

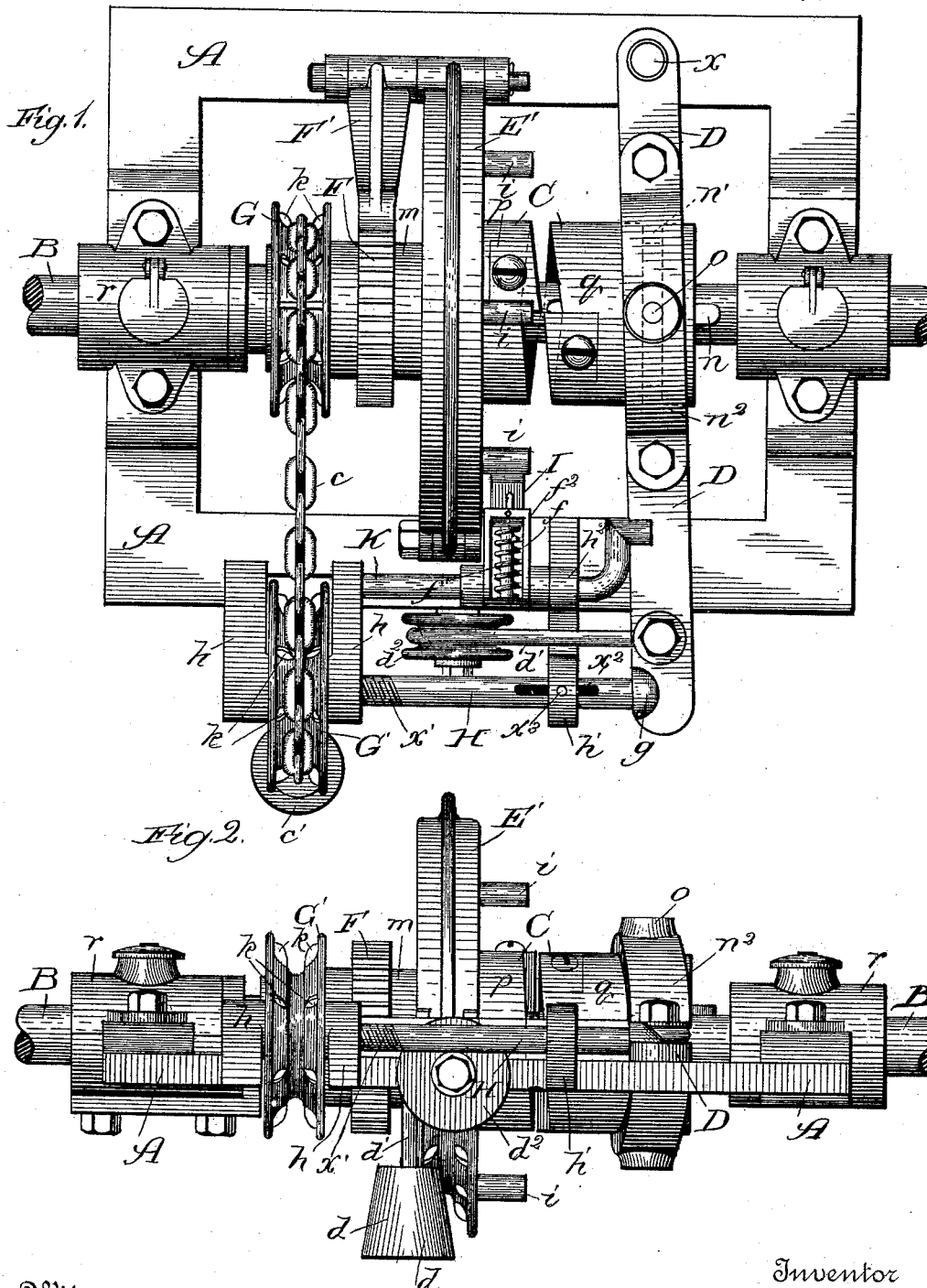
(No Model.)

2 Sheets—Sheet 1.

W. H. CUMMINGS.  
GRAIN SHOVELING APPARATUS.

No. 422,123.

Patented Feb. 25, 1890.



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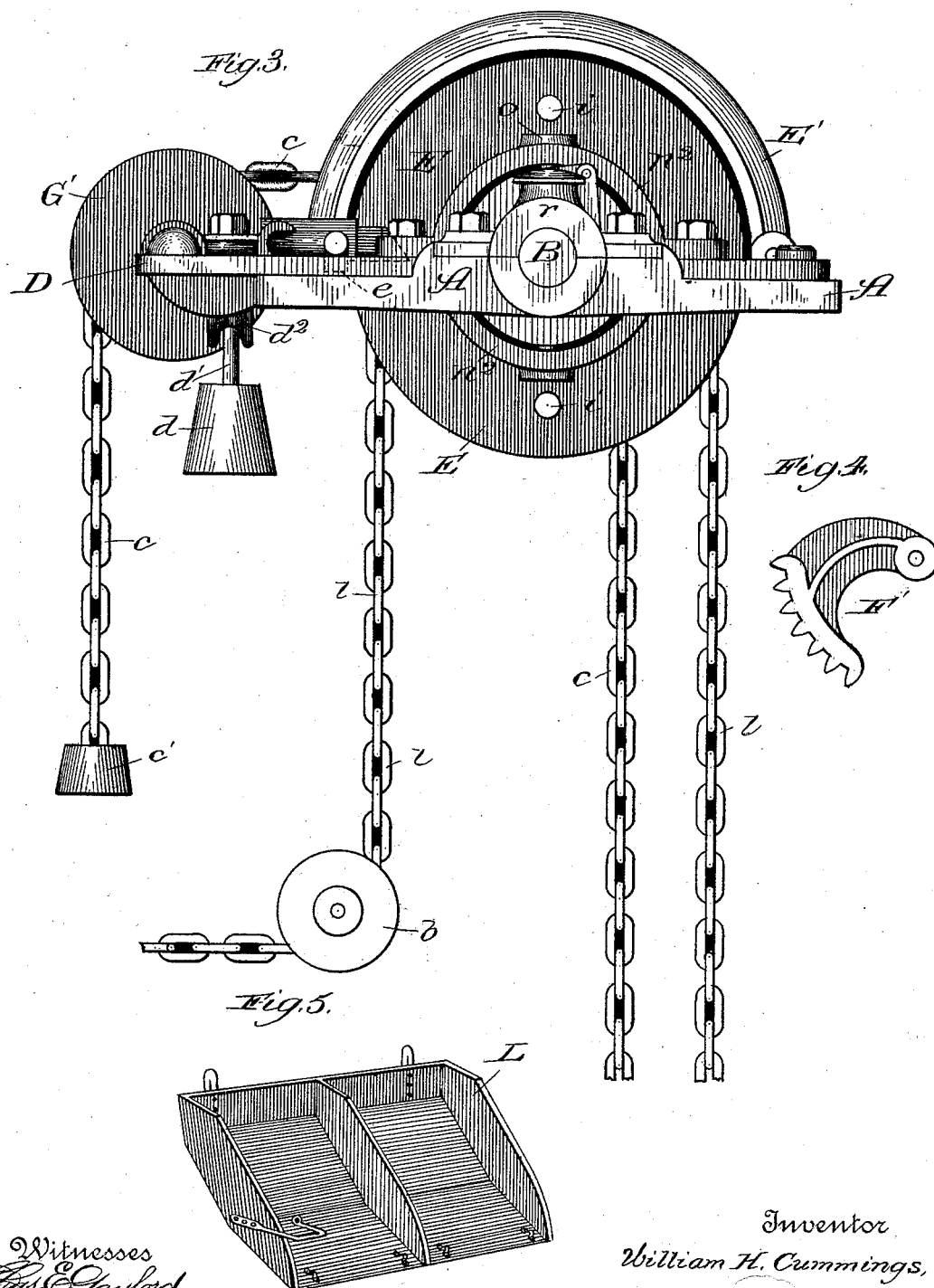
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# UNITED STATES PATENT OFFICE.

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## GRAIN-SHOVELING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 422,123, dated February 25, 1890.

Application filed December 9, 1889. Serial No. 333,008. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM H. CUMMINGS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Grain-Shoveling Apparatus, of which the following is a specification.

My invention relates to an improvement in the class of apparatus adapted for use in shoveling loose material generally, but entitled as above because of the more common use thereof or particular usefulness for shoveling grain from cars into the receptacles provided to receive it at grain-elevator buildings.

More definitely stated, my invention relates to an improvement on the form of the aforesaid shoveling apparatus, in which, generally described, the shovel or scoop, controlled in its work by an operator who manipulates and guides it inside the car, is connected by a suitable flexible connecting medium—such as a chain or cable—with power mechanism located outside the car-door, and is drawn into the car by the operator to the points therein from which the shoveling is to be done, thereby unwinding and distending the chain or cable, which is then gripped by the power mechanism and thereby drawn in the opposite direction to shovel the grain to the place of dumping, (the car-door.)

The object of my invention is to provide a generally-improved machine in the foregoing class, both as to simplicity and compactness in the construction and reliability and easiness of operation.

My invention consists in the general construction of my improved apparatus, and it also consists in details of construction and combinations of parts.

In the accompanying drawings, Figure 1 is a plan view of my improved machine. Fig. 2 is a view of the same in elevation regarded from the bottom of Fig. 1; Fig. 3, a side view regarded from the left-hand side of Fig. 1; Fig. 4, a view in elevation of a detail, and Fig. 5 a perspective view of a shovel suitable for use with my improvement.

A is the frame of the machine, which may be of the general rectangular form illustrated, and at opposite sides it supports the journal-bearings *r*, for the rotary power-shaft B, pro-

vided with means (not shown) for transmitting to it the driving-power, such as a belt-pulley, or if hand-power be the driving-medium, a crank.

On the shaft B is the clutch C, formed in the two parts *q* and *p*. The part *q* is secured to the shaft to rotate with it by means of a feather *n*, and has connected with it by a pin *o*, extending into a groove *n'* in the clutch portion, an operating-lever D, fulcrumed to the frame at *x* and formed between its extremities with a collar *n*<sup>2</sup>, surrounding the part *q* of the clutch. The part *p* of the clutch is loose upon the shaft B, and is extended around the latter in the form of a sleeve *m*, having secured to it adjacent to the clutch portion *p* a peripherally-grooved pulley E, which should be shielded by a suitable guard E', supported at opposite ends of the frame as shown, and which pulley, if a chain *l* be used with it, as and for the purpose hereinafter stated, should, like the various other pulleys employed in the machine, if used with chains, operate like sprocket-wheels, by providing it in its peripheral groove with cogs *k*. The pulley E is provided on one side near its periphery with pins *i*, which should be at equal distances apart, and of which four are shown, though more or fewer may be used.

Adjacent to the pulley E, I provide on the sleeve *m*, as a rigid or integral part thereof, a cog-wheel F, engaged by a segmental rack F', pivotally secured for the purpose to the frame A, as shown, the function of which cog-wheel and rack is to operate as a counter-weight, as is hereinafter explained, for which reason these parts may be supplanted by any suitable form of counter-weight without thereby departing from my invention. Further along on the sleeve *m* is the pulley G, and in line with the latter is a similar pulley G', confined in a suitable bearing *h* on the frame A, and supported on a longitudinally-reciprocating rod H, screw-threaded, as shown at *x'*, toward one end, which passes through the center of the pulley G', and which is therefore correspondingly threaded. The opposite end of the threaded rod H, toward which it is supported in a bearing *h'*, extending from the frame, coincides with the lever D toward its free end to engage with the latter, as and

for a purpose hereinafter explained, and may for the purpose be provided, as shown, with a head  $g$  to enter a corresponding socket in the lever, and the rod  $H$  should be slotted longitudinally, as shown at  $x^2$ , to admit into it a pin  $x^3$ , extending from the bearing  $h'$  and provided to prevent rotation of the rod.

I is a spring-pawl extending into the path of the pins  $i$  on the pulley  $E$ , and the spring  $f$  of which is confined around its stem  $f'$  in a guide-frame  $f^2$ , secured to a rocking bar  $K$ , supported at one end in the bearing  $h$  and toward its opposite end in a bearing  $h^2$ , beyond which it should be bent, as illustrated, to overlap eccentrically of its axis, the lever  $D$  being provided near its overlapping end with a lug  $e$  (indicated by dotted lines in Fig. 3) extending across the plane of the inner edge of the lever, and affording in the normal position of the bar  $K$  a stop to the movement of the lever  $D$  by resisting the action of a weight  $d$ , connected with it by a rope  $d'$  or chain passing over a pulley  $d^2$ , journaled upon the frame  $A$ . The pulleys  $G$  and  $G'$  are connected by a chain  $c$ , controlled by a weight  $c'$  at the end passing over the pulley  $G'$ . The chain  $l$  for the pulley  $E$  is passed around a guide-pulley  $b$ , Fig. 3, and has secured to its end, in a usual manner, a shovel or scoop  $L$ , such as that illustrated in Fig. 5.

The operation of the machine is as follows: The machine being properly supported adjacent to the door-opening in the car to be emptied and the shaft  $B$  being rotated, the operator draws the scoop  $S$  into the car to the desired point, thereby, through the frictional action of the chain on the pulley  $E$ , turning the clutch portion  $p$  in the direction contrary to the rotation of the shaft  $B$  in lengthening out the said chain. The described rotation of the clutch portion  $p$  obviously also rotates in the same direction the sleeve  $m$  and the cog-wheel  $F$  and pulley  $G$  thereon, causing the cog-wheel to raise the pivotal segmental rack  $F'$ , (the weight or resistance of which is greater than that of the opposing weight  $c'$ ), and permitting the weight  $c'$  to lower the chain  $c$ , and in doing so rotate the pulley  $G'$ . Rotation of the pulley  $G'$  by the action of its internal screw-thread on the threaded rod  $H$  forces the latter lengthwise inward or toward the left, thereby withdrawing it from contact with the lever  $D$ . The pins or stops  $i$  on the pulley  $E$ , in the forward rotation described of the said pulley, strike successively the beveled end of the pawl  $I$  and pass it without material impediment by driving it inward against its spring  $f$ . When the operator reaches with the scoop  $S$  the desired point in the car, in resting it there the strain of his exertion in pulling the scoop ceases and permits the gravity of the pivoted segmental rack  $F'$  to act against the cog-wheel  $F$ . This effects turning in the backward direction of the sleeve  $m$ , and with it of the pulley  $E$ , until the pin  $i$  thereon, which is nearest the spring-pawl  $I$ , strikes the latter from under-

neath, in which direction, not being beveled on its under side, the pawl is not caused to yield lengthwise of its axis, but is turned with its pivotal support afforded by the rocking bar  $K$  by the respective pin  $i$  in passing it. This turning of the rocking bar  $K$  removes its lug  $e$  from contact with the lever  $D$ , and permits the weight  $d$  to exert its gravity on the lever to cause it to pull the sliding part  $q$  of the clutch  $C$  into engagement with the part  $p$  thereof. Thus the sleeve  $m$  and all the parts it supports are carried around in the direction of rotation of the shaft  $B$ , thereby causing the pulley  $E$  to withdraw the scoop  $S$ , through the medium of the chain  $l$ , toward the discharge opening or door in the car, to which the scoop is guided and at which it is dumped by the operator. The rotation of the shaft  $B$  turns the pulley  $G'$  in the same direction, and thus drives the rod  $H$  longitudinally outward against the lever  $D$ , thereby causing the latter to separate the clutch portion  $q$  from its companion part and permit the rocking bar  $K$  to assume by gravity its normal position with the lug  $e$  against the lever to hold it against the resistance of the weight  $d$ . As will thus be seen, the operation of the machine to permit manipulation of the scoop or shovel properly to set it into the material to be shoveled and to effect its carriage to the point of dumping is thoroughly automatic and reliable, whatever the length of the connecting medium  $l$ , and that the means for the purpose involve a simple and compact construction which renders the operation easy.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a shoveling apparatus, the combination, with the rotary power-shaft  $B$ , of a clutch  $C$ , having the weighted part  $p$  and the part  $q$  controlled through a weighted lever  $D$  and normally held out of engagement with its companion part  $p$  against the weight of the lever, a longitudinally-reciprocating rod  $H$  in the path of the lever and connected with the loose portion  $p$  of the clutch to be moved from the lever in drawing out the shovel  $S$ , and to be moved in the opposite direction with the engagement of the clutch, and means, substantially as described, for releasing the lever  $D$  to permit engagement of the parts forming the clutch, and actuated by the weight on the loose clutch portion, substantially as set forth.

2. In a shoveling apparatus, the combination, with the rotary power-shaft  $B$ , of a clutch  $C$ , comprising the loose part  $p$  and the part  $q$ , secured to the shaft to rotate with it, a weighted lever  $D$ , controlling the clutch portion  $q$ , a weighted sleeve  $m$ , extending around the shaft from the clutch portion  $p$  and carrying the pulley  $E$ , provided with one or more stops  $i$  and a pulley  $G$ , a movable stop for the lever operating to hold it against its weight and having connected with it a pawl  $I$ , extending into the path of the stop or stops  $i$ , and a longitudinally-reciprocating rod  $H$

in the path of the lever and connected with the sleeve *m* to be moved from the lever by turning the sleeve in the direction against the resistance of its weight, and to be moved in the opposite direction by turning the sleeve in the contrary direction of resistance of its weight, substantially as and for the purpose set forth.

3. In a shoveling apparatus, the combination, with the rotary power-shaft B, supported in a frame A, of a clutch C, comprising the loose part *p* and the part *q*, secured to the shaft to rotate with it, a weighted lever D, controlling the clutch portion *q*, a weighted sleeve *m*, extending around the shaft from the clutch portion *p* and carrying the scoop-chain pulley E, provided with one or more stops *i*, and the pulley G, a longitudinally-reciprocating threaded rod H, supported in line with the free end of the lever D, a pulley G', supported on the threaded end of the rod and confined against lateral movement and connected with the pulley G, and a movable stop for the said lever operating to hold it against its weight, and having connected with it a pawl I, extending into the path of the stop or stops *i*, substantially as and for the purpose set forth.

4. In a shoveling apparatus, the combination, with the rotary power-shaft B, supported in a frame A, of a clutch C, comprising the loose part *p* and the part *q*, secured to the shaft to rotate with it, a weighted lever D, controlling the clutch portion *q*, a weighted sleeve *m*, extending around the shaft from the clutch portion *p* and carrying the scoop-chain pulley E, provided with one or more stops *i*, and the pulley G, a longitudinally-re-

ciprocating threaded rod H, supported in line with the free end of the lever D, a pulley G', supported on the threaded end of the rod and confined against lateral movement, a chain *c*, connecting the pulleys G and G', and provided with a weight, and a rocking bar K, supported to extend against the lever D, and provided with a pawl I, projecting into the path of the stop or stops *i*, substantially as and for the purpose set forth.

5. A shoveling apparatus comprising, in combination with a frame A, a rotary shaft B, a clutch C, having the part *p* loose on the shaft, and the part *q*, secured to the shaft to rotate with it, a weighted lever D, controlling the clutch portion *q*, a sleeve *m*, extending around the shaft from the clutch portion *p*, and carrying the pulley E, provided with one or more stops *i*, a cog-wheel F, and a pulley G, a pivotal segmental rack F', engaging with the cog-wheel F, a rod H, threaded toward one end and supported to extend at its opposite end against the lever D and held against rotation, a pulley G', supported on the threaded end of the rod and confined against lateral movement, a weighted chain *c*, connecting the pulleys G and G', a rocking bar K, supported to extend against the bar D, and provided with a spring-pawl I, projecting into the path of the stop or stops *i*, and a chain *l* on the pulley E, having the shovel L secured to it, the whole being constructed and arranged to operate substantially as described.

WILLIAM H. CUMMINGS.

In presence of—

J. W. DYRENFORTH,  
M. J. FROST.