(No Model.) 3 Sheets—Sheet 1.

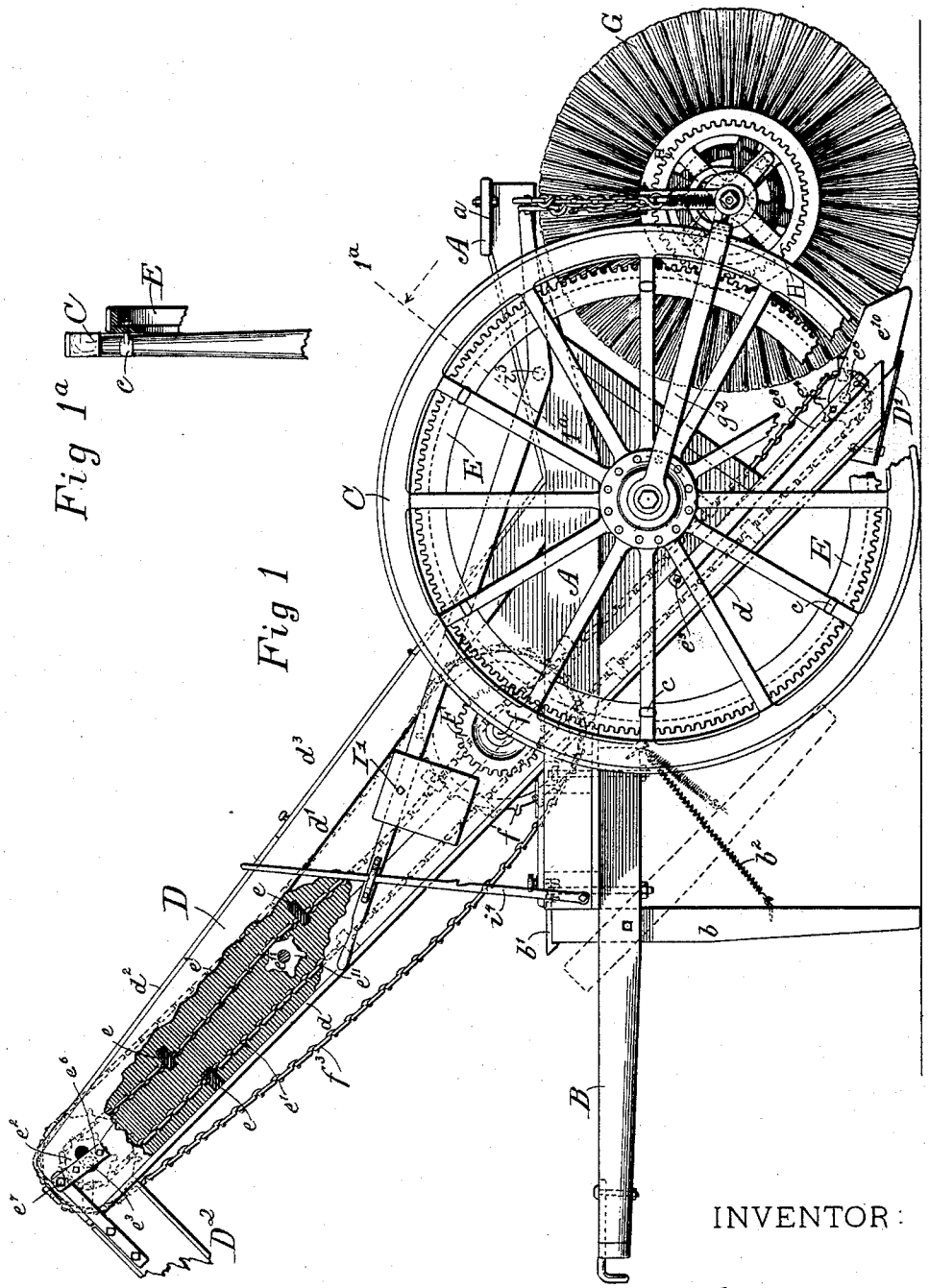
A. B. VANDEMARK.

STREET SWEEPER.

No. 483,702. Patented Oct. 4, 1892.

Fig 1ª

Fig 1



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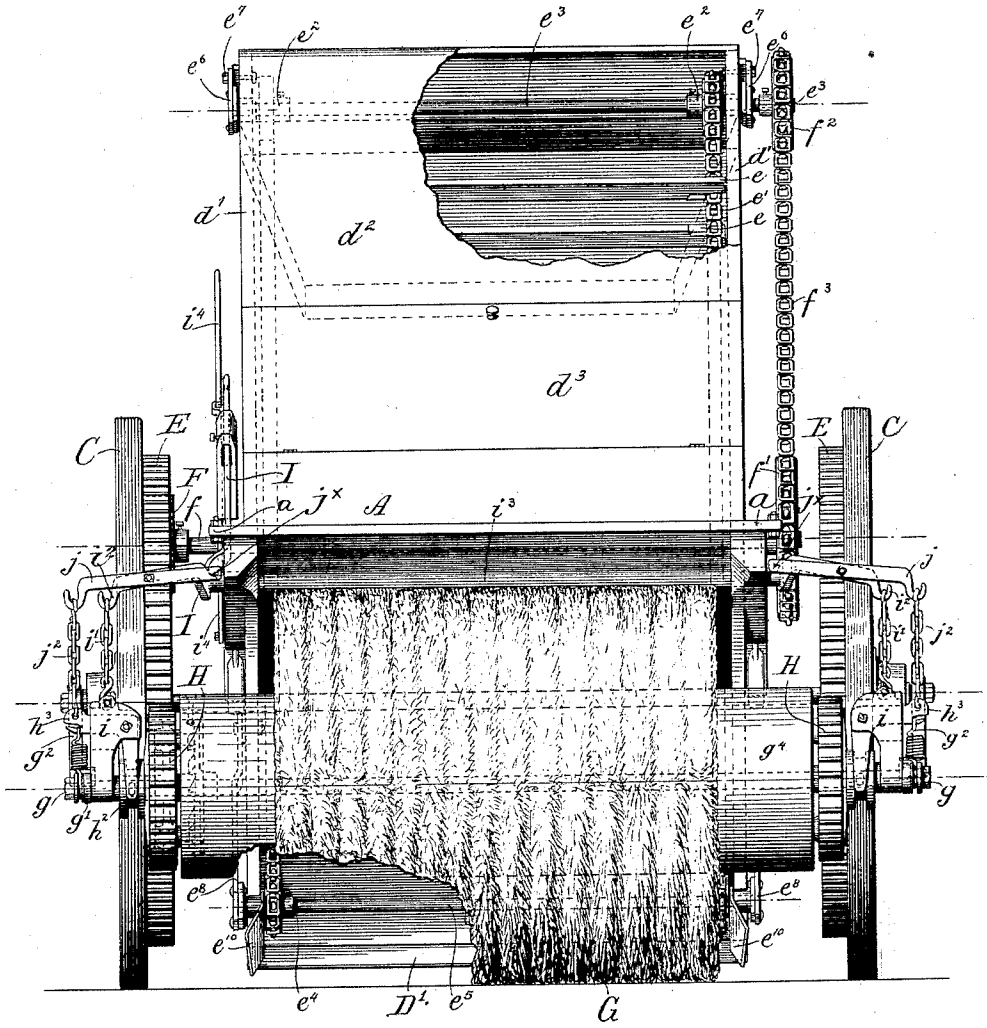

Fig 2

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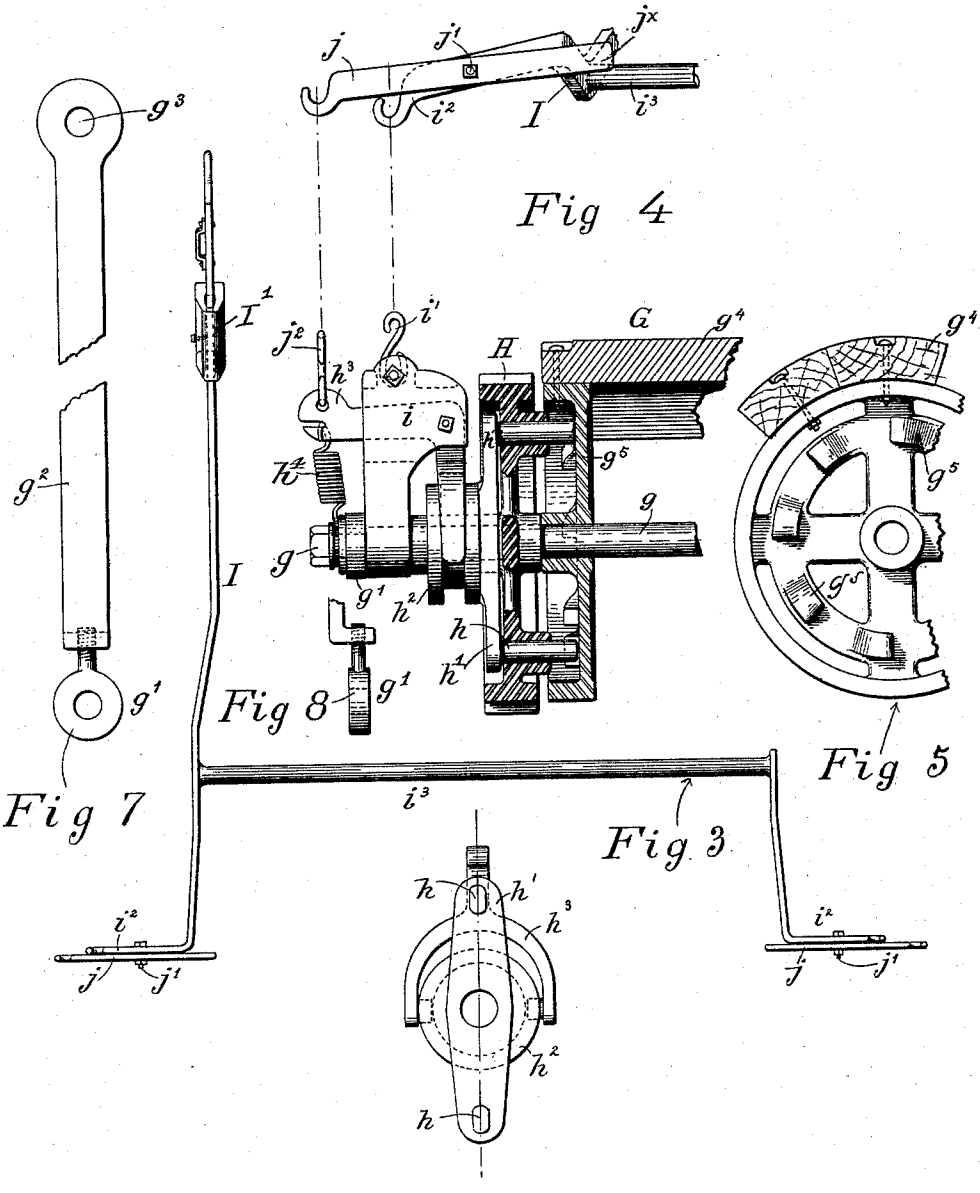

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UNITED STATES PATENT OFFICE.

ARCHIBALD B. VANDEMARK, OF NEW YORK, N. Y.

STREET-SWEEPER.

SPECIFICATION forming part of Letters Patent No. 483,702, dated October 4, 1892.

Application filed February 8, 1892. Serial No. 420,674. (No model.)

To all whom it may concern.

Be it known that I, ARCHIBALD B. VANDEMARK, a citizen of the United States, and a resident of the city, county, and State of New York, have invented certain Improvements in Street-Dirt Loaders, of which the following is a specification.

My invention relates to the class of dirt-loaders wherein the loader when drawn along sweeps the dirt up into an inclined chute or way, in which it is carried upward by an endless conveyer and discharged into a cart or wagon, to which the loader is coupled.

My invention will be fully described hereinafter, and its novel features carefully defined in the claims.

In the drawings which serve to illustrate the invention, Figure 1 is a side elevation of a loader embodying my improvements. Some of the parts are represented as broken away in order to better show the mechanism behind. Fig. 1^a is a fragmentary section taken in the plane indicated by the dotted line 1^a in Fig. 1. Fig. 2 is a rear elevation of the loader, partly broken away for purposes of illustration. Fig. 3 is a plan view of the disengaging-lever detached. Figs. 4, 5, and 6 are detached views, on a larger scale, of the disengaging-gear and mechanism. Figs. 7 and 8 are detached views on the same scale as Fig. 4 of the drawing-links which couple the axle to the loader.

A is the frame of the loader, B the tongue for coupling the loader to a cart or wagon, and C the ground-wheels, mounted rotatively on a suitable axle, on which the frame A is mounted. Fixed in the frame A is an inclined chute or way D, which comprises a bottom d, sides d', one of which is represented in Fig. 1 as partly broken away to disclose the interior of the chute, and a cover d^2, also represented in Fig. 2 as partly broken away. This cover d^2 has in it, as here shown, a door d^3 to afford access to the chute from above. Within the chute D is arranged an endless conveyer, which consists of a series of flights e, secured to two endless chains e', mounted on a pair of sprocket-wheels e^2 on a shaft e^3 at the upper end of the chute and on a similar pair of sprocket-wheels e^4 on a shaft e^5 at the lower end of the chute. In order that the conveyer may not become choked or stalled, as will be explained more fully hereinafter, the upper conveyer-shaft e^3 is rotatively mounted in a pair of arms e^6, pivoted to the sides of the chute at e^7, and the lower conveyer-shaft e^5 is rotatively mounted in a pair of arms e^8, pivoted to the sides of the chute at e^9. The ground-wheel C is broken away in Fig. 1 to show the arms e^8 the more clearly. The conveyer is driven from the ground-wheel through the medium of a toothed wheel-rim E, secured to and concentric with the ground-wheel, a pinion F, gearing with said wheel-rim and fixed on a shaft f, mounted rotatively in bearings in the frame of the loader, a sprocket-wheel f' (see Fig. 2) on said shaft f, a sprocket-wheel f^2 on the upper conveyer-shaft e^3, and a chain f^3 on the said sprocket-wheels. At the lower rear end of the chute, rather near the ground-level, is fixed a shoe D′, and on the bosses of the bearings which support the lower conveyer-shaft e^5 in the arms e^8 are fixed laterally-arranged wings e^{10}, which are arranged just within the sides of the chute and form flaring prolongations of the same.

G is the rotary broom, the shaft g of which is rotatively mounted in bearings g' in the ends of two drawing-links g^2. In the other ends of these links are eyes g^3, which are fitted to the respective ends of the axle, which protrude through the hubs of the ground-wheels and are secured by nuts in the usual manner. These links compel the broom to follow the loader, but permit it to be raised and lowered. The broom is driven from the wheel-rim E through the medium of a pinion H, loosely mounted on the broom-shaft and in gear with the teeth of the respective wheel-rims E.

Hereinbefore I have only mentioned one wheel-rim E; but I prefer to employ two, one on each ground-wheel C, and to provide the broom with two pinions H and two sets of mechanism for disengaging said pinions. However, as these mechanisms are alike a minute description of one will suffice.

Normally the pinion H is in engagement with the broom through the medium of a ratchet on the latter in such a manner that when the ground-wheels are rotating forward they drive the broom, rotating it in a direction opposite to the ground-wheels, thus caus-

ing it to sweep the dirt into the lower open end of the chute D; but should either ground-wheel rotate backward the ratchet on the broom will permit the pinion H in that side to rotate without interfering with the proper rotation of the broom. Provision is also made for disengaging the pinion from the broom when the latter is lifted. These mechanisms I will now describe with especial reference to Figs. 4, 5, and 6. In Figs. 4 and 5, the former of which shows a fragment of the broom and a pinion H in section and the latter of which shows a fragment of the end of the broom, I have only represented the segments g^4, which receive the tufts, and have omitted the latter as tending only to obscure these figures. On the circular end frame of the drum is formed a ratchet g^5, the teeth of which are engaged by shiftable driving-studs h, (one or more, but preferably two,) carried by the pinion H. These studs h are fixed to and project from a cross-piece h', having a grooved boss h^2, mounted rotatively on the boss of the pinion H. The studs h form, practically, a part of the piece h', and when in position, as seen in Fig. 4, they play in and through apertures in the pinion-arms and engage the teeth of the ratchet on the drum. Fig. 6 is a face view of the cross-piece h' with its studs detached from the pinion. The driving-studs h are held up into engagement with the ratchet-teeth by means of a forked elbow-lever h^3, the forked end of which engages the grooved boss h^2, and a spring h^4, coupled at one end to the elbow-lever and at the other end to the broom-shaft. The elbow-lever h^3 finds a fulcrum-bearing in a lifting-link i, in which the broom-shaft finds a bearing and which is coupled by a chain or other suspender i' from a hook in a laterally-bent short branch i^2 of the broom-lifting lever I. This lever is fixed to a rock-shaft i^3, which has bearings in the frame A, and is provided at its other end with the short arm of a lifting-lever similar to the lever I. This construction permits of lifting both ends of the broom simultaneously with one lever. On the lever I is mounted a counter-weight I′ to partly counterbalance the broom, and on the frame A is secured an upright retainer i^4 for the lever when depressed and the broom raised, this retainer having in it a notch or notches to receive and hold said lever.

It is desirable that when the work of the broom is finished and it is raised off from the ground by the lever I it shall also be disengaged and thrown out of gear, so as not to rotate with the pinions H. This result I accomplish by drawing back the studs h automatically by the act of lifting the broom, so that they will be out of engagement or gear with the ratchet-teeth on the broom and will be so held while the broom is in an elevated position. The mechanism I employ for this purpose consists of a short lever j, (see Fig. 4,) pivotally attached at j' to the short laterally-bent branch i^2 of the lever I, and coupled at one end to the elbow-lever h^3 by a chain or other connector j^2. The end $j^\times$ of the lever j opposite to that where the chain j^2 is attached is so arranged with respect to a projecting part a of the frame A that in the operation of lifting the broom from the ground by the aid of the lever I after the broom has been raised free from the ground the end $j^\times$ of the lever j catches under the detent a, and in the further upward movement of the lever I the fulcrum of lever j is carried upward. This has the effect to impart an upward pull on the outer end of the elbow-lever h^3, causing its forked extremity to draw back the studs h out of gear with the ratchet on the broom.

It will of course be understood that the disengaging device just described is in duplicate, as seen in Fig. 2, one set of mechanism being provided for each pinion H.

Fig. 1ª shows a convenient mode of securing the toothed wheel-rim E to the spokes of an ordinary ground-wheel C by means of U-shaped clips c, similar to those commonly employed for securing the wooden portion to an iron axle.

For convenience in supporting the loader in proper position when not coupled to a cart, I pivot to the tongue B a leg b, and mount on the frame A a suitable hook b' to take over the upper end of said leg and hold it in an erect position, the leg above the tongue having a bearing against the frame A. This leg has, as here shown, a spring b^2 to draw it up out of the way (see dotted lines in Fig. 1) when the loader is in use.

The chains e' of the conveyer may be the well-known "link-belts," and the upper or return sides of the chains may be carried on idler sprocket-wheels e^{11}, mounted on the sides of the chute D. One of these idlers is clearly shown in Fig. 1.

My loader is designed particularly for loading up street-dirt which has been swept into a ridge or row by the street-sweeper, and the operation will usually be as follows: The operator hooks the loader to his cart, gets into position, lowers his broom and drives on, following the line of the ridge of dirt. The broom sweeps the dirt up into the lower open end of the chute, where it falls on the inclined bottom of the chute and is carried up through the chute by the flights on the conveyer. The upper end of the chute D is provided with a downwardly-inclined supplementary chute D^2, which directs the dirt down into the cart. Should the broom sweep into the chute some large object—such as an old boot or a can—the sprocket-wheels of the conveyer will rise to allow it to pass, their shafts being mounted in swinging arms (as before described) for this purpose. This is an important feature of my loader, as it provides against the clogging or choking of the conveyer. The shoe D′ will be elevated above the ground only sufficient to pass over the collected ridge of dirt to be swept up. After the cart is loaded it will be uncoupled and an empty cart cou-

pled to the loader. When the work is done, the operator raises the broom by depressing the lever I, and this movement disengages the gearing and allows the loader to be drawn away without rotation of the broom.

It will be observed by reference to Fig. 1 that while the shoe D′ extends out well under the broom the frame A extends back over it, the latter thus serving to screen it above and prevent the dust and dirt from being scattered about. The chute D is provided with a cover d^2, also, in order to prevent the escape of flying dust and dirt when the loader is in operation. The lateral wings e^{10} also prevent the escape of dirt laterally at the sweeping-point.

The object in providing the drawing-links g^2 with bearing-eyes g' having screw-shanks which screw into the ends of the links, as seen in Figs. 7 and 8, is in part to permit of adjusting the pinions H on the broom-shaft up to the wheel-rims E, so that their respective teeth will mesh properly, and in part to permit the ends of the broom to rise unequally to some extent without binding at the journals.

Having thus described my invention, I claim—

1. In a dirt-loader, the combination, with the axle and ground-wheels, the inclined chute mounted thereon, the endless conveyer mounted in said chute and driven from the ground-wheels, the broom rotatively mounted in drawing-links pivoted to the said axles, and the gearing intermediate between the broom and ground-wheels, whereby the former is driven from the latter, of means for raising the broom and a disengaging mechanism operated automatically when the broom is raised for disengaging the gearing which drives the broom, substantially as set forth.

2. In a dirt-loader, the combination, with an inclined chute having a close stationary bottom d and sides d', of the endless conveyer mounted therein and having shafts at its upper end, the lower ends being provided with sprocket-wheels which carry the conveyer-chains, said shafts being adapted to rise each independently of the other at their bearings and thus permit the passage of large objects carried up by the conveyer-flights.

3. The combination of the rotatively-mounted broom, the pinion H, mounted loosely on the broom-shaft, the ratchet g^5 on the end frame of the broom, the grooved boss h^2, arranged to slide on the hub of the pinion H and carrying studs h, which normally engage the ratchet g^5 and which play in guide-apertures in the pinion, and means for operating said grooved boss for disengaging the studs h from the ratchet on the broom, substantially as set forth.

4. The combination, with the broom mounted rotatively in arms, whereby it may be raised and lowered and said broom provided at its end with a ratchet g^5, forming one member of a driving-clutch, and the other or sliding member of said clutch mounted rotatively on the broom-shaft and having a grooved boss, of the elbow-lever h^3, having a fork which engages the groove in said boss, the lifting-link i, in which the lever h^3 is fulcrumed, a lifting and disengaging mechanism, substantially as described, coupled to one arm of said elbow-lever, and a spring for effecting the automatic engagement of the clutch, substantially as set forth.

5. The combination of the broom rotatively mounted in the lifting-link i, the said link, the clutch device, the sliding member of which is operated by an elbow-lever h^3, which is fulcrumed in the link i, the said elbow-lever, the broom-raising lever I, coupled to the link i, the lever j, fulcrumed on the lever I and coupled at one end to an arm of the elbow-lever h^3, and the machine-frame having a projection in the path of the free end of the lever j, whereby when the broom is raised the shorter lever j engages said projection and disengages the clutch, substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

ARCHIBALD B. VANDEMARK.

Witnesses:
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GEO. B. DUNN.