

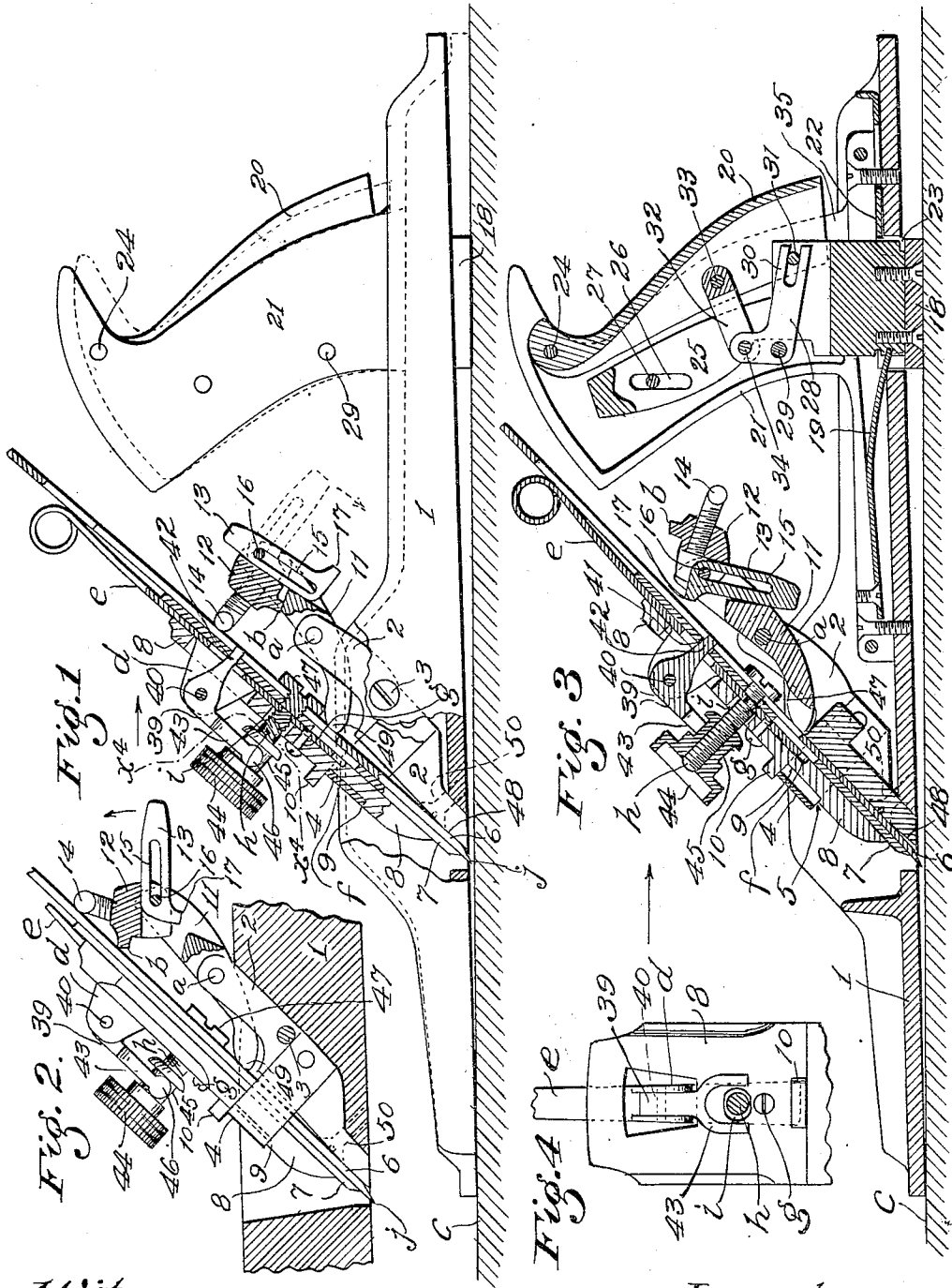
H. M. WOOD.
BENCH PLANE.

APPLICATION FILED NOV. 8, 1907.

Patented Oct. 29, 1912.

2 SHEETS—SHEET 1.

1,042,741.



Witnesses
C. C. Holly
J. Townsend.

Inventor
Harvey M. Wood
by James R. Townsend
his Atty

H. M. WOOD.

BENCH PLANE.

APPLICATION FILED NOV. 8, 1907.

1,042,741.

Patented Oct. 29, 1912.

2 SHEETS—SHEET 2.

Fig. 7.

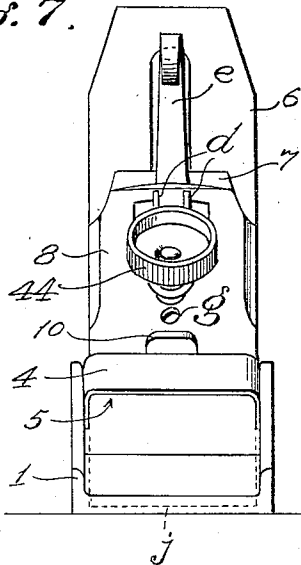


Fig. 5.

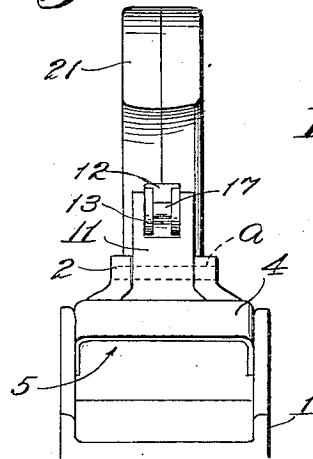


Fig. 8.

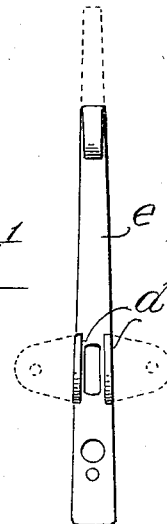
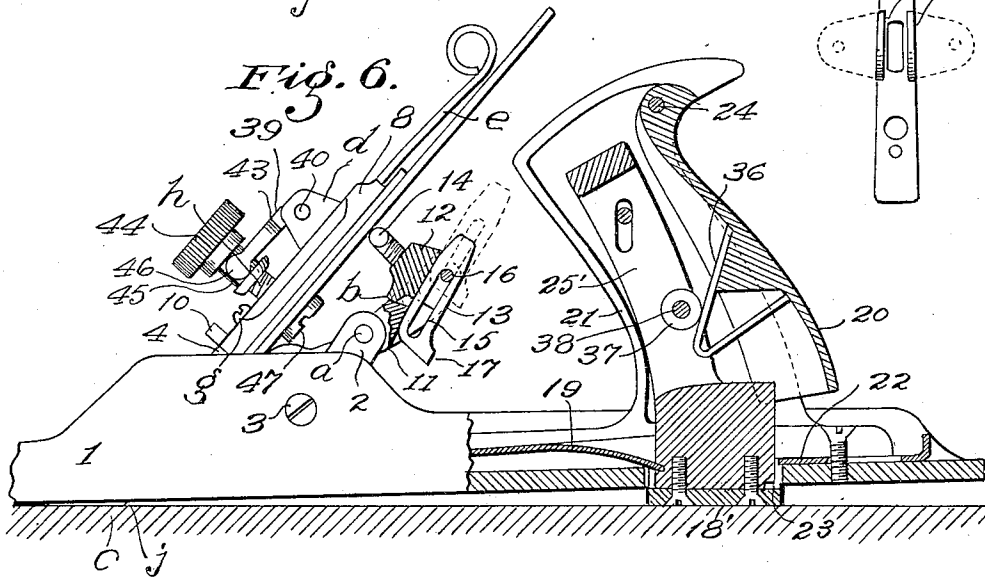


Fig. 6.



Witnesses
C. C. Holly.
J. Townsend.

Inventor
Harvey M. Wood.
James R. Townsend
his atty

UNITED STATES PATENT OFFICE.

HARVEY M. WOOD, OF LOS ANGELES, CALIFORNIA.

BENCH-PLANE.

1,042,741.

Specification of Letters Patent.

Patented Oct. 29, 1912.

Application filed November 8, 1907. Serial No. 401,341.

To all whom it may concern:

Be it known that I, HARVEY M. WOOD, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Bench-Plane, of which the following is a specification.

Objects of this invention are: to protect the blade from wear on the back stroke of the plane; to provide for ready and accurate adjustment of the blade so that the edge thereof will be straight with the bottom of the plane; to insure ease of removing, replacing, adjusting and setting the bit; to provide for perfect clamping of the bit to prevent chattering or looseness of the same; to readily lock the bit-clamping device; to accurately adjust the bit-clamping device for different thicknesses of blade; and to avoid liability of springing the shoe.

In this invention provision is made whereby the cutting edge of the blade is normally held free from contact with the surface on which the plane rests, thus to avoid liability of injury to such edge by reason of grit or hard substances that may be on or may form such surface.

An object of the invention is to provide for a plane, improved means applicable to either a wooden or a metal shoe or stock, whereby the bit may be held securely against vibration or buckling and yet be left so free as to allow the workman to readily adjust the bit as to depth and evenness of cut while the bit is clamped; also to so construct and arrange the bit-clamping and adjusting means that the one will not interfere with the other, and so that the bit adjusting means will be in a perfectly accessible and convenient place for manipulation by the workman while the plane is resting on the surface to be planed.

Another object is to so construct the device by which the bit is held, that the same may be placed on the market and sold without, and independent of, the plane shoe or stock, and which may be installed in either a wooden or a metal shoe or stock by an ordinary workman.

Another object is to so construct the plane that the bit may be moved up and down in adjusting the same without any obstruction from wedging between the frog and the cap.

Other objects and advantages may appear from the subjoined detail description.

An object is to provide a plane in which

the bit is so mounted that the workman can adjust the same both as to depth of cut and as to parallelism with the bottom of the shoe, with the greatest ease and convenience, and in which the tendency of the lines of force effective on the bit in actual work, to displace the bit from true position, will be minimized.

The accompanying drawings illustrate the invention.

Figure 1 is a side elevation of the plane as applied in a metal shoe or stock as it appears on the back stroke or while at rest. The working position of the shoe and handle on the forward stroke is indicated by dotted lines. The position of the other parts of the plane on the forward stroke is not indicated. The shoe is broken to expose the parts. The position of the locking lever when it is adjusted to loosen the dog is indicated in dotted lines. Portions are sectioned for clearness of illustration. Fig. 2 is a fragmental view of the frog and bit holder with bit in a wooden shoe, and showing the locking lever in position for moving the dog into clamping position. Fig. 3 is a vertical, longitudinal section of the plane showing the dog fully thrown back and the bit released ready to be withdrawn. Fig. 4 is a fragmental view from the left of Figs. 1, 2 and 3, the adjusting thumb-nut being omitted and its screw sectioned on line x^1-x^1 , Fig. 1. Fig. 5 is a front elevation looking in the direction of the arrows in Figs. 1 and 3 and omitting the clamping-cap and bit-adjusting device and showing the parts in the positions shown in Fig. 3. Fig. 6 is a fragmental side elevation partly in longitudinal mid-section, showing a form of handle different from that shown in Figs. 1 and 3. Dotted lines indicate the position of the locking lever when unlocked. Fig. 7 is a front elevation looking in the direction of the arrows in Figs. 1 and 3. Fig. 8 is a plan of the lateral adjusting lever detached. Dotted lines indicate the form of the blank from which said lever is struck.

1 is the shoe of the plane; 2, the frog which may be detachably secured thereto by means of screws 3, and which is provided with a clamping-yoke 4 leaving an open space 5 to receive the bit 6 with its usual shaving-breaker 7 and the clamping-cap 8. Said clamping-cap is provided with a recess 9 to engage the yoke 4 to hold the clamping-cap in true position.

10 is a lug on the cap 8, above the recess to engage the yoke to prevent the clamping-cap from sliding too far down when released.

5 11 is a clamping bolster pivoted at *a* to the upper end of the frog 2 and provided at its upper end with a pivoted member or dog 12 and a locking lever 13. The dog 12 is provided with an adjustable head 14 to
10 engage the underside of the cutting bit 6, and a stop *b* to engage the bolster when the head 14 has moved past the center of pivot 16 into fastening position shown in Fig. 1. The locking lever 13 is provided with a slot
15 15 running on the pivot 16 of the dog 12, and also provided with a stop 17 to engage said dog to lift the same out of engagement with the cutting bit when the locking lever 13 is in one position, as shown in dotted
20 lines in Fig. 1. Said locking lever is adapted to be reversed from the unlocking position shown in Fig. 2 to the locked position shown in solid lines in Fig. 1, where the end thereof which is provided with the stop 17
25 engages the bolster, thus to prevent the pivoted member from turning on its pivot. The clamping yoke holds the lower end of the shaving breaker in position to engage the lower end of the forward side of the bit, and
30 the bolster 11 with the adjustable head 14 engages the underside of the bit at two levels that are above the level of the clamping yoke, so that when the head 14 is brought tightly against the under side of the bit the
35 same will be forced upward and forward, thus moving the bit, the shaving breaker and the cap as a lever upon a fulcrum formed by the yoke 4, thereby to force the point of the bit firmly against the frog. The locking
40 lever 13 will be seen to act as a lever as in its operation the stop 17 acts to engage and lift the dog 12 out of engagement with the cutting bit when the lever is in the position shown by dotted lines in Fig. 1.

45 18 is an adjustable heel-piece or runner normally depressed by a spring 19 and operable by a palm-piece 20 in the handle 21 of the plane whereby the heel-piece is drawn up flush with the sole of the shoe on the
50 forward stroke of the plane. The spring 19 is of sufficient tension to normally depress the heel-piece and thus lift and sustain the rear end of the plane when the heel-piece is free to be depressed and the plane
55 is on the work and is subject to be depressed by the weight of the hand on the handle 21 so that in the operation of planing, the weight of the workman's hand on the handle of the plane will bring the sole of the shoe
60 flat onto the surface to be planed.

22 is a latch to engage a notch 23 in the runner 18 to hold the same retracted in its flush position. Any suitable mechanism may be provided to connect the runner 18
65 with the palm-piece 20. In the form shown

the palm-piece 20 is a lever pivoted at 24 to the handle 21. The palm-piece is carried by a carrier 25 that is an upward extension from the runner 18. Said carrier is mounted by slot 26 and pintle 27 to move up and down in the handle 21 to which the pintle 27 is fixed.

28 is a bell crank lever pivoted to the handle by pivot 29 and provided with a slotted portion 30 that engages a pin 31 on the carrier 25. The other end of said lever is connected with the palm-piece by a link 32 pivoted at 33 to the palm-piece 20 and at 34 to the bell-crank 28.

The palm-piece 20 projects rearwardly through a rear slot 35 in the handle 21 and is held normally retracted by the spring 19 pressing downward on the carrier 25 which in turn operates the bell-crank and link to hold the palm-piece up and back in the position shown in Figs. 1 and 3. When the hand of the operator forces the palm-piece 20 forward the link 32 operates the bell-crank and carrier to lift the heel-piece or runner 18 relative to the handle. It thus occurs that the weight of the hand on the handle and the forward pressure of the hand on the palm-piece cooperate to bring the sole of the plane onto the board *c* to be planed.

In Fig. 6 another form of means for bringing the heel-piece flush with the sole is shown. In either form the operator may move the palm-piece forward by gripping the handle, thus mechanically withdrawing the runner 18 or 18' to flush position. In the form shown in Fig. 6 a lug having a face 36 is carried aslant by the palm-piece 20 and extends downwardly and forwardly from said palm-piece to engage an antifric-
105 tion roller 37 journaled on the hanger 25' by a pin 38, so that when the palm-piece is pushed forward the antifric-
110 tion roller is lifted, thereby lifting the hanger 25' and its heel-piece 18'.

No claim is made herein to the means for lifting the heel of the plane as the same is the subject matter of a divisional application Serial No. 725,577, filed October 14th, 1912.

39 is a bit-adjusting bell-crank-lever pivoted by a pivot 40 to ears *d* of the lateral adjustment lever *e* which is mounted in a recess *f* in the under face of the clamping-cap 8 to which it is pivoted by a pivot *g*. Said bell-crank-lever 39 is adapted to move the bit up and down by reason of the engagement of one arm 42 of said lever in a hole 41 in the shaving-breaker 7. Said arm 42 practically fits the hole 41 so that there is substantially no lost motion between the lever *e* and the arm 42 when the crank-lever 39 is vibrated, wherefore any movement of the lever 39 on its pivot 40 will effect either an upward or a downward adjustment of the
130

bit. The other arm 43 of the lever 39 is bifurcated and embraces a grooved thumb-nut 44 that is screwed onto a screw *h* which is fixed to the lateral adjusting-lever *e* and extends through and plays in a slot *i* of the cap 8. By this construction the lever *e* is made to carry means whereby the bit may be adjusted up and down and laterally, so that when the lever *e* is swung on its pivot *g* either to the left or to the right it will cant the shaving-breaker 7 and its blade 6 in one or the other direction, thus changing the angle of the cutting edge of the blade relative to the bottom of the shoe or stock 1. It is thus to be noted that while the bit is held frictionally against the under-face of the cap 8 by the bolster 11 and the head 14, as shown in Fig. 1, that it is also pivotally connected with the cap 8 and consequently with the shoe or stock 1, through the medium of the shaving breaker 7, the bell-crank-lever arm 42 in the hole 41 of said shaving breaker, the lateral adjusting-lever *e* which carries the bell-crank lever 39, the nut 44 and screw *h* which is fixed to the lever *e*, and the pivot *g* by which the lever *e* is pivoted to the cap. By this construction, the bit, while being frictionally held in place by the cap and the clamping means is adjustable longitudinally and laterally by manipulation of the lever *e* and thumb-nut 44.

The pivot *g*, the screw *h* and the arm 42 of the crank-lever 39 are located along the axial line of the lever *e*, and the pivotal connection between the lever *e* and the cap at *g* is located between the cutting edge *j* of the blade and the pivotal point at 41 by which the blade is pivoted to the lever *e*, consequently the lines of force applied to the cutting edge *j* of the blade arm are transmitted to the pivot *g* through the pivotal point 42 that is on the farther side of said pivot *g* from the edge *j* and the tendency toward displacement of the bit from striking knots or uneven places in the board to be planed, is minimized.

The thumb nut 44 has an annular groove 45 in which the ends 46 of the bell-crank arm 42 extend so that as the thumb nut is screwed or unscrewed the bell-crank 39 will be operated to cause the blade 6 to which the shaving-breaker 7 is secured in the usual manner by a screw 47, to slide up and down along the under face of the cap.

In practice the workman can readily adjust the blade up and down by turning the thumb-nut, and can bring the edge of the blade into parallelism with the bottom face of the shoe by simply moving the lever *e* by pressure on the handle thereof. The parts for effecting both these movements are on top of the plane and may be conveniently reached while the plane is resting on the board to be planed.

The bit is frictionally held against the

under face of the cap by three points of support, viz., the bit seat 48 of the frog, 2, the lower tips 49 of the bolster, and the adjustable head 14 of the dog 12, and the cap thereof adjustably held against the yoke 4.

The action of the bolster and dog on the frog is that of a toggle joint, and the stop *b* is arranged to engage the bolster immediately after the head 14 has slipped past its point of greatest pressure so that the bolster is locked in the bit clamping position when the stop *b* has reached the bolster.

The bit seat 48 is aslant at approximately the angle at which the bit is to stand when clamped in place for work and the cap is adapted and arranged to come to rest in clamping position with its under face parallel with the seat 48 so that the bit, including the blade 6 and shaving breaker 7, may slide freely up and down between said seat and cap without wedging.

The frog 2, yoke 4, bolster 11, and parts carried thereby, may be manufactured and placed on the market independently of the shoe or stock 1 and may be installed in either a wooden or a metal stock or shoe by a mechanic and secured by means of screws 50.

Since the bit clamping and adjusting means are all fastened to the frog, there is no liability of springing the shoe by the operation of clamping the bit.

By the arrangement shown the bit is held firmly by being pressed from the rear forwardly against the cap, thus insuring rigidity and solidity of the support.

I claim:—

1. The combination of a shoe, a frog detachably secured thereto, a yoke on said frog, a recessed clamping cap extending through said yoke, the recess in said cap being arranged to accommodate said yoke, a bit comprising a blade and shaving-breaker interposed between said frog and cap, a bolster fulcrumed on said frog, a dog pivotally mounted in said bolster, a head on said dog, and means on said dog for causing said bolster and head to bear against said bit to clamp the same in position.

2. The combination of a shoe, a frog secured thereto, a yoke on said frog, a recessed clamping cap extending through said yoke, the recess in said cap being arranged to receive said yoke, a bit comprising a blade and shaving-breaker interposed between said frog and cap, a bolster fulcrumed on said frog, a dog pivotally mounted on said bolster, a head on said dog, a slotted lever pivotally attached to said dog, said lever being arranged to be operated to cause said dog and said bolster to bear against said bit and to hold said dog in position.

3. The combination of a shoe, a frog detachably secured thereto, a yoke on said frog, a recessed clamping-cap extending through said yoke, the recess in said cap

being arranged to accommodate said yoke, a lug on said cap to limit the movement of the same, a bit comprising a blade and shaving-breaker interposed between said frog and cap, a bolster pivotally secured to said frog and arranged to press said bit and cap toward the yoke, a dog on said bolster, a head on said dog, a lever loosely connected with said dog and arranged to bring the head of said dog in contact with the rear of said bit, and means for adjusting said bit comprising a lever pivoted to the cap, a screw fixed to such lever, a grooved thumb-nut, a bell-crank-lever pivoted on said first-named lever and arranged with one end in engagement with said thumb-nut, and the other end operably connected with said bit whereby by the operation of said thumb-nut the bit may be moved up and down.

4. The combination of a shoe, a frog detachably secured thereto, a yoke on said frog, a recessed cap extending through said yoke, a lug on said cap to limit the movement thereof, a bit comprising a blade and shaving-breaker interposed between said frog and cap, and locking means pivotally connected with said frog and arranged to bear at two points against the rear of said bit to lock the same in position.

5. The combination of a shoe, a frog detachably secured thereto, a clamping yoke on said frog, a cap extending through said yoke and provided with a lug for limiting the movement thereof, a bit beneath said cap, a bolster pivotally attached to said frog, means pivotally connected to said bolster and cooperating therewith to clamp said bit in place, and means for adjustably securing said bit in position.

6. The combination of a shoe, a frog secured thereto, a cap, a bit interposed between said frog and cap, a bolster pivotally mounted on said frog, a dog pivoted to said bolster, a head on said dog, a lever mounted on the pivot which pivots the dog to the bolster, said lever being provided with a slot and a stop and being arranged to force the head of said dog into engagement with the rear of said bit, and the stop on said lever being arranged to retract the dog from engagement with the bit.

7. An attachment for the stock or shoe of a plane comprising a frog constructed to receive a bit and a cap therefor, means carried by the frog and engaging the bit at an upper and a lower level to press the bit toward the cap, and means below such

lower point to retain the cap against such pressure.

8. A bit-holder comprising toggle means to engage the bit in the rear at an upper and a lower point to press the bit in a forwardly direction, and means to engage the bit below such lower point to hold the bit against such pressure.

9. The combination with a bit, of means to engage the under side of the bit at an upper and a lower level for pressing the bit in one direction, a cap on the upper side of the bit, means below such lower level to hold the cap against such pressure, and means pivotally connected with the cap and with the bit to adjust the bit.

10. A frog adapted to be fastened in the stock of a plane, a cap, means to hold the cap in place on the frog, a bit, and an adjustable toggle-joint means beneath the bit and above the level of the cap-holding means to press the bit toward the cap.

11. The combination with means for holding a bit, of a lever pivoted thereto and adapted at one end to engage the bit, means pivotally connected with said lever at the other end to engage said bit, and a sliding latch in the form of a lever for operating said last-named means to tighten the bit and adapted to engage the lever to latch the pivotal means.

12. The combination with means for holding a bit, of a lever pivoted thereto, one arm of said lever being adapted to engage the back of the bit, slotted means pivotally connected with the other arm of said lever to engage the back of said bit, and means pivoted to said pivoted means for operating the same.

13. A frog provided with a bit-seat, a cap, cap retaining means connected with the frog, a bit, means pivoted to the frog to press the bit toward the cap, the same comprising a bolster, a dog pivoted thereto and provided with an adjustable head to engage the bit, and a slotted lever pivoted to said head and adapted to serve as locking means to lock the head in bit-engaging position, and as a handle to operate said head.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 2d day of November, 1907.

H. M. WOOD.

In presence of—

JAMES R. TOWNSEND,
M. BEULAH TOWNSEND.