

1,297,486.

M. B. MURRAY.
CASTING SEPARATING MACHINE.
APPLICATION FILED NOV. 16, 1917.

Patented Mar. 18, 1919.
6 SHEETS—SHEET 1.

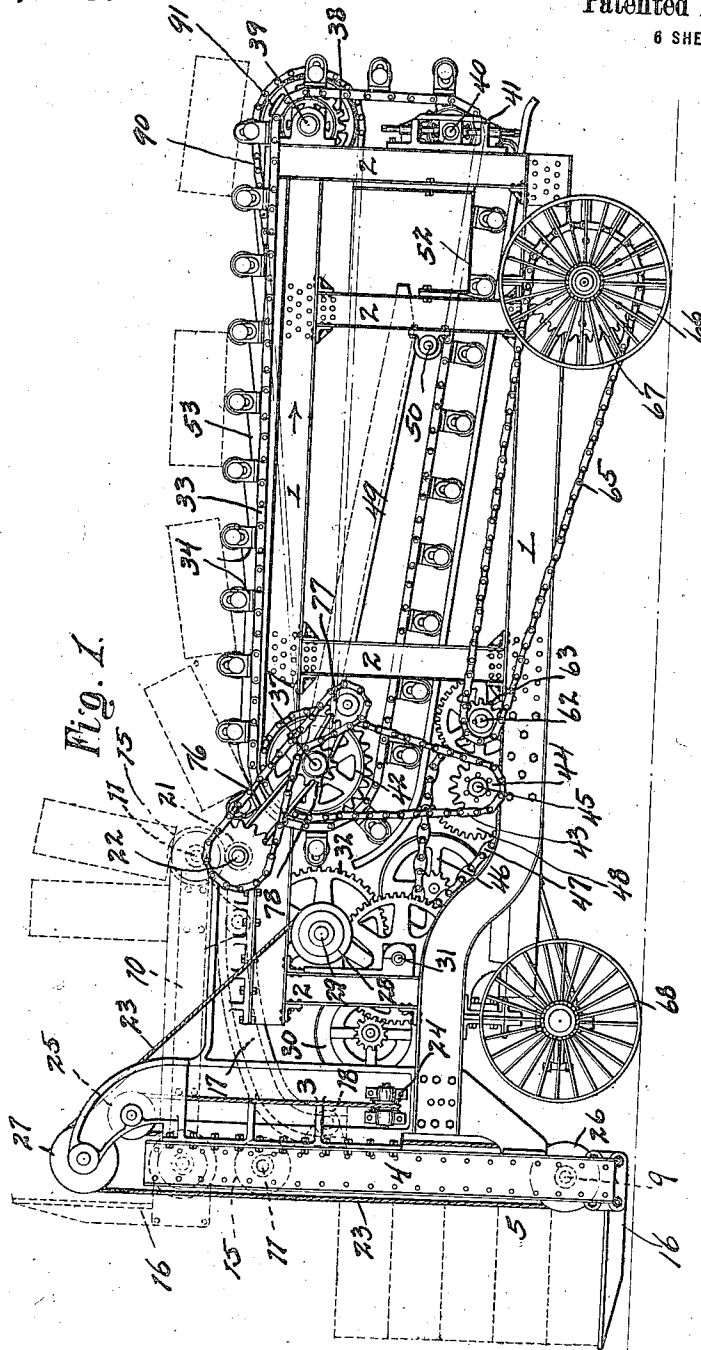


Fig. 1.

Witness
Emmett B. Miller

Inventor
MONTFORD B. MURRAY

By

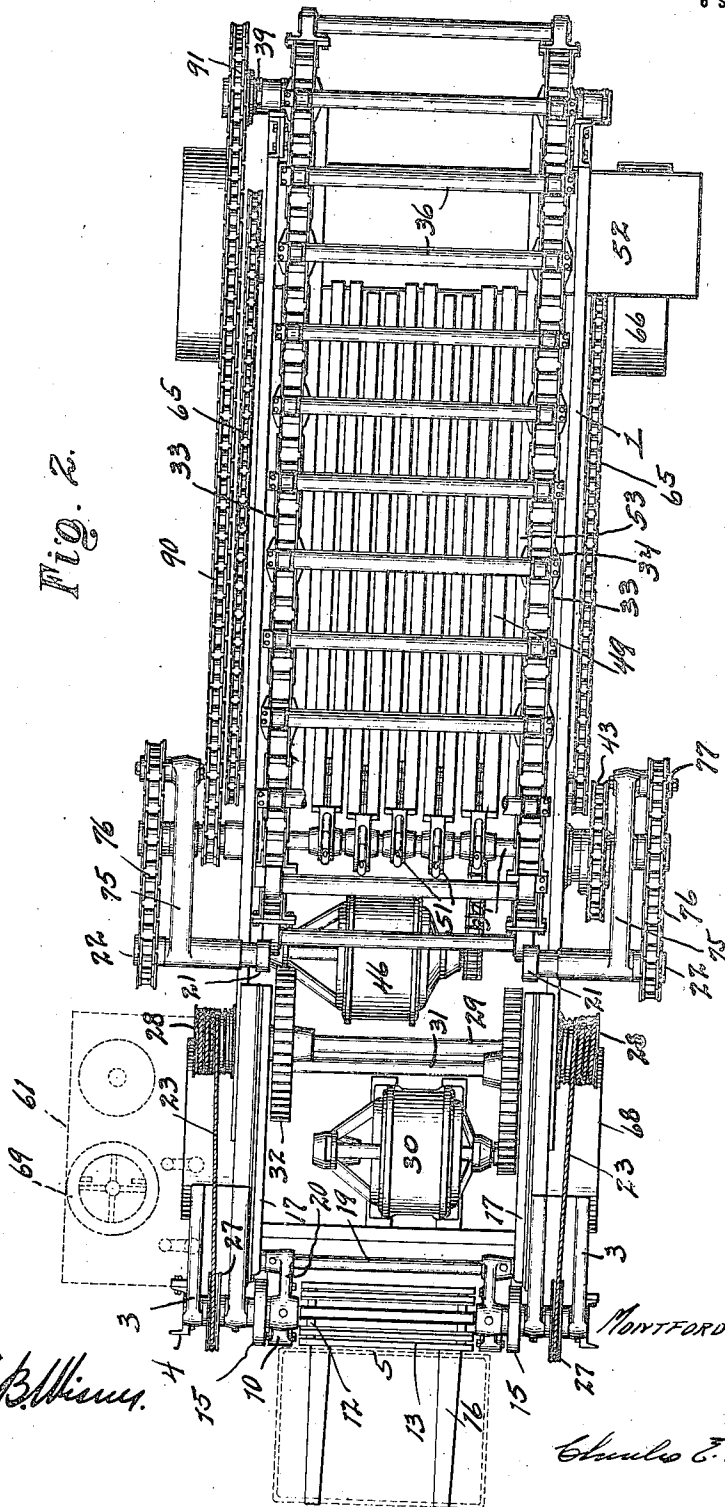
Charles E. Miller
Attorney

1,297,486.

M. B. MURRAY.
CASTING SEPARATING MACHINE.
APPLICATION FILED NOV. 16, 1917.

Patented Mar. 18, 1919.
6 SHEETS—SHEET 2.

Fig. 2.



Witness
Thomas B. Murray

Inventor
MONTFORD P. MURRAY
Charles E. Murray
Attorney

M. B. MURRAY.
CASTING SEPARATING MACHINE.
APPLICATION FILED NOV. 16, 1917.

1,297,486.

Patented Mar. 18, 1919.

6 SHEETS—SHEET 3.

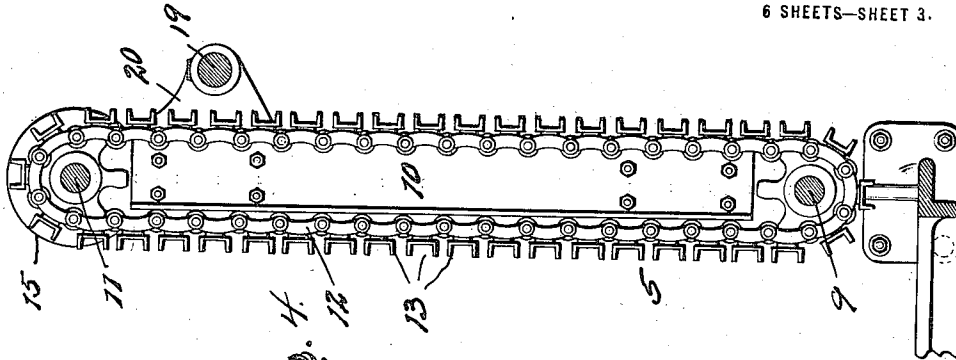


Fig. 4.

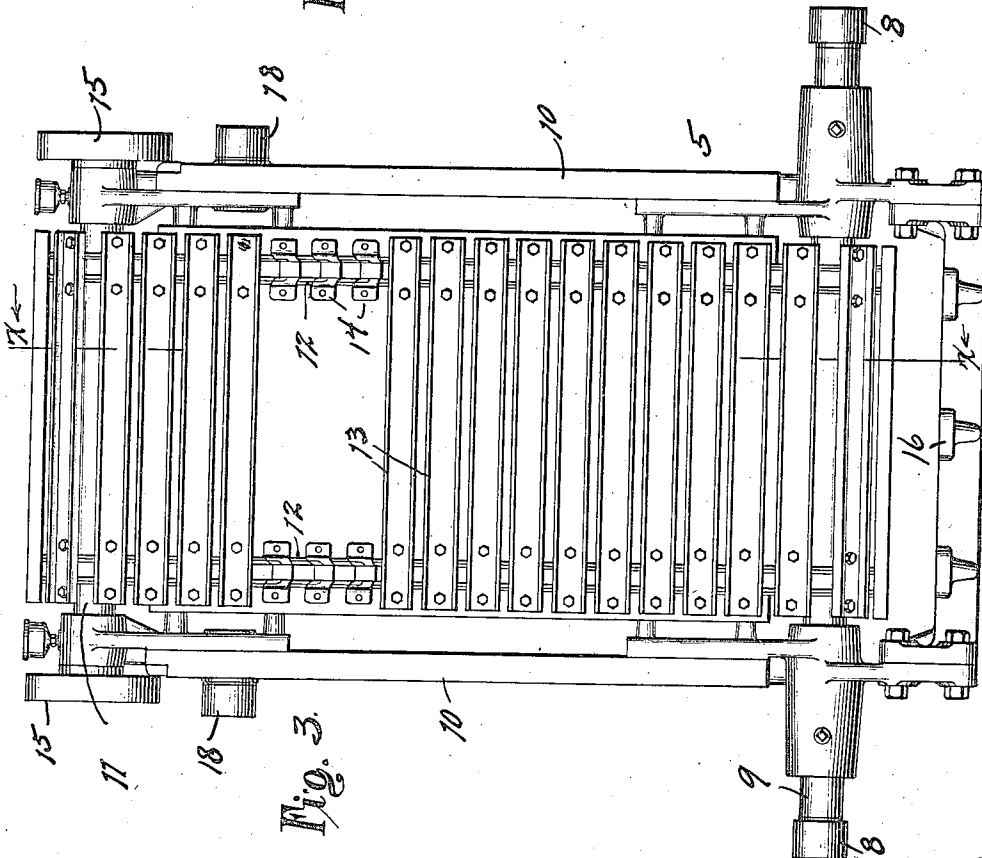


Fig. 3.

Witness
Emmanuel W. Wines

Inventor
MONTFORD B. MURRAY

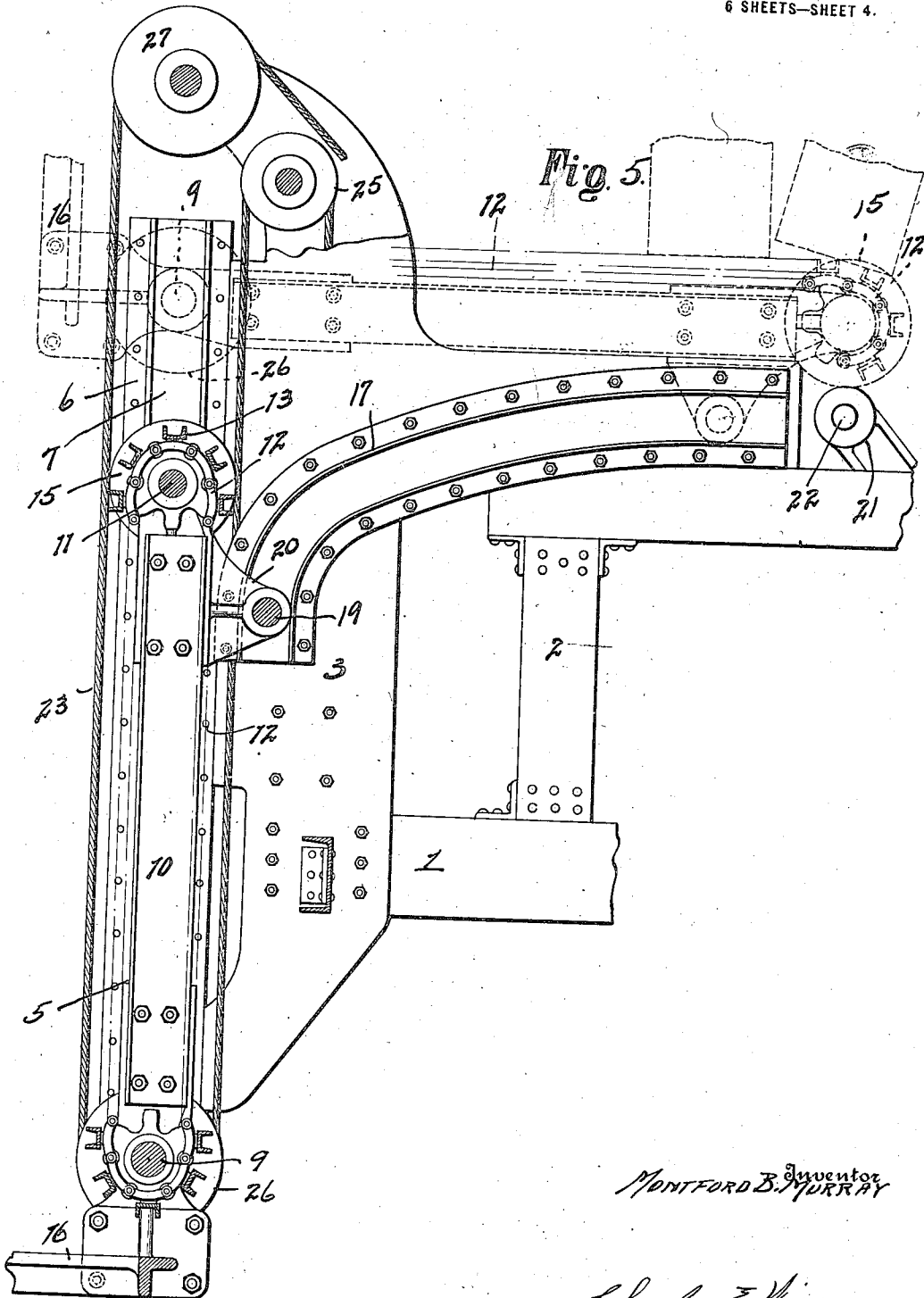
By

Charles E. Wines
Attorney

M. B. MURRAY.
 CASTING SEPARATING MACHINE.
 APPLICATION FILED NOV. 16, 1917.

1,297,486.

Patented Mar. 18, 1919.
 6 SHEETS—SHEET 4.



INVENTOR
 MONTFORD B. MURRAY

CHARLES E. MURRAY
 ATTORNEY

M. B. MURRAY.
CASTING SEPARATING MACHINE.
APPLICATION FILED NOV. 16, 1917.

1,297,486.

Patented Mar. 18, 1919.

6 SHEETS—SHEET 5.

Fig. 7.

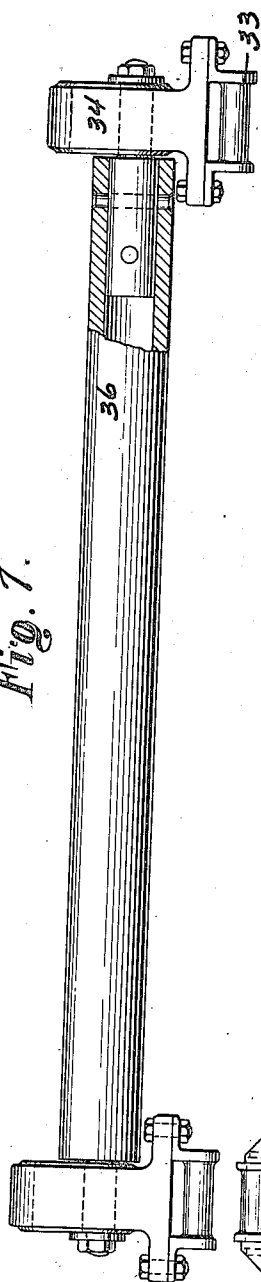


Fig. 6.

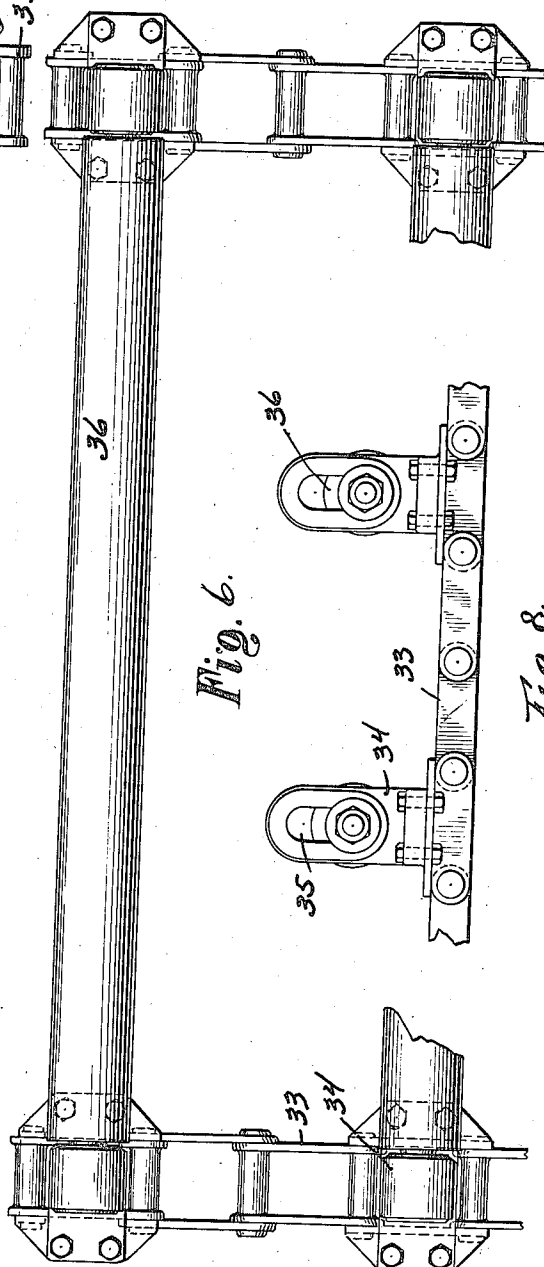
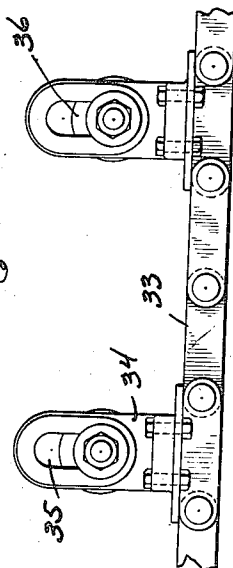


Fig. 8.



Witness
Emuel W. Wines

Inventor
MONTFORD B. MURRAY

334

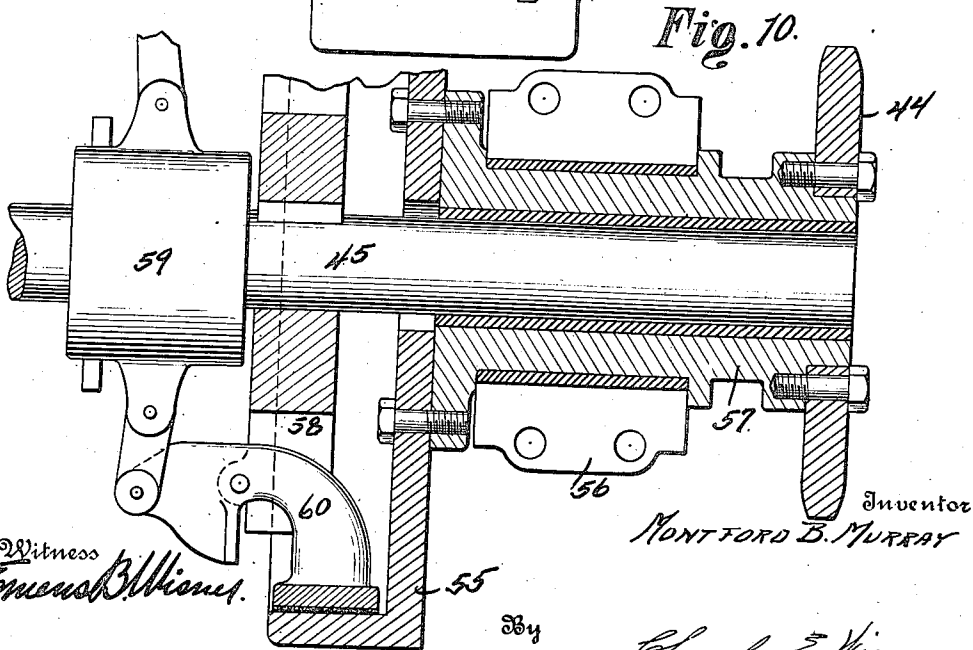
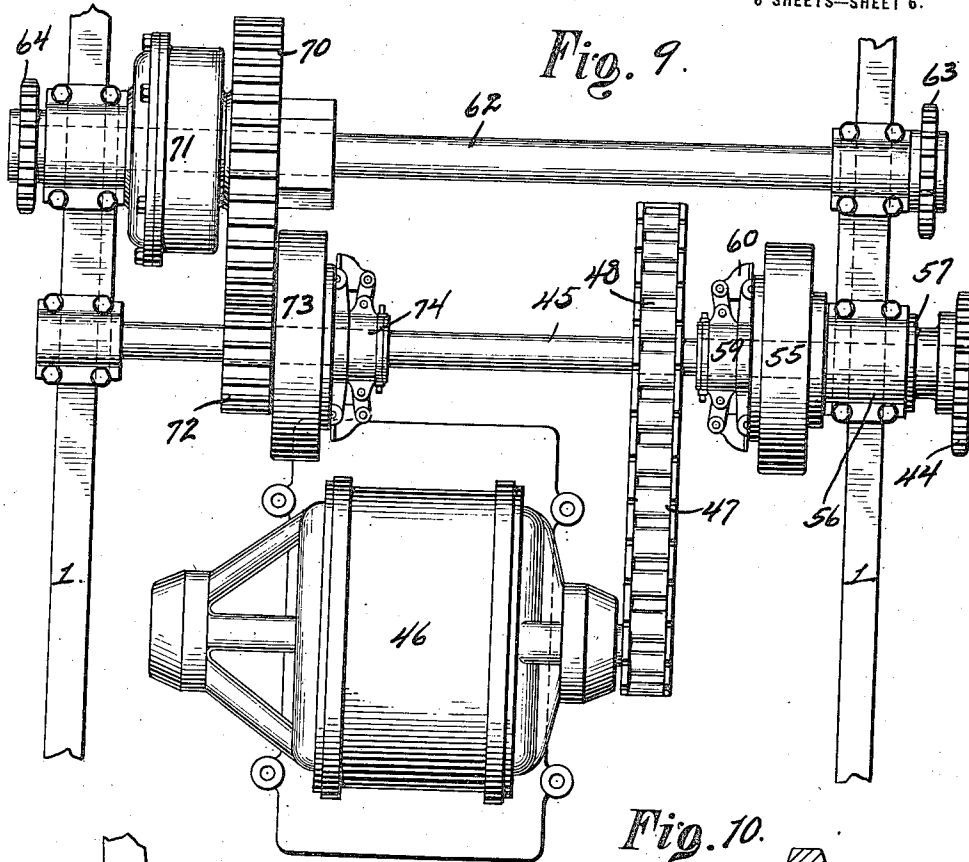
Charles E. Wines
Attorney

M. B. MURRAY.
CASTING SEPARATING MACHINE.
APPLICATION FILED NOV. 16, 1917.

1,297,486.

Patented Mar. 18, 1919.

6 SHEETS—SHEET 6.



Witness
Emerson B. Wilson.

Inventor
MONTFORD B. MURRAY

By

Charles E. Wilson
Attorney

UNITED STATES PATENT OFFICE.

MONTFORD B. MURRAY, OF ALBION, MICHIGAN.

CASTING-SEPARATING MACHINE.

1,297,486.

Specification of Letters Patent.

Patented Mar. 18, 1919.

Application filed November 16, 1917. Serial No. 202,433.

To all whom it may concern:

Be it known that I, MONTFORD B. MURRAY, a citizen of the United States, residing at Albion, county of Calhoun, State of Michigan, have invented a certain new and useful Improvement in Casting-Separating Machines, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to machines for separating castings, and its object is a machine adapted to take a stack of annealing pots containing the castings and packing and separate the castings and packing. A further object of the invention is a self-propelled machine adapted to pick up stacks of pots in sequence from a row and separate the castings and packing as stated and discharging the empty pots, packing, and castings separately. Other objects of the invention reside in the means employed for taking the stack of pots and shaking the contents from the individual pots of the stack in sequence. Further features of the invention are involved in the means for shaking the pots and in delivering the castings separately from the packing. These and other objects and the several novel features of the invention in its preferred form are hereinafter more fully described and claimed and shown in the accompanying drawings in which—

Figure 1 is a side elevation of a machine embodying my invention.

Fig. 2 is a plan view thereof.

Fig. 3 is a front elevation of the device for picking up the stack and transferring the pots to the shaker device.

Fig. 4 is a section taken on line $x-x$ of Fig. 3.

Fig. 5 is an enlarged detail showing the device for picking up the stack of pots and mechanism employed in elevating the stack to position for delivering the pots to the shaker.

Fig. 6 is a plan view showing the rollers on which the pots are delivered for the shaking operation.

Fig. 7 is an elevation thereof showing the mounting of the roller.

Fig. 8 is an end view showing the method

of mounting the rollers to allow vertical movement thereof.

Fig. 9 is a plan view of the driving mechanism employed for operating the machine.

Fig. 10 is a detail of a portion of the driving apparatus.

The machine consists preferably of the metal framework indicated at 1 and having upper and lower horizontal members connected by vertical members 2 forming a substantially rectangular box like skeleton frame. At the forward end of this framework is carried a structure 3 carrying the fixed vertical members 4 which in turn support what I have termed the transfer and unloading device 5 indicated more clearly in Figs. 3, 4 and 5. Attached to the inner side of the vertical members 4 is a member 6 having a channel 7 therein providing a guideway at each side for rollers 8 on the ends of the horizontal shaft 9. This shaft is carried at the lower end of the vertical members 10 forming the unloader framework as indicated clearly in Fig. 3. A shaft 11 is also provided at the upper end of these frames and both the shafts 9 and 11 have a pair of sprocket wheels thereon as indicated clearly in Fig. 4. On each upper and lower sprocket wheels runs a chain 12, the chains being connected by a series of bars 13 which may be attached thereto in any approved manner as by the U shaped brackets 14. The shaft 11 on opposite ends is provided with a smooth faced friction wheel 15 whereby the shafts and chains may be operated as hereinafter described. Extending across the lower end of the unloader and preferably supported beneath the pots for the shaft 9 is a table member 16 on which the stacks of pots rest when the unloader is in vertical position as shown in Fig. 1, the pots being indicated thereon in dotted lines.

The frame of the machine on the inside and on opposite side members thereof is provided with a grooved track member 17, each track member receiving a roller 18 on each side member 10 of the unloader frame as indicated clearly in Fig. 3. The rollers are each supported on a stub shaft 19 carried by a bracket 20 connected with the frame members 10. As before stated the rollers 8 ride in the vertical channels 7 mounted on the unloader frame and the rollers 18 ride in the grooved channel 17

attached to the framework. Therefore, by vertical movement of the unloader frame the said frame may be brought upward from the position shown at the left hand end of Fig. 1, the upper end of the framework drawing to the right by reason of the rollers 18 riding in the channels 17, as the vertical frame is moved upward until it assumes the horizontal position as indicated by dotted lines in Figs. 1 and 5. In this position the friction wheels 15 are brought into engagement with similar wheels 21 on the shafts 22 operated in a manner hereinafter stated. Therefore, when the unloader device has been brought to the position shown by dotted lines in Fig. 1, by reason of the weight of the device and load carried, the wheels 15 are made to frictionally engage the driving wheels 21 and thus the shaft 11 and the chain members 12 are rotated. This movement moves the pots toward the right as indicated by dotted lines in Fig. 1 to the shaker device hereinafter described.

The unloader device is moved upward in the manner described by means of a cable 23. This cable may be attached to the frame member as indicated at 24 in Fig. 1, passes thence upward about a pulley 25, thence downward about a pulley 26 loosely mounted thereon so that rotation of the pulley does not rotate the shaft. From the pulley 26, the cable extends upward about the pulley 27 and thence downward to the winding drum 28 on the shaft 29 extending crosswise of the machine near the forward end. This shaft 29 is driven by means of a motor 30 in geared relation with a gear on a shaft 31 extending crosswise from the machine which is in turn geared to the shaft 29 by means of a gear meshing with the gear 32. It is to be noted that there is a cable 23 on opposite sides of the machine as indicated more clearly in Fig. 1, and thus on rotation of the shaft 29 the unloader frame is raised with the lower end thereof driven in the vertical channels 7 and the upper end turned to bring the unloader to horizontal plane as previously stated, whereupon the chains 12 are operated and the box is delivered to the unloader. When the pots have been discharged as stated, the overhanging weight of the unloader is sufficient to return it to vertical position on release of the winding drums and cables 23.

It is to be understood that in a foundry for instance, where a great many castings are made, the pots are usually stacked in rows after the castings have been poured and this machine is brought to the rows and the first stack is placed thereon and machine operated to deliver the pots to the shaking device after the manner described and then the machine is moved forward and the sec-

ond stack of the row is picked up and emptied and the operation repeated for all the stacks.

The shaking device to which the pots are delivered from the transfer and unloader device is indicated in Figs. 1, 2, 6, 7 and 8. In Figs. 1 and 2 it will be observed that a chain 33 is provided on opposite sides of the machine. Each chain is provided with equidistantly spaced link members to which are attached the vertical members 34 provided with the vertical slots 35 therein as indicated in Fig. 6. In these slots are mounted rollers 36, a roller extending between oppositely positioned members 34 on the two chains 33 as seen in Fig. 1. These chains run about a sprocket wheel at the forward end on the shaft 37 in the inside of the framework and on opposite sides thereof as will be understood from Fig. 2. These chains extend from the sprocket 37 to the rear end of the machine about a sprocket 38 on the shaft 39 supported at the upper side of the framework at the end and thence about a sprocket on the shaft 40, which shaft is adjustably mounted in the bracket 41 carried at the lower side of the framework at the end. By this arrangement for adjusting the shaft the chains may be tightened to take up slack. These chains are driven by the shaft 37 which shaft is driven by means of a chain 43 running on the sprocket 42 of the shaft 37 and sprocket 44 of the drive shaft 45 extending across the lower side of the framework. The shaft 45 is driven by means of an electrical motor 46 which drives a chain 47 connected with a sprocket wheel 48 on the shaft 45. This driving mechanism is shown in detail in Fig. 9 and by driving the shaft 37 as indicated, the chains 33 are made to move in the direction of the arrow shown in Fig. 1. As also indicated in said figure, the annealing pots with the castings and packing therein are discharged from the transfer table in the manner hereinafter described to fall onto the rollers 36 carried by the chains 33 open side downward so that the castings and packing are both discharged therefrom to fall between the rollers, those being all that extends across the machine at the point mentioned from the shaft 37 to the rear end of the machine as will be understood from Fig. 2. The castings and packing in falling through the rollers, fall onto a series of longitudinally extending bars 49 lying at an angle to the horizontal as is shown in Fig. 1. At the lower end these bars 49 rest loosely on the shaft or bar 50 extending transversely of the machine and at the upper forward end are connected with the shaft 37 in a manner indicated in Fig. 2. This shaft is provided with a series of eccentrics, the eccentric bands 51 extending thereabout each being connected with a bar 49, and by arrangement of the

eccentric and connection of the bars there-
with the bars during rotation of the shaft
are given a reciprocatory motion. The bars
are spaced apart transversely of the ma-
chine as indicated and the motion of the bars
continues to shake the material from the
castings and packing dropping through be-
tween the bars, and the castings, by reason
of the motion of the bars, being finally dis-
charged at the lower end onto the inclined
table 52 down which the castings roll into
suitable collecting device that maybe posi-
tioned to receive the same. The packing
simply drops through the bars and onto the
floor and the pots are discharged at the rear
end of the machine riding off from the roll-
ers 36 in the manner indicated with the pot
at the end of the machine shown in Fig. 1.

In order to insure the pots being dis-
charged of their contents, a sawtooth track
53 is provided on each side of the upper
part of the framework of the machine pref-
erably just inside the chain member 33 and,
by movement of the chains about the
sprockets, the rollers are moved vertically
in the slots provided in the members 34 and
the pots are shaken vertically to discharge
the contents.

To further insure the proper driving of
the chains 33 the shaft 37 on the end oppo-
site that shown in Fig. 1 is provided with
a sprocket on which runs a chain 90 driving
a sprocket 91 on the shaft 39 at the rear end
of the machine.

The driving mechanism for operating the
shaker is shown clearly in Fig. 9 where it
may be seen that the chain 47 drives the
shaft 45 on the outer end of which is the
gear 44 for driving the chain 43 and the
shaft 37. As will be understood from Fig.
9, a clutch device 55 is mounted on the shaft
45 which, as shown in Fig. 10, extends
through the pot 56 on the frame member of
the machine and through the hub 57 of the
gear 44. The gear and hub are rotatable on
the shaft and are connected to the outer
drum of the clutch 55, the inner clutch mem-
ber of which is indicated at 58 and the oper-
ating collar at 59. The member 58 is keyed
to the shaft 45 and, by sliding of the collar
59, the member 58 is, through operation of
the dogs 60, made to frictionally engage the
member 55 by which connection the gear 44
is made to turn with the shaft 45. There is
an operating lever for this clutch (not here
shown), operable from the operator's stand
61 shown by dotted lines in Fig. 2. By the
described arrangement, the shaker chains
may be operated at will.

Carried on the frame at the rear of the
shaft 45 is a transverse shaft 62 having
sprockets 63 and 64 on opposite ends thereof
each connected by means of a chain 65 with
a sprocket 67 on each rear wheel 66 of the
machine. By operation of the motor 46, a

shaft 62, and sprockets 63 and 64, the ma-
chine may be propelled to any desired posi-
tion on the floor, it being understood that
the forward wheels 68 are steering wheels
guided, for instance, by means of a steering
wheel 69 at the operator's stand. The shaft
62 is provided with a gear 70 driving a dif-
ferential gear set in the casing 71 connected
respectively with two parts of the shaft 62
as will be readily understood. The gear 72
on the shaft 45 meshes with the gear 70 and
drives the same and the gear 72 is connected
with a case or drum 73 of a clutch similar
in construction to that of the clutch 55, the
shell 73 and gear being loosely mounted on
the shaft and adapted to be clutched thereto
by operation of the sliding member 74.
Thus at will the machine may be propelled
over the floor by setting of the clutch mem-
bers 74, and the clutches 73 and 55 may be
independently or simultaneously driven as
determined by the operator by setting the
clutches. As we stated heretofore, the fric-
tion wheels 15 of the transfer and unload-
ing device are operated by reason of con-
tact with similar wheels 21. These wheels
21 are shown plainly in Fig. 2, being on
independent shafts, carried in bearings pro-
vided in brackets 75 on each side respec-
tively, of the machine. On the outer end
of the shafts for the friction wheels 21 are
sprockets operated by a chain 76 which
chain runs over an idler sprocket 77 in the
opposite end of the bracket. The chain 76
intermediate the shaft for the friction
wheels 21 and the idler 77 runs over a
sprocket 78 on the shaft 37 by means of
which the chain is driven, as will be under-
stood from Fig. 1.

From the foregoing description it be-
comes evident that while the machine is
large and substantial in character it is com-
paratively simple and economical in opera-
tion, particularly in that annealing pots in
quantity may be emptied of their contents
and for this purpose it is preferable that the
stacks of pots be slightly elevated above the
floor in order to allow the foot or receiver
member 50 of the transfer and unloading
device to be inserted thereunder by move-
ment of the vehicle. Thereupon the wind-
ing drums 28 are set into operation winding
up the cables 23 and raising the transfer and
unloading devices in a manner hereinafter
stated to the horizontal position with the
rollers 15 in contact with the driving rolls
21 and operating the chains 12 and the con-
veyer. The conveyer moves the pots in se-
quence backward and face downward onto
the shaker device, which, by reason of the
vertical movement of the rollers on which
the pots are deposited, shakes the material
out of the pots and onto the grating formed
of the bars 49. The castings are delivered
to the inclined table 52 at the rear of the

device upon which they may be allowed to deposit on the floor or into any suitable receptacle properly positioned therefor. It is further to be noted that the control of the device is simple indeed, the motor 30 for operating the winding drum being controlled from the operator's table although the connecting mechanism for control thereof is not here indicated, the mechanism for starting and stopping the motor being well known in character. It is further to be noted that at the will of the operator the shaking device may be operated during or independently of movement of the vehicle by the driving chains 65.

Having thus briefly described my invention its utility and mode of operation what I claim and desire to secure by Letters Patent of the United States is—

20 1. A machine for separating castings and packing from annealing pots comprising a pick-up device consisting of a frame having a table adapted to be introduced beneath a stack of pots, a transfer device carried by the frame in fixed relation with the table, and means for raising the frame and transfer device and turning the same to a position whereby the stack of pots rests upon the transfer device, the transfer device being inoperative in the pick-up position, operating means for the transfer device with which the said transfer device is brought to operative relation upon the raising of the frame, and transfer device, a shaker onto which the pots are discharged by the transfer device, a receiver for the castings and packing, and means for separating the castings and packing.

2. In a machine for separating castings and packing from the annealing pots, consisting of a shaker device movable longitudinally of the machine and having parts movable rapidly in a vertical plane during the longitudinal movement, and means for picking up a stack of pots, the said means consisting of a frame adapted to be turned from vertical to horizontal position, means for turning the frame, and transfer apparatus carried by the frame brought into operation upon turning the frame to horizontal position, the transfer device discharging the pots onto the shaker.

3. In a machine adapted to separate castings from the annealing pots and packing, a pick-up device adapted to pick-up filled annealing pots, a shaker device, a transfer device adapted to receive the pots from the pick-up device and transfer the same to the shaker device, means for operating the shaker device to discharge the contents of the pots and finally separately discharge the empty pots, a receiver onto which the contents of the pots fall, the receiver consisting of a series of inclined spaced bars, the spacing allowing the packing to pass there-

through and the bars retaining the castings, means for operating the bars and agitate the castings, the agitation tending to roll the castings down the inclined bars and discharge the packing therebetween, and a receiving table onto which the castings pass from the bars.

4. In a device of the character described, mechanism for picking up a stack of filled annealing pots with the open side upward, means for elevating the pick-up device and turning the same to horizontal position, means for discharging the pots from the said device, a shaker positioned to receive the pots from the pick-up, a transfer device, the pots being discharged thereonto open side downward, the shaker mechanism being adapted to rapidly shake the pots in a vertical plane and further being adapted to discharge the pots from the machine, a grating positioned below the shaker device onto which the packing and castings from the annealing pots is delivered, the grating being of a character to allow the packing and like material to fall therethrough and retain the castings, means for operating the grating to discharge the castings at a point separately from the packing, and means operable at will for propelling the machine to pick up stacks of pots in sequence.

5. In a machine of the character described, a pick-up device adapted to pick up a stack of filled annealing pots, a table on which the pots are received, a frame connected with the table and extending at a right angle to the plane of the table, a transfer device consisting of a pair of chains and bars connecting the same and shafts for the chains, means for raising the framework and receiving table and turning the same with the transfer device lying in a horizontal plane, means operable at will for driving the said chains to discharge the pots in sequence from the transfer device, a shaker device onto which the pots are discharged open side downward, the shaker device being adapted to rapidly shake the pots in a vertical plane, a receiver for the packing and castings shaken from the pots consisting of a series of spaced inclined bars reciprocable in alternate relation, the bars being spaced allowing the packing to pass therebetween and retaining the castings, movement of the bars tending to discharge the castings at the lower end thereof, and a receiver for the castings at the lower end of the bars.

6. A machine for picking up a stack of pots containing packing and castings, comprising a pick-up device at the forward end of the machine, means for raising the pick-up device and turning the same to a horizontal plane, means for discharging the pots in sequence from the pick-up device, a shaker device onto which the pots are discharged from the pick-up device, the shaker device

consisting of a series of chains spaced apart and spaced rollers connecting the two chains, the rollers being adapted for limited vertical movement relative to the chains, and a saw-tooth member adjacent each chain on which the rollers ride producing rapid vertical movement thereof to shake the pots during the traveling of the same on the rollers whereby the pots are emptied of their contents and finally discharged from the machine by operation of the chains, means for operating the chains at will, a receiver onto which the packing and castings fall from the shaker, the receiver being adapted to allow the packing to pass therethrough and to retain the castings, means for discharging the castings from the receiver, and an inclined table onto which the castings are discharged.

7. In a machine of the character described, a pick-up and transfer device, comprising a vertical stationary framework at the forward end of the machine, a transfer device supported thereby consisting of a receiving table normally positioned in a horizontal plane and a conveyer device positioned in a vertical plane, means for propelling the machine to introduce the receiver table beneath the stack of filled annealing pots, a vertical guideway on each fixed vertical member, rollers on the receiver and conveyer frame operating in the guideways at the lower end thereof, a second pair of guideways on the fixed part of the framework, said second guideways being curved in form and extending toward the rear of the machine, a pair of rollers near the upper end of the conveyer frame riding in the curved guideways, means for raising the conveyer and receiver frame whereby the rollers at the lower end of the conveyer frame are brought to the upper part of the guideways therefor and the rollers at the upper end are brought toward the rear of the machine by the curved guideways positioning the conveyer device in a horizontal plane with the pots resting thereon, means brought into operation by the positioning of the device in a horizontal plane

adapted to drive the conveyer and discharge the pots therefrom in sequence, a shaker device for receiving the pots and discharging the contents thereof, a receiver onto which said contents are discharged, means for operating the shaker to discharge the pots separately from the packing and castings, and means for operating the receiver to discharge the castings separately from the packing.

8. In a machine for separating the castings from the packing and annealing pots consisting of means for picking up a stack of filled annealing pots, a shaker device, mechanism adapted to receive the pots from the pick-up device and transfer the same to the shaker device, the shaker device being adapted to discharge the contents of the pots and to pass the empty pots from the machine, a receiver onto which the contents of the pots is delivered, means for operating the receiver, the receiver being in the nature of a grating through which packing may pass by agitation of the grating and delivering the castings separately from the packing, power mechanism for operating the pick-up device, and independent power mechanism adapted to at will operate the transfer mechanism and the shaker and receiving devices and independently or simultaneously propel the machine.

9. A machine for separating castings and packing from the annealing pots comprising means for picking up a vertical stack of filled pots, means for turning the pick-up means and pots thereon to horizontal position, a transfer device brought into operation by the horizontal positioning of the pick-up device adapted to transfer the filled pots to the shaker device, said shaker device being adapted to discharge the empty pots from the machine, a receiver for the castings and packing, and means for separately discharging the castings and packing from the machine.

In testimony whereof, I sign this specification.

MONTFORD B. MURRAY.