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PORTABLE MAGNETIC SEPARATOR

1,958,351

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2 Sheets-Sheet 1

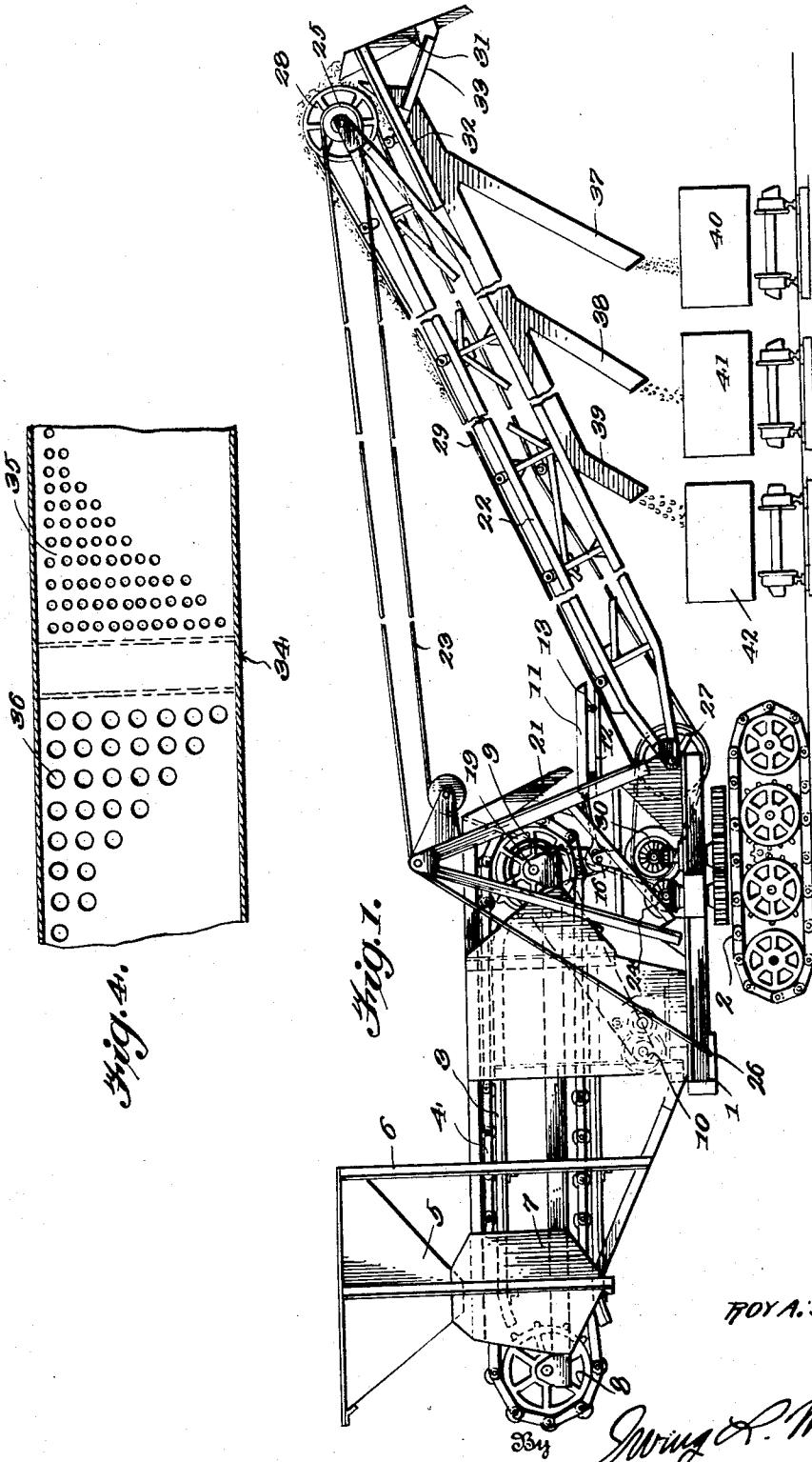


Fig. 4.

Fig. 1.

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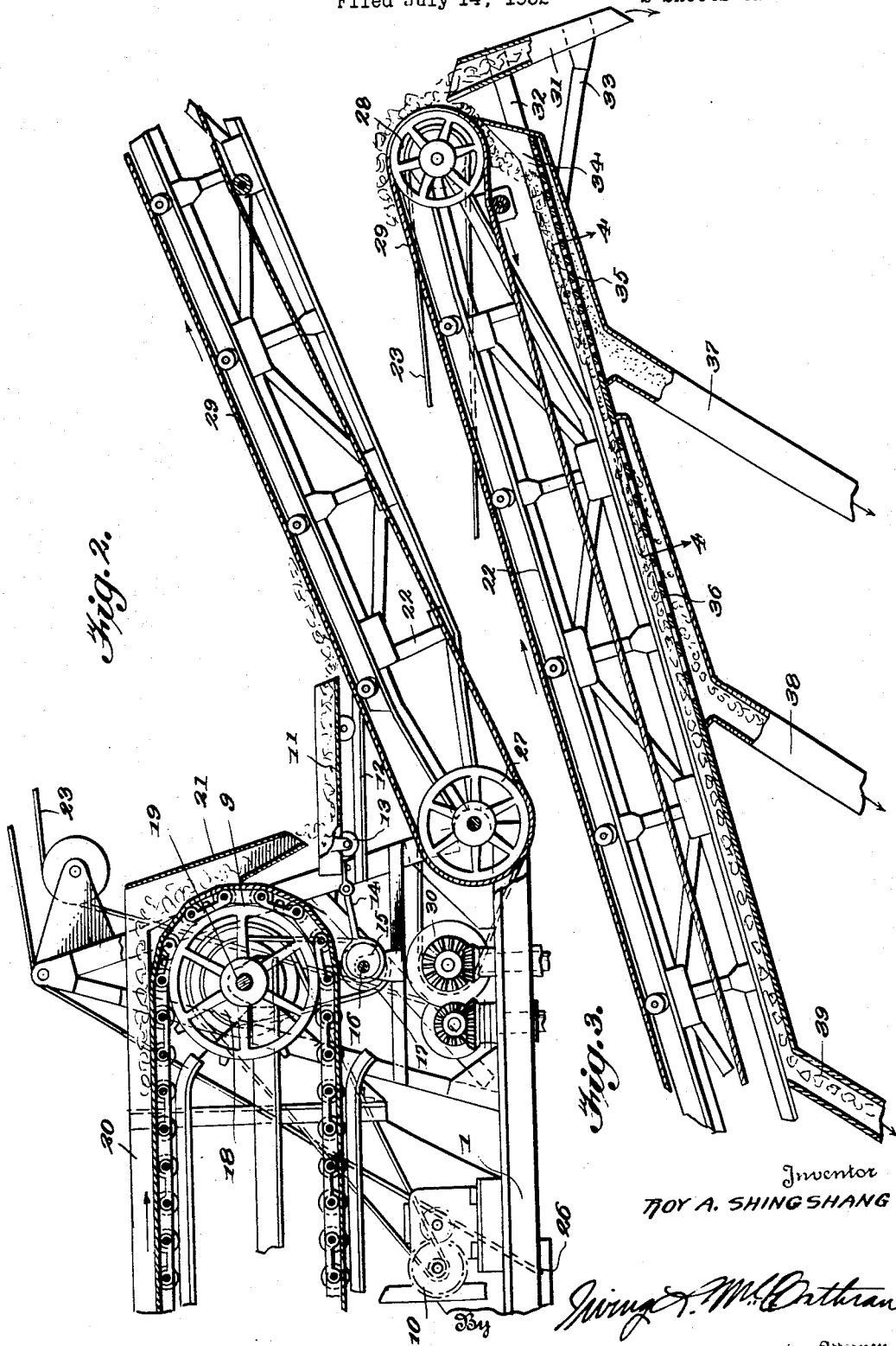


Fig. 2.

Fig. 3.

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PORTABLE MAGNETIC SEPARATOR

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1 Claim. (Cl. 209—38)

This invention relates to portable magnetic separators, and has for its object the production of a simple and efficient portable separator which is so constructed as to facilitate the reclaiming of magnetic material from any kind of refuse.

Another object of this invention is the production of a simple and efficient means for conveying the refuse to a convenient point where the refuse may be readily separated for the purpose of reclaiming magnetic material and then classifying the material to be delivered into the various receptacles after the magnetic material has been properly separated.

Another object of this invention is the production of a simple and efficient magnetic separator, which is constructed largely of standard commercial parts and which are readily available to the trade.

Another object of this invention is the production of a simple and efficient means whereby a magnetic drum is provided at one end of an elevating conveyor for causing the magnetic material to adhere to the drum during its rotation and thereby facilitate the separation of the metallic or magnetic material from the other portions of refuse such as ashes, slag and other material.

With these and other objects in view, this invention consists in certain novel constructions, combinations and arrangements of parts as will be hereinafter fully described and claimed.

In the drawings:—

Figure 1 is a side elevation of the assembled device;

Figure 2 is an enlarged side elevation, certain parts thereof being shown in longitudinal section illustrating the primary conveyor, the shaker tray, and the inclined conveyor which is adapted to elevate the refuse for the purpose of facilitating the separation of the magnetic material therefrom;

Figure 3 is an enlarged longitudinal sectional view, certain parts thereof being shown in side elevation of the outer or upper end of the inclined or elevated conveyor; and

Figure 4 is a section taken on line 4—4 of Figure 3.

By referring to the drawings, it will be seen that 1 generally indicates the truck table which is supported upon the conventional continuous tread truck 2. Mounted upon the truck table 1 in the conventional manner is a primary conveyor 3 which is provided with a continuous cast iron apron 4, this apron 4 being adapted to travel in the direction of the arrow indicated in Figure 2. A suitable hopper 5 is supported near

one end of the conveyor apron 4 upon the vertically extending standards 6, as shown, and this hopper carries a suitable shield 7 for the purpose of permitting refuse to be properly deposited upon the conveyor apron 4. This conveyor apron 4 is supported in any suitable or desired manner upon the end drums 8 and 9, the drum 9 being driven by means of a suitable motor 10. A shaker tray or feeder 11 is mounted upon the trackway 12, the tray or feeder 11 being supported upon rollers 13 which are adapted to freely travel upon the upper end of the trackway 12. The shaker tray or feeder 11 is connected to a shaker arm 14, which shaker arm 14 is actuated through the medium of an eccentric 15 clearly shown in Figure 2 of the drawings. The eccentric 15 is carried by a shaft 16 which shaft is driven through the medium of a belt 17, the belt 17 also passing over a pulley 18 carried by the drive shaft 19, which supports the conveyor apron drum 9 previously described.

The conveyor apron or chains 4 passes through a trough 20 which extends longitudinally of the conveyor 3 and is provided with a discharge chute 21 near its forward end for the purpose of discharging refuse into the shaker tray or feeder 11, as shown clearly in Figure 2.

Attached to the truck table 1, as is usually the custom with the trade, is a conveyor frame 22, this conveyor frame being so supported as to permit the same to be removed when desired, and the conveyor frame may be elevated and lowered by means of the elevating cable 23 which may be actuated from the drum 24, one end of the cable 23 passing over the idle pulley 25 and being in turn anchored as at 26. The conveyor frame 22 carries the drum 27 at its lower end and the magnetic drum 28 at its upper end. This magnetic drum 28 may be of any suitable or desired type of magnetic drum without departing from the spirit of the invention. A conveyor belt 29 passes over these drums 27 and 28 and the belt 29 may be driven from the drive or power means 30. Located at the extreme outer end of the conveyor frame 22 is a discharge chute 31 for discharging uncleaned refuse of a non-magnetic character which may be dropped over the upper end of the conveyor belt 29, this chute being carried by the frame 32 and braced by means of a suitable brace 33, as illustrated.

Extending longitudinally of the conveyor frame 22 upon the underside thereof, and projecting up to the extreme upper end of the conveyor frame is a reclaiming chute or trough 34, hanging below the conveyor belt 29, as shown. The

bottom wall of the reclaiming chute 34 is provided with a series of different size perforations indicated by the numerals 35 and 36, the perforations 35 being of a smaller size than the perforations 36. Under the series of perforations 35 is arranged a discharge spout 37 and communicating with the series of larger perforations 36 is also a discharge spout 38. At the lower end of the classifying or reclaiming chute 34 is a discharge spout 39, thereby permitting the reclaimed magnetic parts to be sifted out into three separate classifications according to size, and discharged through the relative spouts 37, 38 and 39, respectively. Suitable receptacles such as cars, or trucks 40, 41 and 42, may be respectively placed under the spouts 37, 38, and 39, for collecting the magnetic material reclaimed through the medium of the chute 34.

It should be understood that the operation of the device is as follows:—The refuse is dumped into the hopper 5 where it is conveyed down in the direction of the arrow toward the discharge spout 21 upon the conveyor chain 4 where the larger particles of metal or magnetic material may be lifted from the conveyor. The other portions of the refuse will then pass into the shaker tray 11 and then be properly distributed upon the inclined conveyor belt 29 and carried to the upper end of the conveyor belt. The magnetic portions of the refuse will then adhere to the belt due to the magnetic force of the magnetic drum 28 and the ashes, slag, and other unreclaimed refuse will pass out through the spout 31 to a suitable receptacle or conveyance. As the belt 29 continues to travel on the underside of the conveyor frame in the direction of the arrow shown in Figure 3, the magnetic particles, due to the travel of the belt, will drop into the reclaiming chute 34 and upon the bottom of the chute, the smaller particles passing down through the chute 37, the larger particles through the

chute 38, and finally the still larger particles out through the chute 39, each chute 37, 38, and 39, depositing the magnetic material in different receptacles or classified piles.

It should be understood that certain mechanical changes may be employed without departing from the spirit of the invention, so long as these changes fall within the scope of the appended claim.

Having described the invention, what is claimed as new is:—

A separator comprising a main frame, a horizontal conveyor carried by said frame, a chute extending downwardly from one end of said conveyor, a hopper adjacent the other end of said conveyor for delivering material onto the conveyor, a shaker tray extending horizontally with one end beneath the lower end of said chute, a conveyor frame pivoted at one end to the main frame under said shaker tray, means to support said conveyor frame at a determined upward incline, rotatable drums at upper and lower ends of the conveyor frame, the upper drum being a magnetic drum, an endless conveyor belt extending longitudinally of the conveyor frame and trained about said drums, a chute extending downwardly from the upper end of the conveyor frame to receive non-magnetic material from the belt as it passes about the upper drum, a trough extending longitudinally of the conveyor frame under the lower flight of the conveyor belt with its upper end beneath the upper drum, and spouts extending downwardly from said trough in spaced relation to each other longitudinally thereof, certain of said spouts having mouths at their upper ends extending toward the upper end of the trough beneath the same and the bottom of the trough having portions above the mouths perforated for permitting graded material to pass from the trough into the spouts.

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