

June 1, 1926.

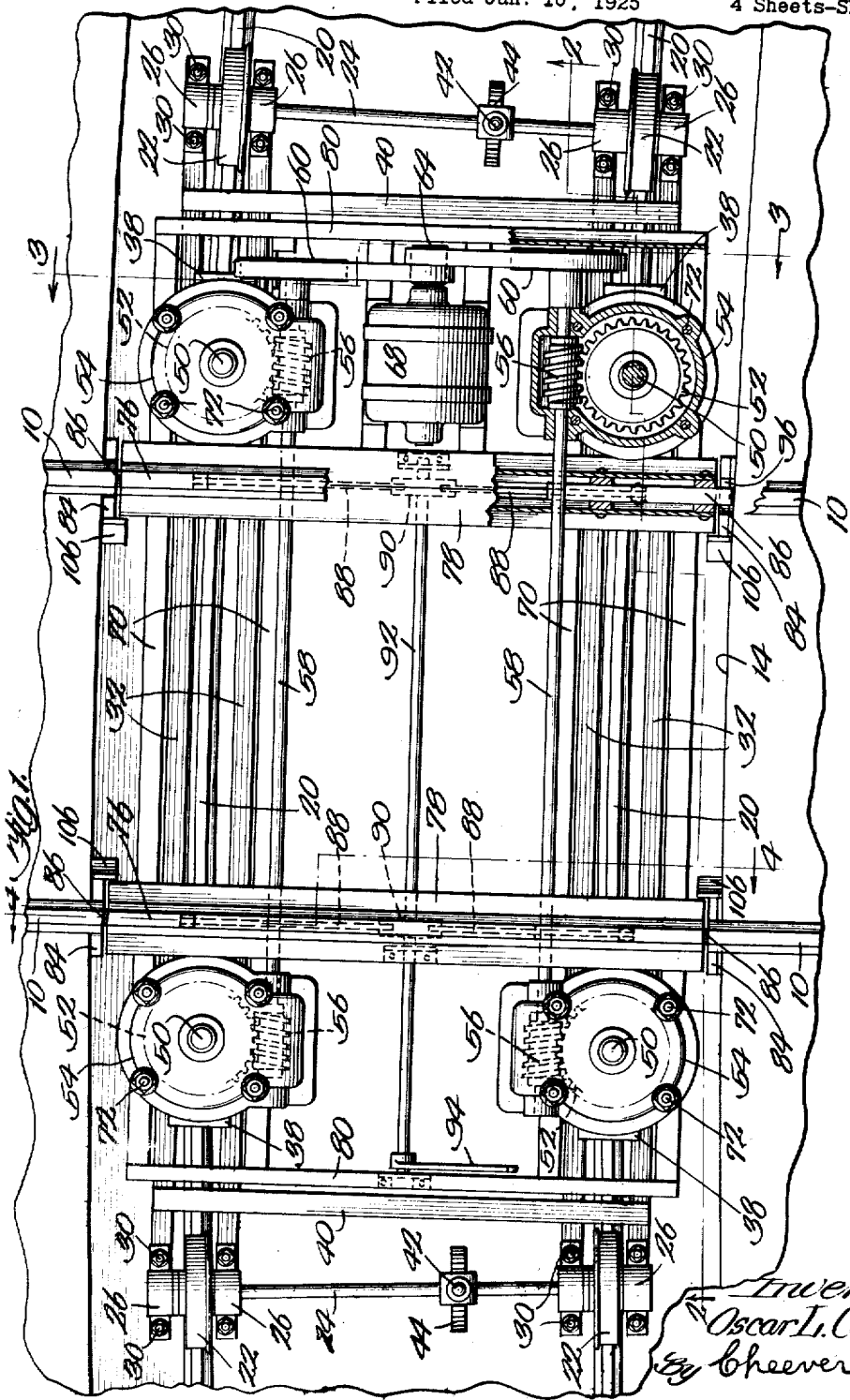
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DROP PIT MECHANISM FOR UNWHEELING LOCOMOTIVES

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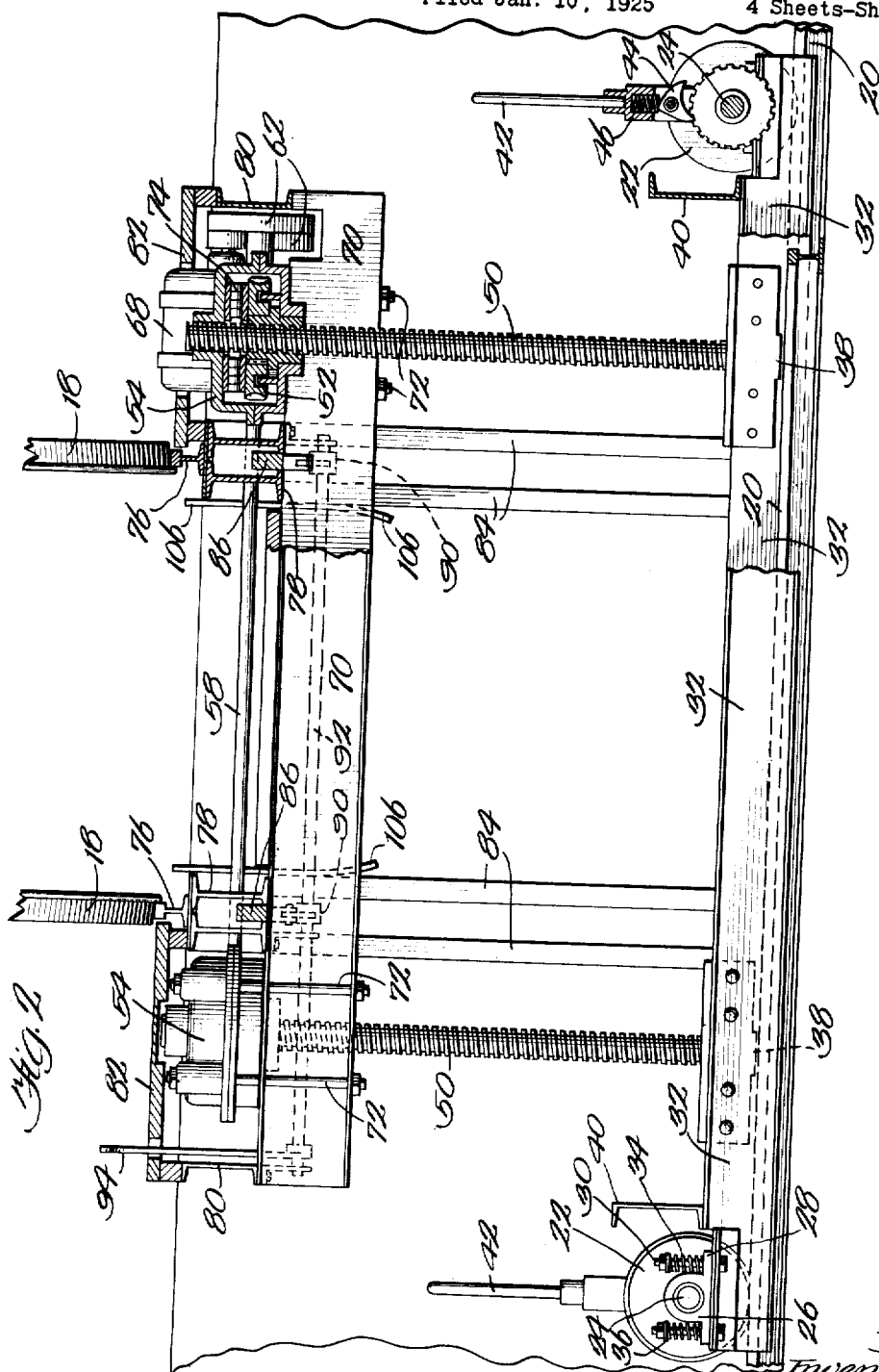
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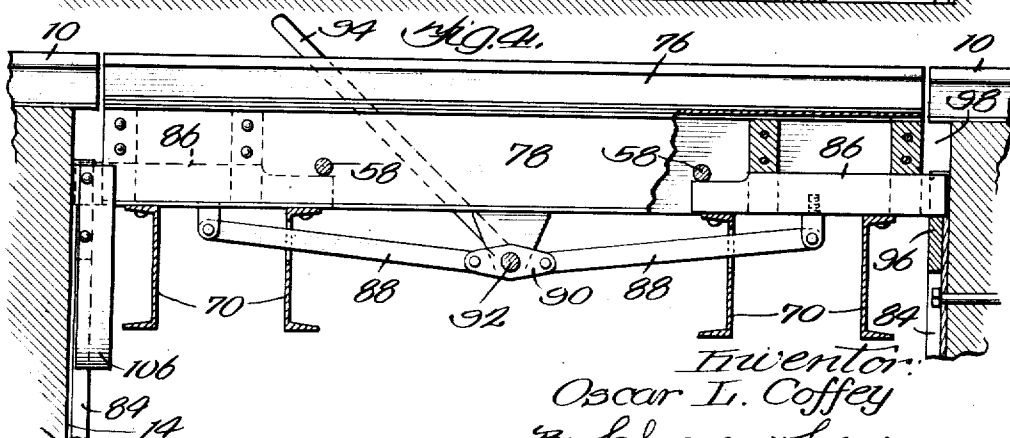
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DROP PIT MECHANISM FOR UNWHEELING LOCOMOTIVES

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UNITED STATES PATENT OFFICE.

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DROP-PIT MECHANISM FOR UNWHEELING LOCOMOTIVES.

Application filed January 10, 1925. Serial No. 1,517.

This invention relates to so-called drop pits for removing heavy wheels from vehicles of various kinds, specifically railroad locomotives. One object of the invention is to provide a pit construction and wheel carrying mechanism operating therein adapted to take a pair of wheels from a vehicle, such as a locomotive, and replace them upon another adjacent track in such a position and condition that they can be rolled away for work to be done upon them.

The invention consists in mechanism capable of attaining the foregoing and other objects, which can be comparatively easily and cheaply made, which is satisfactory in use and is not readily liable to get out of order, and particularly in such a device in which the vertical travel of the lifting mechanism is comparatively short thereby making a very shallow pit possible:—a very essential feature where the equipment is installed on low more or less damp ground.

Referring to the drawings in which like numerals designate the same parts throughout the several views:

Figure 1 is a plan view of mechanism illustrating this invention in its preferred form.

Figure 2 is a sectional view of a pit on the line 2—2 of Figure 1, the wheel handling mechanism of this invention therein being shown in side view.

Figure 3 is an end view, taken on the irregular line 3—3 of Figure 1.

Figure 4 is an end view on the line 4—4 of Figure 1.

Figure 5 is a plan view of the track situation, particularly the vicinity of a round house having this invention applied thereto.

Figure 6 is an elevation on the line 6—6 of Figure 5.

In the specific embodiment of the invention of Figures 5 and 6, two sets of more or less parallel, separated railroad tracks 10 and 12 are laid sufficiently far apart so that the locomotive or other vehicle whose wheels are to be handled can traverse one track and the wheels can, when removed to the other track, be moved away from the proximity of the vehicle.

Across these tracks in a suitable gap therein provided for the purpose is dug or otherwise formed an elongated pit 14, preferably but not necessarily open, having the bottom surface 16 sufficiently below the level of

tracks 10 and 12 so that the wheel manipulating apparatus hereafter described can, when loaded with vehicle-locomotive wheels 18, as shown at the left hand end of Figure 6 travel along suitable transverse tracks 20 on the bottom 16 of the pit 14 from one track, as 10, to the other track, as 12. In the particular case here illustrated, the pit 14 is curved about the center, below Figure 5, at which tracks 10 and 12 meet. If tracks 10 and 12 were really parallel pit 14 would be straight and at right angles thereto.

The vehicle wheel transporting mechanism used in pit 14 is carried on four wheels 22, adapted to traverse track 20. These wheels are arranged in pairs on the opposite ends of shafts 24 journaled in bearing blocks 26 having horizontally extending flanges 28 perforated so that they can reciprocate vertically freely on bolts 30 extending rigidly upward from trolley side frames 32, each bolt being encased by compression spring 34 bearing at its bottom on adjacent flange 28 of the adjacent bearing 26, and bearing at its opposite end on washer 36 under the head of the adjacent bolt 30. Each trolley side frame 32 is made up of a plurality of parallel beams, in the particular case here illustrated channels, Figure 3, located on opposite sides of an adjacent rail 20, said beams being connected across and over the adjacent rail by at least two spaced load carrying members—specifically, castings 38, adapted to either rest upon or clear the adjacent rail depending upon the effect of the load on the adjacent springs 34 as will more fully appear hereafter.

Trolley side frames 32, referred to, one for each rail 20, are rigidly cross connected by any suitable means as, for instance, beams 40.

The described trolley is propellable in either direction along track rails 20 by any suitable means, in the particular case here illustrated manually manipulatable levers 42, each rockable on a shaft 24, equipped with conventionally selectively opposite acting ratchets 44 controlled by spring 46 and engaging a toothed wheel 48 rigid on adjacent shaft 24.

Rising from each of the four corners of the trolley frame 32—40 and in the particular case here illustrated, rigid in castings 38, are four load carrying screws 50 each having threaded thereon a worm wheel 52

running in oil or the like within a case 54
slidable up and down the screw. Also in-
side each case and meshing with the worm
wheel is a worm 56. Groups of two worms
5 are on the opposite ends of parallel shafts
58 which are, in the particular case here il-
lustrated, parallel to and above side frames
32. These shafts are driven in unison by
any suitable means, in the particular case
10 here illustrated, through sprocket gears 60
on the shaft ends, connected by sprocket
chains 62, to independent sprocket pinions
64, on the shaft 66, of an electric motor 68
supplied with current from any outside
15 source. The motor is mounted upon a load
carrying, vertically reciprocal frame 70
rigidly suspended from cases 54 by bolts
72. The result of the construction described
is that the power of motor 68 is transmitted
20 through shafts 58 to worms 56 to rotate
worm wheels 52 and thus cause them to
move in unison up or down screws 50 and
thus correspondingly move entire frame 70.
The rotation of worm wheels 52 is facili-
25 tated by conventional anti-friction devices
74 interposed between the tops of the worm
wheels and the interiors of the tops of the
cases 54.

Extending across frame 70 are railroad
30 track rail sections 76 selectively interfitable
in tracks 10 and 12 to bridge pit 14. These
rail sections are physically supported on
beams 78 rigidly secured by any suitable
means, directly to frame 70. These beams
35 78 and end beams 80, preferably but not
necessarily, carry workman sustaining plat-
forms 82 covering the cases 54.

Immediately adjacent to the ends of rails
of tracks 10 and 12 on the interiors of the
40 upright walls of pit 14 are spaced, parallel
positioning bars 84 enterable by horizontal-
ly reciprocal locking bolts 86 one at each
end of each rail section and simultaneously
manipulatable through conventional con-
45 necting rods 88, toggles 90 on a common
shaft 92 and a hand lever 94.

When rail sections 76 are in alignment
with track 10, or 12, as the case may be,
these lock bolts rest upon and carry the en-
60 tire frame 70 load to stationary supports
96, across bars 84. There is sufficient clear-
ance 98 above supports 96 so that frame 70
and rails 76 can be raised sufficiently above
the position of Figure 4 to permit ready
55 releasing of the bolts 86 by proper manipu-
lation of lever 94.

In the operation of the device, assume
that the parts are in the positions shown
in the drawings with a locomotive having
60 wheels 18 which are to be removed resting
on rail sections 76. The operator first
starts motor 68 in proper direction to slight-
ly raise frame 70 to thereby take the weight
off bolts 86 and permit their withdrawal
65 from supports 96. During this period, the

springs, not shown, of the locomotive 102
may be conventionally fastened in posi-
tion. The motor 68 is now reversed thus
causing the worm wheels 52 to travel down
the screws 50 thus causing frame 70 and 70
wheels 18 to travel downward, until the tops
of wheels are at least below engine frame
104 or if desired, but not necessarily, the
extreme lowered position of Figure 6 is
reached, motor 68 is stopped and levers 42 75
are now manipulated to cause wheels 22 to
traverse tracks 20 until rail sections 76 are
in the vertical planes of rails 12. The oper-
ator now manipulates motor 68 to raise
frame 70 until rail sections 76 are in align- 80
ment with rails 12 on which wheels 18 can
now be rolled. In replacing the wheels, the
operations described are reversed.

Owing to the fact that frame 70 and
rails 76 constitute the only possible bridge 85
across pit 14 at rails 10 and 12, there is
when pit 14 is wholly open no other struc-
ture to be cleared by the frame 70 as it
moves from one track position to the other
with the result that the downward travel is 90
a minimum. In actual practice, this mecha-
nism is operative on a vertical travel of
slightly over two feet; the normal depth
of frame 104 below the axles of wheels 18,
while in prior constructions, a travel of over 95
four feet is necessary. As noted heretofore,
this is of great importance where flooding
of the pit has to be considered.

The locomotive or other vehicle wheels
to be handled by this mechanism have well 100
known predetermined weights, obviously
very much less than the weight of the part
of the locomotive or other vehicle sustained
by those wheels when the vehicle travels on
a track. The springs 34, heretofore re- 105
ferred to, are so proportioned that when any
set of vehicle wheels 18, which the device
is designed for, are clear of the locomotive
or other vehicle which they normally sus-
tain and rest upon the platform rails 76 110
on frame 70, the track engaging cast mem-
bers 38 will clear the track rails 20 by, say,
an eighth of an inch, and that when a sub-
stantial portion of the locomotive or other
vehicle weight is carried by those wheels 115
while resting on rails 76, the trolley 32—40
will be moved downward until the members
38 rest upon the rails 20—with the result
that the engine load is carried directly
through members 38 to the rails 20, and 120
there is no undue strain upon the wheels 22
and shafts 24. This construction is made
necessary by the well-known fact that the
locomotive drivers and other wheels to be
handled by the device are in normal posi- 125
tion on the locomotive spring supported, and
that in order to remove the wheels, it is
necessary to slightly elevate them to release
these springs, not shown in the drawing.
It is therefore during this spring adjust- 130

ing operation necessary that the motor 46 cause the elevating mechanism to move the platform 52 upward a slight distance from the position of Figure 2, thus during this upward movement causing the device to take a substantial portion of the load of the engine normally carried by the particular wheels 18 to be handled by this mechanism. This upward movement also, as heretofore described, lifts the bolts 86 off from members 96 so that the operator can manipulate lever 94 to withdraw the bolts 86 and thereby permit the lowering of frame 70 and finally the transporting of the wheels 18 through the pit.

Guides 106 on uprights 84 are provided for assisting the transporting mechanism in getting rail sections 76 into alignment with rail members of track 10 or 12 as the case may be.

By using four screws 50 a very safe non-upsettable structure is produced. The use of screws makes the machine much more reliable than hydraulic devices heretofore generally in use.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In mechanism of the class described, a trolley having wheels, rails on which the wheels of said trolley rest, yieldable means supporting the trolley upon said wheels whereby the trolley may move downward with respect to said wheels when a load is placed on the trolley in excess of the sustaining capacity of said yieldable means, members on the trolley normally spaced from said rails adapted to engage the latter when the trolley is moved downward with respect to said wheels, to relieve the wheels of excess load, screw shafts carried by said members, and a load carrying frame mounted on and vertically reciprocable along said shafts.

2. In mechanism of the class described, a wheeled trolley including a trolley frame, rails on which the wheels of said trolley rest, shafts on which said wheels are mounted, bearings for said shafts, yieldable means sustaining the frame upon said bearings whereby the frame may move downwardly with respect to said bearings, shafts and wheels when a load is placed on said frame in excess of the sustaining capacity of said yieldable means, and members on the frame normally spaced from said rails adapted to engage the latter when the frame is moved downward with respect to said bearings,

shafts and wheels to relieve such parts of excess load.

3. In mechanism of the class described, a wheeled trolley including a trolley frame, rails on which the wheels of said trolley rest, shafts on which said wheels are mounted, bearings for said shafts, yieldable means sustaining the frame upon said bearings whereby the frame may move downwardly with respect to said bearings, shafts and wheels when a load is placed on said frame in excess of the sustaining capacity of said yieldable means, members on the frame normally spaced from said rails adapted to engage the latter when the frame is moved downward with respect to said bearings, shafts and wheels to relieve such parts of excess load, and a vertically movable load carrying mechanism on said frame.

4. In mechanism of the class described, in combination with a drop pit and permanent track rails terminating adjacent to said pit, a trolley within said pit including a frame, yieldable means supporting said frame whereby it may move downward when excess loads are imposed thereon, track rails carried by said frame, means for elevating said frame above and lowering the same below a position in which the rails carried thereby are alined with said permanent track rails, locking bolts carried by said frame, and fixed supports with which said locking bolts are engageable when said frame carried track rails are alined with said permanent track rails to prevent downward movement of said frame under excess loads.

5. In mechanism of the class described, in combination with a track, a plurality of trolley wheels traversing said track, a shaft sustaining each wheels, bearings for said shafts, a trolley frame having side members on opposite sides of each of the rails of the track and cross members over the track members, a plurality of bolts extending from the trolley frame through perforations in the bearings, a spring for each bolt tending to hold the cross members on the trolley frame off the track rails, and a load moving device on the trolley capable of moving loads of different weights some of which force the cross members on the trolley onto the track against the action of said springs and some of which do not.

In witness whereof, I have hereunto subscribed my name.

OSCAR L. COFFEY.