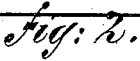
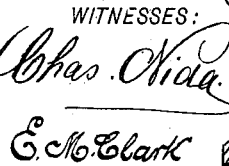


2 Sheets—Sheet 1.

GAGE FOR ALIGNING ENGINES.

Patented Aug. 18, 1891.



BY *Munn & Co*
ATTORNEYS

G. J. HUNT & T. F. McKECHNIE.

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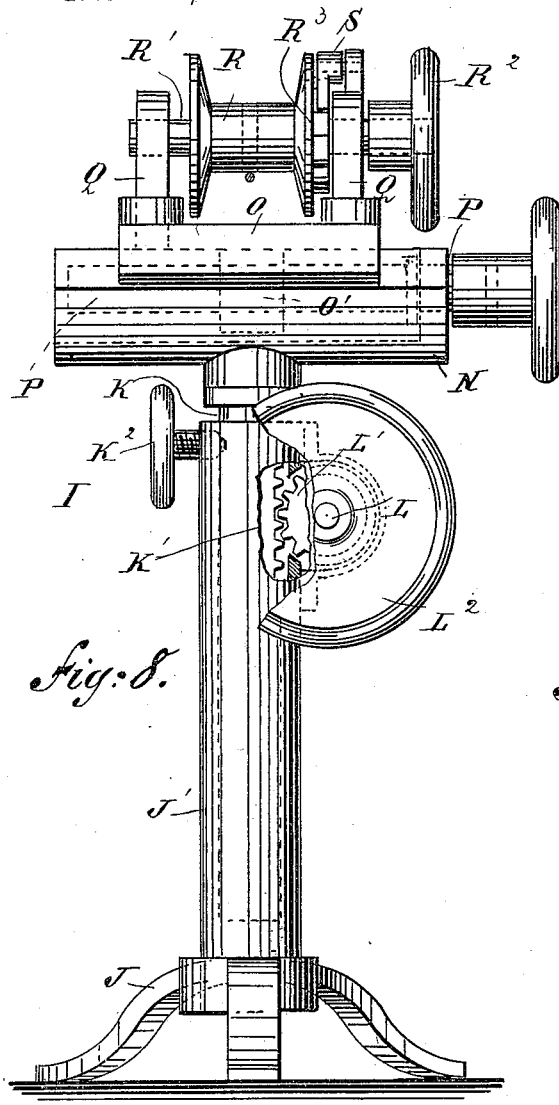


Fig. 8.

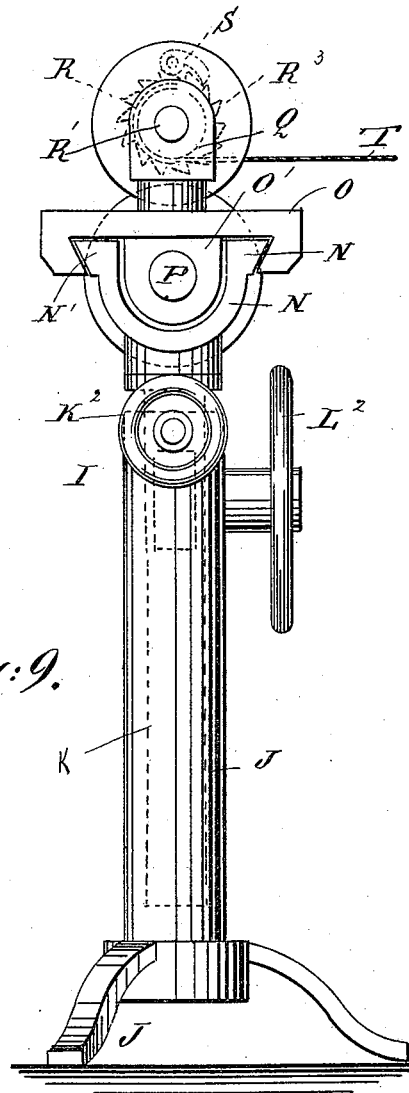


Fig. 9.

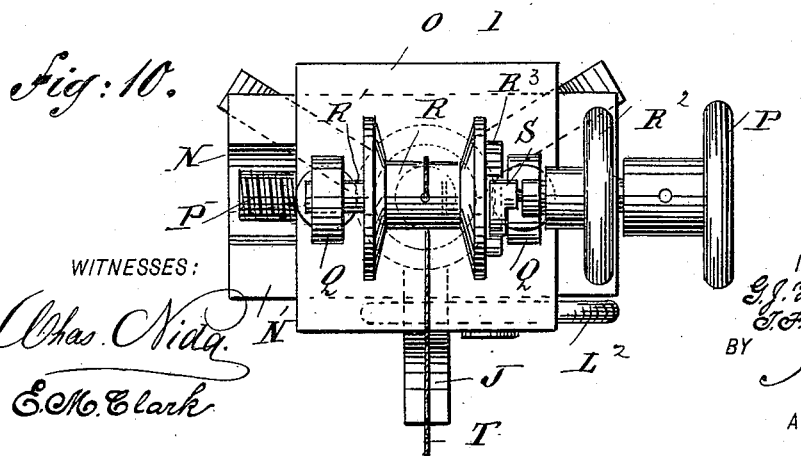


Fig. 10.

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UNITED STATES PATENT OFFICE.

GEORGE J. HUNT AND THOMAS F. McKECHNIE, OF NEW WESTMINSTER,
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GAGE FOR ALIGNING ENGINES.

SPECIFICATION forming part of Letters Patent No. 458,055, dated August 18, 1891.

Application filed December 30, 1890. Serial No. 376,194. (No model.)

To all whom it may concern:

Be it known that we, GEORGE J. HUNT and THOMAS F. McKECHNIE, of New Westminster, in the Province of British Columbia and Dominion of Canada, have invented a new and Improved Device for Aligning Engines, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved device especially designed for use in assembling the parts of an engine, so as to bring the same in proper alignment without the tedious process of calibering, as is now practiced.

The invention consists of adjustable heads having central openings and adapted to be secured to the cylinder, and a cord-holder adapted to be vertically or laterally adjusted to bring it in line with the central openings of the heads.

The invention also consists of certain parts and details and combinations of the same, as will be more fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of the improvement as applied, the cylinder being shown in section. Fig. 2 is an enlarged plan view of a head with parts in section and the covers removed. Fig. 3 is a transverse section of the same on the line *xx* of Fig. 2. Fig. 4 is an end view of one of the feet of the head. Fig. 5 is a side elevation of the pinion for actuating the feet of the head. Fig. 6 is a side elevation of an extension for the feet of the head, parts being in section. Fig. 7 is a side elevation of a pointer to be used for centering pistons, &c. Fig. 8 is a side elevation of a cord-holder. Fig. 9 is an end elevation of the same, and Fig. 10 is a plan view of the same.

The improved device for aligning engines is provided with two heads *A* and *A'*, similar in construction and adapted to be secured in the ends of the bore of the cylinder *B* of the engine, the parts of which are to be assembled. Each head is provided with a casing *A*², in which are fitted to slide racks *C* and *C'*, pro-

vided with rods *D* and *D'*, respectively, extending in opposite directions through the ends of the casing *A*² and as plainly illustrated in Figs. 2 and 3. On the outer ends of the rods *D* and *D'* are secured the feet *E* and *E'*, respectively, each provided with two parallel arms *E*², adapted to engage the inside of the cylinder *B*, as is plainly shown in Fig. 1. Each of the arms *E*² is provided near its outer end with a lug *E*³, adapted to abut against the end of the cylinder, so as to prevent displacement of the head. The racks *C* and *C'* are in mesh at opposite sides with a pinion *F*, provided with a hollow hub *F'*, mounted to turn in suitable bearings in the casing *A*². On one outer end of the hub *F'* is formed a screw-thread *F*², on which screws a nut *G*, adapted to abut against the casing, so as to lock the hub *F'* and its pinion *F* in place after the rods *D* and *D'*, with their feet *E* and *E'*, are adjusted. On the extreme outer end of the hub *F'* is secured a knob *F*³ for conveniently turning the pinion *F*, so as to move the two racks *C* and *C'* inward or outward to disengage or engage the feet *E* and *E'* from or with the cylinder, as previously described.

In one end of the hub *F'* is secured a bushing *H*, provided with an opening *H'*, which can be used for sighting, or through which is adapted to pass a cord, as hereinafter more fully described. The feet *E* and *E'* are preferably secured to their respective rods *D* and *D'* by means of a pin *E*⁴, which when removed permits the removal of the respective foot. In large cylinders an extension *E*⁵ can be placed on the end of the respective rod *D* or *D'* in place of the foot, and secured therein by the pin *E*⁴, which passes through a socket *E*⁷ in the extension. On the outer end of the extension *E*⁵ is formed a reduced part *F*⁴, adapted to receive the respective foot *E* or *E'*, secured thereto by a pin *E*⁴. The pointer shown in Fig. 7 can be used within the hub *F'* in place of the bushing *H* for centering pistons and other parts of the engine.

In connection with the heads *A* and *A'* a cord-holder *I* is provided adapted to be placed on the end of the frame on which the cylinder *B* is placed. This cord-holder is provided with a suitable base *J*, on which is erected a

hollow post J', in which is fitted to slide a rod K, provided on one side with rack-teeth K', in mesh with a pinion L', secured on a shaft L, mounted to turn in suitable bearings on the hollow post J'. A hand-wheel L² is secured on this shaft L, so as to permit the operator to conveniently turn the said shaft to rotate the pinion L', so as to move the rod K up or down in the hollow post J. When the desired position has been reached, a set-screw K², screwing into the hollow post J' against the rod K, serves to fasten the latter in place.

On the upper end of the rod K is secured a horizontally-extending semicircular frame N, provided at its top with parallel guideways N', on which is fitted to slide a plate O, having a downwardly-extending nut O', engaged by a screw-rod P, mounted to turn and held in suitable bearings in one end of the frame N and provided at its outer end with a hand-wheel P' for conveniently turning the said screw-rod P to move the plate O forward and backward on the guideways N' of the frame N.

On top of the plate O are secured the standards Q, in which is mounted to turn a shaft R', carrying a spool R, on which is adapted to be wound a cord T, previously mentioned, and adapted to pass through the openings H' of the bushings H in the heads A and A'. (See Fig. 1.) On one outer end of the shaft R' of the spool or drum R is secured a hand-wheel R² for conveniently turning the said drum to wind up or unwind the cord or rope T. On one of the faces of the spool or drum R is formed a ratchet-wheel R³, engaged by a pawl S, pivoted to one of the standards Q and serving to lock the drum R in place when the cord T has been drawn tight.

The device is used as follows: In assembling the parts of an engine the cylinder is first placed on the frame in a proper position, and then the heads A and A' are secured in the bore of the cylinder, as previously mentioned, by the operator first turning the pinion F so as to move the rods D and D' outward to engage their feet E and E' with opposite sides of the cylinder B. When this has been accomplished, the operator screws up the nut G so as to lock the pinion F in place, thereby securely holding the heads A and A' in position. When the bushings H are in place, their openings H' serve as sights for placing the holder I in the proper position on the lower end of the frame supporting the cylinder B or at any other convenient place. The spool or drum R, with the extended cord T, can then be brought into proper position by adjusting the frame N vertically by means of the rack K' and pinion L', as previously described, and by adjusting the plate O laterally by turning the screw-rod P, as previously mentioned. By this vertical and lateral adjustment the cord T can be brought into the proper place relative to the bushings H of the heads A and A', the openings H' of the said bushings being in the axial line of the cylinder B.

When the cord T is in a proper place, the other parts of the engine can be readily laid out or set on a frame, so as to be in proper alignment with the cylinder B. In this manner the slides for the cross-head, as well as the bearings for the main driving-shaft, will be readily located in the proper place.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. In a device for aligning engines, the combination, with a cord-holder, of an adjustable head having a central opening and adapted to be secured to the cylinder to connect by a rope with the said cord-holder, substantially as shown and described.

2. In a device for aligning engines, a head comprising a casing, two rods fitted to slide in the said casing in opposite directions, feet held on the outer ends of the said rods and provided with parallel arms adapted to engage the side of the cylinder, and lugs on the outer ends of the said arms to abut the cylinder end, substantially as shown and described.

3. In a device for aligning engines, a head comprising a casing, two rods fitted to slide in the said casing in opposite directions, feet held on the outer ends of the said rods and adapted to engage the side of the cylinder, a pinion adapted to engage racks on the said rods and provided with a hollow hub, and a bushing having a central opening and adapted to be fitted into the said hollow hub, substantially as shown and described.

4. In a device for aligning engines, a head comprising a casing, two rods fitted to slide in the said casing in opposite directions, feet held on the outer ends of the said rods and adapted to engage the side of the cylinder, a pinion adapted to engage racks on the said rods and provided with a hollow hub, a bushing having a central opening and adapted to be fitted into the said hollow hub, and a nut screwing on a thread of the said hub and against the said casing to lock the said pinion in place, substantially as shown and described.

5. In a device for aligning engines, a head comprising a casing, two rods fitted to slide in the said casing in opposite directions, feet held on the outer ends of the said rods and adapted to engage the side of the cylinder, a pinion adapted to engage racks on the said rods and provided with a hollow hub, a bushing having a central opening and adapted to be fitted into the said hollow hub, and extensions adapted to be secured to the said rods, substantially as shown and described.

6. In a device for aligning engines, a cord-holder comprising a base having a hollow post, a rod fitted to slide in the said base, a horizontal frame secured on the said rod, a plate fitted to slide in the said frame, and a spool or drum mounted to turn on the said plate, substantially as shown and described.

7. In a device for aligning engines, a cord-

- holder comprising a base having a hollow post, a rod fitted to slide in the said base, a horizontal frame secured on the said rod, a plate fitted to slide in the said frame, a spool or drum mounted to turn on the said plate, and means, substantially as shown and described, for imparting a vertical movement to the said rod and lateral movement to the said plate, as set forth.
8. In a device for aligning engines, a cord-holder comprising a base having a hollow post, a rod fitted to slide in the said base, a horizontal frame secured on the said rod, a plate fitted to slide in the said frame, a spool or drum mounted to turn on the said plate, and a ratchet-wheel and pawl for locking the said drum in place, substantially as shown and described.

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Witnesses:

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JOHN T. BARRY.