R. BATES & J. H. WILD.

Combined Punch, Drill, Shears, &c.

No. 216,641. Patented June 17, 1879.

Fig: 1.

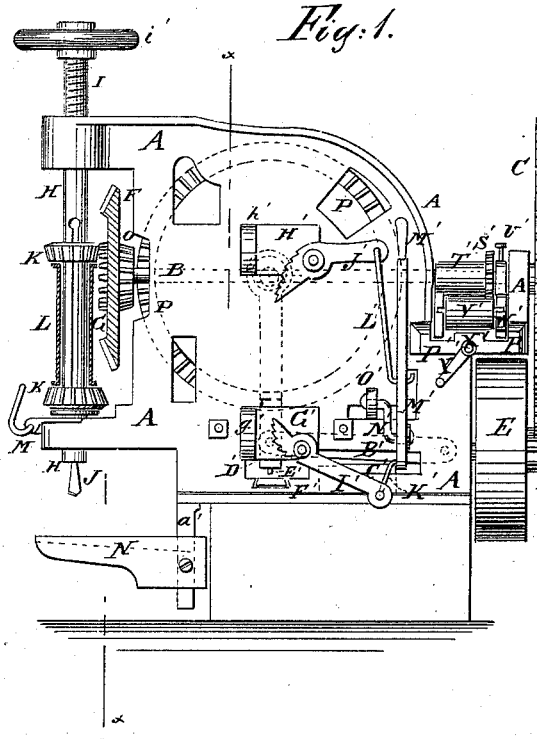


Fig: 2.

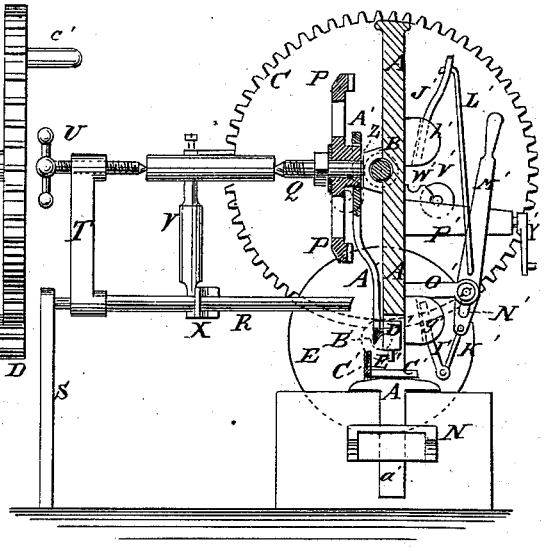


Fig: 3.

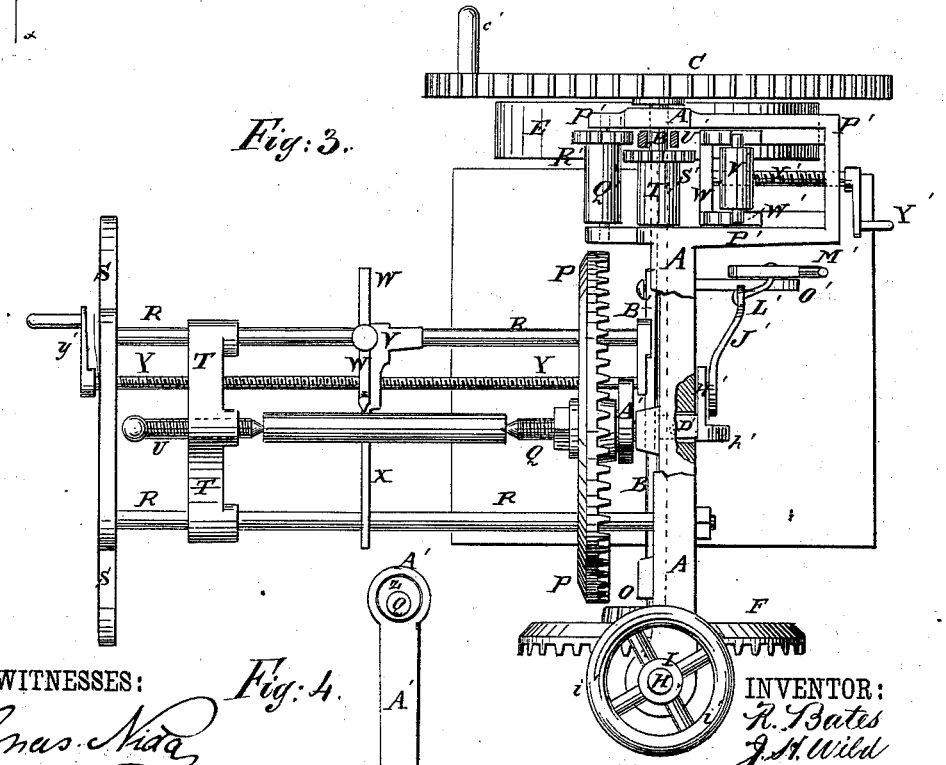
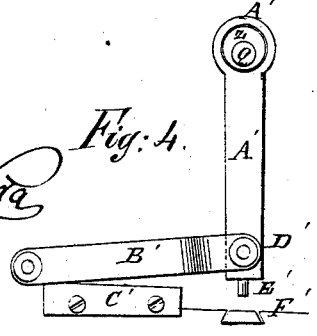


Fig: 4.



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UNITED STATES PATENT OFFICE.

ROBERT BATES, OF COLUMBUS, AND JOSEPH H. WILD, OF SPRING VALLEY, OHIO.

IMPROVEMENT IN COMBINED PUNCH, DRILL, SHEARS, &c.

Specification forming part of Letters Patent No. **216,641**, dated June 17, 1879; application filed February 21, 1879.

To all whom it may concern:

Be it known that we, ROBERT BATES, of Columbus, in the county of Franklin and State of Ohio, and JOSEPH H. WILD, of Spring Valley, in the county of Greene and State of Ohio, have invented a new and useful Improvement in Combined Punch, Drill, Shears, Tire-Bender, Tire-Upsetter, and Lathe, of which the following is a specification.

Figure 1 is a side view of our improved machine. Fig. 2 is a detail section of the same, taken through the broken line *x x*, Fig. 1. Fig. 3 is a top view of the same, part being broken away to show the construction. Fig. 4 is a detail view of the punch and shears detached from the frame.

Similar letters of reference indicate corresponding parts.

The object of this invention is to furnish a combination-machine for use in blacksmiths' shops, carriage-makers' shops, and in other small shops which will allow the mechanic to have his drill, punch, shears, bender, upsetter, and lathe connected with the same frame, so that they can be purchased at a comparatively small cost, and will take up but little space, while being convenient and effective for either use, and which shall be so constructed that it may be worked by hand or by power, as may be desired or convenient.

The invention consists in a device formed of a frame, sliding shaft, and actuating-gears, as hereinafter described.

A is an upright frame, the lower edge of which is firmly secured to a bed or base. B is the driving-shaft, which passes longitudinally through the frame A, or through a groove in the side of the said frame, in such a way that it may slide longitudinally in its bearings.

To one end of the shaft B is attached a large gear-wheel, C, which is provided with a crank-handle, *c'*, to allow the machine to be worked by hand when desired.

The teeth of the gear-wheel C mesh into the teeth of a small gear-wheel, D, attached to or formed upon the hub of the fly-wheel E, which revolves upon a journal attached to the frame A. The fly-wheel E is so formed that a belt may be passed around it when the machine is to be driven by power.

The small gear-wheel, D, is made wide, so that the gear-wheels C D will not be thrown out of gear by the longitudinal movement of the shaft B.

To the other end of the shaft B is attached a large bevel-gear wheel, F, to the outer end of the hub of which is attached, or upon it is formed, a small bevel-gear wheel, G.

At the forward side of the bevel-gear wheel F G is placed a shaft, H, the lower part of which revolves and slides in bearings attached to or formed upon the lower part of the edge of the frame A. The upper part of the shaft H revolves in the cavity of a tubular screw, I, which is swiveled to its upper end. The screw I has a hand-wheel, *i'*, attached to its upper end, and works in a screw-hole in an arm formed upon the upper part of the edge of the frame A, so that the shaft H may be moved down and up by turning the swiveled hand-screw I. The lower end of the shaft H is so formed as to serve as a holder for the drill J.

Upon the shaft H are placed two bevel-gear wheels, K, which are connected with the said shaft H by tongues and grooves, so that they may slide longitudinally upon the said shaft H while carrying the said shaft with them in their revolution.

The bevel-gear wheels K are kept at such a distance apart by a sleeve, L, placed between them upon the shaft H, that when either of them is thrown into gear with one of the gear-wheels F G the other will be thrown out of gear.

The lower gear-wheel K, or a washer placed beneath the said gear-wheel, rests upon the fork of a bent lever, M, which is pivoted to the lower bearing of the shaft H, so that the gear-wheels K may be conveniently adjusted to receive motion from the large gear-wheel, F, or the small gear-wheel, G, according as the drill J is required to be driven with a faster or slower motion.

The work to be drilled rests upon a table, N, secured adjustably to an arm, *a'*, projecting downward from the lower corner of the

frame A by a set-screw or other suitable means. The table N is slotted for the passage of the drill J, and has a number of holes formed in it to receive pins for securing the work in place.

To the inner end of the hub of the large bevel-gear wheel, F, is attached, or upon it is formed, a small bevel-gear wheel, O, the teeth of which mesh into the teeth of a large bevel-gear wheel, P. The gear-wheel P revolves upon a journal, Q, attached to the middle part of the side of the frame A.

The journal Q has a screw-thread cut upon its outer part to receive the nut by which the gear-wheel P is secured in place, is made long, and has its outer end pointed to adapt it to serve as a lathe-center. The outer side of the gear-wheel P is made flat, and the said wheel has a number of slots and holes formed through it to adapt it to serve as a lathe-plate.

To the frame A, a little below the wheel P, are attached the ends of two parallel rods or bars, R, the outer ends of which are attached to and supported by an upright frame, S.

To the rods or bars R, near their outer ends, are attached the ends of a V bar or frame, T, which has a screw-hole formed through it at its angle to receive the hand-screw U. The forward end of the hand-screw U is made pointed, to adapt it to serve as the other lathe-center.

V is the holder in a socket, in the upper end of which is adjustably secured the cutter W. The lower end of the tool-holder V is formed upon or rigidly attached to the bar X, which has holes formed through its end parts to receive the rods or bars R.

The bar X slides upon the rods or bars R, and has a screw-hole formed through it to receive the screw Y, which is swiveled to the frame, S and A, and has a crank or hand wheel, y', attached to or formed upon its outer end, so that by turning the said screw the tool-holder V may be moved back and forth along the rods or bars R.

Upon the inner end of the hub of the gear-wheel P is formed an eccentric, Z, upon which is placed the upper end of the bar A′, which passes down along the side of the frame A, and to its lower end is pivoted the end of the movable blade or cutter B′ of the shears. The other end of the cutter B′ is pivoted to the frame A in such a position that the revolution of the eccentric Z will move the said cutter up and down along the side of the stationary cutter C′, which is secured to the said frame A. An opening is formed in the lower part of the frame A to allow the work to be conveniently placed in the shears B′ C′.

Upon the inner side of the bar A′ is formed, or to it is attached, an arm, D′, which passes through a slot in the frame A, and has a punch, E′, attached to its lower edge. The metal to be punched is passed through an opening in the lower part of the frame A, and rests upon a die, F′, attached to the said frame A at the bottom of the said opening.

To the other end of the arm D′ is attached, or upon it is formed, a plate, G′, which slides up and down along the other side of the frame A. Upon the plate G′, at one edge, is formed a lug, g', for a wheel-tire or other iron to rest against while being upset.

To the frame A, directly above the lugged plate G′ g', is attached, or upon it is formed, a similar lugged plate, H′ h'. The outer sides of the plates G′ H′ are inclined or beveled to adapt them to receive a wheel-tire.

To the plates G′ H′ are pivoted lever-cams I′ J′, the inner ends or cams of which are corrugated or roughened to prevent them from slipping upon the tire or other iron while clamping it against the lugs g' h' and upsetting it.

To the outer ends of the cam-levers I′ J′ are pivoted the ends of two connecting-rods, K′ L′, the other ends of which are pivoted to the lever M′ upon the opposite sides of and equally distant from the pivot of the said lever M′. The lever M′ is pivoted to one arm of a crank, N′, the other arm of which is pivoted to an arm or bracket, O′, attached to or formed upon the frame A. The outer end of the lever M′ projects into such a position that it may be conveniently reached and operated by the workman.

To the upper part of the end of the frame A, just below the shaft B, is attached, or upon it is formed, a horizontal frame, P′, to one end of which, near and a little below the said shaft B, is pivoted a roller, Q′.

To one end of the roller Q′ is attached, or upon it is formed, a gear-wheel, R′, the teeth of which mesh into the teeth of a similar gear-wheel, S′, attached to or formed upon the end of the roller T′. The roller T′ is placed upon the driving-shaft B, and is connected with it by a tongue and groove or other suitable means, so that the roller T′ may slide longitudinally upon the shaft B, and may be carried around by and with the said shaft in its revolution.

This construction allows the roller T′ to be thrown into and out of gear with the roller Q′, when desired. The roller T′ is secured in either position by a forked key, V′, placed upon the shaft B at one or the other end of the said roller.

V′ is the third roller, the journals of which revolve in notches in the side frames of the carriage W′, which slides out and in in ways in the frame P′.

To a cross-bar of the carriage W′ is swiveled the forward end of the screw X′, which passes in through a screw-hole in the end bar of the frame P′, and has a crank or hand wheel, Y′, attached to its outer end for convenience in operating it.

By this construction, by operating the screw X′, the position of the third roller, V′, may be regulated as it is required to give more or less bend to the tire or other iron.

Several notches are formed in the side bars of the carriage W′, at different heights, to re-

ceive the journals of the third roller, V′, so that the said roller may be adjusted to bend the iron to a greater or less circle, as may be required.

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

The herein-described device, consisting of the frame A, the sliding shaft B, and the actuating-gears specified, adapted to receive and operate a drill, a lathe, shears, a punch, a tire-shrinker, and a tire-bender, as shown and described.

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Witnesses to the signature of Robert Bates:
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