

C. B. LONG.
MACHINE FOR PLANING VALVE SEATS OF STEAM ENGINES.
No. 30,234. Patented Oct. 2, 1860.

Fig. 1

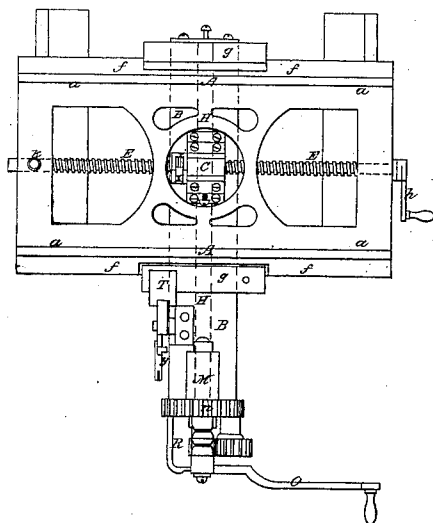


Fig. 2

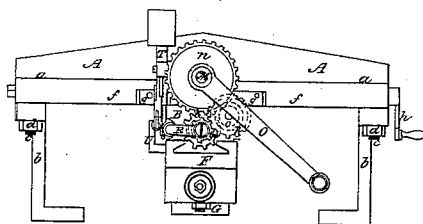


Fig. 3

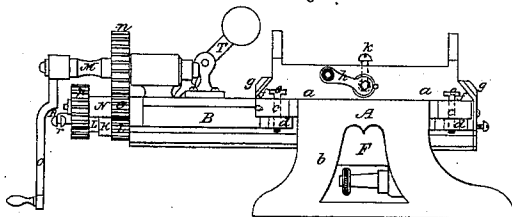


Fig. 4

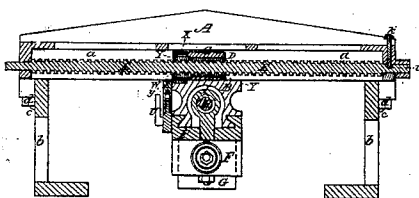


Fig. 5

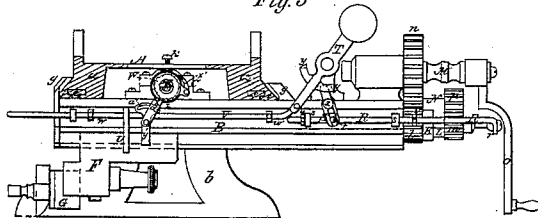


Fig. 6

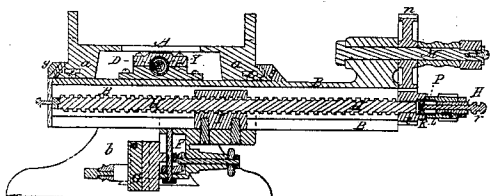


Fig. 7



Fig. 8



Fig. 9



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UNITED STATES PATENT OFFICE.

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PLANING VALVE-SEATS OF STEAM-ENGINES.

Specification of Letters Patent No. 30,234, dated October 2, 1860.

To all whom it may concern:

Be it known that I, CHARLES B. LONG, of Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful or Improved Machine for Planing the Seats of Slide-Valves of Steam-Engines; and I do hereby declare that the same is fully described and represented in the following specification and the accompanying drawings, of which—

Figure 1 is a top view; Fig. 2, a rear elevation; Fig. 3, an end elevation; Fig. 4, a transverse and central section of it. Fig. 5, is a side view of the tool carriages and feeding and other mechanism thereof, to be hereinafter described. Fig. 6, is a longitudinal and vertical section of the machine.

My said invention when used is intended to be bolted to a steam engine so as to extend across a valve seat thereof, in such manner as to enable such seat to be repaired or planed by the machine, my said machine being particularly applicable to the planing of, the valve seats of, locomotive steam carriages. It differs from an ordinary planing machine used for planing metal because in the latter, the cutter is usually stationary, while the bed carrying the work to be planed, is moved back and forth under the cutter, the latter being provided with a mechanism for feeding it laterally relatively to the work, whereas, in my valve seat planing machine, there is no bed or carriage for holding the work, and for moving it back and forth under the cutter, and furthermore, the cutter itself is moved back and forth over the work by mechanism specially or particularly applied to its two carriages and they are simultaneously operated upon by a feeding mechanism, by which they and the cutter are fed or moved laterally at the proper times.

In the drawings, A, exhibits the main frame for supporting the operative parts of the mechanism. This frame consists of a horizontal rail frame, *a*, supported by two standards, *b*, *b*. The said standards, are each affixed to the rail frame by means of two screws, *c*, *c*, and nuts, *d*, *d*, the heads of the screws being made to enter two parallel, T, or dovetailed grooves, *e*, *e*, formed longitudinally through the rail frame. These devices enable the two standards to be adjusted either nearer to, or farther apart or with respect to the middle of the rail frame as circumstances may require. Extending

transversely underneath the said frame, A, there is a carriage, B, so adapted to the rail frame by means of inclined ways or rails, *f*, *f*, and slides or lugs *g*, *g*, as to be supported by such frame A, and be capable of being moved longitudinally thereof. On the top of the carriage, B, is a box, C, which is fastened to the said carriage and supports a rotary female screw shaft D, whose bore contains a female screw, Y, to be worked on a long male screw, E, formed on a shaft extending longitudinally through and supported by and so as to be capable of revolving in the rail frame *a*. One end of the shaft of the screw, E, has a crank, *h*, fixed on it. At or near the opposite end of such shaft, a small hole or recess, *i*, (see Fig. 4,) is made therein to receive a pin, *k*, extending into the frame, *a*. While the said pin may be within the recess, the screw shaft will be estopped from being revolved by its crank.

To the carriage, B, a cutter carriage, F, is applied so as to be capable of being moved longitudinally under the carriage, B, and transversely with respect to the frame, A. Said carriage, F, supports a tool carrier, G, which is hinged to it, so as to be capable of being swung forward from its vertical position in order to enable the tool to drag over the work while the carriage, F, may be in the act of being retracted. Furthermore, the carriage, B, contains or supports a long male screw, H, which turns in a female screw, I, projecting from the cutter carriage. The shaft of the said screw, H, projects beyond the rear end of the carriage B, and supports two separate tubular shafts, K, L, which are placed concentrically upon it and with respect to one another as shown in the drawings. Each of the said shafts, K, L, has a pinion or gear, *l*, or *m*, affixed to it. The gear, *l*, of the inner tubular shaft K, engages with a larger gear, *n*, fixed upon a driving shaft, M, as shown in the drawings. The gear, *n*, engages with a gear, *o*, fixed upon another shaft N, which carries another gear, *p*, that engages with the gear, *m*, before mentioned.

From the above, it will be perceived, that when the driving shaft is put in rotation by means of a crank, O, applied as shown in the drawings, rotary motions in opposite directions will be simultaneously imparted to the two tubular shafts, K, L, and that, if either of them be clutched to the screw H, or its

shaft, the said screw shaft or screw will be rotated by and with such tubular shaft. The gears are so made as to cause the screw, H, to be revolved much faster while it may be retracting the cutter carriage than while it may be impelling the same forward. A clutch, P, slides longitudinally in the rear part of the shaft of the screw, H, and so as to be capable of entering either of the shafts K, L, in such manner as to engage it with or lock it to the screw, H. This clutch has a grooved head, *r*, which receives a forked slider or pitman, R. This pitman slides freely in bearings *s*, *s*, projecting from the carriage B. The said pitman has a stud, *t*, and two shoulders or collars *u*, *v*, affixed to it and arranged as shown in Figs. 2, and, 5. The stud enters a forked tripping lever, S, which turns upon a fulcrum, *w*, and projects into or between two lateral bent arms *y*, *y*, of a weighted lever, T, arranged and formed as shown in the drawings and particularly in Figs. 7, and, 8, one of which is a rear view and the other a lower end view of it.

From the cutter carriage F, a bent arm, U, extends as shown in Figs. 4, and 5. During the forward as well as during the backward movement of the cutter carriage, the bent arm, U, will be carried in contact with one of two stops or collars, *w*, *w*, fixed upon a slide rod, V, whose rear end is jointed to the lower end of the lever, T. The said bent arm, U, being so carried against such collar will move weighted lever, T, on its fulcrum sufficiently to carry the weight of the upper arm of said lever far enough in an opposite direction to enable it by its gravitating power to move the lever in such manner against the bifurcated lever, S, as to cause it to put the pitman, R, in motion, in manner so as to move the clutch from one shaft K, into the other, L, or vice versa, as the case may require. In this way and by such means, the reciprocating, longitudinal movements of the tool carriage, F, will be produced.

On the screw shaft, D, there is a ratchet,

W, which is embraced by a pawl lever, X, carrying a spring pawl, *x'*. The lower end of the said pawl lever, has a small tripper or tripping lever, *y'*, which during either the advance or retreat of the bent arm, U, is struck by the same and moved so as to move the pawl lever on the ratchet, the movements of the pawl lever being such as to produce an intermittent rotary motion of the ratchet.

Fig. 9, exhibits a rear side view of the pawl lever, X, and its tripping lever, *y'*, and shows a pin, *z*, as projecting from the pawl lever into a curved slot, *a'*, made in the tripping lever.

By imparting to the screw shaft, D, an intermittent rotary motion, as above described, the carriage, B, and the cutter carriage, F, will be fed or moved laterally so as to cause the cutter or tool during each of its forward movements to operate in a new path on the work.

I claim—

1. The arrangement and combination of the carriage, B, and its feeding mechanism with the supporting frame, A, the cutter carriage, F, and its mechanism for imparting to it reciprocating longitudinal movements as described, the whole being substantially as and for the purpose as specified.

2. The combination and arrangement of the parts for operating the screw, H, for effecting the reciprocating movements of the cutter carriage, F, such parts being the two tubular shafts, K, L, the clutch, P, the pitman or slide rod, R, the bifurcated lever, S, the weighted lever, T, and its shouldered rod, V, and the bent arm, U, the whole being applied to the said screw and the two carriages B, and F,—and the tubular shafts K, L, being geared to the driving shaft substantially as described.

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