Jan. 30, 1923. 1,443,728.

O. L. COFFEY.

BRAKE.

FILED DEC. 22, 1920. 2 SHEETS—SHEET 1.

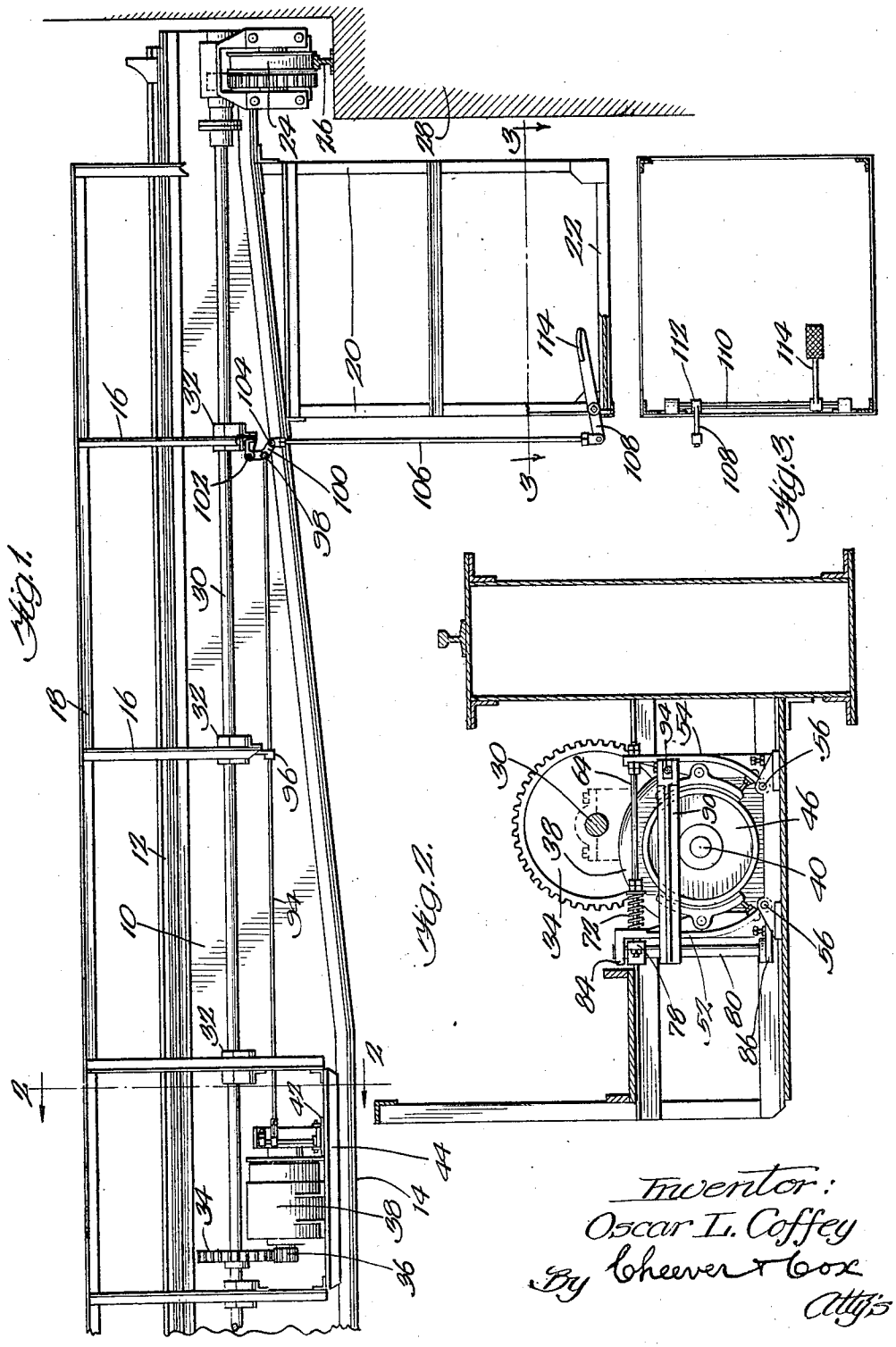


Fig. 1.

Fig. 2.

Fig. 3.

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Fig. 4.

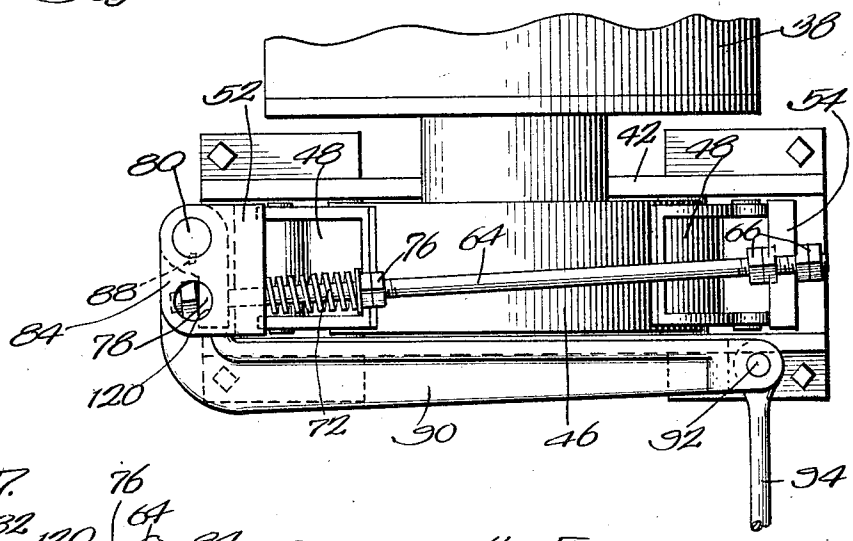


Fig. 7.

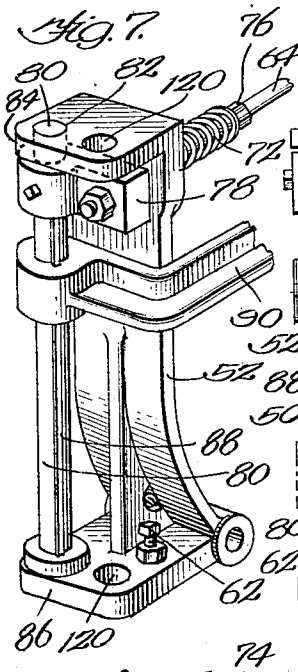


Fig. 5.

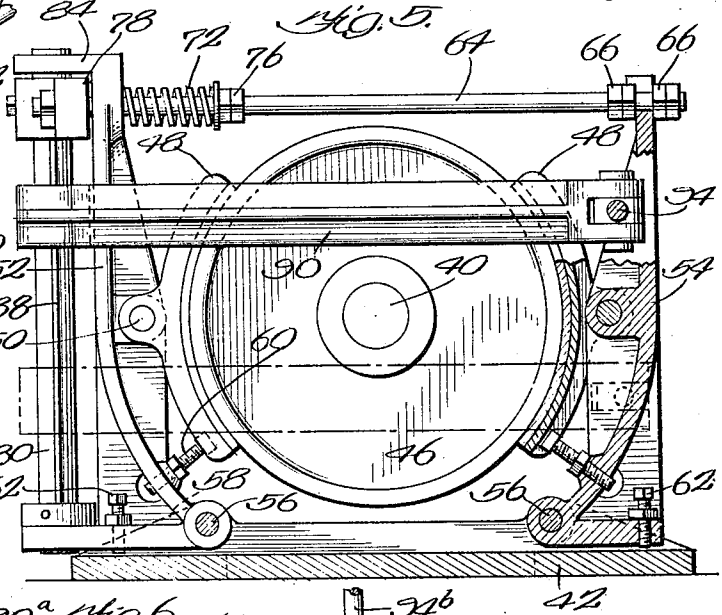
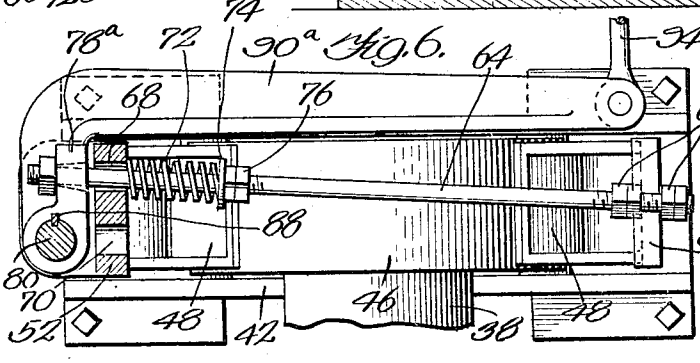


Fig. 6.



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Patented Jan. 30, 1923. 1,443,728

UNITED STATES PATENT OFFICE.

OSCAR L. COFFEY, OF HARVEY, ILLINOIS, ASSIGNOR TO WHITING CORPORATION, OF HARVEY, ILLINOIS, A CORPORATION OF ILLINOIS.

BRAKE.

Application filed December 22, 1920. Serial No. 432,385.

To all whom it may concern:

Be it known that I, OSCAR L. COFFEY, a citizen of the United States, residing at Harvey, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Brakes, of which the following is a specification.

This invention relates to brakes, however applied to the object, to be slowed down or stopped. The particular object of the invention is to provide a brake mechanism particularly one of the normally open type for use in connection with the power devices of traveling cranes, in modern construction electric cranes, which is of such a character that it can be readily adjusted to varying sizes of cranes and varying power mechanism equipments on the same crane, in such a way that the crane operator, in the cage provided for him, and in the position therein determined by other apparatus than the brake mechanism, can readily and conveniently operate the brake mechanism.

The invention consists in mechanism for carrying out the foregoing objects which can be easily and comparatively cheaply made, which is satisfactory in use and is not readily liable to get out of order. More particularly the invention consists in many special features fully set forth in the specification and claims.

Referring to the drawings in which like numerals designate the same part thruout the several views:—

Figure 1 is a side view of one portion of the crane, having the mechanism of this invention applied thereto.

Figure 2 is a sectional detail view taken on approximately the line 2—2 of Figure 1.

Figure 3 is a detail plan view on the line 3—3 of Figure 1.

Figure 4 is a plan view of the essential brake mechanism removed from other parts of the device.

Figure 5 is a face view, partially in section, of mechanism of Figure 4.

Figure 6 is an alternative construction from that of Figure 4, showing the operating lever reversed in assembling the device and the resulting corresponding changing parts.

Figure 7 is a perspective view of the left hand vertical member of Figures 4 and 5, viewed in approximately the direction of the arrow 7 of Figure 4.

Figure 1 shows one conventional form of traveling crane 10, having the usual flanged upper edge 12 and lower edge 14, the same carrying in the usual manner upright post 16 supporting a railing 18 in conventional construction. From the right hand end of the crane girder and attached parts is suspended the operator's cage 20 having working floor 22 on which he stands and moves about in the ordinary manner. The crane itself is carried on wheels 24 which travel on a conventional track 26 on conventional side wall supports. The wheels 24 are conventionally driven by a shaft 30, suitably journalled at points 32 along the crane, and receiving power thru conventional gearing 34—36 in operative relation with an electric motor 38 having a central operating shaft 40. Electric current is supplied by any suitable means not shown thru the motor 38 to cause it to rotate in conventional manner to drive the shaft 30 and consequently the wheels 24 to cause the crane to move along the track 26.

The problem to be solved by this invention is to provide brake mechanism, particularly of the open type for ready application to the shaft 30 or the shaft 40 and particularly to shaft 40, regardless of differences which may arise in constructing different cranes, in the position of the shaft 40 with reference to the shaft 30 and to other parts of the crane mechanism described.

The particular form of brake mechanism which accomplishes the desired result is shown in its preferred form in Figures 4 to 7 inclusive. A base plate 42 is provided, adapted for suitable placement on the same platform 44 of the crane which carries the motor 38, in suitable relation to the shaft 40 as illustrated in Figure 5. Shaft 40 carries above this platform 42 a conventional form of brake wheel 46. On each side of the brake wheel 46 are brake shoes 48, each pivoted at 50 to a vertically rockable member 52, or 54, as the case may be, which are in turn suitably pivoted to the base 42 on pivot pins 56 carried in lugs 58 rising from the base. In order to keep the brake shoes from dragging at their tops on brake wheel 46 each shoe is supported at its lower end by an adjustable screw 60 entering the adjacent supporting member 52 or 54 as the case may be. These last mentioned supports are adjustable

about their respective pivots 56 upward from the base 42 by adjusting screws 62, suitably installed in conventional form so that when these screws are released members 52 and 54 will respectively settle down toward the base 42 and when the screws are moved in the opposite direction these members will be tilted upward away from the base to adjust the brake shoes 48 closer to the brake wheel 46.

Extending across the top of brake wheel 46 is a horizontally disposed rod 64, loosely but more or less firmly connected to the upper end of member 54 by passing thru a suitable perforation in it and being engaged by the nuts 66. This connection is loose enough so that the rod 64 may, in assembling the parts, be selectively inserted thru a selected one of the holes 68 and 70 in the upper end of member 52. In either event the rod 64 is encased adjacent to member 52 in a spring 72 bearing at one end against member 52 and bearing at the other end against a washer 74 adjustably positioned along the rod by a nut 76 travelling on a suitable screw thread on the rod 64. By adjusting this nut 76 the pressure on spring 72 may be adjusted to more or less forcibly tend to move the upper end of member 52 away from the members 74 and thus consequently tend to force member 52 away from member 54 and thus separate the brake shoes 48. In the particular preferred form of construction shown in Figure 4 the rod 64 is inserted thru hole 70 which is in what will be referred to as the front edge of member 52. Under this condition the operating mechanism of Figures 4, 5, and 7 is used which comprises a short lever arm 78 suitably temporarily rigidly secured to a vertical shaft 80 journalled in holes 82 provided for it in lugs 84 and 86 projecting from the member 52 as clearly shown in Figure 7. The shaft 80 has splined to it thru a spline mechanism 88 an angular lever 90 projecting as shown in the drawings out from the side of the brake mechanism and thence around the front of the mechanism as shown in Figure 4, into a position where it may be engaged, thru the agency of suitable pin connection 92, by connecting rod 94, carried in suitable supports 96, along the edge of the crane girder. The opposite end of this rod 94 is connected at 98 intermediate of the ends of an angular lever 100, one of whose ends or arms is pivoted at 102 to the crane girder and whose opposite arm is pivoted at 104 to a vertical rod 106 adapted to be reciprocated upward by a lever 108 adjustable along a square shaft 110 by suitable adjustment nut 112. This squared shaft 110 is in turn rockable by foot lever 114 engageable by the foot of the operator in the cage 20. Attention is called at this point to the fact that by making the lever 108 adjustable along shaft 110 the constructor is not seriously troubled by the particular point at which a rod 106 comes down from crane girder to the cage, in making his connection with the foot lever 114 whose position is accurately determined for him by tools in the operator's cage which have no relationship whatever to the brake mechanism. In other words the lever 114 is positioned by independent mechanism and in constructing cranes with different sized motors, etc., the rod 106 will descend from the crane in quite variable positions along the shaft 110 and it is therefore absolutely necessary for satisfactory work to provide some sort of adjustment, such for instance as that here shown for readily attaching the parts together in operative position where they do happen to come together and this is accomplished by this invention.

The mechanism just described takes care of the operation of the brake when the operator's cage is on the side of the brake mechanism shown in Figure 1. If, however, it is necessary to conduct a rod performing the functions of a rod 94 in the opposite direction from that shown, viz: to the left of the brake mechanism as positioned in Figure 1 it is only necessary to provide an alternative form of lever whose form does not enter into this invention to take the place of the lever 90.

Attention is called to the fact that by making lever 90 adjustable vertically on the shaft 80 thru the agency of spline 88, the motor in the brake mechanism may be raised or lowered vertically within limits without changing the mounting of the rod 94 in the supports 96 provided for it on the crane girder. This takes care of the required adjustments which necessarily arise in using motors of different sizes and powers in place of motor 36 shown in the drawings.

If, for any reason, it is desired to operate the crane by a rod 94^b extending from the general brake mechanism in the opposite direction from rod 94 but in alignment therewith, the operator has only to make the change shown in Figure 6 in which in the particular case here illustrated, the shaft 80 is shifted from the holes 82 heretofore described, to other bearing holes 120, clearly appearing in Figure 7, provided for it, in which position the lever 78 in Figure 6 designated 78^a is reversed in position and the rod 64 is shifted from holes 70 to holes 68 in member 52 as clearly appearing in member 56. In this position member 90, designated as 90^a in Figure 6, produces exactly the same result when manipulated by rod 94^b that it did when rod 94 was manipulated, viz.: in each case when the lever is moved in one direction, the members 52 and 54 are moved toward each other against the action of spring 72 to force the brake shoes on to

the brake wheel and in the opposite movement the pressure on the spring 72 is released to allow it to therefore force members 52 to 54 apart and thus release the brake.

Especial attention is called to the particular mounting of the lever 100 and the power result of the same when it is operated by pressure on foot lever 114. When the operator presses downward on lever 114 he causes lever 106 to move in a counter clockwise direction about pivot 102. In the initial part of this movement the effective power acting to produce this rotation is the horizontal distance between the pivot 102 and the central axis of rod 106 as shown in Figure 1. As movement of rod 106 continues upward its pivot end 104 moves to the right in a counter clockwise direction about pivot 102 with the result that the effective lever arm becomes greater as the pivot 104 swings upward, becoming greatest when pivots 102 and 104 are in the same horizontal line. Conversely, in the position shown in the drawing, the lever arm effective between pivots 102 and pivots 98 to pull rod 94 is the distance between them, while as lever 100 moves in a counter clockwise direction and the pivot 98 swings upward, the effective lever arm about pivot 102 tending to cause pull to the right on rod 94 becomes less, decreasing until the free end of rod 94 swings up practically into contact with pivot 102. It, therefore, follows that this construction produces a very powerful result in that the effective power of rod 106 to pull rod 94 progressively increases as it moves upward.

While the devices described is applied especially to traveling cranes, it may be applied anywhere where its use would be desirable and without departing from the invention.

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 rotatable brake wheel, a base adjacent to said brake wheel, members pivoted to the base, adapted to swing toward and from the brake wheel on opposite sides thereof, means tending to hold said movable members apart and away from the brake wheel and a pivoted lever mechanism for moving said movable members toward the brake wheel, and means permitting shifting said lever mechanism along its own axis of rotation.

2. In mechanism of the class described, a brake wheel, pivotally mounted lever arms on opposite sides of the brake wheel, carrying brake shoes adapted to engage the wheel, a rod connected to one lever arm and passing thru a selected one of openings provided for it in the other arm, means carried by the rod tending to move the lever arms with reference to the wheel and a lever engaging said rod and selectively pivotable to the adjacent perforated lever arm in different positions, depending upon which opening in that arm the rod goes thru, whereby when the last mentioned lever is manipulated the first mentioned lever arms are moved against the action of the spring regardless of in which particular perforation in the lever arm, the rod may be inserted.

3. In mechanism of the class described, a brake lever arm provided with two separated perforations thru which a rod may pass, a rod selectively passable thru one of said perforations and a lever mechanism carried by the first lever selectively positionable in two different positions on the first lever corresponding to said perforations in the lever, operative in each position to manipulate the rod in the corresponding perforation in the lever.

4. In mechanism of the class described, a brake lever member, a shaft pivotally mounted on and wholly carried by the brake lever member, a rod extending from and reciprocatable with reference to the brake lever member, a lever carried by said shaft and engaging said rod to reciprocate it, and means for rocking the shaft for the purposes set forth.

5. In mechanism of the class described, a brake lever member, a shaft pivotally mounted on and carried by the brake lever member, a rod reciprocatable with reference to the brake lever member and a lever carried by said shaft and engaging said rod to reciprocate it, means for rocking the shaft for the purposes set forth, means for selectively bodily positioning said shaft in two different positions on opposite sides of the rod, and means enabling the shaft, in either of its positions, to operate the rod.

6. In mechanism of the class described, a brake lever member, a rod reciprocatable at an angle thereto, a selectively mountable in two different spaced apart openings in the brake lever member, a shaft pivotable to the brake lever member in two different sets of bearings provided for it, one adjacent to each opening thru which the rod may enter and a lever connecting between the shaft and rod, operatable in each alternative position of the shaft in one of its sets of openings and the rod in a corresponding one of its set of openings.

7. In mechanism of the class described, a brake lever member, a shaft running in general parallel to the length of the lever, pivoted thereto, mechanism connected to the brake lever member, operated by rocking of said shaft and an operating lever selectively positionable along the shaft adapted to operate in any of its positions, for the purposes set forth.

8. In mechanism of the class described, a brake lever member, a shaft running in gen-

eral parallel to the length of the lever, pivoted thereto, mechanism connected to the brake lever member, operated by rocking of said shaft and an operating lever selectively splined along the shaft adapted to operate in any of its positions, for the purposes set forth.

In witness whereof, I have hereunto subscribed my name in the presence of two witnesses.

OSCAR L. COFFEY.

Witnesses:
JOHN S. TOWNSEND,
PAUL W. BIELFELDT.

Certificate of Correction.

It is hereby certified that in Letters Patent No. 1,443,728, granted January 30, 1923, upon the application of Oscar L. Coffey, of Harvey, Illinois, for an improvement in "Brakes," an error appears in the printed specification requiring correction as follows: Page 3, line 109, claim 6, strike out the article "a"; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 27th day of February, A. D., 1923.

[SEAL.]

KARL FENNING,
Acting Commissioner of Patents.