed top sides, associated fixed inclined floor-sections, side valves hinged to one of said fixed parts, a central tilting floor having segment-shaped brackets secured to its under side, fixed concave curved tracks, and friction-rollers between said tracks and brackets, substantially as and for the purpose specified.

3. In a dumping-car, in combination, fixed top sides, associated fixed inclined floor-sections, side valves hinged to one of said fixed parts, a central tilting floor, segment-shaped brackets secured to the under side of said floor, friction-rollers mounted in said brackets, cross-trusses below said tilting floor, concave tracks secured upon said trusses, pedestal-brackets supported below said tilting floor, a shaft extending through one or both end bulk-heads of the car, mounted in said last-named brackets, and suitable connecting mechanism between said shaft and tilting floor, substantially as and for the purpose specified.

4. In a dumping-car, the combination of fixed top side pieces, fixed inclined upper floor-sections, side valves appropriately hinged to one of said fixed parts, a central tilting floor adapted to support the lower edges of said valves, and mechanism for operating said tilting floor with inclined discharge-floors adapted to form with said tilting floor, one of said valves, and one upper fixed inclined floor-section a continuous inclined surface over which the load will slide and be discharged outside the running-gear of the car, substantially as and for the purpose specified.

5. In a dumping-car, the combination of fixed top sides, fixed inclined top floor-sec-

tions, side valves appropriately hinged to one of said fixed parts, a tilting floor adapted to support the lower edge of said valves, and mechanism for tilting said floor with fixed inclined discharge-floors and hinged discharge-floor sections, each of which is adapted to be moved to and supported in two operative positions—viz., one in which it forms with its associated fixed discharge-floor a continuous inclined discharge-floor and one in which it leaves an opening between itself and the tilting floor and is adapted to engage with one of the side valves and form with it a partition which compels the discharge of the load through said opening—substantially as and for the purpose specified.

6. In a dumping-car, the combination of fixed top sides, fixed inclined upper floor-sections, side valves appropriately hinged to one of said fixed parts, and a movable floor intermediate of said two side valves with fixed inclined discharge-floors, hinged discharge-floor sections, and means for moving each of said hinged discharge-floor sections into and supporting it in two operative positions—viz., one when it forms with its associated fixed discharge-floors a continuous inclined discharge-floor and one substantially at right angles thereto where it is adapted to interrupt the outward movement of its associated valve and form with it a partition which compels the discharge of the load through the bottom of the car—substantially as and for the purpose specified.

7. In a dumping-car of the herein-described species, fixed outwardly-inclined discharge-floor sections, combined with hinged discharge-floor sections, and mechanism for moving each of said hinged sections into and out of and means for supporting it in a position where it forms with its associated fixed section a continuously and downwardly inclined discharge-floor which lies wholly below the cargo-carrying floor of the car, substantially as and for the purpose specified.

8. In a dumping-car, the combination of fixed sides, side valves hinged thereto, a floor adapted to support the lower edges of said valves, segment-shaped brackets secured to the under side of said floor, and friction-rollers mounted in said brackets with cross-trusses, concave tracks secured upon said trusses, a shaft mounted in brackets below said floor, two spools secured to said shaft, two loosely-mounted sheaves, and two cables, chains, or bands oppositely wound upon said spools, respectively, passing each under one of said sheaves and connected one to one side and the other to the other side of said floor, substantially as and for the purpose specified.

9. In a dumping-car, the combination of fixed top sides, fixed inclined top floors, and brackets secured to one or both of said fixed parts with valves having brackets secured on the outside thereof and near their upper edges, and links pivotally connected with both the brackets on the valves and the fixed brackets, and means for supporting and releasing the lower edges of said valves, substantially as and for the purpose specified.

10. In a dumping-car, the combination of fixed top sides, fixed inclined top floors, and brackets secured to one or both of said fixed parts with side valves extending lengthwise of the car, brackets secured to the outside and near the upper edge of said valves, links loosely pivoted at their ends, respectively, with the brackets on the valves and the fixed brackets, the brackets on the valves being provided with flanges, as *g*, adapted to engage each with the upper side of its associated link or links, substantially as and for the purpose specified.

11. In a dumping-car, the combination on each side of the car of an outwardly and downwardly inclined discharge-floor permanently fixed below the level of the cargo-box, a movable discharge-floor section, a rock-shaft extending from one end of the car to the other and placed slightly below the level of the upper edge of the fixed discharge-floor, and straps secured to the under side of said movable discharge-floor section and rigidly fixed to the rock-shaft, means for rocking the shaft, and means for supporting the free edge of the movable discharge-floor section when it is in a position where it forms with the fixed discharge-floor section a continuous discharge-floor, substantially as and for the purpose specified.

12. In a dumping-car, the combination of fixed top sides, fixed inclined upper floor-sections, and valves hinged to brackets secured to one or both of said fixed parts with a tilting floor adapted when in a horizontal position to support the lower edges of said valves, a shaft mounted in bearings below said tilting floor and extending the entire length of said car and out through both ends, suitable connecting mechanism between said shaft and tilting floor, ratchet-wheels on both ends of the shaft, and pawls adapted to engage with said ratchets, substantially as and for the purpose specified.

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Witnesses:

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