

Nov. 22, 1949

A. T. C. DEAR

2,488,966

REFUSE COLLECTING VEHICLE

Filed Feb. 20, 1948

3 Sheets-Sheet 1

FIG. 1

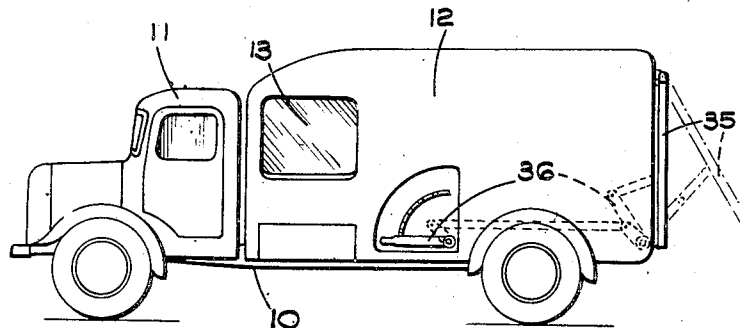
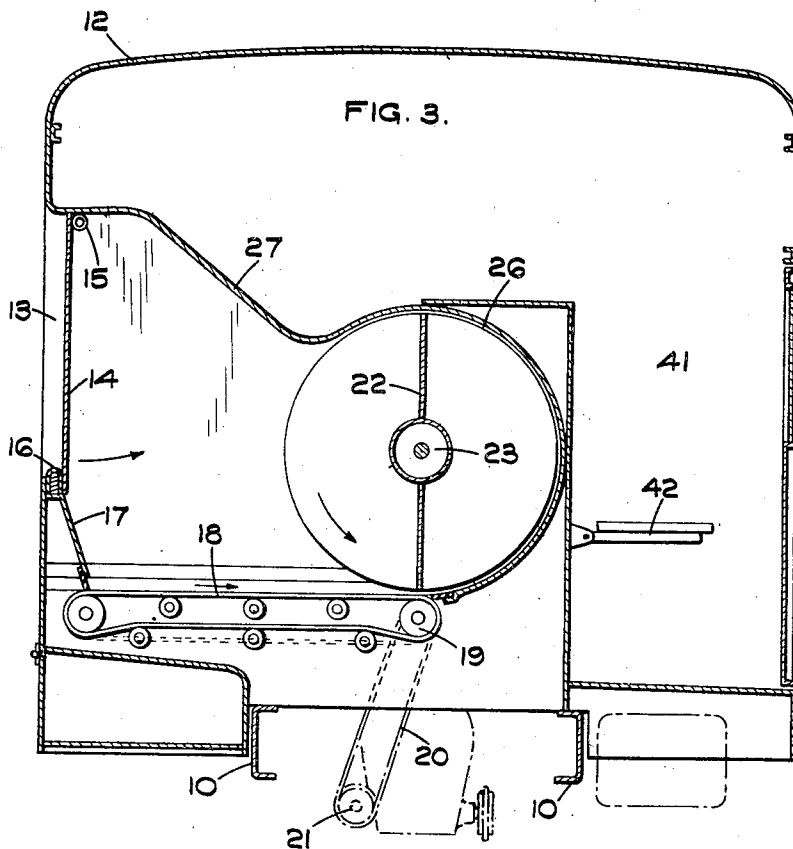


FIG. 3.



INVENTOR

Alexander Thomas Cameron Dear

Lucke & Lucke

BY

AGENTS.

Nov. 22, 1949

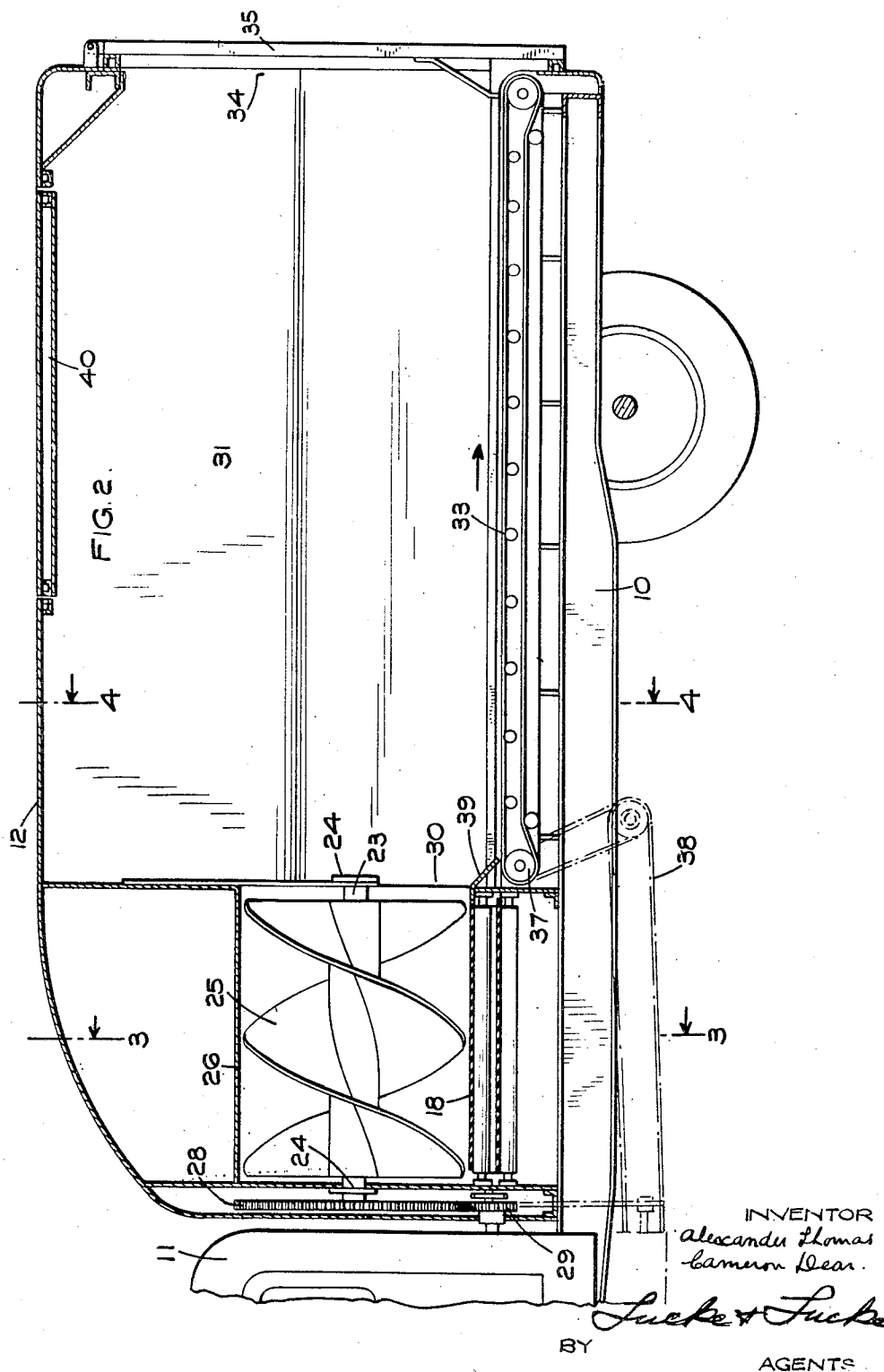
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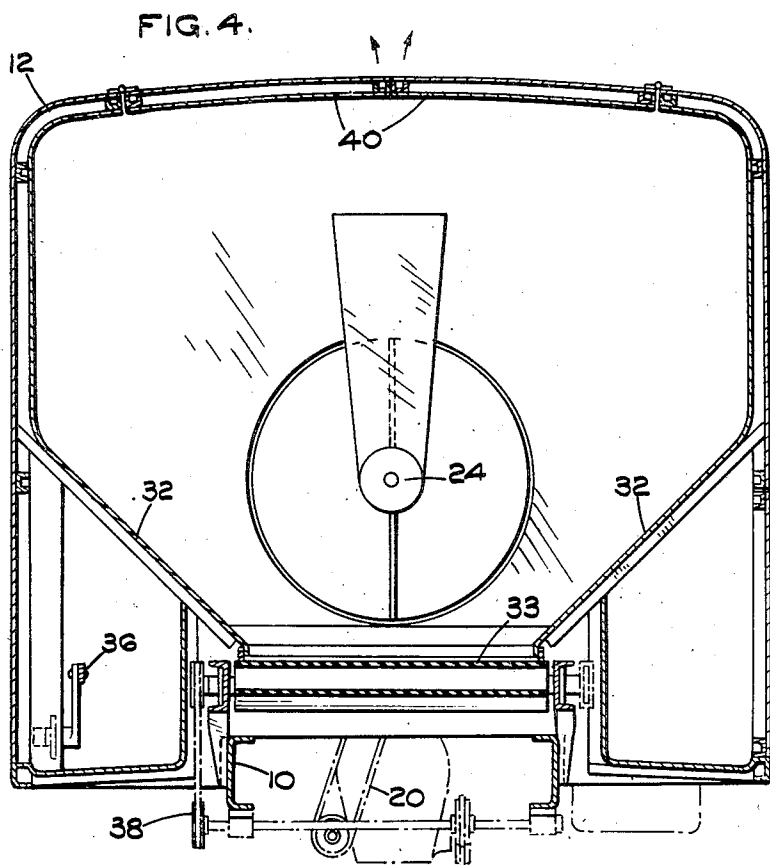
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REFUSE COLLECTING VEHICLE

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3 Sheets-Sheet 3



INVENTOR
Alexander Thomas Cameron Dear

Lucke & Lucke
BY

AGENTS.

UNITED STATES PATENT OFFICE

2,488,966

REFUSE COLLECTING VEHICLE

Alexander Thomas Cameron Dear, West Bromwich, England, assignor to Lewin Road Sweepers Limited, West Bromwich, England, a British company

Application February 20, 1948, Serial No. 9,772
In Great Britain January 8, 1948

Section 1, Public Law 690, August 8, 1946

5 Claims. (Cl. 214—67)

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This invention relates to refuse collecting vehicles and is concerned with such vehicles of the kind comprising a refuse container having a charging opening through which the refuse is tipped or otherwise delivered into the interior of the container, and a rotatable impeller having blades for feeding the delivered refuse into the interior of the container so as to pack it therein and thus utilise economically the storage capacity of the container.

Hitherto in refuse collecting vehicles of the above kind the charging opening has been disposed at the rear of the vehicle with the impeller disposed within the container a short distance inwardly from the opening and the same opening has been used for discharging the refuse from the container; and to enable the refuse to be discharged, i. e. displaced rearwardly in relation to the container, the latter has been mounted for bodily rotation about a central axis extending longitudinally of the vehicle and provided with a spiral or helical blade so that on rotating the container in the proper direction having regard to the hand of the spiral, the refuse is ejected through the charging opening.

The above described known arrangement is subject to a number of disadvantages. In the first place the mounting of the container for bodily rotation is an expensive construction involving accurate manufacture of the container and the provision of special supporting bearings. Furthermore, in order to ensure that the material which is tipped into the container through the charging opening is delivered to the impeller blades and thus fed by the impeller forwardly of the container so as to be packed into the interior thereof, it is necessary for the lowest edge of the charging opening to be disposed an appreciable height above the lowest part of the impeller blades so that when the refuse is delivered through the opening it has a sufficient gravity fall to enable it to reach the impeller and thus be fed by the impeller forwardly of the container.

This limitation on the height of the lowest edge of the charging opening in relation to the impeller necessitates in practice the provision of a relatively small charging opening which can only be used with standard domestic refuse bins and a non-standard domestic bin or other container cannot conveniently be employed.

Furthermore, the above known arrangement can only be used for refuse collecting purposes, the provision of the impeller at the rear end of the vehicle adjacent to the opening therein precluding the additional use of the vehicle for other

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purposes when required such as, for instance, the distribution of sand or grit on the roads.

Still a further objection of this known arrangement is that the mounting of the impeller at the rear end of the container which is itself rotatable, calls for the provision of an impeller driving shaft to rotate the same extending from the front end of the vehicle through the container along the longitudinal centre line thereof. The provision of this shaft increases the expense of the construction while it entails the serious disadvantage that any refuse which is in elongated form, for example, rope, string, wire and the like, tends to become immovably wound around the longitudinal shaft as a result of the relative rotation which occurs between the shaft and the container during both charging and discharging of the container.

The object of the invention is to provide a construction of refuse collector of the above kind which is cheaper than the above known arrangement and in which the disadvantages of the above known arrangement are avoided.

Referring to the drawings:

Figure 1 is a side elevation of one form of refuse collecting vehicle constructed in accordance with the present invention.

Figure 2 is a longitudinal sectional view of the rear part of the vehicle depicted in Figure 1.

Figures 3 and 4 are cross sectional views on the lines 3—3 and 4—4 of Figure 2 respectively.

The refuse collecting vehicle illustrated comprises a chassis 10 on the front end of which is mounted the usual driver's compartment 11 in front of which is disposed a power unit (not shown) and behind which is disposed the refuse container 12 which is formed as a sheet metal body provided in one of its vertical sides adjacent to this front end and conveniently in the near side a rectangular charging opening 13 through which the refuse is delivered into the interior of the container 12.

The vehicle depicted is adapted for left hand running on the road so that the charging opening 13 is disposed on the left hand side of the vehicle but in the case of a vehicle intended for right hand running on the road the charging opening would, of course, be disposed in the side thereof opposite to that illustrated.

The opening 13 is normally closed by a door 14 of the flat type hinged to the body at 15 about its upper edge and the opening is made of a substantial size so that refuse from a receptacle of any non-standard form can be discharged there-through. Extending downwardly and inwardly

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from the sill 16 of the opening is a deflector plate 17, the lower end of which terminates immediately above one end of a transversely disposed horizontally extending refuse loading conveyor 18 of the endless belt type and driven from driving roller 19 connected by chain 20 and shaft 21 to a suitable power take-off provided on the power unit and not shown in the drawing. A clutch operable by the driver is interposed between the shaft 21 and the power take-off to enable the loading conveyor 18 to be driven when desired.

The conveyor 18 is driven so that the upper run of the belt carries the discharged refuse inwardly of the vehicle and to an impeller 22 which is supported for rotation about a longitudinal axis disposed above the inner end of the conveyor 18, i. e. above the driving roller 19 and this impeller includes a longitudinally extending shaft 23 supported at opposite ends in bearings 24 provided on the body of the refuse container, the impeller further including two sets of helically disposed blades 25 mounted on the shaft which form, in effect, a double-start screw so that when the impeller is rotated in the direction indicated in Figure 3, refuse fed thereto by the conveyor 18 is forced rearwardly of the vehicle.

The impeller is enclosed on all of its sides except those adjacent to the conveyor 18 and opening 13 by a sheet metal impeller housing 26 of part cylindrical form, one edge of the housing terminating adjacent to the roller 19 and the other edge being continued so as to form an upper closure 27 to the space through which the refuse is loaded through the opening 13.

The front end of the impeller shaft 23 carries a gear wheel 28 which is driven by a further gear wheel 29 connected to the driving roller 19 so that the impeller is driven simultaneously with the conveyor 18 and the arrangement is such that the peripheral speed of the impeller blades is the same as the speed of the conveyor belt 18.

The front end of the impeller housing 26 is closed but the rear end thereof is open as indicated at 30 so that the refuse can be forced therethrough by the impeller into the interior of the refuse containing compartment 31 which is disposed immediately to the rear of the impeller 22.

The longitudinal sides of this compartment are conveniently vertical in their upper part and are downwardly and inwardly inclined in their lower part as indicated at 32 in Figure 4, and terminate each at one of the two edges of a longitudinally extending refuse discharge conveyor 33 of the endless belt type, the front end of which conveyor is disposed below and immediately to the rear of the opening 30 and the rear end of which conveyor is disposed at the rear end of the vehicle adjacent a refuse discharge opening 34 having a door 35 hinged to the body of the vehicle about its upper edge and provided with operating mechanism indicated generally at 36 in Figure 1 for retaining the door normally closed although permitting of its opening when discharge of the refuse from the interior of the compartment 31 is desired.

The discharge conveyor 33 is provided at its forward end with a driving roller 37 which is driven by mechanism indicated generally at 38 through a clutch operable by the driver and not shown in the drawing, to which the drive is im-

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parted from the power take-off already referred to. The arrangement is such that the refuse discharge conveyor can be operated independently of the loading conveyor 18 and impeller 22.

For deflecting on to the conveyor 33 the refuse fed by the impeller through an opening 30 the lower edge of the latter is provided with a deflector plate 39.

Towards its rear end the roof of the compartment 31 is provided with a pair of hinged trap doors 40 which can be raised to permit of bulky articles of refuse being placed directly into the compartment 31 as well as to permit of the latter being hopper loaded with grit sand and the like for road sprinkling purposes when desired.

In operating a refuse collecting vehicle constructed as above described, when it is desired to charge the compartment with refuse, the clutch is operated so as to drive the loading conveyor 18 and impeller 22 and refuse is tipped through the loading opening 13, which refuse is fed by the conveyor 18 to the impeller and forced rearwardly by the latter into the compartment 31.

The operation is continued until the compartment 31 is filled, the impeller serving by reason of its blades to pack further refuse into the compartment even when this is relatively full so that the refuse is packed tightly therein and the vehicle is employed to maximum capacity.

The discharge conveyor 33 need not be operated during the charging of the compartment with refuse and reliance may be placed entirely on the impeller for this purpose although somewhat more rapid loading of the compartment may be effected if the discharge conveyor is operated during charging.

When it is desired to empty the compartment, i. e. to tip the refuse, the door 35 is opened and the discharge conveyor 33 is driven so as to drive its upper belt round in the rearward direction indicated thereby effecting rapid discharge of the refuse through the discharge opening 34.

Sticking of the refuse to the sides of the compartment during the discharge thereof is substantially avoided by the slope provided to the lower part of these sides as indicated at 32.

The vehicle is provided on the side of the impeller opposite to that having the loading opening with a compartment 41 having seats 42 for the refuse collecting operatives.

The inner wall of the compartment 41 is provided with an opening 9 so that access may be obtained to the space above the closure 27 so that coats and the like may be stored in this space.

In the form of the invention illustrated, the loading opening is disposed immediately to the rear of the front end of the container, but if desired, it may be disposed a short distance to the rear of such end.

The sill 16 of the loading opening is disposed at such a height in relation to the ground that the receptacle from which the refuse is discharged through the opening can readily be lifted and handled.

A refuse collecting vehicle in accordance with the present invention possesses the advantage that its construction is cheaper than the arrangement of collector already enumerated, it avoids the disadvantages stated of such construction, while possessing all the advantages of that kind of refuse collector in which a bladed impeller is employed for delivering the charged refuse into

the interior of the container and for packing it tightly therein.

I claim:

1. In a refuse collecting vehicle a refuse container having a refuse loading opening at its front end and a refuse discharge opening at its rear end, said refuse loading opening being disposed in a side wall of the refuse container, a rotatable bladed impeller at the front end of the container, said impeller having helical blades being rotatable about an axis which is longitudinal in relation to the vehicle, a refuse loading conveyor adapted to convey refuse from said loading opening to said impeller, said impeller having the periphery of its blades disposed adjacent one end of said loading conveyor, means for transmitting drive to said loading conveyor, means for transmitting drive to said impeller so as to rotate it in a direction for packing refuse rearwardly of the container, means for rotating said impeller simultaneously with and at a peripheral speed corresponding to the speed of the refuse loading conveyor, a refuse discharge conveyor extending from said impeller to the discharge opening and means for transmitting drive to said refuse discharge conveyor.

2. In a refuse collecting vehicle a refuse container having a refuse loading opening at its front end and a refuse discharge opening at its rear end, said refuse loading opening being disposed in a side wall of the refuse container, a rotatable bladed impeller at the front end of the container, said impeller having helical blades and being rotatable about an axis which is longitudinal in relation to the vehicle, a refuse loading conveyor adapted to convey refuse from said loading opening to said impeller, said impeller having the periphery of its blades disposed adjacent one end of said loading conveyor, means for transmitting drive to said loading conveyor, means for transmitting drive to said impeller so as to rotate it in a direction for packing refuse rearwardly of the container, means for rotating said impeller simultaneously with and at a peripheral speed corresponding to the speed of the refuse loading conveyor, a refuse discharge conveyor extending from said impeller to the discharge opening, said discharge conveyor having a width less than the maximum width of the refuse container and the lower part of the sides of the latter sloping inwardly and downwardly towards the longitudinal edges of the discharge conveyor and means for transmitting drive to said refuse discharge conveyor.

3. In a refuse collecting vehicle, a refuse container having a refuse loading opening at its front end and a refuse discharge opening at its rear end, a rotatable bladed impeller at the front end of the container and adjacent the bottom thereof and mounted for rotation about a substantially horizontal axis, a refuse loading conveyor extending from a position adjacent the lower part of the refuse loading opening to a position adjacent the lower part of the impeller, said refuse loading opening being adapted to receive refuse directly from a refuse bin on discharge of the contents of the latter through the loading opening, and being adapted to convey the received refuse to the lower part of the impeller, means for transmitting drive to said loading conveyor, means for transmitting drive to said impeller so as to rotate it in a direction for packing refuse rearwardly of the container, a

refuse discharge conveyor at the bottom of said refuse container extending from the lower part of said impeller to the discharge opening, and means for transmitting drive to said refuse discharge conveyor.

4. In a refuse collecting vehicle a refuse container having a refuse loading opening at its front end and a refuse discharge opening at its rear end, said refuse loading opening being disposed in a side wall of the refuse container, a rotatable bladed impeller at the front end of the container and adjacent the bottom thereof and mounted for rotation about a substantially horizontal axis, a refuse loading conveyor extending from a position adjacent the lower part of the refuse loading opening to a position adjacent the lower part of the impeller, said refuse loading opening being adapted to receive refuse directly from a refuse bin on discharge of the contents of the latter through the loading opening, and being adapted to convey the received refuse to the lower part of the impeller, means for transmitting drive to said loading conveyor, means for transmitting drive to said impeller so as to rotate it in a direction for packing refuse rearwardly of the container, a refuse discharge conveyor at the bottom of said refuse container extending from the lower part of said impeller to the discharge opening, and means for transmitting drive to said refuse discharge conveyor.

5. In a refuse collecting vehicle a refuse container having a refuse loading opening at its front end and a refuse discharge opening at its rear end, said refuse loading opening being disposed in a side wall of the refuse container, a rotatable bladed impeller at the front end of the container and adjacent the bottom thereof, said impeller having helical blades and being rotatable about an axis which is longitudinal in relation to the vehicle, a refuse loading conveyor extending from a position adjacent the lower part of the refuse loading opening to a position adjacent the lower part of the impeller, said refuse loading opening being adapted to receive refuse directly from a refuse bin on discharge of the contents of the latter through the loading opening, and being adapted to convey the received refuse to the lower part of the impeller, said impeller having the periphery of its blades disposed adjacent one end of said loading conveyor, means for transmitting drive to said loading conveyor, means for transmitting drive to said impeller so as to rotate it in a direction for packing refuse rearwardly of the container, a refuse discharge conveyor at the bottom of said refuse container extending from the lower part of said impeller to the discharge opening, and means for transmitting drive to said refuse discharge conveyor.

ALEXANDER THOMAS CAMERON DEAR.

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