

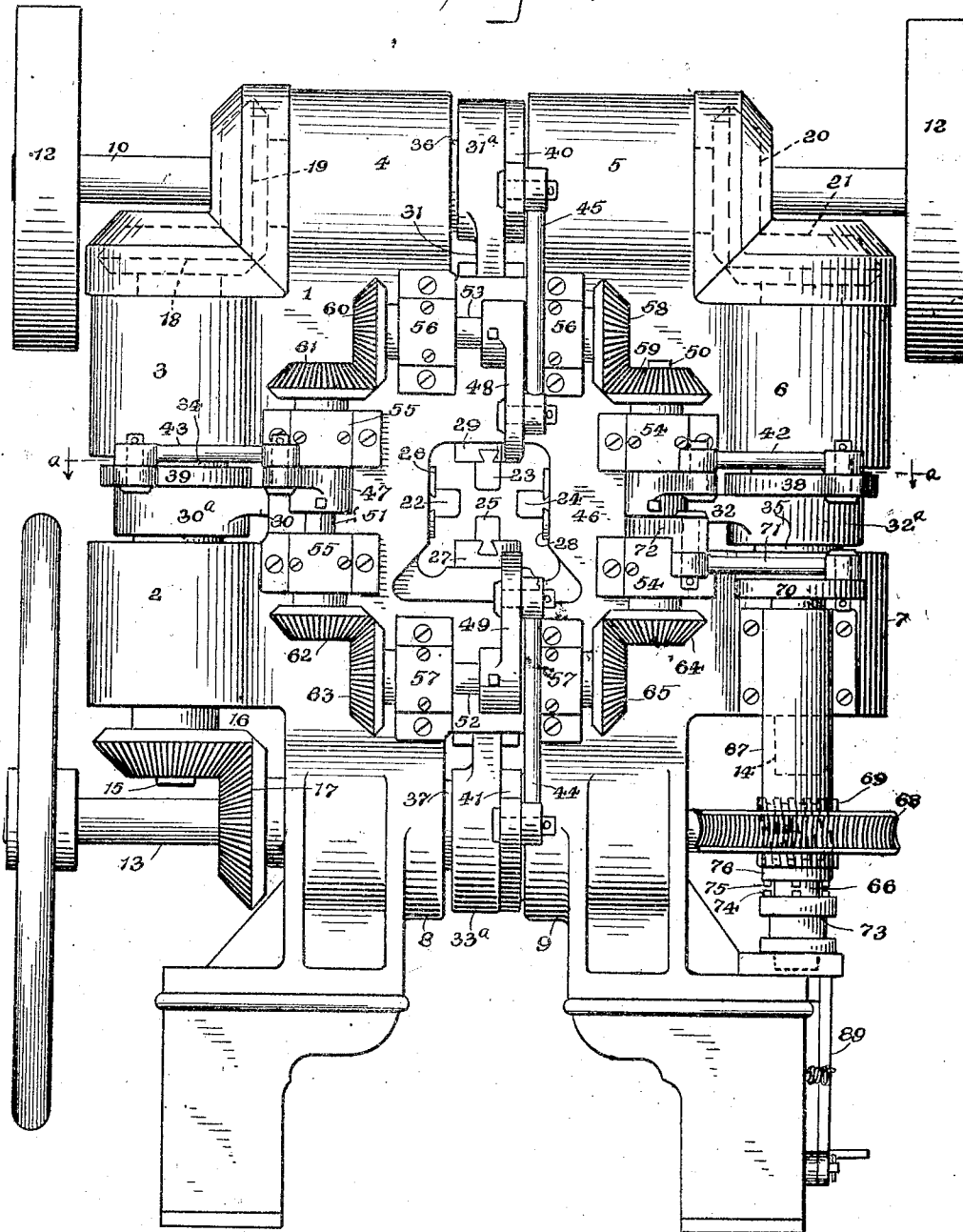
A. BERG.
SWAGING MACHINE.
APPLICATION FILED DEC. 12, 1908.

952,298.

Patented Mar. 15, 1910.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

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Andrew Berg

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Geo. O. Phillips

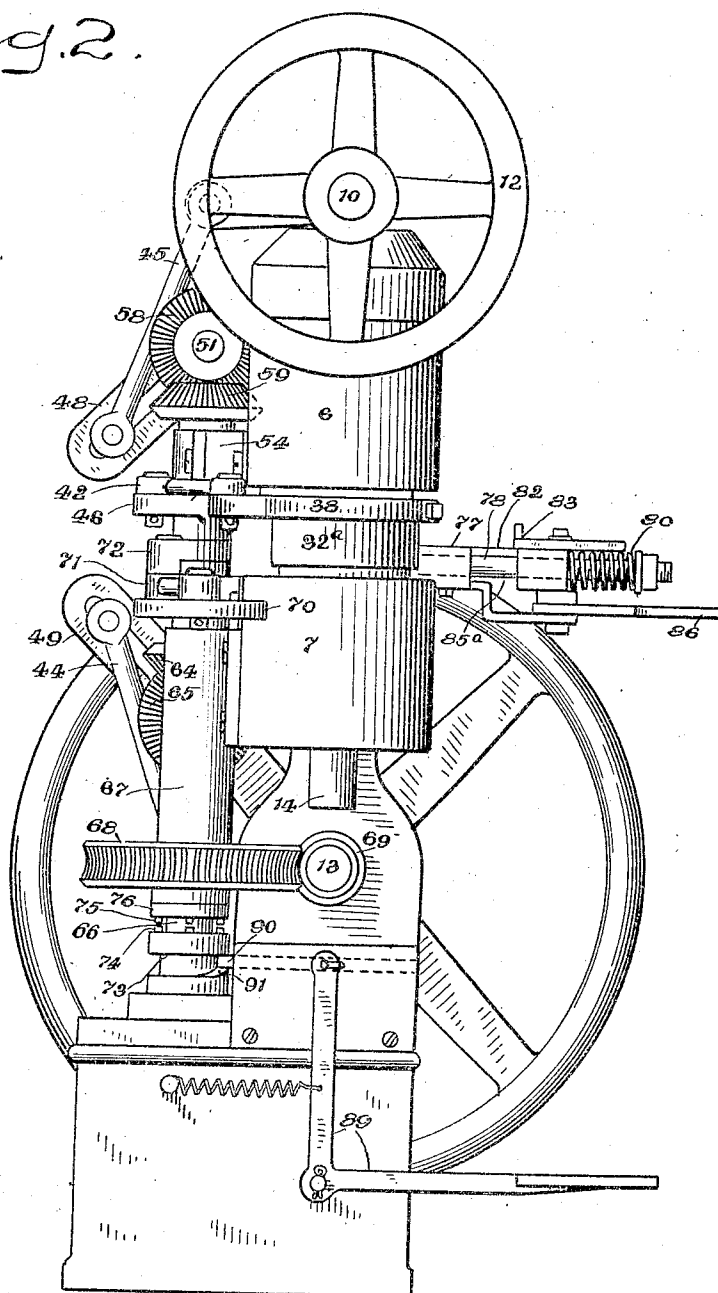
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3 SHEETS—SHEET 2.

Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 3.

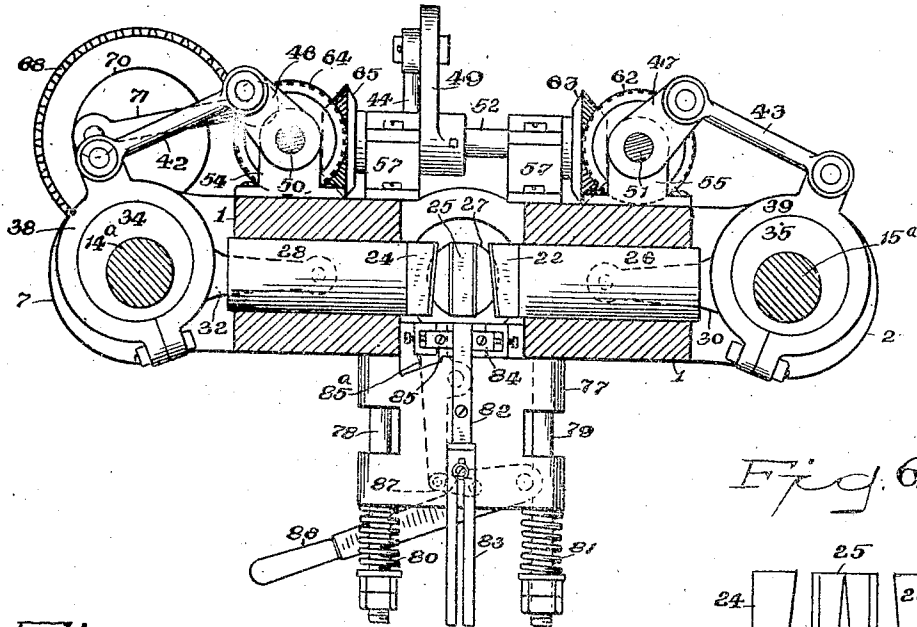


Fig. 4.

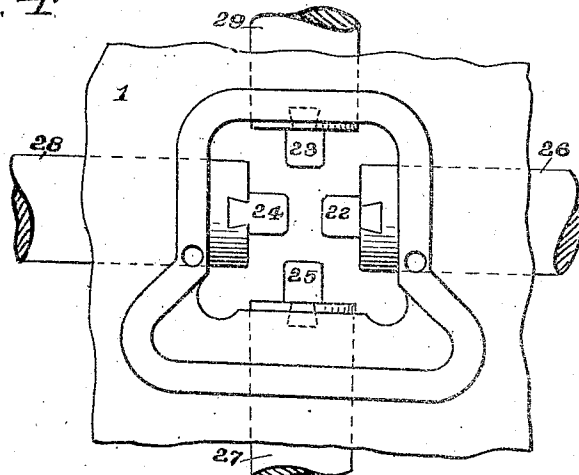


Fig. 5.

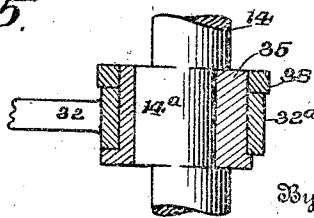
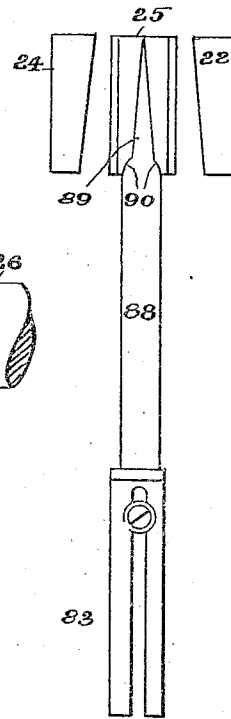


Fig. 6.



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UNITED STATES PATENT OFFICE.

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SWAGING-MACHINE.

952,298.

Specification of Letters Patent. Patented Mar. 15, 1910.

Application filed December 12, 1908. Serial No. 467,177.

To all whom it may concern:

Be it known that I, ANDREW BERG, a citizen of the United States, and a resident of Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Swaging-Machines, of which the following is a specification.

My invention relates to swaging machines and it consists in certain details of construction to be more fully described in the following specification and such features believed to be new and novel are particularly pointed out in the claims.

To enable others skilled in the art to understand my invention, reference is had to the accompanying drawings, in which—

Figure 1 represents a vertical rear elevation of the machine; Fig. 2 is a side elevation; Fig. 3 is a sectional view of the machine frame on line *a a* of Fig. 1; Fig. 4 is a broken section of the machine and the pitmen carrying the swaging dies; Fig. 5 is a broken view of one of the swaging crank shafts and sectional view of the pitman mechanism connected therewith; and Fig. 6 is a detail view of three of the swaging dies and a finished file tang.

1 is the frame of the machine provided with the housings 2, 3, 4, 5, 6, 7, 8 and 9 in which is journaled the main driving shaft 10 carrying the driving pulleys 11 and 12, the horizontal shaft 13 and the vertical shafts 14 and 15 rotatably connected together through the medium of the bevel gears 16, 17, 18, 19, 20 and 21.

22, 23, 24 and 25 are the swaging dies removably secured to the reciprocating pitmen 26, 27, 28 and 29. The several pitmen are pivotally connected to the arms 30, 31, 32 and 33 having the head portions 30^a, 31^a, 32^a and 33^a, which heads are journaled on the eccentrics 34, 35, 36 and 37, and these eccentrics are journaled on crank portions of the shafts 10, 13, 14 and 15. Two of these cranks, viz., 14^a and 15^a are shown at Figs. 3 and 5.

38, 39, 40 and 41 are straps adjustably clamped to the before mentioned eccentrics, and 42, 43, 44 and 45 are links pivotally supported by one end to said straps and by the other end to the arms 46, 47, 48 and 49, secured to the horizontal and vertical secondary shafts 50, 51, 52 and 53, journaled in the boxes 54, 55, 56 and 57 and are rota-

tably connected together by gears 58, 59, 60, 61, 62, 63, 64 and 65.

The vertical shaft 66 (Figs. 1 and 2) is journaled in the bracket 67, and 68 is a worm gear journaled on said shaft and normally running idle thereon through the medium of the worm 69 secured to the shaft 13.

70 is a plate mounted on the upper end of shaft 66, and 71 is a link eccentrically and pivotally connected by one of its ends to said plate while its opposite end is pivotally connected to the arm 72 secured to the vertical shaft 50. On the lower end of shaft 66 is the clutch sleeve 73 rotatably connected with said shaft and vertically movable thereon and carrying the clutch pins 74 adapted to be brought into engagement with the clutch pins 75 of the clutch collar 76 secured to or forming an integral part of the worm gear 68 for the purpose to be hereinafter more fully described.

The work holding chuck 77 is slidably mounted on the horizontal studs 78 and 79 projecting from the front of the machine frame and it is flexibly held against the frame by means of the springs 80 and 81. The rib 82 rises above the upper surface of the chuck to support the piece to be operated upon by the dies.

83 is an adjustable gage against which the outer end of said piece rests.

84 is a stationary jaw located near the dies, and 85 is a movable jaw having the tail-piece 85^a and which is actuated to open and close said movable jaw through the medium of the handle lever 86 and link 87. The dies can be shaped to swage work of any form required. Those shown are particularly adapted for swaging file tangs. The body 88 of the file (Fig. 6) rests on the rib 82 of the chuck and is held firmly in position by the jaws with its rear end against the gage 83 and its forward end projecting into the swaging field, the horizontal dies 22 and 24 being tapered to form the tang 89. During the swaging operation the file will, by reason of the taper faces of the dies 22 and 24, be forced back against the pressure of the springs 80 and 81, which will produce the curved shoulders 90. As fast as the taper dies reduce the stock, the flat and vertically operating dies will maintain the thickness of the tang correspondingly with the thickness of the body of the file.

Operation: The shafts 10, 13, 14 and 15

and the worm gear 68 run continuously, and by reason of their central cranks also communicate a continuous reciprocatory movement to the die-carrying pitmen. The

crank mechanism is so adjusted that the pitmen reciprocate in pairs. In other words, when the dies in the horizontally moving

pitmen 26 and 28 are approaching each other, the dies in the vertically operating

pitmen are receding from each other, thus giving alternate blows on the four sides of a piece. While the pitmen are thus idly reciprocating, their dies will be out of contact with a piece to be swaged, and during this

idle reciprocation the links 42, 43, 44 and 45 will simply swing or turn on their pivotal supports without actuating the shafts 50, 51, 52 and 53. When a piece to be swaged is in position as before described, the treadle lever 89 is actuated to withdraw the bolt 90

and permit the clutch sleeve 73 to be carried up into engagement with the clutch collar 74 through the influence of a spring (not shown), and thus bring the short vertical shaft 66 under the rotative influence of the worm gear 68, and, while the pitmen are reciprocating, the shaft 66 will slowly rotate

and, by means of the eccentrics, gradually advance the dies toward each other as fast as the piece of work is reduced, and when the shaft 66 has made a complete revolution, the cam projection 91 on the clutch sleeve 73 will engage the underside of the bolt 90 and cause said sleeve to be disengaged from

said clutch and thus bring shaft 66 to a state of rest with the pitmen and their actuating mechanism in open position with the pitmen still reciprocating, as shown at Figs. 1 and 3. The straps 38, 39, 40 and 41 are adjustably secured to their respective eccentrics so that, by shifting said straps, the inward travel of the pitmen may be regulated. In other words, the nearer the high point of the eccentrics approaches the center or axial

line of the pitmen in their rotary travel, the closer the dies will come together.

While I show mechanism for actuating four pitman carrying dies adapted to be brought gradually nearer each other as the swaging progresses, I hold myself at liberty to employ only one die carrying pitman and its operating mechanism as shown, in which case a stationary anvil would be required.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. A swaging machine comprising radially reciprocating pitmen carrying dies at their inner ends and their actuating mechanism, combined with mechanism for automatically decreasing the distance between the dies of the reciprocating pitmen during the swaging operation.

2. A swaging machine comprising a frame, shafts journaled therein and means for ro-

tatively connecting them together, pitmen carrying dies at one end, mechanism connecting the other end of the pitmen with the shafts whereby said pitmen are reciprocated, mechanism connected with the pitman reciprocating mechanism for automatically and gradually lessening the distance between the face of dies during the operation of swaging, for the purpose set forth.

3. A swaging machine comprising a frame, radially reciprocating pitmen therein, shafts journaled in said frame and means for rotatively connecting them together, each shaft having a crank, an eccentric journaled on each crank to actuate the pitmen, an arm journaled on each eccentric, said pitmen carrying dies at their inner ends, and means for pivotally connecting their outer ends with said arms, for the purpose set forth.

4. A swaging machine comprising a frame, shafts journaled therein and means for rotatively connecting them together, each shaft having a crank, an eccentric journaled on each crank, an arm journaled on each eccentric, pitmen carrying dies at their inner ends and means for pivotally connecting their outer ends with said arms, a strap secured to each eccentric, secondary shafts and means for rotatively connecting them together, links connecting said straps with the secondary shafts, and means for rotating the secondary shafts while the pitmen are reciprocating and automatically turn the eccentrics so as to gradually lessen the distance between the faces of the dies during the swaging operation, for the purpose set forth.

5. A swaging machine comprising a crank shaft, an eccentric journaled on the crank portion of said shaft, a pitman carrying a die at its inner end, an arm pivotally connected with the opposite end, said arm journaled on the eccentric, means for rotating said shaft to reciprocate the pitman, mechanism connected with the eccentric for automatically turning the eccentric and thus gradually advancing the pitman toward the work to be operated upon while the pitman is reciprocating, for the purpose set forth.

6. In a swaging machine, in combination with swaging mechanism, a movable work holding chuck, jaws therefor, tension springs for normally locating the chuck and a gage for the work, for the purpose set forth.

7. A swaging machine comprising a frame, shafts journaled therein and means for rotatively connecting them together, each shaft having a crank, an eccentric journaled on each crank, an arm journaled on each eccentric, pitmen carrying dies at their inner ends and means for pivotally connecting their outer ends with said arms, a strap adjustably connected with each eccentric, secondary shafts and means for rotatively con-

necting them together, links connecting said
straps with the secondary shafts, a worm
wheel, a shaft therefor on which said worm
wheel normally runs idle, a worm on one of
5 the crank shafts meshing with the worm
wheel, means for bringing the worm wheel
shaft into rotative engagement with the
worm wheel and means for connecting the
worm wheel shaft with one of the secondary
10 shafts for automatically turning the eccen-

trics and thus gradually advancing the re-
ciprocating pitmen into the swaging field,
for the purpose set forth.

Signed at Bridgeport in the county of
Fairfield and State of Connecticut this 8th 15
day of Dec. A. D. 1908.

ANDREW BERG.

Witnesses:

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J. EDW. BROSNAN.