Sept. 4, 1956 E. P. HORN 2,761,639

EXPANSION COMPENSATING PEDESTAL

Filed March 10, 1953

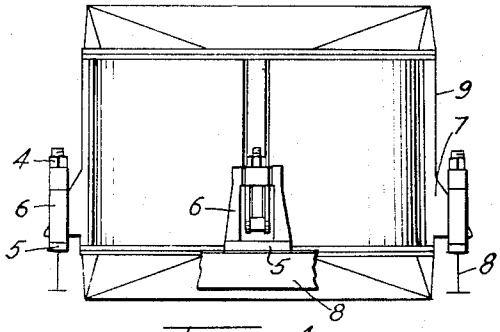


Fig. 4.

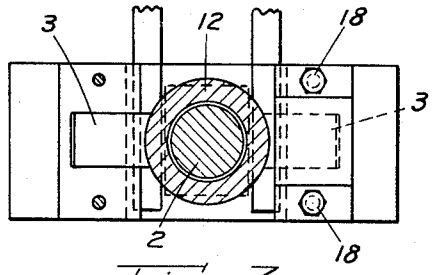


Fig. 3.

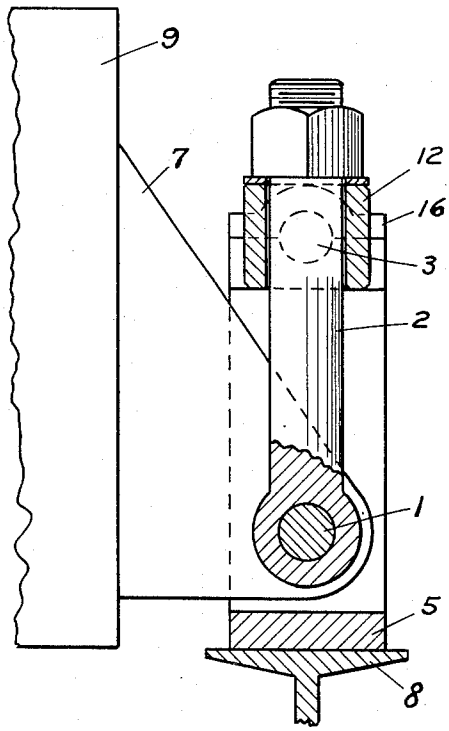


Fig. 2.

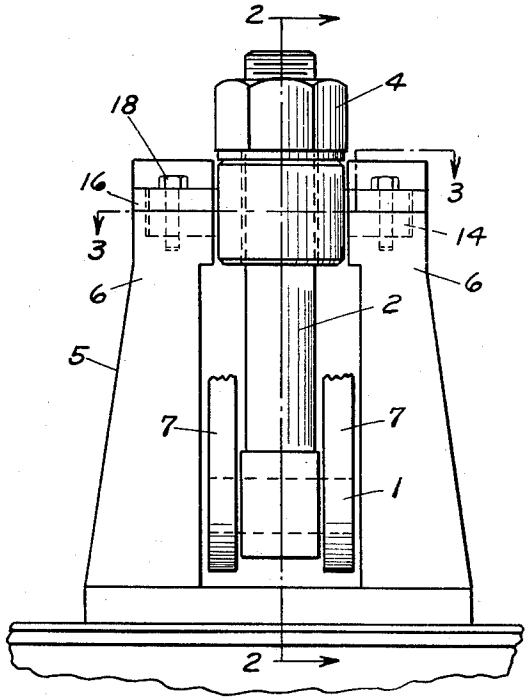


Fig. 1.

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EXPANSION COMPENSATING PEDESTAL

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1 Claim. (Cl. 248—17)

The present invention relates to an improved mounting means for heavy machinery which is subject to a great amount of thermal expansion, and particularly to an adjustable level pedestal type mounting for a rotary type regenerative air preheater.

In heat exchangers of the rotary regenerative type where heating gases and relatively cooler air to be heated pass through passages in a rotor on opposite sides of a plane through its vertical axis, the structural steel work of the housing and the housing supports becomes subjected to great strains due to the unequal expansion and contraction of the members being exposed to widely varying temperatures.

It is usually the custom to support an air preheater of the type referred to herein by resting it directly upon a plurality of circumferentially spaced sliding pad type mountings which in turn rest directly upon a supporting framework of steel beams. These sliding mountings have a low coefficient of friction; however, they do require a substantial force to move them out or in over the support beam as the preheater expands or contracts with the changing temperature. In the pedestal type mounting of this invention the force required to slide the preheater mountings out or in is greatly reduced by a novel leverage system more readily understood by reference to the accompanying drawings.

Figure 1 is an elevational view of the pedestal type mounting embodying the present invention.

Figure 2 is an elevation, partly in section as seen from line 2—2 of Figure 1.

Figure 3 is a plan view, partly in section as seen from line 3—3 of Figure 1.

Figure 4 is a side elevation of a cylindrical body supported by a plurality of circumferentially spaced support pedestals.

In the drawing a bifurcated pedestal 5 rests directly upon the support framework of beams 8 which are of design strength sufficient to support the entire preheater structure. Spanning the ends of the bifurcates 6 the pedestal 5 is a member comprising two trunnion-like arms 3 projecting outwardly from diametrically opposite sides of a sleeve 12 having a vertically extending bore. Each of the outwardly extending arms 3 rests in a semi-cylindrical recess 14 formed in an upper end face of each bifurcate 6 of the bifurcated pedestal 5. Fitting over each arm 3 is a retaining cap 16 bolted to the upwardly extending bifurcates 6 of pedestal 5 by paired bolts 18.

Passing through the vertically disposed bore 10 in the sleeve 3 is a tension member 2 having its upper end threaded to receive a nut 4 and its lower end drilled and reamed to produce a press fit with a pin 1 which connects paired machinery support arms 7 to the tension member 2. The machinery support arms 7 are attached

to the preheater housing 9 at a plurality of spaced locations, the number of which is dependent upon the size and weight of the unit to be supported.

When installing an adjustable machinery pedestal of this type it is not necessary that the support beams 8 be absolutely level since by the adjustable pedestal of this invention the machine carried may be readily leveled by a simple adjustment, up or down, of the nut 4.

Since the machine weight is supported at each pedestal by a tension member 2 of uniform cross section, the portion of the total weight carried by each pedestal may be readily determined by use of a strain gage or extensometer when applied to each tension link.

In a sliding pad mount of the type commonly used to support heavy machinery, the force required to slide the machinery leg out on its pad support is equal to the weight carried on a leg times the coefficient of friction. In the pedestal type mounting of the type herein described, the force required to move the machinery leg out is greatly reduced, because the tension member 2 acts as a lever with a mechanical advantage equal to the lever length "L" divided by the radius "R" of the pin 3. Since friction acts on both pins 1 and 3, the force required would equal twice the weight carried by the pedestal times the coefficient of friction, times the ratio of R/L (see Figure 2 of drawing). As an example, if the pedestal carried 30,000 pounds, $L=15$ inch, $R=1$ inch, and the coefficient of friction=0.10, the force required to move the link would equal 400 pounds. On a sliding pad foot, the force required would equal $30{,}000\times0.10$ or 3000 pounds. Varying the length of tension member 2 will produce a corresponding variation in the force required to move the linkage.

What I claim is:

A support for a rotary regenerative air preheater having a housing comprised of a plurality of diametrically located support pedestals adapted to be positioned outward of the outer periphery of the housing; each pedestal comprising a bifurcated member having a base portion mounted upon a horizontally disposed support means and a pair of vertical members extended in spaced relation from the ends of said base portion, a metallic sleeve having oppositely extended horizontal arms, means pivotally supporting the arms on the end faces of said vertical members; cap means on the ends of the vertical members overlying the end portions of the arms; a tension member extended slideably through the sleeve and terminating adjacent the horizontal base portion; a pair of parallel support arms adapted to be attached to the housing; means pivotally connecting said arms to the lower end portion of the tension member, said means having an axis parallel to the axis of the means pivotally supporting the oppositely extended arms whereby the radial arms are supported for movement in a single plane and means longitudinally moveable along the tension member contacting the upper end faces of the sleeve to properly position the lower portion of said tension member.

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