W. BLACKER.

MECHANICAL OR POWER ACTUATED HAMMER.

APPLICATION FILED SEPT. 16, 1912.

1,054,332.

Patented Feb. 25, 1913.

3 SHEETS—SHEET 1.

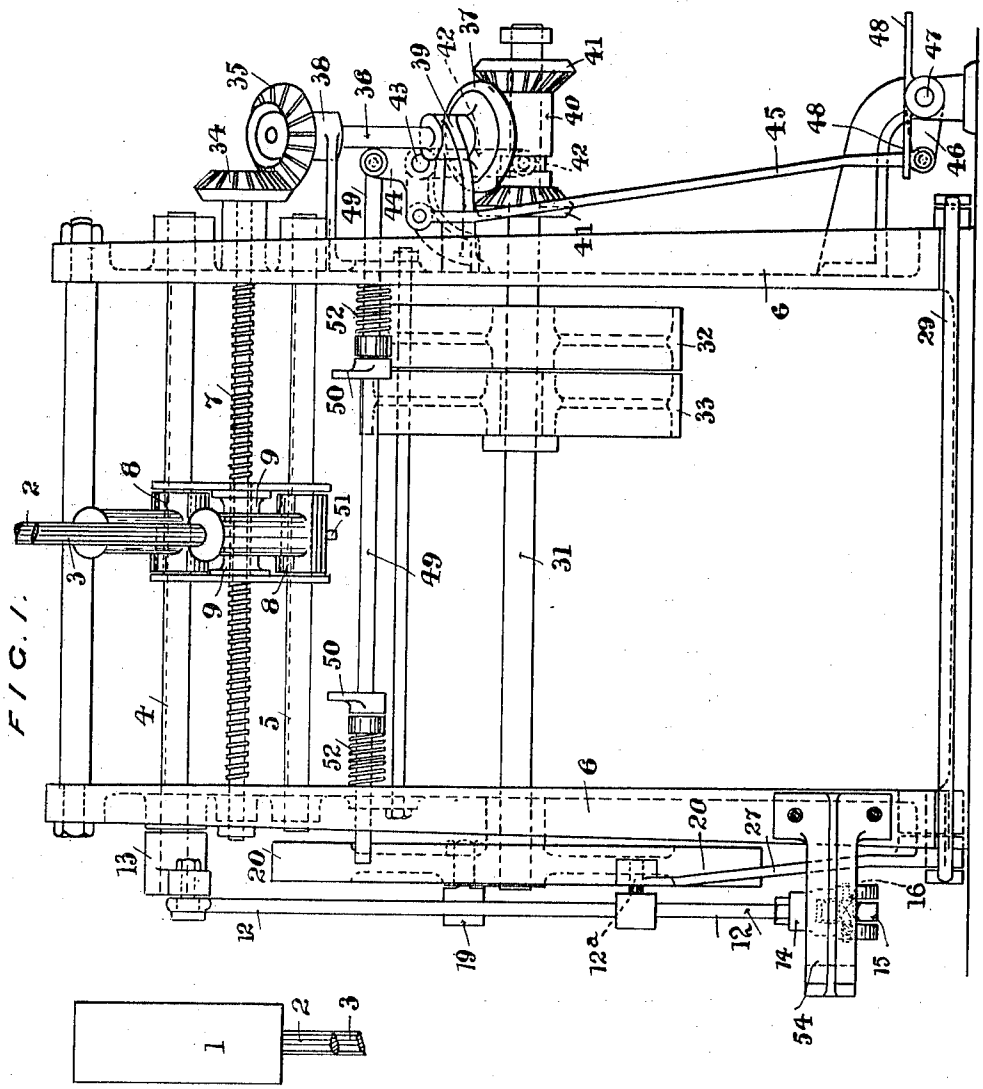

FIG. 1.

WITNESSES

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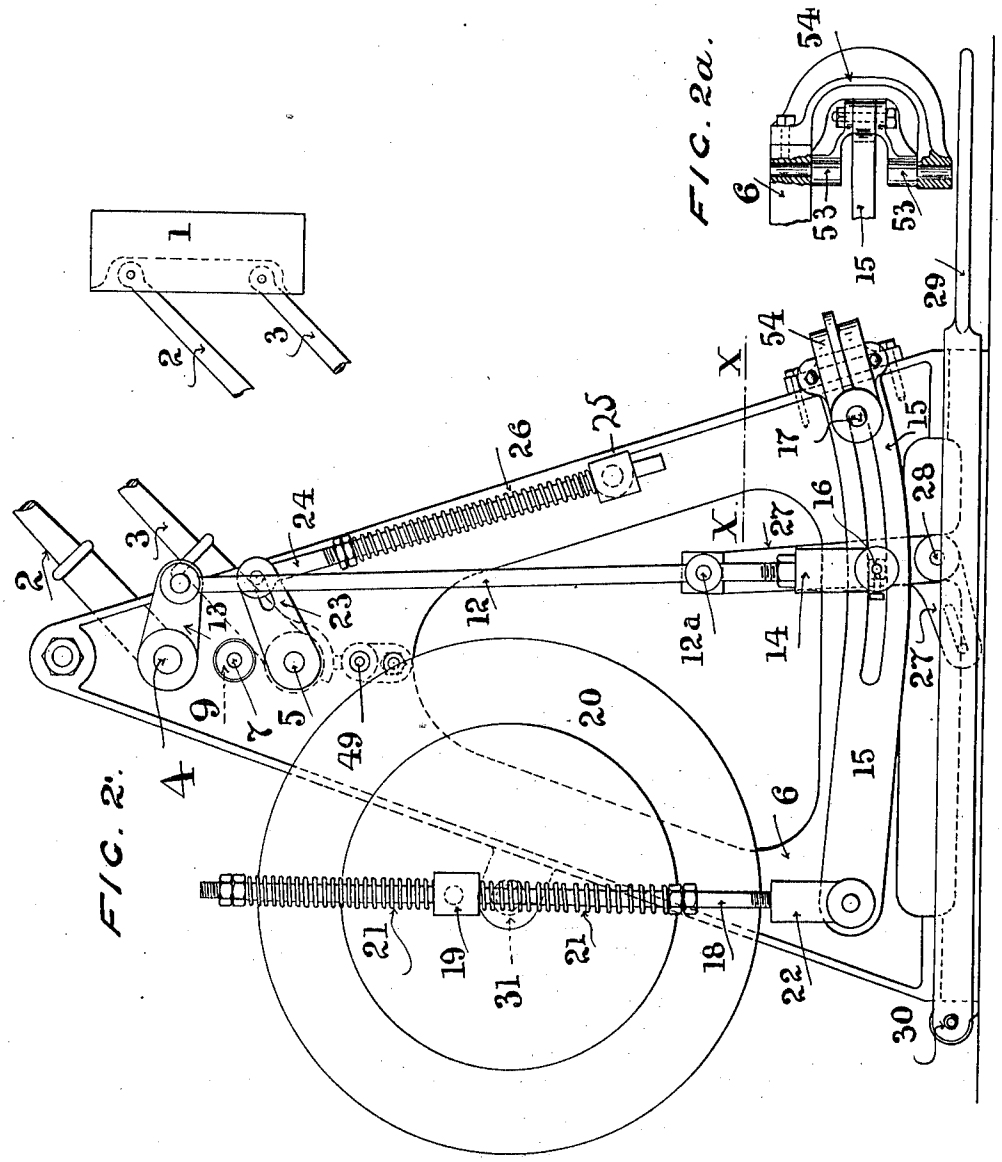

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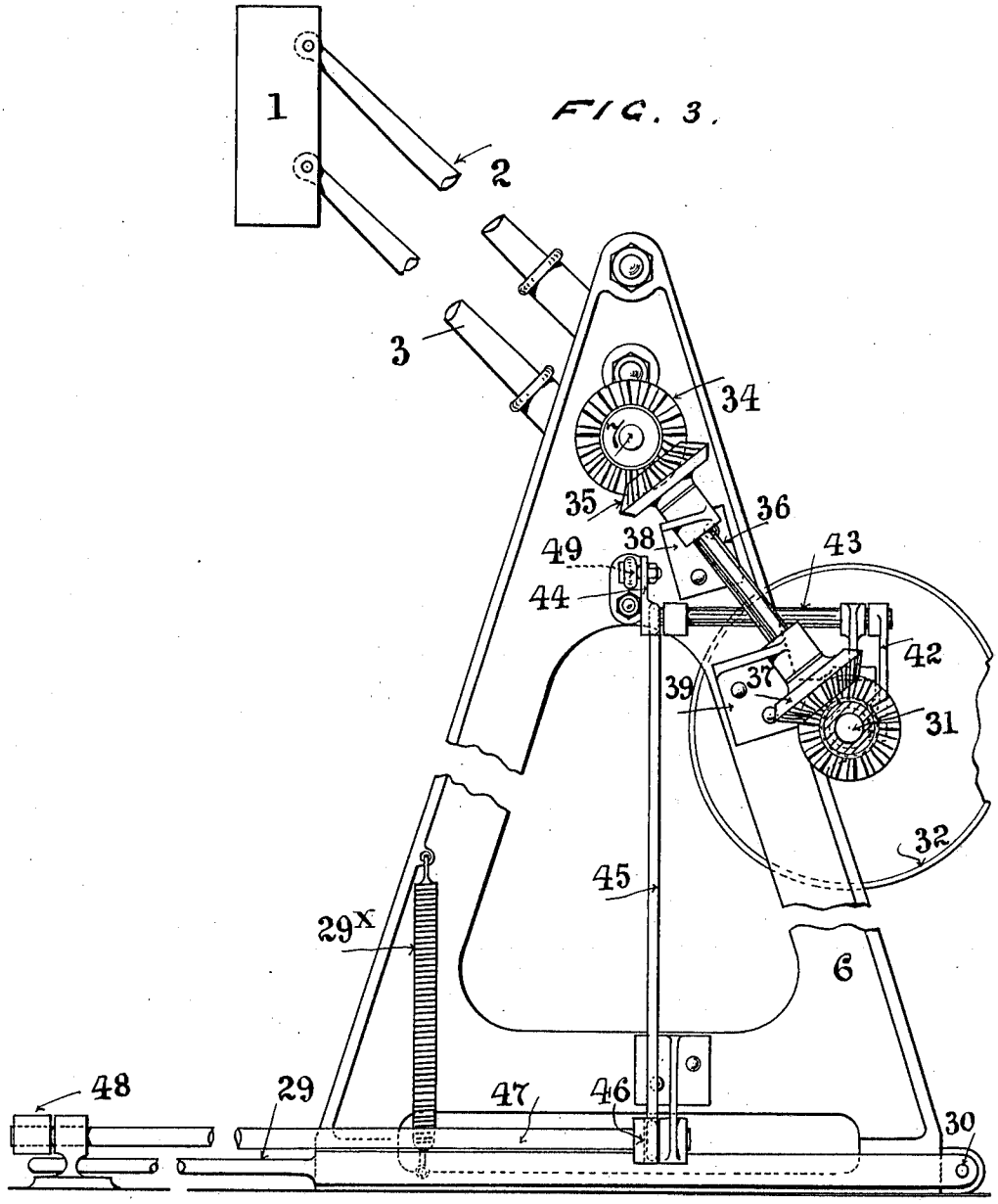
3 SHEETS—SHEET 3.

FIG. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM BLACKER, OF STALYBRIDGE, ENGLAND.

MECHANICAL OR POWER-ACTUATED HAMMER.

1,054,332. Specification of Letters Patent. Patented Feb. 25, 1913.

Application filed September 16, 1912. Serial No. 720,559.

To all whom it may concern:

Be it known that I, WILLIAM BLACKER, a subject of the King of Great Britain and Ireland, residing at 18 Acres Lane, Stalybridge, in the county of Chester, England, blacksmith, have invented new and useful Improvements in Mechanical or Power-Actuated Hammers, of which the following is a specification.

This invention relates to power actuated hammers, for use by smiths and others, wherein the hammer or block is pivoted upon parallel rods which are swung by power through arcs.

The invention has reference to improvements calculated to increase the efficiency of hammers of this class.

The improved construction is hereafter fully described and is illustrated by the attached drawings, to which reference is to be made.

In the said drawings: Figure 1 is a front elevation of my improved hammer, the head or tup being shown detached for want of space in the sheet. Fig. 2 shows an end elevation looking from the left. Fig. 2ª is a detail plan view on the line X—X Fig. 2. Fig. 3 shows a side elevation looking from the right-hand side. In each of the Figs. 2 and 3 the hammer head is shown detached for want of room. The anvil, on which the hammer head strikes, is not shown in the drawings.

I mount the hammer or tup 1 on rods or parallel arms 2, 3 carried upon upper and lower shafts 4, 5, which shafts are supported in end standards 6, 6, and, I utilize an intermediate screwed shaft 7 to set or effect transverse movement of the hammer head and its carrying parts. For preference, I form both the upper and lower shaft 4, 5 with keyways for the brackets or slides 8, 8 in which the hammer rods or parallel arms 2, 3 are fixed, and so as to better distribute the work. The slides or brackets 8, 8, are held between the cheeks of a traverse device 9 the boss of which is formed as or fitted with a nut engaged by the screwed shaft 7. I fit both the connecting rod 12 which swings the hammer, and the spring connecting rod 24 (which assists to raise the hammer) at the same end of the machine.

To drive the hammer and swing it with respect to the anvil I act by means of a connecting rod 12 upon a crank or lever arm 13 fixed to the upper shaft 4 and this connecting rod has central adjusting means such as a turnbuckle 14, or right and left hand screws, or other equivalent device.

The connecting rod 12 is acted upon by a pivoted slotted link or slotted lever 15, for convenience, hereafter called a slotted link, and the connecting rod has a die 16, or its equivalent, which can play in such slot. Said slotted link 15 is fulcrumed at 17 toward the front of the machine, and, its opposite extremity is acted upon by a vertical rod 18 passing freely through a crank pin 19 or eccentric pin or block mounted on a fly wheel 20 or otherwise. The vertical rod 18 has a spring or springs 21, 21, both above and below the crank pin 19, and so can yield either up or down according to the resistance offered to the blow from the hammer. A suitable jointing connection such as the slotted adjustable block 22 is made between the spring controlled rod 18 and the slotted link 15. It follows, from the foregoing, that, as the fly-wheel 20 rotates, the crank pin 19 rocks the slotted link 15 on its fulcrum 17, and the die 16 on the connecting rod is affected to an extent corresponding to its relative position between the fulcrum point 17 and the point along the slot in the link 15 where the die on the actuating rod rests for the time being. If the die 16 coincides with the fulcrum no movement is imparted to the hammer, and, just as the die recedes from that fulcrum so the hammer is swung through an increasing traverse. On the lower shaft 5, a crank or lever 23 is fitted to work with a spring rod 24 supported on an anchoring abutment 25, with the object, that, the spring 26 shall tend to elevate the hammer and do some portion of the work in raising the hammer block.

To move the connecting rod 12 to shift the die 16 along the slotted link 15 I may employ a bell-crank lever 27, jointed at 12ª to the connecting rod and fulcrumed at 28. This bell crank lever 27 is acted upon by a foot-treadle 29 pivoted at 30 and reaching to the front of the machine. A spring 29ˣ serves to lift-up the foot treadle 29.

In order to produce a lasting fulcrum for

the slot link I may fix steel castings 53 or equivalent parts, to the end of the forged slotted link 15, each casting having a trunnion to fit bearings in a double cheeked bracket 54 and in the end support 6, the bracket 54 being formed in one with or attached to the end standard 6. This is clearly shown by the detail plan Fig. 2a.

The machine has preferably but one driving shaft 31 which latter carries the fly wheel 20, and fast and loose pulleys 32, 33, which latter may be in a position mid-way in the length of the machine, and I effect the driving of the traversing screw 7 from such shaft 31 by means of spur gear and clutches.

Conveniently I use bevel gear and clutches arranged at one end of the machine. In the construction shown, I mount a bevel pinion 34 on the screwed shaft 7 and gearing therewith is a bevel pinion 35 on an inclined shaft 36 which shaft carries a lower bevel gear 37. The shaft 36 is supported in bearings 38, 39, as shown by Fig. 3. On the main shaft 31 is a sleeve 40 with bevel gears 41, 41, and this sleeve is worked by a fork or bar 42 on the shaft 43 carried in bearings as shown. The shaft 43 is acted upon by a bell-crank lever 44 one arm of which is jointed by a connecting rod 45 to a lever 46 on a shaft 47, which shaft, carries, or combines with it, a foot-treadle 48. If the foot-treadle 48 be moved in one direction, the sleeve 40 is correspondingly shifted and the screw threaded traversing shaft 7 is rotated to shift the hammer, &c., to the left, and, if moved in the opposite direction the sleeve is shifted to cause the hammer to be moved to the right. The sleeve is arranged to be normally "out", that is, the bevel gears 41, 41 are out of gear normally, and it will be later apparent how this condition results.

To prevent breakage should a clutch or gear wheel be kept in too long, I fit a releasing motion of a suitable kind. According to the preferred arrangement I have a stop rod 49 with adjustable or other collars 50 thereon which are acted upon by a projection 51 carried by the lower traversing support 8 for the hammer rods. This stop rod 49 passes through bearings in the side frames, and, springs 52 are fitted at each end intermediate of the frames and the stop collars. It is also clear that the stop rod 49 is connected up to the vertical limb of the bell-crank lever 44. Thus, the stop rod normally acts to keep the clutch box 40 out of gear and the foot treadle 48 in a horizontal position. Now, in the event of the clutch box being kept in too long, it will be seen that the projection 51 will then encounter one of the stop collars 50 and so at once act on the stop rod 49 and impart end movement, and, owing to the connections described, the clutch is automatically taken out and the foot jerked off the foot treadle.

I may vary the means of disengaging the clutch, so long as the traversing of the hammer rod supporting device is employed to disengage the clutch to prevent breakages.

Means are provided to adjust any or all of the yielding springs employed.

I declare that what I claim is:

1. A parallel power hammer, having upper and lower transverse shafts, brackets or slides thereon, inter-connecting or keying means between said transverse shafts and said brackets or slides, hammer swinging gear at one end of the machine including a slot link, hammer raising gear at the same end of the machine, and a connecting rod actuating the upper transverse shaft from the slot link and means for adjusting the connecting rod along the slot link.

2. A parallel power hammer, having an upper transverse shaft, a lower transverse shaft, brackets thereon, hammer arms supported by said brackets, inter-connecting means between the transverse shafts and the brackets, a fly wheel and crank, and a spring pressed rod, slot link mechanism in connection therewith, a connecting rod worked by such mechanism, a crank on the upper transverse shaft and a spring pressed spindle and crank acting upon the lower transverse shaft to assist in raising the hammer.

3. A parallel hammer in which is combined a driving shaft, a fly wheel and crank, and actuating rods and springs in connection therewith, and a slotted link, a movable connecting rod and means for influencing the same, and upper and lower transverse shafts, a crank connection from said connecting rod to the upper transverse shaft and means to assist in raising the hammer as described.

4. A parallel power hammer, including upper and lower transverse shafts, means to actuate the shafts to effect movement of the hammer, and a revoluble screwed shaft, a main driving shaft, movable gear wheels thereon, and a slidable device and gear operated by the gear wheels to rotate the screwed shaft to traverse the hammer as set forth.

5. A parallel power hammer, including transverse shafts, traversing means, slidable hammer supporting brackets, means to actuate the transverse shafts to swing the hammer, and a movable shaft, springs in connection therewith, a driving shaft and shiftable gear thereon, and lever mechanism intermediate of the gear and the movable shaft whereby the gear is disengaged, as set forth.

6. A parallel power hammer, comprising upper and lower transverse shafts, a screw shaft, brackets slidable on the transverse shafts, swing arms thereon, gear for the screw shaft, a main driving shaft and gear

thereon, a movable stop rod and adjustable devices thereon, and lever mechanism worked by said stop rod to throw the gears in and out, a movable foot treadle and means intermediate of said foot treadle and the lever mechanism whereby the one acts with the other, as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM BLACKER.

Witnesses:

RICHARD WEBSTER IBBERSON,

NORMAN KIERNAN.