June 5, 1951 E. E. BROSIUS 2,555,953

SOAKING PIT COVER CARRIAGE

Filed July 9, 1946 2 Sheets-Sheet 1

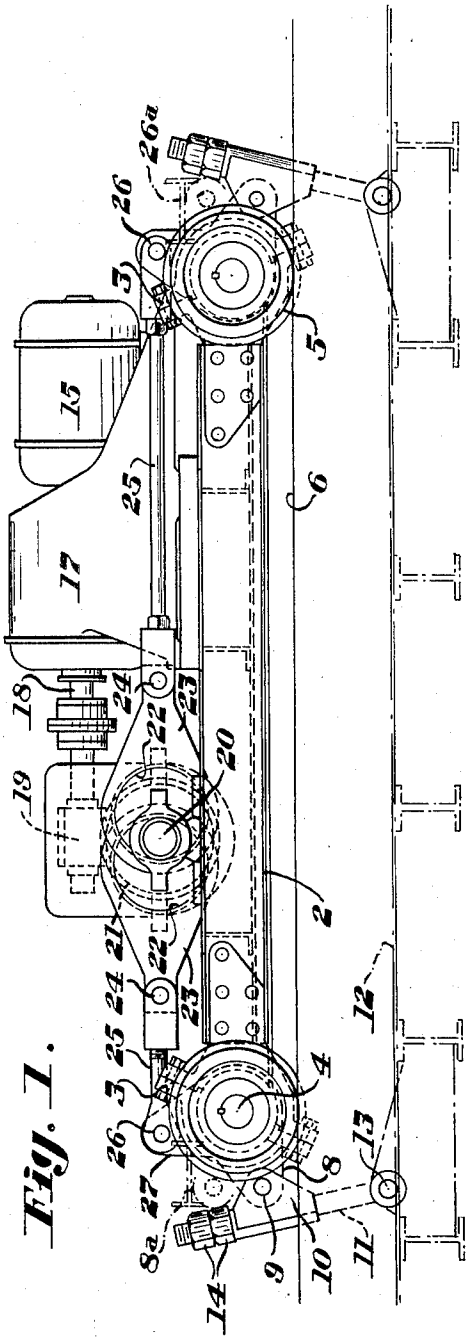


Fig. 1.

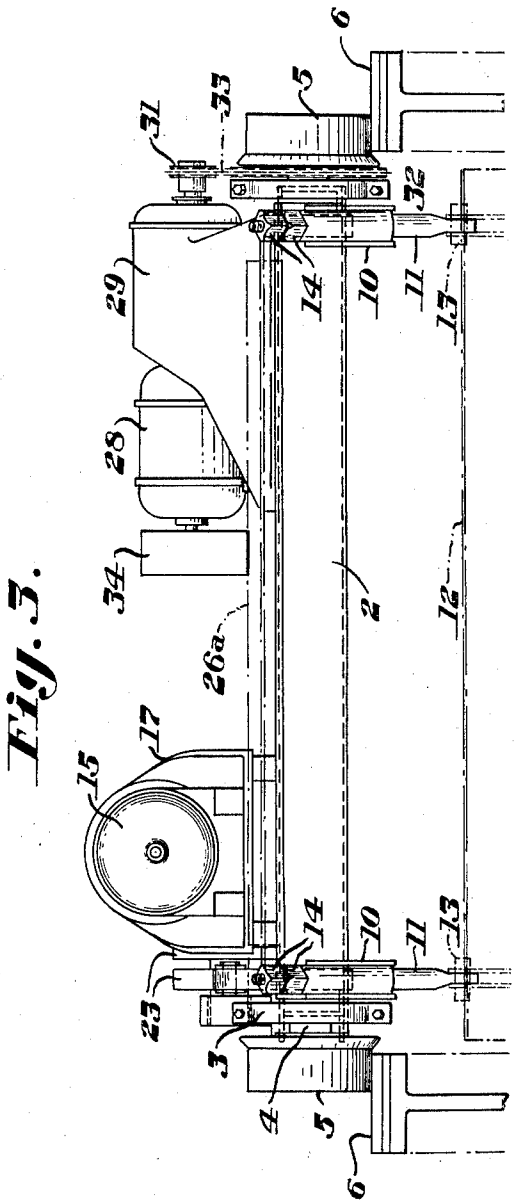


Fig. 3.

INVENTOR
EDGAR E. BROSIUS

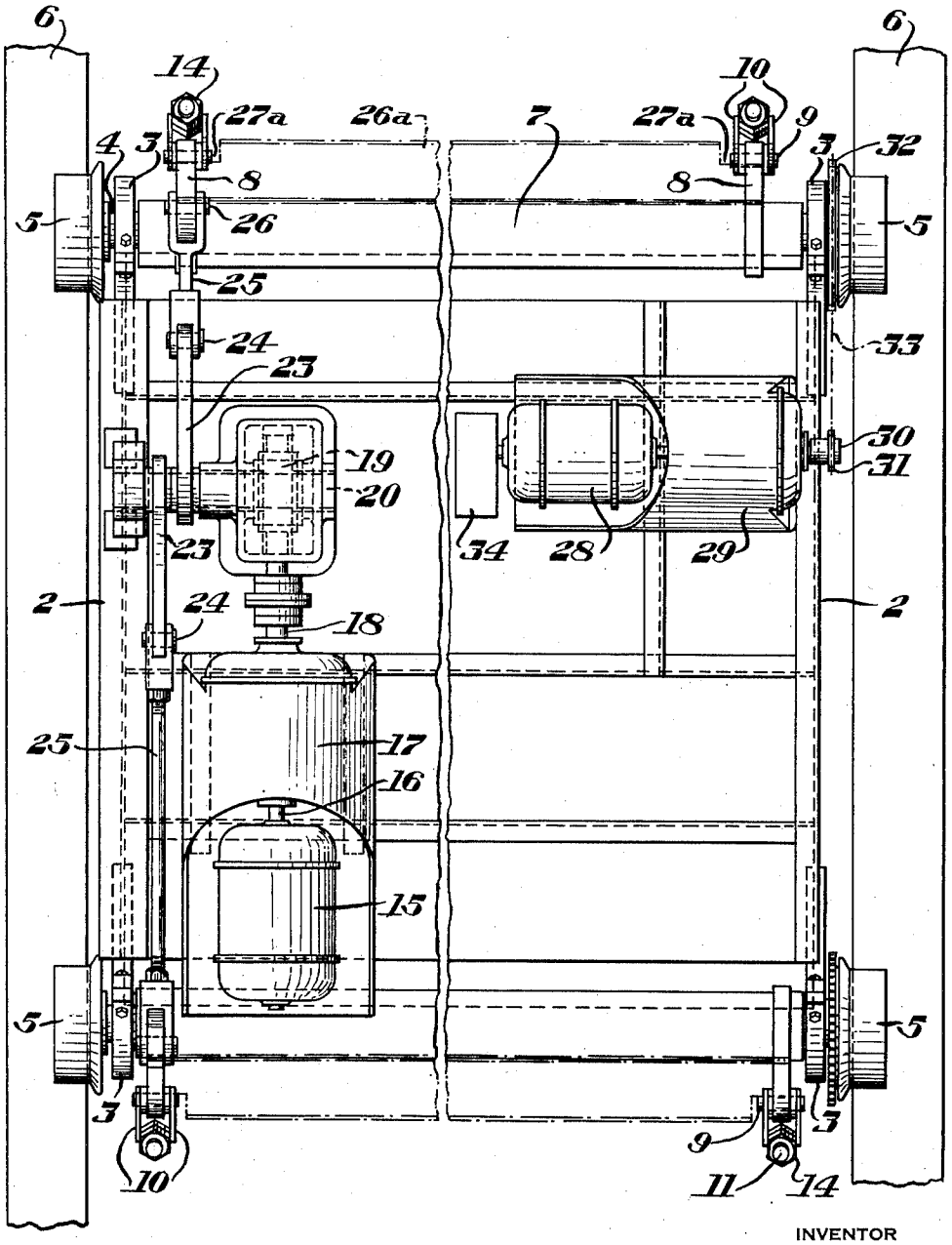
by Dabney, Brown & Wells
his attorneys

June 5, 1951 E. E. BROSIUS 2,555,953

SOAKING PIT COVER CARRIAGE

Filed July 9, 1946 2 Sheets-Sheet 2

Fig. 2.



INVENTOR
EDGAR E. BROSIUS

by Stebbins, Blum & Webb
his attorneys

Patented June 5, 1951 2,555,953

UNITED STATES PATENT OFFICE

2,555,953

SOAKING PIT COVER CARRIAGE

Edgar E. Brosius, Pittsburgh, Pa., assignor to Salem-Brosius, Inc., a corporation of Pennsylvania

Application July 9, 1946, Serial No. 682,435

10 Claims. (Cl. 268—10)

1

This invention relates to soaking pit cover carriages and has to do particularly with features of such carriages contributing to reliability of operation, simplicity and low cost. The invention is concerned with novel means for actuating the cover supporting means to raise and lower the cover and with novel means for protecting the carriage against damage in the event that in an emergency the carriage must be moved by a crane.

I provide an extremely simple but effective mechanism for changing the elevation of the cover supporting means of a soaking pit cover carriage. I preferably employ eccentric means for changing the elevation of the cover supporting means. Desirably I provide a soaking pit cover carriage comprising cover supporting means adjacent the respective ends of the carriage, a shaft, two eccentrics on the shaft and connections from the respective eccentrics to the cover supporting means adjacent the respective ends of the carriage whereby to change the elevation of the cover supporting means upon turning of the shaft.

I further provide a soaking pit cover carriage comprising a shaft adjacent each end of the carriage, cover supporting means connected with each shaft adjacent each end thereof, a source of power and a single connection between the source of power and each shaft for turning the shafts to change the elevation of the cover supporting means. The shafts are preferably quill shafts surrounding the carriage axles.

I desirably drive the cover supporting means actuating mechanism by a worm driven through reducing gearing by an electric motor. The worm may mesh with a worm wheel on a shaft carrying two eccentrics. An eccentric strap may cooperate with each of the two eccentrics and rods may extend from the respective eccentric straps to the respective ends of the carriage where they are respectively connected with the quill shafts. Turning of the eccentric shaft thus causes turning of the quill shafts and raising or lowering of the cover supporting means depending upon the direction in which the quill shafts are turned.

Each quill shaft preferably has one projection to which the corresponding eccentric strap rod is connected by a pin connection. Each quill shaft also preferably has two other projections, one adjacent each end, to which the cover supporting means are connected. The cover supporting means per se may be of conventional design.

2

The quill shafts may be positioned at the ends of the carriage in such positions that if in an emergency it should be necessary to move the carriage by means of the crane the crane hook would, if the quill shafts were not protected, engage a quill shaft at an end of the carriage. This would be undesirable since the quill shafts might thus be damaged. I provide a bumper at each end of the carriage, the bumpers being presented endwise of the carriage when the cover supporting means actuating mechanism is in the position which it occupies when the cover is raised. Desirably the bumpers are connected with the respective quill shafts. The bumpers may take any appropriate form; I prefer to employ I-beams. Each bumper is desirably connected with its quill shaft by being welded to the two projections adjacent the respective ends of the quill shaft which carry the cover supporting means. Thus each bumper turns with its quill shaft but since it is never desired to move the carriage when the cover is in its lowered or pit closing position the position of the bumper at that time is immaterial. The carriage is only moved when the cover is in its raised or inoperative position and the bumpers are so positioned that they are presented endwise of the carriage when the cover is raised. Thus if in an emergency it is necessary to move the carriage by means of the crane the crane will engage a bumper of the carriage instead of engaging a quill shaft and damage will thus be obviated.

Other details, objects and advantages of the invention will become apparent as the following description of a present preferred embodiment thereof proceeds.

In the accompanying drawings I have shown a present preferred embodiment of the invention, in which

Figure 1 is a side elevational view of a soaking pit cover carriage;

Figure 2 is a top plan view of the soaking pit cover carriage shown in Figure 1; and

Figure 3 is an end elevational view of the same carriage.

Referring now more particularly to the drawings, the soaking pit cover carriage comprises a frame of any desired structure, as, for example, a frame fabricated of structural shapes welded or bolted together in usual manner. The frame is designated generally by reference numeral 2. At its ends the frame has journals 3 in which are mounted axles 4 carrying wheels 5 through which the carriage is supported on rails 6 for movement longitudinally of the rails in con-

ventional manner to move the cover laterally of the pit to allow access to the pit to charge or draw ingots. When the carriage is disposed directly over the pit the cover is lowered to close the pit and when it is desired to charge or draw an ingot the cover is first raised and then the carriage is moved laterally to position the cover at a point offset from the pit. When the pit is again to be closed the carriage is moved back into position over the pit whereupon the cover is lowered into its operative or pit closing position.

Surrounding each axle 4 is a quill shaft 7. Each quill shaft is mounted for turning movement about the axle which it surrounds. Each quill shaft has two projections 8 which lie in parallel planes normal to the quill shaft axis and are of uniform size and shape and uniformly positioned. To each projection 8 is connected through a pivotal connection 9 a bracket 10 containing a cover supporting member 11 to which the cover 12 is connected by a pin connection 13. The cover supporting members 11 are generally in the form of bolts having their upper ends threaded and nuts 14 are turned onto the upper ends of the members 11 to maintain them in desired position and to provide for adjustment. There are four cover supporting members 11, one adjacent each of the corners of the carriage, and they carry the cover 12 by four-point suspension. In the drawings they are shown in their lowermost position when the cover is in operative or pit closing position.

When the quill shafts are turned inwardly (i. e., when the left hand quill shaft, viewing Figure 1, is turned clockwise and the right hand quill shaft is turned counterclockwise) the pins 9 are raised which of course raises the brackets 10 and the cover supporting members 11, resulting in lifting the cover off of the pit until the cover clears the pit when the carriage is adapted to be moved on the wheels 5 to a position offset from the pit as above explained. In Figure 1 the projections 8 are shown in their uppermost position in chain lines at 8a. As will be seen the quill shafts rotate through only a small angle to effect raising and lowering of the cover.

Mounted on the carriage is an electric motor 15. The motor shaft 16 is connected through reducing gearing 17 with a shaft 18 carrying a worm 19. Mounted on the carriage is a cross-shaft 20 carrying a worm wheel 21 meshing with the worm 19. The shaft 20 also carries two eccentrics 22 which are disposed with their high points angularly displaced 180° on the shaft. Cooperating with each eccentric 22 is an eccentric strap 23. Pivoted to each eccentric strap 23 by a pin connection 24 is a connecting rod 25 which is connected through a pin connection 26 with a projection 27 connected with one of the quill shafts 7.

When the motor 15 is operated it turns the shaft 18 at relatively low speed (e. g., 78 R. P. M.). Since the worm 19 is carried by the shaft 18 it rotates and drives the worm wheel 21. The worm wheel 21 drives the shaft 20 and rotates the eccentrics 22. This causes shifting of the eccentric straps 23 generally in the right and left direction viewing Figure 1. Such shifting of the eccentric straps 23 in turn causes turning of the quill shafts 7 through the connecting rods 25. Since the eccentrics are angularly displaced 180° from each other on the shaft 20 rotation of that shaft always causes the rods 25 to move in opposite directions. In other words, both rods 25 are either simultaneously moving toward the shaft 20 or they are simultaneously moving away from the shaft 20. This in turn results in the two quill shafts 7 always turning in opposite directions which is proper for raising and lowering of the cover.

The mechanism provided for actuating the cover supporting means is highly effective, simple and efficient and inexpensive. Only a single connection extends between the driving shaft 20 and each quill shaft. The worm and eccentric driving means insures smooth operation of the quill shafts and is conducive to long life of the carriage and freedom from damage and severe wear.

A bumper 26a in the form of an I-beam is connected with each of the quill shafts 7 and is so positioned relatively thereto that when the cover is in raised position the bumper is presented endwise of the carriage. Desirably the bumper is connected to the quill shaft through the projections 8 as by being welded thereto. At each end of the bumper a portion may be cut away as shown at 27a to provide clearance for the bracket 10 and cover supporting member 11. When it is necessary to move the carriage by means of the crane, as in the event of power failure on the carriage itself or other disability of the means for moving the carriage, the crane engages one of the bumpers 26a and through it pushes the carriage. Contact between the crane and the quill shaft itself is thus avoided and damage to the carriage obviated.

Mounted on the carriage is an electric motor 28 which through reducing gearing 29 drives a shaft 30. The shaft 30 carries a sprocket 31. Likewise one of the axles 4 carries a sprocket 32. A sprocket chain 33 is trained about the sprockets 31 and 32. Thus rotation of the shaft 30 by the motor 28 causes turning of the axle and movement of the carriage along the tracks 6. The motor 28 is reversible so the carriage may be moved in either direction. A brake 34 may be provided in connection with the motor 28 for insuring stopping of the carriage where desired.

While I have shown and described a present preferred embodiment of the invention it is to be distinctly understood that the invention is not limited thereto but may be otherwise variously embodied within the scope of the following claims.

I claim:

1. A soaking pit cover carriage comprising axles carrying wheels for supporting the carriage, a quill shaft surrounding each axle, cover supporting means connected with the quill shafts, a source of power and separate connections from the source of power to the respective quill shafts to turn the latter to change the elevation of the cover supporting means.

2. A soaking pit cover carriage comprising axles carrying wheels for supporting the carriage, a quill shaft surrounding each axle, cover supporting means connected with the quill shafts, a driving shaft, two eccentrics on the driving shaft and connections from the respective eccentrics to the respective quill shafts to turn the latter to change the elevation of the cover supporting means.

3. A soaking pit cover carriage comprising axles carrying wheels for supporting the carriage, a quill shaft surrounding each axle, cover supporting means connected with the quill shafts, a source of power, a worm driven thereby and connections from the worm to the respective

quill shafts to turn the latter to change the elevation of the cover supporting means.

4. A soaking pit cover carriage comprising axles carrying wheels for supporting the carriage, a quill shaft surrounding each axle, cover supporting means connected with the quill shafts, a source of power, a worm driven thereby, a shaft driven by the worm, two eccentrics on said shaft and connections from the respective eccentrics to the respective quill shafts to turn the latter to change the elevation of the cover supporting means.

5. A soaking pit cover carriage comprising a turnable member disposed at an end of the carriage, cover supporting means carried thereby and a bumper also carried by the turnable member, the bumper being presented endwise of the carriage when the turnable member has been turned to raise the cover supporting means.

6. A soaking pit cover carriage comprising a shaft extending transversely of the carriage at an end thereof, cover supporting means carried by the shaft, means for turning the shaft to change the elevation of the cover supporting means and a bumper also carried by the shaft and positioned so that when the shaft has been turned to raise the cover supporting means the bumper is presented endwise of the carriage.

7. A soaking pit cover carriage comprising axles carrying wheels for supporting the carriage, a quill shaft surrounding an axle, the quill shaft being disposed at an end of the carriage, cover supporting means connected with the quill shaft, means for turning the quill shaft to change the elevation of the cover supporting means and a bumper connected with the quill shaft and positioned so that when the quill shaft has been turned to raise the cover supporting means the bumper is presented endwise of the carriage.

8. A soaking pit cover carriage comprising axles carrying wheels for supporting the carriage, quill shafts respectively surrounding the axles, the respective quill shafts being disposed at the ends of the carriage, cover supporting means

connected with the quill shafts, means for turning the quill shafts to change the elevation of the cover supporting means and bumpers connected with the respective quill shafts and positioned so that when the quill shafts have been turned to raise the cover supporting means the bumpers are presented endwise of the carriage at the respective ends thereof.

9. A soaking pit cover carriage comprising axles carrying wheels for supporting the carriage, a quill shaft surrounding an axle, the quill shaft being disposed at an end of the carriage, projections on the quill shaft, cover supporting means carried by the projections, means for turning the quill shaft to change the elevation of the cover supporting means and a bumper carried by the projections and positioned so that when the quill shaft has been turned to raise the cover supporting means the bumper is presented endwise of the carriage.

10. A soaking pit cover carriage comprising a turnable member disposed at an end of the carriage, cover supporting means carried thereby, eccentric means for turning said member and a bumper carried by said member, the bumper being positioned on the turnable member so that when the turnable member has been turned to raise the cover supporting means the bumper is presented endwise of the carriage.

EDGAR E. BROSIUS.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
703,322	Treat	June 24, 1902
796,934	Ryan et al.	Aug. 8, 1905
1,594,588	Baily	Aug. 3, 1926
2,021,866	Masteller	Nov. 19, 1935
2,052,187	Mawhinney et al.	Aug. 25, 1936
2,287,645	Spencer	June 23, 1942