

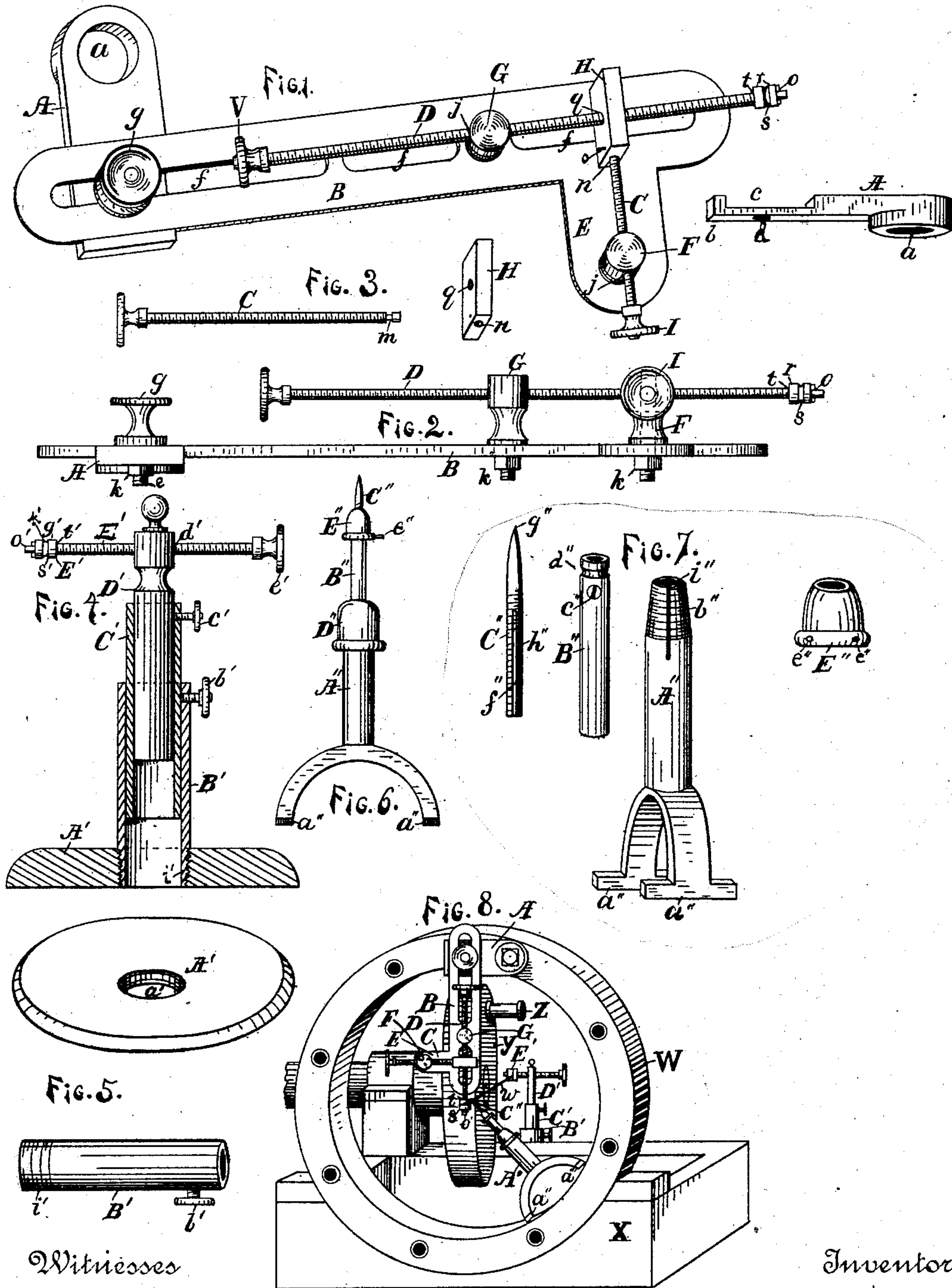
(No Model.)

C. E. BARNES.

DEVICE FOR ALIGNING STEAM ENGINES.

No. 374,168.

Patented Dec. 6, 1887.



Witnesses

George H. White
James C. Wiley

Inventor

Cortez E. Barnes
By his Attorney
Isidore J. Wiley

UNITED STATES PATENT OFFICE.

CORTEZ E. BARNES, OF REED CITY, MICHIGAN.

DEVICE FOR ALIGNING STEAM-ENGINES.

SPECIFICATION forming part of Letters Patent No. 374,168, dated December 6, 1887.

Application filed March 24, 1887. Serial No. 232,316. (No model.)

To all whom it may concern:

Be it known that I, CORTEZ E. BARNES, a citizen of the United States, residing at Reed City, in the county of Osceola and State of Michigan, have invented a new and useful Device for Aligning Steam-Engines, of which the following is a specification.

My invention relates to improvements in the means of supporting and adjusting a line for the purpose of aligning steam-engines; and the objects of my invention are, first, to provide a support for the line that may be used on any engine regardless of the size or diameter of the cylinder; second, to provide for perfectly adjusting the line to the position required by means of adjusting rods, screws, &c.; third, to provide a support for the line that may be attached to one point only on the cylinder and will leave the greatest possible amount of space clear for the use of calipers; and, fourth, to provide calipers that will invariably point to the center of the cylinder and stand directly at right angles with the walls of the cylinder, thus obviating the danger of carrying over beyond a direct line and insuring the procuring of the exact center of the cylinder. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of the first feature of my invention. Fig. 2 is a side view of the same. Fig. 3 is a view of its several parts detached. Fig. 4 is a sectional view of the second feature of my invention. Fig. 5 is a view of its several parts detached. Fig. 6 is a view of the third feature of my invention. Fig. 7 is a view of its several parts detached, and Fig. 8 shows my invention as applied to use on an engine.

Similar letters refer to similar parts throughout the several views.

The base or support A, the body or bar B, the adjusting-rods C and D, and the supports F, G, and H constitute the main features of the portion of my invention that is attached to the cylinder of an engine for the purpose of supporting and adjusting the line. The base A', the standard B', the extensions C' and D', and the adjusting-rod E' constitute the main features of the portion of my invention that stands at the foot of the engine for a like purpose; and the base A'', the extensions B'' and C'', and the nuts D'' and E'' constitute the main

features of the central portion of my invention, or the calipers.

W is the cylinder, X is the engine-bed, Y is the main shaft and crank, and Z is the wrist-pin, of an engine.

The base or support A is provided with a hole, *a*, by means of which it is secured to the end of the cylinder with one of the bolts used for holding the cylinder-head in place, and with a body, *b*, which has a rabbet or groove, *c*, across one side for the reception of the body or bar B, and a hole, *d*, for the reception of a bolt, *e*, used in securing the body or bar B to the base or support A. The body or bar B is made of a proper width or thickness to work freely in the rabbet or groove *b* in the base, is provided with slots *fff* for the reception of the bolt *e* and for the purpose of regulating this bar to correspond with the size of the cylinder, and is provided with an arm, E, at one end for the support of the adjusting-rod C. This arm may be made a part of the body B, or it may be made separate and extend over and be bolted to the body in such a manner that it will adjust itself to the position of the adjusting-rod. The adjusting-rod C is provided at one end with a head or thumb piece, I, to facilitate turning the same, has a screw-thread cut its entire length, and is provided at its opposite end with a shoulder and groove, *m*, for the reception and support of the nut H. This adjusting-rod is supported by a standard, F, which is provided with a hole through its outer end arranged with a screw-thread for the reception of this adjusting-rod, and is secured to the body or bar B by passing through a hole in the arm E, and held in place by means of a nut, *k*, in such a manner that it can have a slightly-oscillating motion, so as to adjust itself to the position of the rod.

The nut H is provided on one edge with a hole, *n*, for the reception of the end of the regulating-rod C, and is secured to this rod by means of a pin, *o*, passing through the nut and resting in the groove *m* on the end of the rod. This nut is made wide enough to extend from beyond the adjusting-rods to the face of the body or bar B, thus furnishing a support for the rods when the line is strained, and is provided with a hole, *q*, arranged with a screw-thread for the reception of the adjusting-rod D, and it fits upon the end of the adjusting-

rod C loose enough to allow the rod to turn freely and to allow a slight vibratory motion to the nut, so that it will adjust itself to the position of the adjusting-rods.

- 5 The regulating or adjusting rod D is formed with a head or thumb piece, V, on one end, and is provided with a screw-thread its entire length, arranged to work freely in the hole i in the standard G and the hole q in the nut H, and is turned smooth at one end for the reception of a loose collar or sleeve, r , which is made of a proper size to allow the end of the rod to turn freely in it, and is provided with a groove, s , for the reception of the line w , and is held in place by the shoulder t and the pin o , which passes through the end of the rod. This rod is held in place by means of the standard G, which is provided with a hole, i , arranged with a screw-thread for the reception of the rod, and is secured to the body or bar B by passing through the same, and is held in place by the nut k in such a manner as to allow of a slightly-oscillating motion, so that it may adjust itself to the position of the rod.
- 25 The standards F and G should be made long enough to allow the thumb screw or nut g on the bolt e to pass between the head of the adjusting-rod D and the body B when adjusting my appliance for centering small cylinders.
- 30 In the second feature of my invention the base A' is secured to the floor or other convenient place at the foot of the engine by means of screws or other device, and is provided with a hole, a' , which is arranged with a screw-thread for the reception of the standard B'. The standard B' is made hollow its entire length and is fitted for the reception of the extension C', and is provided at its lower end with a screw-thread, i' , arranged to mesh in the screw-thread in the hole a' in the base, and at its upper end with a set-screw, b' , for the purpose of holding the extension C' in position. The extension C' is made of a proper size to fit closely but freely inside of the standard B', and, when more than one extension is used, is made hollow for the reception of an additional extension, and is provided at its upper end with a set-screw, c' , for the purpose of holding the extension D' in position, and it is held in position by means of the set-screw b' in the standard B'. The extension D' is made of a proper size to fit closely but freely inside of the extension C', and, when no other extensions are used, is made solid and provided at its upper end with a hole, d' , passing through it at right angles, and provided with a screw-thread for the reception of the adjusting-rod E', and is held in position by means of the set-screw c' in the extension C'. The adjusting-rod E' is provided at one end with a head or thumb piece, e' , and has a screw-thread its entire length, arranged to work freely in the screw-thread in the hole d' in the extension D'. It is turned off at g' for the reception of the loose collar or sleeve g' , which is made of a proper size to allow the end of the rod to turn freely, and is held in place by means of the

shoulder t' and the pin o' . This collar is provided with a groove, k' , for the reception and support of the line w .

In the third feature of my invention the base A'' is provided with two divergent feet, $a'' a''$, made broad and arranged to fit the inside circle of the cylinder, and is made hollow and fitted for the reception of the extension B''. The upper end of this body A'' is made tapering and provided with a screw-thread, b'' , and is split down in such a manner that when the nut D'' is screwed on the end or clamp i'' of the body A'' will press equally on all sides of the extension B'', thus holding it at all times in exact line with the base. The nut D'' is made long, so as to be handled conveniently, is made tapering inside, and is provided with a screw-thread and arranged to fit over the end of the body A'' and mesh freely in the screw-threads b'' . The extension B'' is made of a proper size to fit closely but freely inside of the body A'', is made hollow its entire length, and fitted for the reception of the extension C''. Near its upper end and on one side is a short set-screw, c'' , which passes through the wall and extends a sufficient distance inside to enter a groove, f'' , in the side of the extension C'' for the purpose of preventing this extension from turning. The upper end of the extension B'' is turned off and provided with a groove, d'' , for the purpose of securing the nut E'', as hereinafter described. The nut E'' is turned out at one end to a proper size to fit closely but freely over the end of the extension B'', and is secured to this extension by means of rivets $e'' e''$, passing through the sides of the nut and lying in the groove d'' in such a manner as to allow the nut to turn freely on the end of the extension, or it may be secured by means of screws or other device. The hole at the other end of the nut is made smaller and is provided with a screw-thread arranged to work freely in a corresponding screw-thread on the outside of the extension C''. The extension C'' is made of a proper size to fit closely but freely inside of the extension B'', and is provided on one side with a groove, f'' , which is arranged to receive the screw c'' and allow it to work freely thereon for the purpose of preventing this extension from turning when being drawn out or in by the action of the nut E''. It is also provided with a screw-thread, h'' , extending nearly its entire length and arranged to mesh freely with the screw-thread inside of the nut E'' for the purpose of extending or withdrawing this extension by turning the nut E'' to the right or left. The point g'' of this extension is made of a proper size and form to work conveniently on the line, and is so arranged that it is at all times exactly equidistant from the points $a'' a''$, so that, whether extended or withdrawn, it will always point directly to the center of the cylinder, whether the same be large or small.

To use my appliance, which may be made of steel, brass, or other suitable material, attach the base A to the end of the cylinder by means

of one of the bolts that hold the cylinder-head in place. Carry the end of the body or bar B around until it approaches the center of the cylinder sidewise and screw the base A 5 firmly to the end of the cylinder, and, loosening the thumb-screw *g* on the bolt *e*, slide the bar B back or ahead until the end of the adjusting-rod D at *r* stands at or near the center of the cylinder. Then set the thumbscrew 10 or nut *g* up solidly and secure the bar B firmly in place. Bolt the base A' to the floor or other convenient place at the foot of the engine, raise the extensions C' and D', and arrange the adjusting-rod E' so that the sleeve *g'* will stand 15 nearly or quite in line with the center of the cylinder. Attach the line *w* to the collars *r* and *g'* on the adjusting-rods D and E' and strain to the desired tension. Stand the calipers on the bottom of the cylinder and raise 20 or lower the extension B'' until the point of the extension C'' stands at or near the center of the cylinder. Then carry the line sidewise by turning the adjusting-rod C until the line comes directly over the point of the calipers. 25 Place the calipers in the opposite end of the cylinder in like manner and turn the adjusting-rod E' until the line comes directly over the point of the calipers at this end. Place the calipers on the side of the cylinder and raise 30 or lower the line at one end by means of turning the adjusting-rod D until the line stands in its proper position, and at the other end by means of raising or lowering the extension C' or D'. Then carry the point of the calipers to 35 position by turning the nut E'' and manipulate the line by means of the adjusting-rods and extensions until the desired result is attained.

The portion A B of my device may be used 40 without the adjusting-rods by attaching the line to the end of the bar B and adjusting to the center of the cylinder by turning the base A from side to side on the bolt that supports it, and sliding the bar B out or back in the 45 groove *c*; but I prefer the use of the adjusting-rods, as thereby greater accuracy can be attained in aligning the engine.

Having thus fully described my invention, what I claim as new, and desire to secure by 50 Letters Patent of the United States, is—

1. In an appliance for aligning steam-engines, the head-piece having a base, A, bar B, with slots *f*, bolt *e*, adjusting-rods C and D, standards F and G, and the sleeve or collar *r*, 55 a foot-piece having base A', standard B', extensions C' and D', adjusting-rod E', and collar *g'*, and a center piece having body A'', with feet *a'' a''*, extensions B'' and C'', and nuts D'' and E'', substantially as and for the purpose 60 set forth.

2. In a device for aligning steam-engines, the base A, having body *b*, provided with a rabbet or groove, *c*, for the reception of the bar B, hole *a*, and bolt *e*, in combination with the 65 slotted bar B, substantially as specified.

3. In a device for aligning steam-engines, the base A, with bolt *e*, and the slotted bar B,

with arm E, in combination with the standards F and G, the adjusting-rods C and D, the nut H, and the sleeve *r*, substantially as and 70 for the purpose set forth.

4. The combination, in an appliance for aligning steam-engines, of the base A', the body B', the extensions C' and D', the adjusting-rod E', and the collar or sleeve *g'*, substan- 75 tially as and for the purpose set forth.

5. The combination, in an appliance for aligning steam-engines, of the body A'', having feet *a'' a''*, the extension B'', having groove *d''* and set-screw *c''*, the nut D'', arranged to 80 fit over the body A'' at *b''*, the extension C'', having groove *f''* and screw-thread *h''*, and the nut E'', substantially as and for the purpose set forth.

6. The combination, in an appliance for 85 aligning steam-engines, of the base A, the bar B, the adjusting-rods C and D, the standards F and G, the nut H, and the collar or sleeve *r* with the base A', the extensions C and D, the standard B', and the adjusting-rod 90 E, substantially as and for the purpose set forth.

7. The combination, in an appliance for aligning steam-engines, of the base A, the bar B, the adjusting-rods C and D, the stand- 95 ards F and G, the nut H, and the collar or sleeve *r* with the body A'', having projecting feet *a'' a''* and provided with a hole fitted for the reception of the extension B'', and the tapered screw-clamp at its upper end, the ex- 100 tension B'', with screw *c''* and groove *d''*, the extension C'', with groove *f''*, screw-thread *h''*, and point *g''*, and the nuts D'' and E'', substantially as and for the purpose set forth.

8. The combination, in an appliance for 105 aligning steam-engines, of the base A', the standard B', the extensions C' and D', and the adjusting-rod E', having the collar or sleeve *g'*, with the body A'', having divergent feet *a'' a''*, the screw-clamp *i''*, and made hollow 110 for the reception of the extension B'', the extension B'', made hollow for the reception of the extension C'' and having the screw *c''* and groove *d''*, the extension C'', having groove *f''*, screw-thread *h''*, and point *g''*, and the nuts 115 D'' and E'', substantially as and for the purpose set forth.

9. The combination, in an appliance for aligning steam-engines, of the base A, the bar B, the adjusting-rods C and D, the stand- 120 ards F and G, the nut H, and the collar or sleeve *r* with the base A', the standard B', the extensions C' and D', and the adjusting-rod E', and with the body A'', the extensions B'' and C'', and the nuts D'' and E'', substan- 125 tially as and for the purpose set forth.

Signed at the city of Grand Rapids, in the county of Kent and State of Michigan, this 11th day of March, 1887.

CORTEZ E. BARNES.

In presence of—

HENRY BROUWER,
ITHIEL J. CILLEY.