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L. SELINGER ET AL

FEED BOX

Filed May 1, 1923

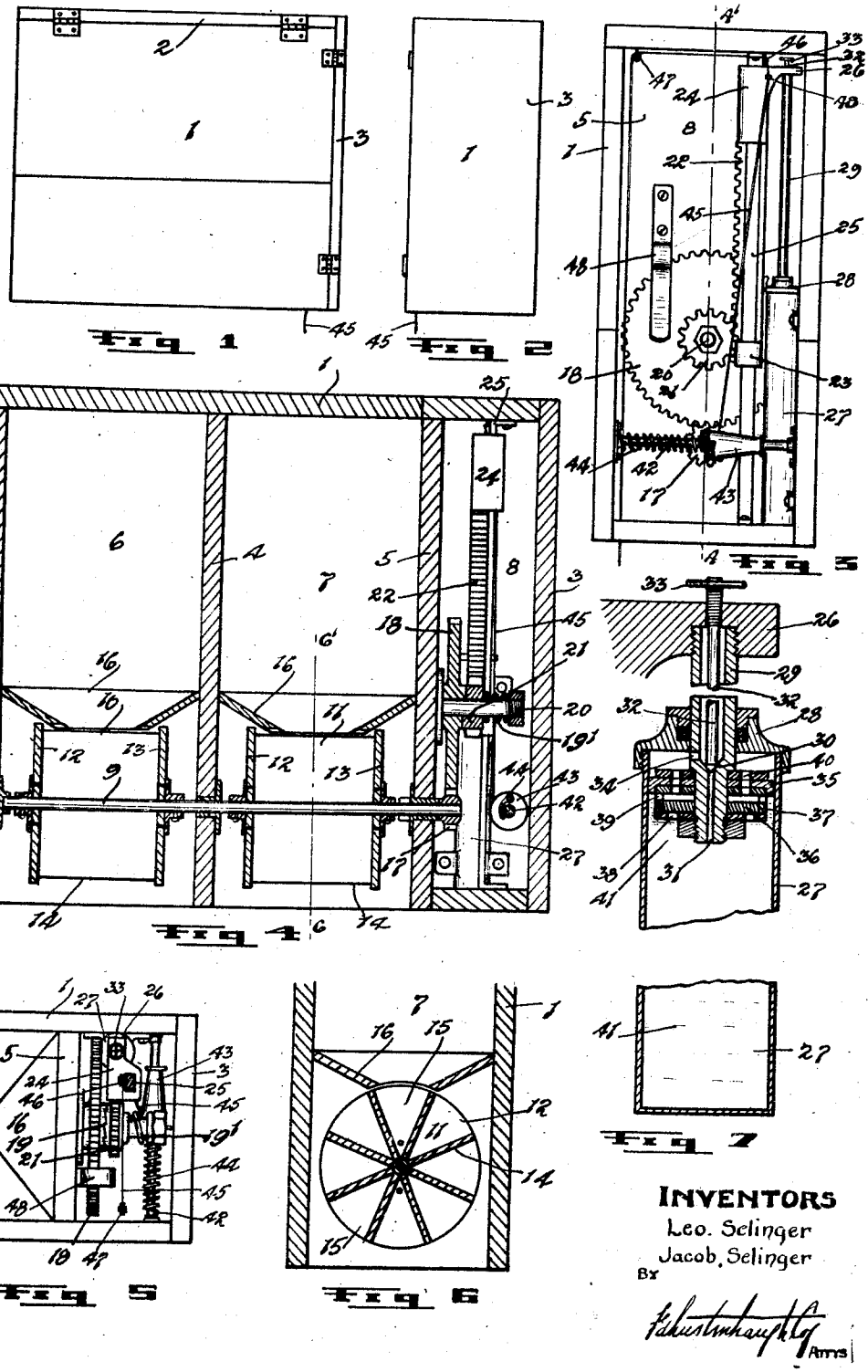


Fig 1

Fig 2

Fig 3

Fig 4

Fig 5

Fig 6

Fig 7

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UNITED STATES PATENT OFFICE.

LEO SELINGER AND JACOB SELINGER, OF LAJORD, SASKATCHEWAN, CANADA.

FEED BOX.

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To all whom it may concern:

Be it known that we, LEO SELINGER and JACOB SELINGER, subjects of the King of Great Britain, both of the town of Lajord, in the Province of Saskatchewan, Canada, have jointly invented certain new and useful Improvements in Feed Boxes, of which the following is the specification.

The invention relates to improvements in feed boxes and particularly to a feed box for feeding grain, such as oats, to horses and an object of the invention is to provide a feed box which will operate to feed a limited and predetermined quantity of grain to the animal, thereby causing him to properly masticate the food.

A further object of the invention is to construct the appliance so that it can be readily regulated to feed a greater or less amount of food as desired and also to construct the same so that it can be readily set and controlled.

A further object is to construct an appliance which can be utilized to control the feed of several animals by simply extending the device through the duplication of certain parts.

A further object is to construct the device so that it can be manufactured at reasonable cost and can be relied upon to operate satisfactorily.

With the above more important objects in view the invention consists essentially in the arrangement and construction of parts hereinafter more particularly described and later pointed out in the appended claims, reference being had to the accompanying drawing in which:—

Fig. 1 is a front view of the device.

Fig. 2 is an end view thereof.

Fig. 3 is an interior view showing certain of the working parts, the end of the box being removed.

Fig. 4 is a vertical sectional view through the box, the section being taken at 4—4′ Figure 3.

Fig. 5 is a plan view of one end of the box with the cover removed and showing interior parts.

Fig. 6 is a vertical sectional view at 6—6′ Figure 4.

Fig. 7 is an enlarged detailed vertical sectional view through the needle valve, the cylindrical casing and other parts associated therewith.

In the drawing like characters of reference indicate corresponding parts in the several figures.

The box 1 is substantially rectangular and is provided at the top with a hinged cover or door 2 and at one end with a hinged door 3, the door 2 permitting of the placing of the grain, such as oats, into the box and the door 3 permitting of inspection of the operating parts. The box is interiorly divided by two partitions 4 and 5 to provide two feed compartments 6 and 7 and a mechanism compartment 8, the latter compartment being at the end having the door 3. The bottom of the box underneath the compartments 6 and 7 is open. A rotatably mounted shaft 9 is mounted in the lower part of the box and centrally crosses the compartments 6 and 7, the said shaft being carried by suitable bearings secured to the partitions and to one end of the box. On this shaft we mount a pair of similar feeders 10 and 11, the said feeders turning with the shaft and each presenting end discs 12 and 13, between which we locate a plurality of suitably spaced vanes or wings 14 radiating from the shaft.

By this construction we provide a plurality of similar more or less V-shaped feed pockets 15. We provide each feed compartment with a more or less hopper shaped bottom 16 and these hopper bottoms feed the grain placed in the compartments into the pockets of the feeders as the same are rotated, as later described.

The mechanism for controlling and rotating the shaft 9 is contained in the compartment 8 and comprises the parts now described.

The shaft 9 is projected through the partition 5 and has the projected end fitted with a pinion 17 which meshes with a gear wheel 18, the gear wheel being rotatably mounted on a stub shaft 20 secured to the partition 5. A pinion 21 is also mounted on the stub shaft. The pinion and gear are provided with engaging clutch members 19, said members being held into engagement by a pressure spring 19′. The pinion 21 meshes continuously with a vertically disposed rack bar 22 which has the ends thereof provided with sleeves 23 and 24 slidably mounted on a guide bar 25 permanently secured to the box. The sleeve 24 is supplied with an outstanding arm 26, the purpose of which will be later described.

To the inner side of the box is permanently secured a vertically disposed cylindrical casing 27 which has the lower end closed and the upper end provided with a screw cap 28. 29 is a tube in the form of a piston rod, the upper end of the tube being securely connected to the arm 26, such as by screwing the upper end of the tube into the arm. The lower end of the tube passes slidably through the cap 28, a suitable bushing being therein provided and the end thereof is contracted to provide a tapering valve seat 30 which communicates with a duct 31 leading to the interior of the cylinder 27. A needle valve 32 adjoins the seat, the stem of the valve extending upwardly through the tube and having the upper end thereof screw threading through the arm 26 and provided with an adjusting wheel 33. Obviously by manipulating the wheel 33 one can seat the valve or open the same a greater or less amount.

Above the valve the tube 29 is provided with an outlet opening 34, the arrangement being such that upon the valve being opened there is a through passage up the duct 31 and out the opening 34. The lower end of the rod 29 is fitted with a plunger or piston 35 operating within the cylinder, the piston being beneath the opening 34 and beneath the piston is located a disc valve 36 which is adapted to operate within a housing 37 formed as an extension on the underside of the piston. Entry openings 38 are provided in the housing beneath the disc valve and further outlet openings 39 are provided in the side of the housing above the disc valve. It will be observed (see Figure 7) that there are ports or openings 40 through the plunger, these connecting the upper part of the casing 27 with the chamber located above the disc valve.

The cylindrical casing 27 contains a regulating liquid, such as oil, indicated at 41, it being desirable that the same be non-freezing. The plunger 35 is adapted to move up and down within the cylindrical casing and it will be apparent that if the needle valve be opened and the plunger forced down the oil in the cylindrical casing will flow through the opening 31 and out the opening 34 under the pressure of the piston and further that the flow of oil will be absolutely controlled by the setting of the needle valve. The pressure of the oil at the underside of the piston will also act through the openings 38 to force up the disc valve so that the said disc valve will close the openings 39 and also those 40. In the up movement of the piston the pressure of the oil, which is then above the piston, will operate through the openings 40 to force down the disc valve and consequently permit the oil to escape past the piston out the openings 39.

According to the above arrangement it is possible for us to regulate the speed at which the piston goes down by setting the needle valve and it is also possible to more or less quickly raise the piston as in the up movement thereof the oil has a more or less free passage through the plunger from the top side to the underside.

In the compartment 8 we locate a cross shaft 42 which carries a conical drum 43 and is adapted to be rotated by a coil spring 44, the spring having one end fixed to the side of the box and the other end attached to the drum which is in turn secured to the shaft.

To the drum we attach one end of a cable, cord or such like 45, the other end of which passes upwardly over suitable pulleys 46 and 47 provided at the top of the box and then extends downwardly and out through the bottom of the box. This cord is fastened at 48 to the upper sleeve 24.

According to this arrangement it will be obvious that by pulling down on the end of the cord extending from the box the sleeve is raised and consequently the rack bar and at the same time turn the drum in a manner to wind up the spring 44. The parts are so shown in Figure 3 which is the set position of the device.

Having brought the parts to this position one places the feed, such as oats, in the feed compartments 6 and 7 and regulates the needle valve to control the flow of oil. Obviously the spring 44 will act to pull down the rack bar which operates to force down the plunger and at the same time slowly rotate the feeders, the speed of rotation depending entirely on the setting of the needle valve. As the feeders rotate they gradually fill with the oats or other grains and expel the same at the underside of the box through the open bottom thereof. The expelled and falling grain can be directed to a box to which the animals have access.

Obviously, by utilizing deflector plates, the present appliance will feed two animals. By increasing the number of feeders and by providing suitable deflector plates, chutes, spouts or other means we can feed any number of animals with the one device.

After the spring 44 has uncoiled the device is reset by pulling the extending end of the cord. This turns the drum and winds the spring and during this movement the clutch member 19 disengages so that the feeders are not operated. The drum 43 is made of a conical shape so that the cord will be working onto the smaller end of the drum as the strength of the spring diminishes. This makes the feed control more regular.

A friction spring 48 is secured to the partition 5 and bears on the gear wheel 18 and retards the rotation of the said wheel 18.

What we claim as our invention is:

1. In combination, a compartment for the reception of feed, said compartment having a discharge opening in the bottom thereof, a shaft crossing the lower part of the compartment, a feeder rotating with the shaft and presenting a plurality of radially disposed pockets, said pockets being adapted to successively register with the outlet opening in the rotation of the feeder with the shaft, a stub shaft adjoining the former shaft, a gear wheel mounted on the stub shaft, a pinion meshing with the gear wheel and mounted on the former shaft, a pinion rotatably mounted on the stub shaft, engaging clutch members carried by the gear wheel and latter pinion, a spring normally maintaining the clutch members engaged, a slidably mounted rack bar engaging with the latter pinion, a cross shaft, a winding drum rotatably mounted on the cross shaft, a spring associated with the drum, a pulling line connected to the drum and to one end of the rack and adapted when pulled in one direction to shift the rack and wind the spring, and means for governing the speed of travel of the rack bar under the influence of the wound spring.

2. In combination, a compartment for the reception of feed, said compartment having a discharge opening in the bottom thereof, a shaft crossing the lower part of the compartment, a feeder rotating with the shaft and presenting a plurality of radially disposed pockets, said pockets being adapted to successively register with the outlet opening in the rotation of the feeder with the shaft, a stub shaft adjoining the former shaft, a gear wheel mounted on the stub shaft, a pinion meshing with the gear wheel and mounted on the former shaft, a pinion rotatably mounted on the stub shaft, engaging clutch members carried by the gear wheel and latter pinion, a spring normally maintaining the clutch members engaged, a slidably mounted rack bar engaging with the latter pinion, a cross shaft, a winding drum rotatably mounted on the cross shaft, a spring associated with the drum, a pulling line connected to the drum and to one end of the rack and adapted when pulled in one direction to shift the rack and wind the spring, and means for governing the speed of travel of the rack bar under the influence of the wound spring, said latter means embodying an oil containing cylinder, a plunger operated in the cylinder, a plunger rod extending from the plunger and connected to the rack bar and suitable controlling valves associated with the plunger and adapted to permit of the slow regulated escape of the oil through the plunger in the movement thereof in one direction and the quick escape of the oil past the plunger in the movement of the same in the other direction.

Signed at Lajord, Sask., this 22nd day of December 1922.

LEO SELINGER.
JACOB SELINGER.

In the presence of—
H. A. HANSON,
PHILLIP SELINGER.