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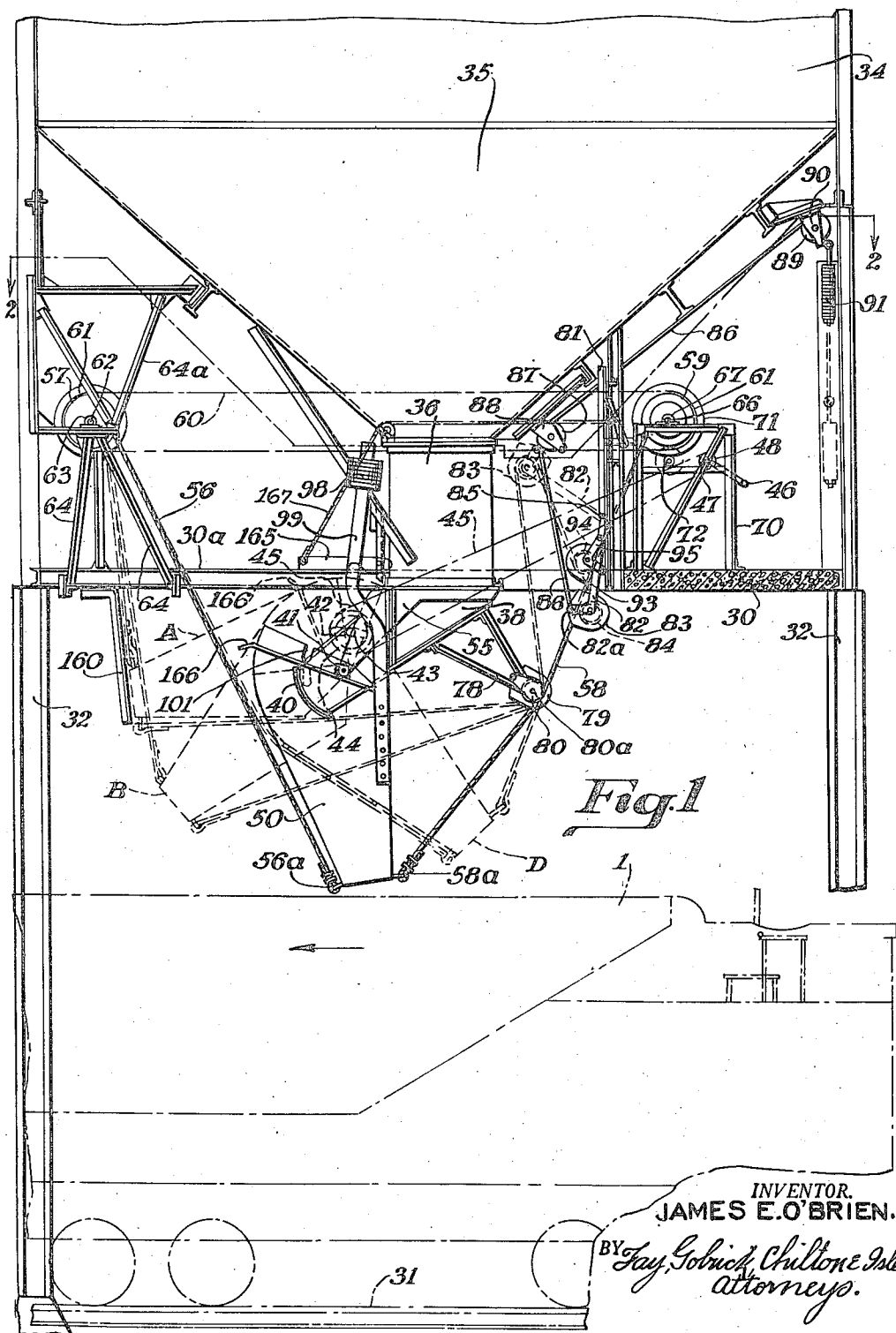
J. E. O'BRIEN

2,456,308

LOCOMOTIVE COALING APPARATUS

Filed May 26, 1944

6 Sheets-Sheet 1



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J. E. O'BRIEN

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6 Sheets-Sheet 2

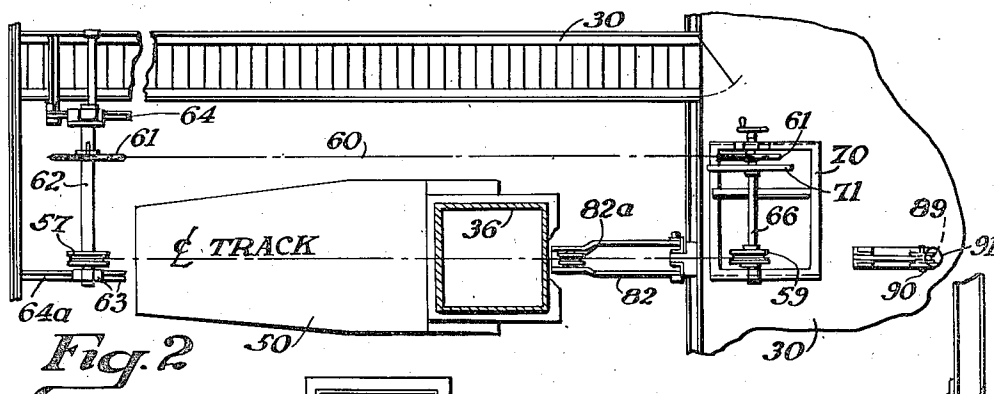


Fig. 2

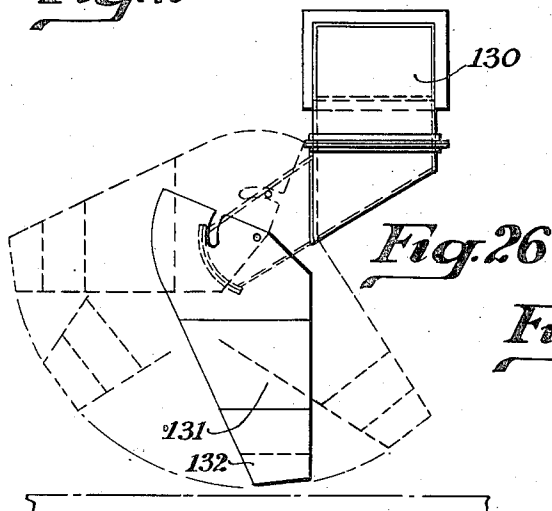


Fig. 26

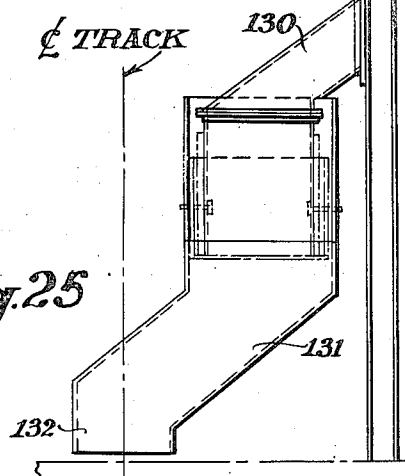


Fig. 25

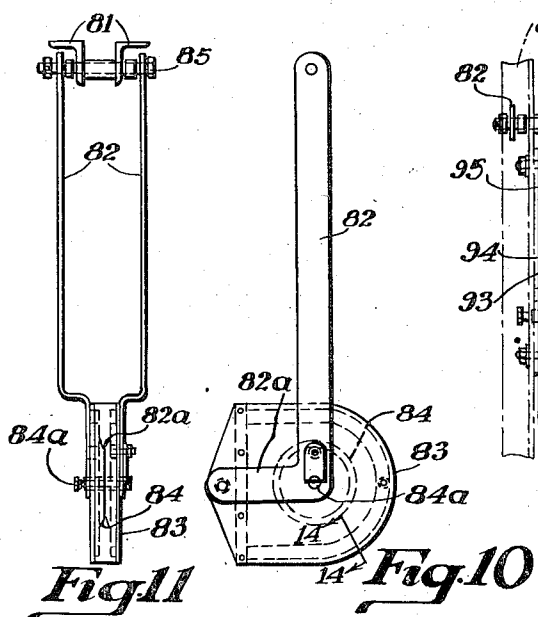


Fig. 11

Fig. 10

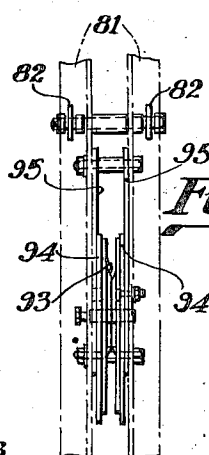


Fig. 13

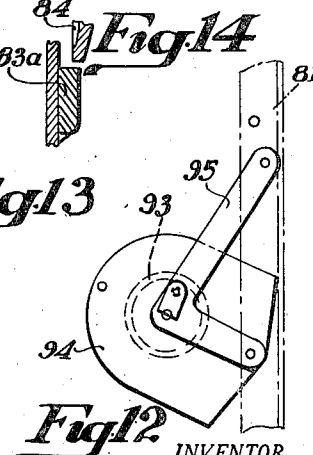


Fig. 12

INVENTOR.
JAMES E. O'BRIEN.
BY *Jay, Sobrick, Chilton & Sola*
attorneys.

Dec. 14, 1948.

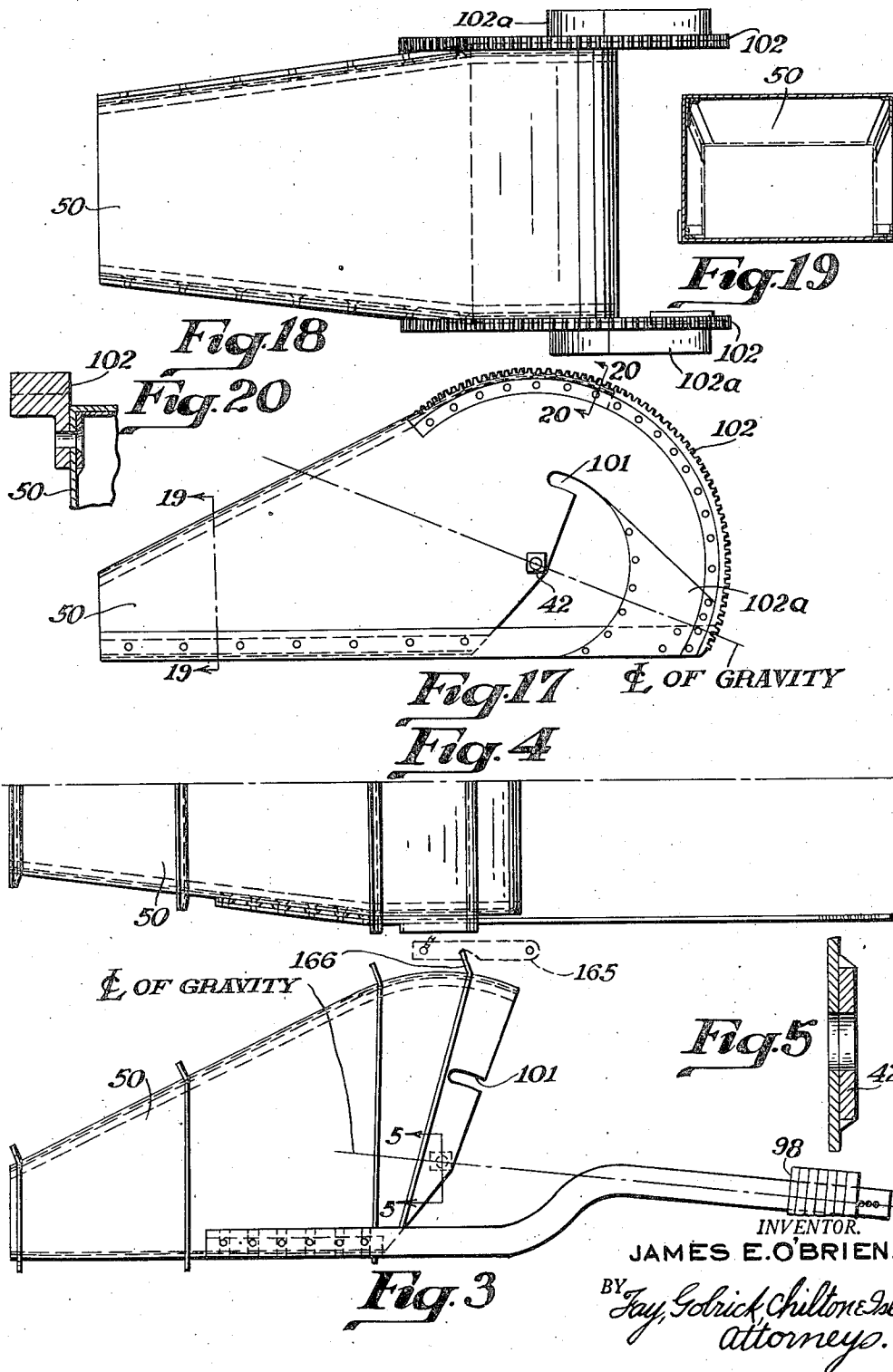
J. E. O'BRIEN

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J. E. O'BRIEN

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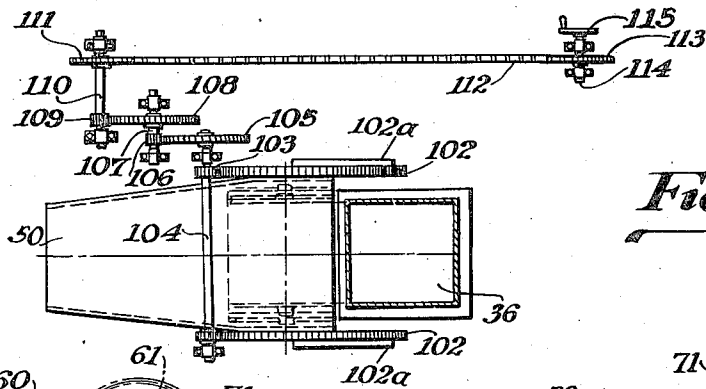


Fig. 15

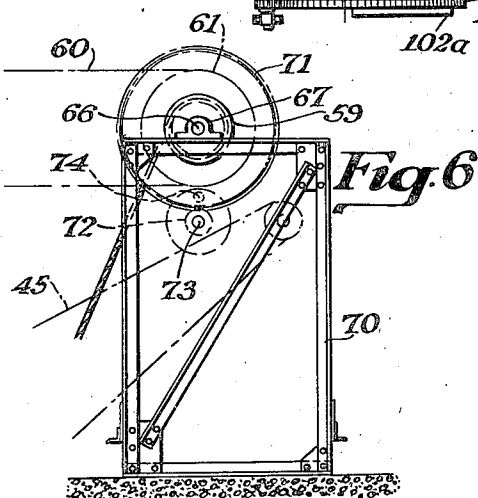


Fig. 6

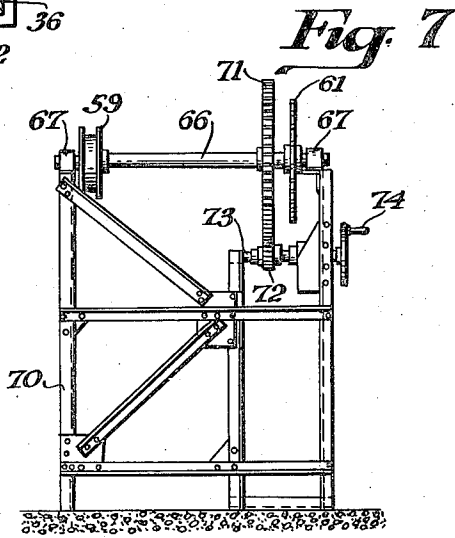


Fig. 7

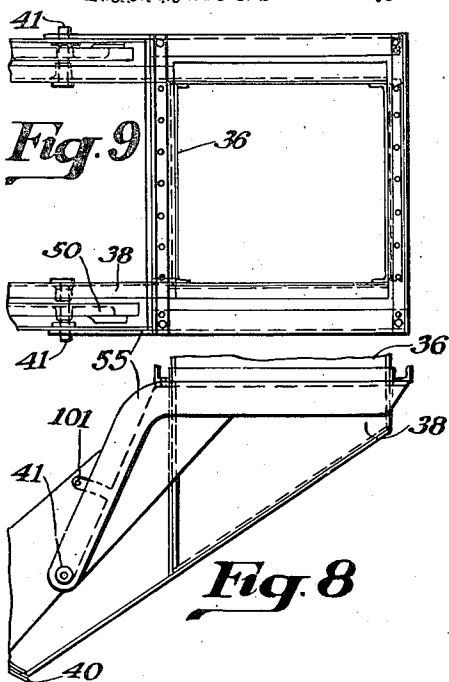


Fig. 8

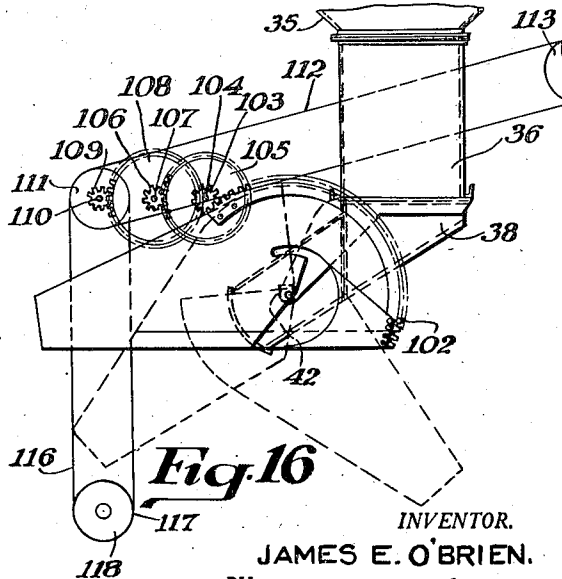


Fig. 16

INVENTOR.
JAMES E. O'BRIEN.
BY *Jay, Golrick, Chilton & Seler*
Attorneys.

Dec. 14, 1948.

J. E. O'BRIEN

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Fig. 21

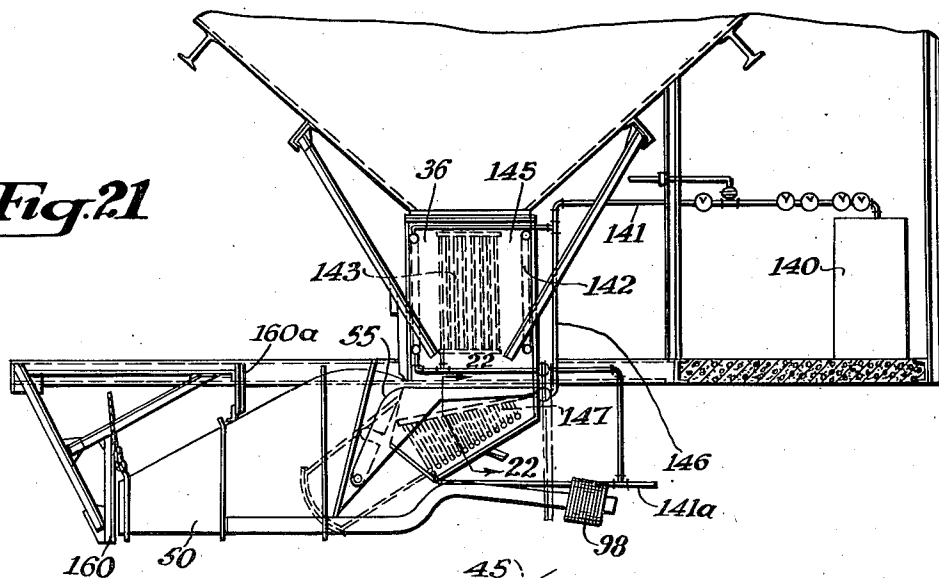


Fig. 24

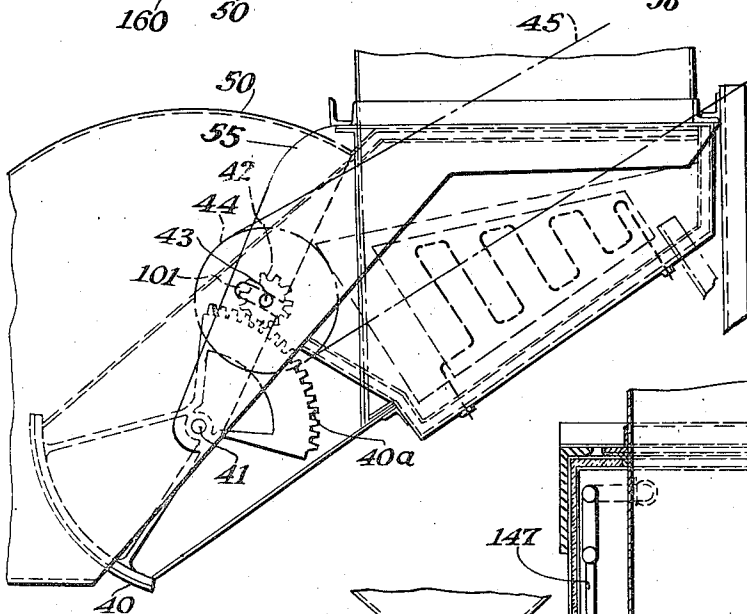


Fig. 22

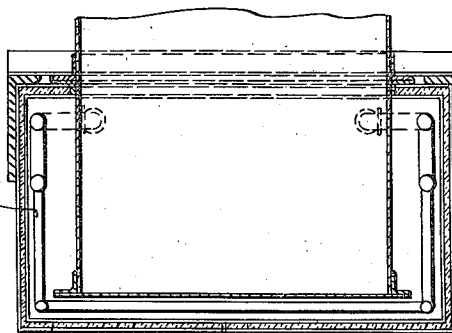
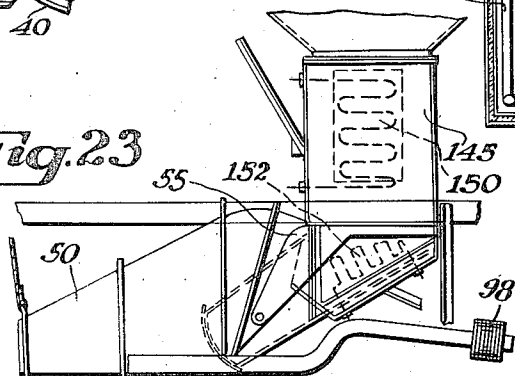


Fig. 23



INVENTOR
JAMES E. O'BRIEN.

BY *Gay, Gohrick, Chilton & Isaacs*
Attorneys.

Dec. 14, 1948.

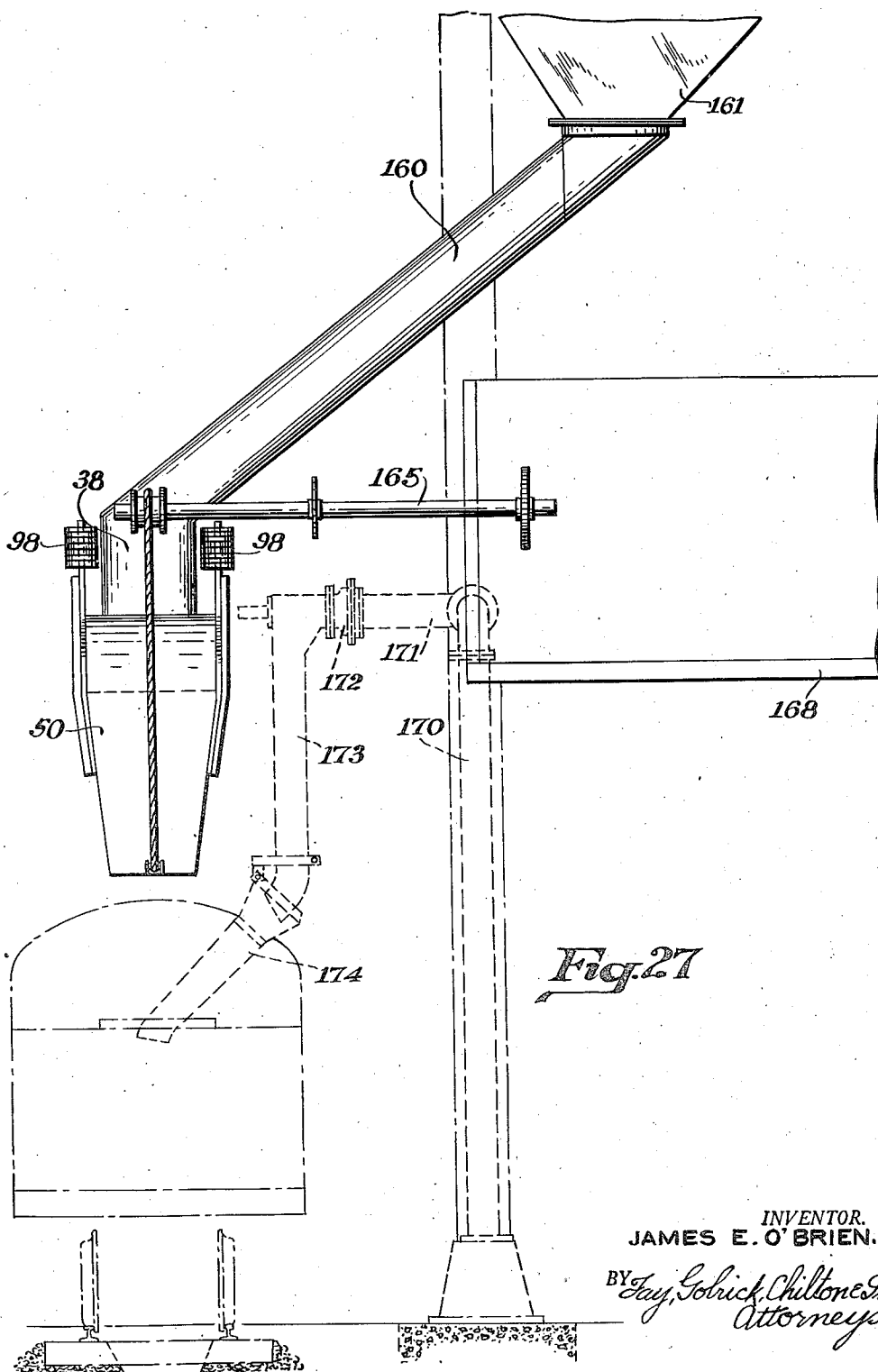
J. E. O'BRIEN

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UNITED STATES PATENT OFFICE

2,456,308

LOCOMOTIVE COALING APPARATUS

James E. O'Brien, Cleveland, Ohio

Application May 26, 1944, Serial No. 537,469

4 Claims. (Cl. 214-41)

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This invention is directed to improvements in coaling devices and primarily locomotive coaling devices.

The present invention arises out of an analysis of locomotive coaling devices heretofore used and primarily for the purpose of developing a locomotive tender coal trimmer which will be operable under the most unfavorable weather conditions to charge the locomotive tender with coal in a highly expeditious manner without necessitating the moving of the locomotive and train, once the tender has been spotted relative to the coal tower and whereby the tender can be serviced in such rapid manner that the train may stand on the main line or high speed track.

Heretofore it has been the practice to use an open or apron type coal chute leading from an elevated coal hopper having either a central bottom discharge opening or a side wall discharge with apron type chute arranged to be lowered or sloped downward sufficiently for coal to flow over it. Such coaling arrangements necessitate moving the locomotive to distribute the coal in the tender coal box and the engine men had to exercise considerable manual effort in assisting in the trimming or distributing of the coal as it was discharged into the tender. Moving the locomotive with or without the train several times a few feet at a time resulting in wear and tear on locomotive equipment such as draw bars, train brakes, etc., and also in waste of power and time in moving the locomotive and train. At locomotive terminals, engine hostlers had to move locomotives several times to completely coal the tenders, which made hostlers go back and forth from locomotive cab to coaling apparatus to move the locomotive a few feet and thus charge the tender with a few tons each time until the tender was filled. After the coaling the locomotive was then shifted to permit the entering of a stand pipe or other type of watering device into the water hatch of the tender to charge the tender with water. This entire servicing operation usually required the delaying of the train for a time period of from 8 to 14 minutes, depending upon the amounts of coal and water required.

In accordance with the provisions of my invention the coal is discharged into the locomotive tender at the rate of about 20 tons per minute, during which time the apparatus functions to spread or trim the coal in the tender so that, for example, a thirty-ton capacity coal box 26 ft. long may be filled properly in about one and one-half minutes, without moving the locomotive or train after the tender has been spotted in coaling position. The arrangement is such that the water servicing of the tender may also be effected at the same station and the entire servicing time reduced to a period of about three to four min-

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utes, depending upon the amounts of coal and water required.

Among the objects of my invention is the provision of an enclosed coaling chute supported for shifting movement relative to the track or longitudinal dimension of the coal box of the tender with associated mechanism for effecting the operation thereof; the provision of a construction which will be of sufficient rigidity and ruggedness to provide for such suspension and operation of the coal chute under heavy tonnage discharge conditions and the arrangement being such that the apparatus may be operated by an attendant or the locomotive fireman stationed on an operating platform of the coal hopper or tower structure. The operating platform may be located at any point convenient to observe filling of the coal box while operating the apparatus.

The apparatus may be power driven or manually operated and the entire arrangement is such that visibility of the coal discharge is afforded the operator or fireman when stationed on the operating platform.

To the accomplishment of the foregoing and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims; the annexed drawings and the following description setting forth in detail certain structure embodying the invention, such disclosed structure constituting, however, but one of various structural forms in which the principle of the invention may be used.

In said annexed drawings:

Fig. 1 is a front elevation of a locomotive coaling apparatus embodying the features of my invention as viewed from the track side and illustrating the elevational disposition thereof relative to the tender of a locomotive spotted at the coaling station;

Fig. 2 is a top plan view of the apparatus for operating the coaling chute while the coal is being discharged therethrough and as viewed by the irregular plane indicated by the line 2-2 of Fig. 1;

Fig. 3 is an enlarged side view of the chute structure per se;

Fig. 4 is a top view of the chute structure as shown in Fig. 3;

Fig. 5 is a cross-sectional detail taken on the plane indicated by the line 5-5 of Fig. 3 through one of two pivot bearings on the chute;

Figs. 6 and 7 are side views of a part of the cable winding mechanism illustrated in Figs. 1 and 2 for swinging the coaling chute;

Fig. 8 is a fragmentary side elevational view of the pivotal mounting structure associated with the coal gate of the hopper for pivotally suspending the coal receiving end of the chute relative to the hopper gate;

Fig. 9 is a plan view of the chute suspending means shown in Figs. 1 and 8;

Fig. 10 is a detail of part of the cable rigging for taking up the slack in one of the cables which swing the chute;

Fig. 11 is an elevational view of the rigging shown in Fig. 10;

Fig. 12 is a further detail of part of the slack cable rigging;

Fig. 13 is an elevation of the cable rigging parts shown in Fig. 12;

Fig. 14 is a cross-sectional detail through one of the cable sheaves when taken substantially along the line 14—14 of Fig. 10;

Fig. 15 is a plan view of a modified form of chute operating means whereby the use of chute swinging cables is eliminated;

Fig. 16 is an elevational view of the modified chute operating means shown in Fig. 15;

Fig. 17 is a side elevational view of the chute structure to be used with the modified form of chute operating mechanism shown in Figs. 15 and 16;

Fig. 18 is a plan view of the chute structure shown in Fig. 17;

Fig. 19 is a cross-sectional view taken through the modified form of chute structure shown along the lines 19—19 of Fig. 17;

Fig. 20 is a cross-sectional detail taken along the plane indicated by the line 20—20 of Fig. 17;

Fig. 21 is a side elevational view of the coaling apparatus shown in Fig. 1 when equipped with steam heating means associated with the coal gate of the hopper structure and also showing buffer stop and weather shield for chute;

Fig. 22 is a cross-sectional view taken through the coal gate substantially along a plane indicated by the line 22—22 of Fig. 21;

Fig. 23 is a side elevational view of the chute and hopper coal gate indicating the installation of electrical heating means in lieu of steam heating means;

Fig. 24 is an enlarged side elevational view of the pivotal end of the chute and the coal gate structure shown in Fig. 23;

Fig. 25 is an elevational view of a track side tower structure showing the manner of adapting my invention thereto;

Fig. 26 is a track side view of the chute structure shown in Fig. 25; and

Fig. 27 is an elevational view of a modification of the coaling apparatus associated with a water tower in a track coaling plant whereby simultaneous coaling and watering of the engine tender may be effected.

My invention contemplates the provision of a swingable coaling chute of the closed or nozzle type pivotally suspended at an enlarged coal receiving end thereof, the enlarged end being of such shape that the chute may be swung from substantially horizontal locomotive clearing position downwardly on an arc of from 140° to 150° while receiving coal from the coal gate of the hopper or bin. This swinging movement also can be effected through an arc which extends on both sides of a vertical plane passing through the pivotal bearings of the chute, whereby the chute may act as a nozzle in directing the coal flowing therethrough from end to end of the tender. The axis of the pivotal mounting for the chute is arranged to extend normally of the tracks or right of way and the tender is spotted on the track so that the mid-region thereof is substantially beneath the pivotal mounting of the chute. The coal gate of the hopper is provided with a swinging closure or coal shut-off means in a known manner, but disposed substantially within

an enlarged coal receiving end of the chute structure. The coal gate is maintained closed when the chute is swung upwardly into a substantially horizontal and locked non-coaling position. The entire arrangement is such that the operator at the coaling station, a hostler or the fireman, may unlock the chute and lower the same until the discharge end of the chute is directed toward one end of the tender, whereupon the coal is released to discharge through the chute and the chute is gradually swung in an arc until the chute is directed at the opposite end of the tender. During this swinging movement coal is discharged through the chute in a very rapid but controlled manner and the operating means provides positive control of the chute to spread and trim the coal as and when it is discharged into the coal box. The elevational disposition of the chute and the length thereof are such that all angles of the coal discharge within the swinging arc of the chute relative to a vertical plane are well below the angle of repose of coal, regardless of the physical condition of the coal. The coaling of the tender may be effected in one or more swinging cycles of the chute as desired.

In the arrangement shown in Fig. 1 the coaling plant is of the track straddling type, that is, a tower structure supports an operator's platform disposed over the track at such an elevation that a train may pass therebeneath without obstruction and the tower structure supports a hopper or coal bin, into which the coal may be discharged by conveyor, elevator, grab bucket or other suitable elevating means. It is also possible to adapt the invention to use with a coal elevating means where no elevated hopper or storage bin is present. For example, it may be adapted to a direct coaling machine.

The elevational disposition of the entire apparatus relative to the railroad tracks is indicated by the position of the tender of a locomotive, shown in dot and dash lines in Fig. 1.

The operator's platform 30 is disposed a substantial distance from the tracks 31 for the purpose stated and may be supported by four columns 32 or other suitable structure. The coal hopper structure illustrated has a pyrimidically shaped bottom 35 converging to a downwardly extending discharge throat 36 substantially square in cross-sectional structure, as shown in Fig. 2, and the bottom thereof terminates at about the level of the platform structure of the tower.

To the bottom of the hopper throat 36 is secured a coal gate structure 38, see Figs. 8 and 9. The coal gate structure extends downwardly and at a fixed angle, at which coal will flow by gravity, relative to the throat structure 36. The gate mechanism is provided with a coal stop or shut-off mechanism in the form of a swinging gate 40 of an arcuate shape to swing about a pivotal mounting 41 on the gate structure to cooperate with complementarily formed edges on the discharge end of the gate structure to shut off the flow of coal. The gate 40 may be swung by any suitable means operated from the operator's platform. In Figs. 1 and 24 such means is indicated as gears 42 suitably mounted on a shaft 43 to engage fan gears 40^a comprising part of the gate structure 40. A sprocket 44, driven by chain 45, is operated by a crank 46 on a shaft 47 driving a sprocket pinion 48, over which chain 45 passes. The coal gate structure so far described is generally known in the art and comprises no part of the present invention except insofar as the same is modified to enter into combination with an

associated positively operated swinging coal chute or coaling nozzle.

The coaling chute or nozzle 50 may be connected directly to, or be associated with, the coal gate structure in such manner as to permit the desired controlled shifting movement thereof and I prefer the connection to be pivotal in structure. The shape of the chute is such that the coal receiving end thereof is of novel design and is sufficiently large to extend over and around the discharge opening of the coal gate structure whatever that gate structure may be. In the construction shown herein the coal gate chute 50 is shown as a tapered box-like structure with one plate radial at the upper end to divert the direction of the flow of coal, see Figs. 1, 3 and 4, of sufficient width and length at the upper end thereof to fit over and swing about the discharge end of the coal gate structure. I provide reinforcing bearing plates 42 welded or otherwise attached to the side walls of the chute structure whereby the chute may be pivotally mounted upon the pivot pins 41, which also pivotally support the coal gate. Additional support for the pins 41 is provided in the form of a depending yoke structure 55, see Figs. 8 and 9, attached to the lower part of the hopper throat structure 36. It will be apparent to those skilled in the art that other suitable mounting may be provided for the coal chute to maintain the same in the shiftable operating relation described relative to the coal gate.

To swing the chute 50 about the pivot pins 41 I provide a duplex cable arrangement comprising a cable reach 56 which extends upwardly over a cable winding drum 57 and a cable reach 58 which extends over a cable winding drum 59, the lower ends of these cables being attached at 56^a and 58^a to the lower end of the chute in any convenient manner, see Figs. 1, 2, 6 and 7.

The two cable drums 57 and 59 are operated simultaneously, whereby one cable is unwound while the other is being wound about its drum. Thus the cables may be maintained in synchronous relation by a chain 60 disposed at a convenient distance above the operator's platform 30 which passes over sprockets 61 on the drum shafts 62 and 66. The drum 57 is mounted upon the shaft 62 and the shaft 62 is supported by bearings 63 carried on a suitable structural framework 64 extending upwardly from the platform structure and by structural framework 64^a extending downward from the bin hopper supports. The drum 59 is supported on the shaft 66 and the shaft 66 is supported by bearings 67, the latter being supported by a structural framework 70 installed on the operating floor at a position opposite to structural framework 64 and 64^a relative to the chute. As stated, the chain 60 extends over sprockets 61, which are of the same diameter carried respectively by the shafts 62 and 66. The shaft 66 is driven by a gear 71 which meshes a pinion 72 on a stub shaft 73 suitably supported on the structural framework 70, shaft 73 and gear 72 being driven by a hand wheel 74, disposed at a convenient height above the floor of the operator's platform 30. Thus, when the operator turns the hand wheel 74 the cable drums 57 and 59 are driven in unison and the cable leads to the drums are arranged so that as one drum unwinds its cable reach the other drum will wind up the other cable reach.

In order that the coal chute may be swung from the inoperative substantially horizontal position shown by the dotted lines in Fig. 1 and

indicated by the reference character A, down to the beginning of the first coaling position, indicated by the dotted lines in Fig. 1 and by the reference character B, as well as through all angular coaling positions from B to D, and at the same time maintain the two cable reaches 56 and 58 in a substantially taut condition, I have provided a cable slack take-up mechanism which acts on the cable reach 58 without unduly burdening manual operation of the chute and which comprises the following swinging elements and associated fixed sheave. Attached to the under side of the coal gate structure 38 is a depending bracket 78 supporting a sheave block 79 and an idler sheave 80 and sheave shaft 80^a, over which the cable reach 58 extends. Attached to a pair of spaced apart angle members 81 (see Figs. 1, 10 and 11), comprising part of the enclosure structure for the operator's platform, is a depending swingable sheave supporting yoke structure in the form of two spaced apart arms 82 having attached to the lower end thereof a sheave block 83 which carries a sheave 84 which revolves on pin 84^a. A pin 85, supported by the structural members 81, permits an upwardly swinging movement of the arm structure 82 to the position shown in dotted lines in Fig. 1. The sheave block structure 83 is such as to maintain the cable reach 58 on sheave 84 regardless of the position of the arms 82 (see Fig. 14).

Attached to an extension 82^a of both the members 82 is a counterweight cable 86 which extends upwardly to and passes over a sheave 87 supported by a bracket or sheave block 88 secured to the under side of the hopper structure above the operator's position. Cable 86 runs upwardly along the bottom of the hopper structure to another sheave 89, supported by bracket 90, then downwardly to counterweight 91, the counterweight serving to tend to maintain the swinging sheave 84 in an upward position to keep cable reach 58 taut.

To maintain the cable reach 58 in proper winding relation to the drum 59 at all times, irrespective of the position of the slack take-up sheave 84, I provide a sheave member 93 and a sheave block 94 supported by L-shaped brackets 95, fixed to the structural members 81, and which are disposed to be spanned by the arm members 82 so that, irrespective of the swung position of the slack take-up sheave 84, cable reach 58 always passes over the fixed sheave 80 and fixed sheave 93 (see Figs. 1, 12 and 13).

To further facilitate the convenient manual manipulation of the chute 50 during the coaling operation, I provide counterweights 98 on the arm 99, attached at such a position to the chute structure as not to interfere with the operation of the chute or the visibility of the platform operator. Also arms 99 are constructed to not foul coaling gate operating shaft 43 and to apply counterweights 98 on center line of gravity of chute to perfectly counterbalance the chute at all times to provide rapid and easy operation of the chute throughout its full range of swinging movement. It will be noted that I have provided arcuate slots 101 in the upper edges of the side walls of the chute structure for the purpose of clearing the shaft member 43, which carries the gear 42 for driving gear 40^a for operation of the coal gate (see Figs. 1, 3, and 17).

In Figs. 15 and 16 I show a modified means for swinging or operating the coal chute which eliminates the use of cables, cable winding drums, slack take-up, etc., and which may comprise

arcuate segment racks 102, the gear teeth of which are concentric about the pivot bearing 42 of the chute, as shown in Figs. 17 and 18. The chute here may be of the same general construction as the chute structure shown in Figs. 3 and 4, with the enlarged ends of the side walls of the chute arcuate in structure to serve as supports for the segment gears 102 and counterweights 102^a, the segment gears 102 being secured to the side walls of the chute structure with rivets or with fitted bolts, as shown in Fig. 20. Counterweights 102^a are applied on center line of gravity of chute to obtain perfect balance and provide easy and rapid operation of the chute.

Referring again to Figs. 15 and 16, it will be seen that I provide pinions 103 which mesh with the segment gears 102, the pinions being carried on a shaft 104 supported by any suitable frame structure attached to the operator's platform. Shaft 104 carries a gear 105, driven by a pinion 106 on shaft 107, which carries a gear 108 driven by a third pinion 109 on shaft 110. Shaft 110 carries a sprocket 111, driven by a chain 112 which passes over sprocket 113 located at the operator's position on the platform. Sprocket 113 is mounted on a shaft 114 which carries a hand wheel 115, the shaft being supported by suitable frame structure, not shown. In this arrangement the means for operating or swinging the chute may also include a sprocket 111, mounted on the shaft 110 in immediate association with a hand wheel 117 and a sprocket 117 mounted upon a stub shaft on an operating platform disposed to one side of the track within reach of the fireman or hostler, whereby either engine man or hostler may operate the chute in the manner desired.

In Figs. 25 and 26 I have shown the shape of the coal chute structure when the same is to be used with the track-side type of hopper construction. The hopper is provided with a coal gate structure 130 extending outwardly toward the tracks, and the lower part of the swingable chute is constructed in an offset manner to have the part thereof intermediate the upper and lower ends of the coal chute extending outwardly at an angle, as generally shown at 131 in Fig. 25. The amount of this offset is such that the discharge end 132 of the chute will be disposed immediately over the center line of the track. One or the other of the chute swinging means hereinbefore described may be utilized to swing this type of chute mounting in the manner and with the same facility as the operation of the arrangement shown in Fig. 1.

In order to have the apparatus described operable under all weather conditions I have provided means for maintaining the coal in the gate structure heated to prevent the freezing of wet coal. In Figs. 21 and 22 I have provided means for heating the coal located in the coal gate structure and in the hopper throat, which may comprise a heating plant 140 located within the operator's enclosure through piping 141 to sets of steam coils 142 and 143, and which are juxtaposed to the walls of the throat structure 36 and enclosed by an insulating housing 145. A branch pipe line 146 extends from the heating pipe 141 to heating coils 147 arranged about the coal gate walls and enclosed by an insulating housing 148. Condensate is drained in suitable manner through drip line 141^a. Thermal responsive regulators may be disposed within the housing if desired.

In Figs. 23 and 24 I show an electrical heating

system comprising resistance heaters 150, arranged about the walls of the throat structure 36 of the hopper within the insulating housing 145 and resistance heating elements 152 within the insulating housing 148. It will be apparent to those skilled in the art that either system can be utilized with equal facility, and through the use of thermal responsive controls if desired.

In Figs. 1 and 21 I show a chute closure means in the form of a weather shield plate 160 depending from the under side of the platform structure, which is positioned to close the discharge end of the chute when the latter is swung to a substantially horizontal position (position A, Fig. 1). This arrangement prevents the ingress of snow, rain and excessive amounts of cold air into the chute during inclement weather.

Fig. 21 also shows chute stop 160^a which serves as a buffer to prevent the chute from being forced upward by exhaust pressure of locomotives passing under the chute.

Any convenient latching means may serve to lock the chute in an inoperative position. A hook latch 165 pivotally attached to the throat structure 36 of the hopper may engage the top of one of the structural members 166 of the chute construction upon the upward swinging of the chute. A cord 167 is attached to the free end of the latch and the cord is extended to the operator's position in any suitable manner for convenient releasing of the latch.

In Fig. 27 I have shown a third arrangement of a shiftable chute suspension associated with a track-side coaling station hopper structure, wherein the coal gate comprises a tubular or square shaped structure 160 connected to the bottom structure 161 of a storage hopper and extending from the hopper bottom outwardly to a position spanning the center line of the track. The chute 50 can be pivotally mounted, as hereinbefore described, upon the coal gate structure 38 and the chute operating means is generally represented by cable drum shaft 165 to indicate the relative disposition of the operating means of the chute and the operator's platform 168, whereby the water tower can be so located in immediate juxtaposition to the coaling station that the tender of the locomotive may be coaled and watered simultaneously. The water tower comprises a riser main or pipe 170, an outwardly extending branch 171, a swivel mechanism 172, a down pipe 173 and a nozzle 174 pivotally suspended to the lower part of the down pipe 173. The nozzle thus can be manipulated transversely of the tender and into the tender water hatch. The subject matter of this water tower construction comprises the subject matter of my co-pending application Serial No. 560,080.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the structure herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore distinctly point out and distinctly claim as my invention:

1. In an apparatus of the character described, the combination of a railroad coaling hopper having a coal discharge throat structure sloping downwardly over a railroad track, a closed type coaling chute, said chute having one open end adapted to overlie the discharge end of said throat, means for pivotally supporting said chute on an axis extending in a direction transversely of the railroad track and through said throat

whereby said chute may be raised to a substantially horizontal position and extending in the general direction of the slope of said throat and having one edge of said end extending adjacent the lower edge of the discharge opening of said throat and the opposite edge of said end opening extended to lie adjacent the upper side of said throat, and whereby said chute may be swung from said substantially horizontal position about said axis downwardly and to a position in which it slopes in the opposite direction from the slope of said throat, the said one edge of the chute being adapted to lie transversely of the bottom side of said throat and said opposite edge being adapted to lie substantially in a horizontal plane through the upper edge of the discharge opening of said throat and spaced from said upper edge for forming a coal passage therebetween, and means for swinging said chute about its axis.

2. In an apparatus of the character described, the combination of a railroad coaling hopper having a coal discharge throat structure sloping downwardly over a railroad track, a coal gate at the outlet of said throat member, said gate being swingable to and from a position over the outlet of said throat, a closed type coaling chute, said chute having one open end adapted to overlie the discharge end of said throat, means for pivotally supporting said chute on an axis extending in a direction transversely of the railroad track and through said throat whereby said chute may be raised to a substantially horizontal position and extending in the general direction of the slope of said throat and having one edge of said end opening extending adjacent the lower edge of the discharge opening of said throat and the opposite edge of said end extended to lie adjacent the upper side of said throat, said chute when in said position, being adapted to overlie said gate, and whereby said chute may be swung from said substantially horizontal position about said axis downwardly and to a position sloping in the opposite direction than that of said throat, said one edge of the chute being adapted to lie transversely of the bottom side of said throat and said opposite edge being adapted to lie substantially in a horizontal plane through the upper edge of the discharge opening of said throat and spaced from said upper edge for forming a coal passage therebetween, means for operating said gate, and means for swinging said chute about its axis.

3. In an apparatus of the character described, the combination of a railroad coaling hopper having a coal discharge throat structure sloping downwardly over a railroad track, a coal gate at the outlet of said throat member, said gate being swingable to and from a position over the outlet of said throat, a closed type coaling chute, said chute having one open end adapted to loosely overlie the discharge end of said throat, means for pivotally supporting said chute on an axis extending in a direction transversely of the railroad track and through said throat whereby said chute may be raised to a substantially horizontal position and extending in the general direction of the slope of said throat and having one edge of said end opening extending adjacent the lower edge of the discharge opening of said throat and the opposite edge of said end opening extended to lie adjacent the upper side of said throat, said chute when in said position, being adapted to overlie said gate, and whereby said chute may be swung from said substantially horizontal position about said axis downwardly and to a position sloping in the opposite direction than that of said

throat, said one edge of the chute being adapted to lie transversely of the bottom side of said throat and said opposite edge being adapted to lie substantially in a horizontal plane through the upper edge of the discharge opening of said throat and spaced from said upper edge for forming a coal passage therebetween, fixed means forming a wall member disposed adjacent to and transversely of the end of said chute opposite said one end when said chute is raised to the substantially horizontal position, means for operating said gate, and means for swinging said chute about its axis.

4. In an apparatus of the character described, the combination of a railroad coaling hopper having a coal discharge throat structure sloping downwardly over a railroad track, a closed type coaling chute, said chute having one open end adapted to overlie the discharge end of said throat, means for pivotally supporting said chute on an axis extending in a direction transversely of the railroad track and through said throat whereby said chute may be raised to a substantially horizontal position and extending in the general direction of the slope of said throat and having one edge of said end extending adjacent the lower edge of the discharge opening of said throat and the opposite edge of said end opening extended to lie adjacent the upper side of said throat, and whereby said chute may be swung from said substantially horizontal position about said axis downwardly and to a position in which it slopes in the opposite direction from the slope of said throat, the said one edge of the chute being adapted to lie transversely of the bottom side of said throat and said opposite edge being adapted to lie substantially in a horizontal plane through the upper edge of the discharge opening of said throat, and spaced from said upper edge for forming a coal passage therebetween, an arm attached to said chute at one side thereof and extending beyond said one end, the extended portion of said arm having a reversed curve therein for disposing the end portion of said arm substantially on the longitudinal center of gravity of the chute, and means for swinging said chute about its axis.

JAMES E. O'BRIEN.

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