To all whom it may concern:

Be it known that I, WILFRIED SALMON, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Locomotive-Pedestal Grinders, of which the following is a specification.

My invention relates to improvements in locomotive pedestal grinders, its object being to provide an improved machine which can be adjusted to the pedestals wherein the axle boxes are supported, and by which the inner sides of the pedestal can be accurately and expeditiously ground.

It is well known that the axes of a locomotive must be arranged and held with the utmost exactness in a position at right angles with the longitudinal axis of the engine, so that they will run true upon the rails, and the wheel at one end of the axle shall not stand in advance of the wheel upon the other end of the axle. The axes are supported in journal boxes, which are wedged tightly between the sides or legs of the pedestal, but the shocks upon the locomotive axle, as the engine is running, are communicated to the journal box and thence to the pedestal, so that the inner sides of the pedestal gradually become worn out of true and allow the axle to work out of position. When this occurs the inner sides of the pedestal must be ground again to a plane surface. The present device is designed to afford means for performing this operation expeditiously and accurately by machinery.

More particularly the invention consists in the construction, combination and arrangement of parts herein described and claimed.

In the accompanying drawings forming part of this specification, Figure 1 is a perspective view of a fragment of a locomotive pedestal showing the relation of the engine axle thereto; Figure 2 is a front view of my improved pedestal grinder fitted to the pedestal in operative position, the pedestal and pedestal grinder being partly broken away; Figure 3 is a side view of the same with the pedestal in vertical section on line T—T of Figure 1; Figure 4 is a front view of an upper fragment of the machine and pedestal showing the machine adjusted to work upon the other leg of the pedestal; Figure 5 is a vertical section on line v—v of Figure 3; Figure 6 is a vertical section on line w—w of Figure 3; Figure 7 is a vertical section on line x—x of Figure 3; Figure 8 is a vertical section on line z—z of Figure 7; Figure 9 is a detail of the clamping means for the wheel shaft box; Figure 10 is a front view of the feed operating and shifting mechanism for the vertical feed screw, showing the clutch members disengaged; Figure 11 is a similar view showing the clutch in engagement with one of the gears and at the limit of its upward travel; Figure 12 is a detail showing the spring lock for the feed shifter; Figure 13 is a vertical section on line u—u of Figure 7; Figure 14 is a vertical section on line e—e of Figure 7, and Figure 15 is a vertical section on line v—v of Figure 10, with some parts broken away.

As shown in the drawings, A represents a locomotive pedestal constructed in the usual manner with a leg 2 having a vertical inner side and a leg 3 having an inner side extending downwardly and outwardly so as to permit the insertion from below of a wedge for wedging the axle box (not shown) tightly between the legs of the pedestal. In the axle box is rotatably supported the axle 4.

My improved machine is designed to be pivotally suspended from the top of the pedestal and braced at the bottom upon the sides of the pedestal. For this purpose a clamp B is secured to the top of the pedestal by means of clamping bolts 5. Separating screws 6 are also provided to force the clamping members apart and release the same from the pedestal. The machine proper consists of a frame C having spaced vertical guides 7. The frame is suspended from the clamp B by means of a pivot bolt 8 which passes freely through the frame and is screwed into the clamp. It is arranged at one side to allow the frame to swing freely toward the slanting leg 3 of the pedestal. The frame is secured in adjusted positions by means of an adjusting bolt 9, which passes through a slotted hole 10 in the frame. The frame is braced at the bottom upon the legs of the pedestal by means of links 11 pivotally secured to adjustment bolts 12 upon the frame and 13 upon the clamps E. The bolts 13 are slidably arranged in the vertical slots 15 in the frame and the other ends of the links are formed with slots 16 to receive the bolts 13 on which the links can thus slide.
bolts 13 may be tightened upon the links by means of nuts 14. The clamps E are removable secured to the lower ends of the legs 2 and 3 of the pedestal by any suitable means, such as the set screws 50.

D is the main cross head which is slidable up and down in the vertical guides 7. Fast upon the back of the cross head is a plate or flange 17 which carries a rearwardly extending U-shaped or forked horizontal cross guide 18. On this guide is slidingly supported a horizontal cross head F, which may be adjusted forward or back by turning the operating handle 19 of the cross-feed screw 20. This screw is square threaded, and passes through a hole which is partly in one of the arms of the guide 18 and partly in the cross head F, as shown in Figs. 7 and 5. As the cross head alone is threaded it will be moved back and forth as the screw is turned.

The main driving shaft 22 is journaled in the downwardly extending gear case 23 of the cross head F, as well as in the flange 17 of the main cross head D. It has a key way 21 its entire length, and feathered upon it within the gear case is a bevel gear 24, which meshes with a bevel gear 25 mounted upon a vertical shaft 26 extending up through the cross head F. This shaft carries at its upper end a bevel gear 27 which is arranged in a recess at the top of the cross head and meshes with a bevel gear 28 upon the horizontal shaft 29 of the cupped grinding wheel 30. Thus the grinding wheel is operated from the main shaft through the medium of these gears. It will be observed that as the gear 24 is feathered upon the main shaft it will permit the cross head F to be adjusted back and forth upon the horizontal guide 18 by means of the feed screw 20.

In order that the cupped wheel may be adjusted to either leg of the pedestal, and set at different angles, the shaft 29 must be capable of being turned on a vertical axis. For this purpose the shaft is journaled in a rotatable housing 32 which fits snugly and rotatably over the cross head, to which it is held by means of screws 33 which engage a split ring 34 in an annular groove in the cross head. The side flange 31 of the housing is split to form a pinch collar, as illustrated in Fig. 8, and formed with ears 35 which are tightened together by means of a clamping bolt 36, whereby the housing may be made fast to the cross head. When the clamping bolt is unscrewed, the housing and emery wheel may be turned around through any angle, and held there by again tightening the bolt.

To permit the emery wheel to be fed in and out toward and away from the surface to be ground, the gear 28 is feathered upon the shaft 29, as shown in Fig. 14, and is self prevented from longitudinal movement by being closely held within a recess 41 in the cross head. The rear portion of the shaft is reduced in diameter and over this reduced portion is fitted an exteriorly threaded sleeve 37 which is confined and held between the shoulder 67 of the shaft, and the terminal nut 68 fast upon the end of the shaft. The sleeve is threaded through a hand wheel 39 which is rotatably secured to the shaft housing. The sleeve is not threaded into the housing but is feathered to it by means of the feather 40, whereby it is held from turning with the shaft. The sleeve and wheel 39 thus serve merely to feed the emery wheel shaft back and forth through the bevel gear 28, without rotating with it. The emery wheel 30 is cupped, as shown in the drawings in order that it may present a flat grinding surface to the pedestal. If it were made with a solid face, the face would become rounded by wear so that it would not grind the pedestal flat.

The main cross head D is moved up and down in the guides 7 by means of a threaded feed screw 42, which is rotatably supported at top and bottom in bearing brackets 43 and passes intermittently through the upper box 44 and the lower box 45 upon the cross head. Not being threaded through the brackets, the screw has no up and down progression, but merely turns. Neither is it threaded through the lower box 45, which serves merely as a bearing; but it has threaded engagement with the upper box 44 as will be clearly seen from Fig. 13, so that when the screw is turned the main cross head will be moved up and down upon it. The cross head may be adjusted to work at any desired height upon the frame by turning the feed screw, its lower end being provided with a handle 64 for that purpose.

Arranged a suitable distance apart from the feed screw are two stop nuts 46, which may be adjusted as far apart as desired, to limit the upward and downward travel of the cross head, as will be described later. Between the stop nuts is a feed shifter 47 having inwardly turned arms 48 through which the feed screw passes freely and rotatably, as shown in Fig. 15. These arms stand outside of the upper and lower cross head boxes 44 and 45, but within the stop nuts 46. The feed screw is provided with a key way 49 extending up and down its entire length.

Sleeved upon the feed screw between the boxes 44 and 45 is an annular clutch 51. This is secured to the clutch shifter 47 by means of a ring 52 which is sleeved within an annular recess on the outside of the clutch. The ring is secured to the feed shifter by means of a pin or bolt 53. The clutch is formed at each end with teeth or serrations in position to engage the oppositely disposed
teeth upon the bevel gears 54 and 55 which are oppositely sleeved upon the feed screw above and below it, respectively, the upper gear 54 standing between the clutch and upper box 44 of the cross head, and the lower gear 55 standing between the clutch and lower box 45 of the cross head. These gears intermesh with a vertical bevel gear 56, which is operated from the main driving shaft 22 by means of a spur gear 57 upon the driving shaft, an idler gear 58, and a gear 59 integral with, or upon the shaft of, the bevel gear 56. Thus, when the driving shaft 22 is turned, it will, through the medium of these gears drive the bevel gears 54 and 55 in opposite directions, and the clutch will be turned by whichever of these gears is in engagement with it. The clutch, being feathered to the feed screw will turn the feed screw, and the feed screw in turn, by reason of its threaded engagement with the box 44 of the cross head, will move the cross head up or down according to the direction in which it is turned by the clutch. When the clutch is not in engagement with either of the gears 54 and 55 above and below it, the parts will stand in the position shown in Fig. 10, and the rotation of the gears will not be communicated to the clutch or feed screw. When the clutch is engaged by the upper bevel gear 54, the clutch and screw will be turned in a direction to raise the cross head and feed shifter, and these parts will continue to move up until the upper arm of the feed shifter strikes the upper stop nut 46, as shown in Fig. 11. This will prevent the clutch shifter from moving up farther, but the cross head will continue to travel up, carrying with it the upper and lower clutch gears 54 and 55, which are fast to it. As the clutch remains stationary on account of its rigid connection with the clutch shifter, the upper clutch gear 54 will move up out of engagement with the clutch, while the lower gear 55 will at the same time move up into engagement with the lower end of the clutch and turn it in the opposite direction, thereby reversing the direction of the feed screw so that it will carry the cross head down again. The cross head will thus be carried automatically up and down as long as the power is applied to the driving shaft. It will be evident that there is a moment of time in the operation of the machine when the clutch has been released from one of the gears and has not yet been engaged by the other gear, for it must be free from one gear before it is engaged by the other. During this interval the clutch will be unactuated and inoperative. To make the interval as short as possible, the feed shifter 47 is provided with a trigger 60 having concaved or dished sides, in position to engage by the spring knob 61 carried by a spring 62 upon the box 44. When the clutch is in intermediate position, out of engagement with both clutch gears, the knob will rest against the end or nose of the trigger, as shown in Fig. 10; while, when the clutch is in engagement with the upper gear 54, as shown in Fig. 11, the cross head being then on its upward travel, the knob will lie just below the trigger. In Fig. 11 the parts are shown in the position assumed by them when the upper feed shifter arm has just engaged the upper stop nut. As the cross head continues to travel up, the knob 61 will ride up on the trigger. The instant it reaches the "dead center" position against the nose of the trigger, as shown in Fig. 10, it will ride down the upper side of the trigger as shown in Fig. 12, thrusting the trigger and feed shifter down and throwing the clutch into engagement with the lower clutch gear 55.

In Fig. 1 is indicated by the dotted line the way in which the sides of the pedestal are apt to become worn. To grind the leg 2 so as to give it a plane surface, the pedestal grinder is hung and secured in the position shown in Fig. 2, the main cross head D being adjusted to the requisite height by means of the handle 64 upon the lower end of the feed screw, and the stop nuts 46 being adjusted to permit the requisite length of up and down travel of the cross head. The frame is swung upon the pivot bolt 8 until the emery wheel 41 is against, or parallel with, the surface to be ground, when the adjusting bolts 9 and 13 are tightened to hold the frame in that position. If the emery wheel is not then in engagement with the pedestal leg, it can be moved forward against it by means of the hand wheel 39; and if it is too near the front or back of the leg it can be moved laterally by means of the feed screw 20. The main shaft 22 may be driven from any suitable source of power. When driven, it will, through the medium of the gears 24 and 25, and 27 and 28, cause the emery wheel to rotate, and will also, through the medium of the spur gears 37, 38 and 59, and the bevel gears 54, 55, and 56, and the clutch and reversing mechanism above described, cause the cross head D, with the emery wheel carried thereby, to work up and down. Thus the grinding wheel will not only be rotated, but will be moved up and down over the surface to be ground.

To adjust the emery wheel for operating upon the slanting leg 3, the split flange 21 is loosened by unscrewing the bolt 31 and the housing of the wheel shaft is turned half way around. When the wheel has been turned into the desired position the flange is again tightened. The adjusting bolts 9 and 13 by which the frame is held in position are then released, and the frame is swung sideways upon its pivot 8 until the guides 7 and the face of the emery wheel are parallel with
the inner side of the leg 3, as shown in Fig. 4. The bolts 9 and 13 are then tightened again.

It is evident that various modifications may be made in the details of construction without departing from the principle of the invention, the scope of which is defined in the claims.

I claim as my invention:

1. A grinder for locomotive pedestals comprising a frame adapted to be pivotally hung upon the pedestal, a power shaft, a grinding wheel in position to work on the pedestal face to be ground and rotatable from the power shaft, and reverse feed mechanism also operated by said power shaft for vertically reciprocating the wheel.

2. A grinder for locomotive pedestals comprising a frame adapted to be adjustably supported upon the pedestal, a vertically movable cross head carried by the frame, a horizontally adjustable cross head carried by the vertical cross head, a grinding wheel journaled in said horizontal cross head, and means actuated from the same source of power for simultaneously rotating the grinding wheel and automatically reciprocating the vertical cross head.

3. A grinder for locomotive pedestals comprising a frame adapted to be adjustably secured upon the pedestal, a vertically movable cross head carried by the frame, a horizontal cross head upon the rear of said vertical cross head, a bearing case supported upon the horizontal cross head and rotatable on a vertical axis, a grinding wheel journaled in the bearing case upon a horizontal axis, and a driving shaft slideable in the horizontal cross head and operatively connected with the vertical cross head and grinding wheel.

4. In a pedestal grinder, the combination with the frame, of a vertically reciprocating cross head supported therein, spaced upper and lower boxes carried on the face of said cross head, a screw rotatably supported on the frame and passing through both of said boxes, having screw threaded engagement with one and passing freely through the other box, stop nuts carried by the screw above and below said boxes, a feed shifter with apertured inturned arms slideable upon the screw between said boxes and stop nuts, clutch gears oppositely arranged upon said screw between said boxes, a clutch feathered upon said screw between the clutch gears and having rotatable support upon the feed shifter, a grinding wheel rotatably supported by the cross head, and means carried by the frame for simultaneously rotating the grinding wheel and actuating the clutch gears, whereby the cross head is reciprocated up and down.

5. A grinder for locomotive pedestals comprising a frame adapted to be adjustably supported upon the pedestal, a vertically movable cross head carried by the frame, a bracket supported upon the rear of the cross head, a grinding wheel rotatably supported upon said bracket in position to work upon the pedestal face to be ground, a power shaft supported in said bracket and in the cross head and operatively connected with the grinding wheel, and mechanism carried by the cross head and operatively connected with said power shaft for automatically reversing the feed of the cross head, whereby the cross head is reciprocated simultaneously with the rotation of the grinding wheel.

6. A grinder for locomotive pedestals comprising a frame adapted to be adjustably secured upon a pedestal, a vertically reciprocating cross head carried by the frame, a horizontal cross head upon the rear of said vertical cross head, a grinding wheel journaled in the horizontal cross head, a power shaft journaled in the vertical cross head, and having sliding journal support in the horizontal cross head, reverse feed mechanism carried by the vertical cross head, and gears upon the power shaft operatively connected with the shaft of the grinding wheel and with said reverse feed mechanism, whereby the travel of the cross head is vertically reciprocated simultaneously with the rotation of the grinding wheel.

In testimony whereof I affix my signature in presence of two witnesses.

WILFRIED SALMON.

Witnesses:
ARTHUR P. LOTHROP,
H. SMITH.