

(No Model.)

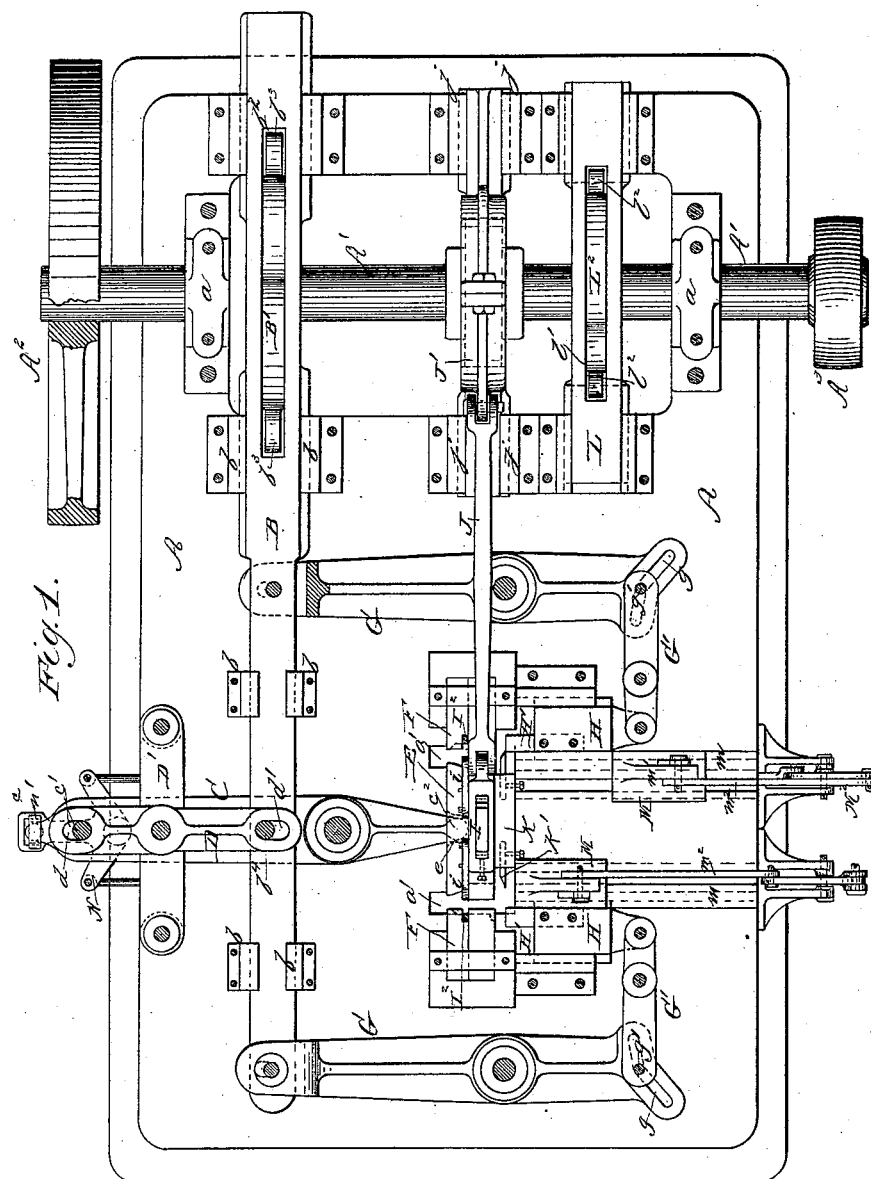
4 Sheets—Sheet 1.

W. HULTGRAN.

SPIKE MACHINE.

No. 304,327.

Patented Sept. 2, 1884.



Witnesses.

Wm R. Bushnell
H. C. W. Arthur

Inventor.

William Hultgran

By

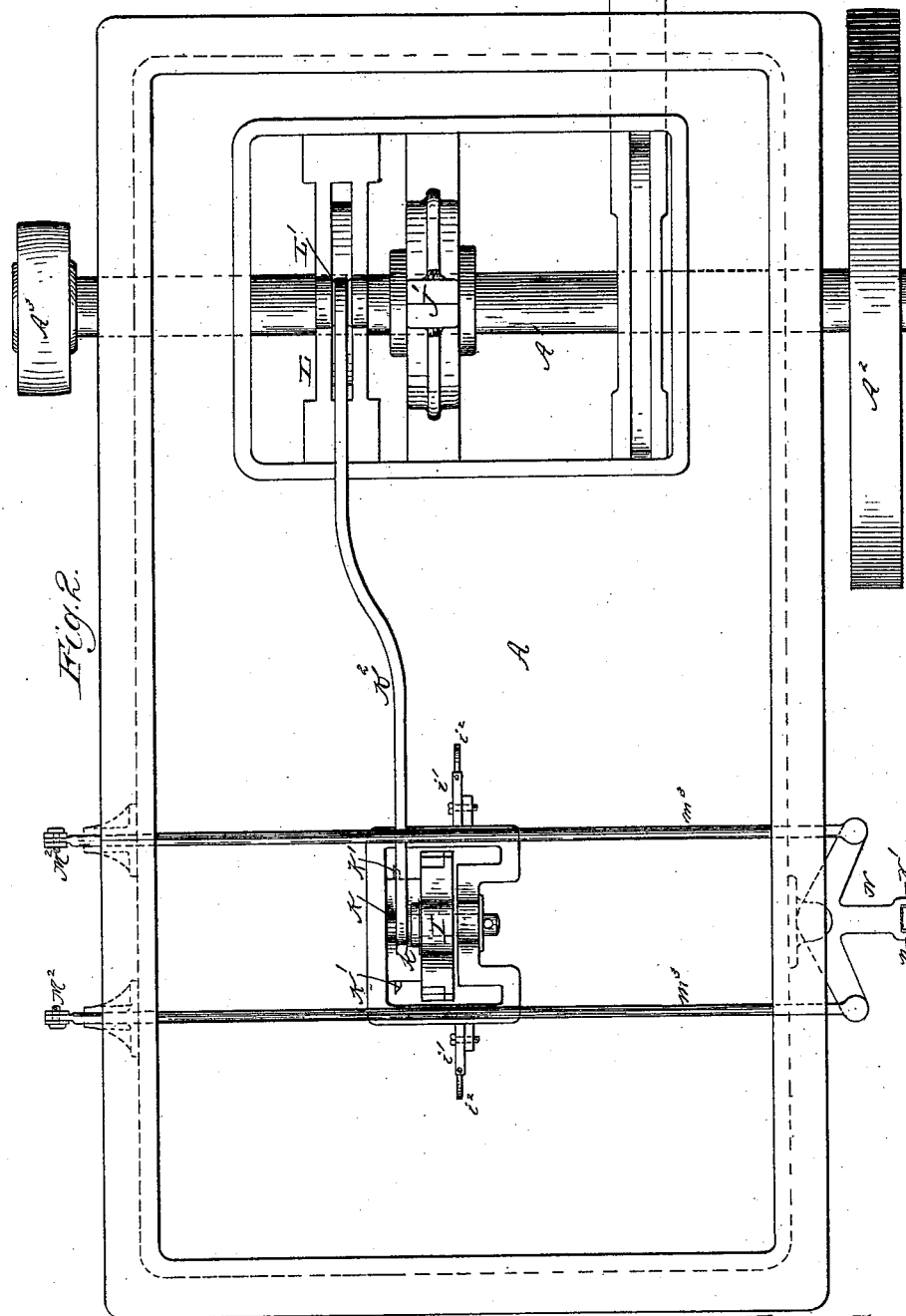
H. H. Harrison
Atty.

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H. C. McArthur,

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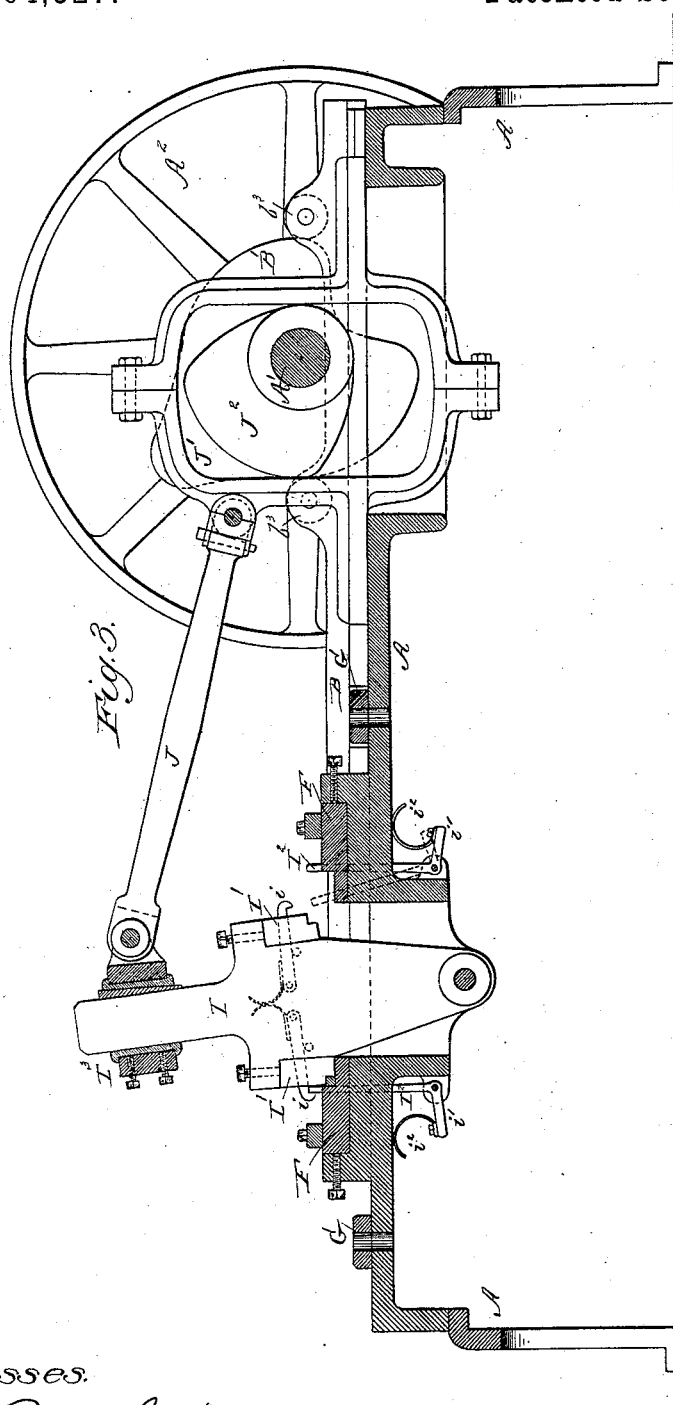
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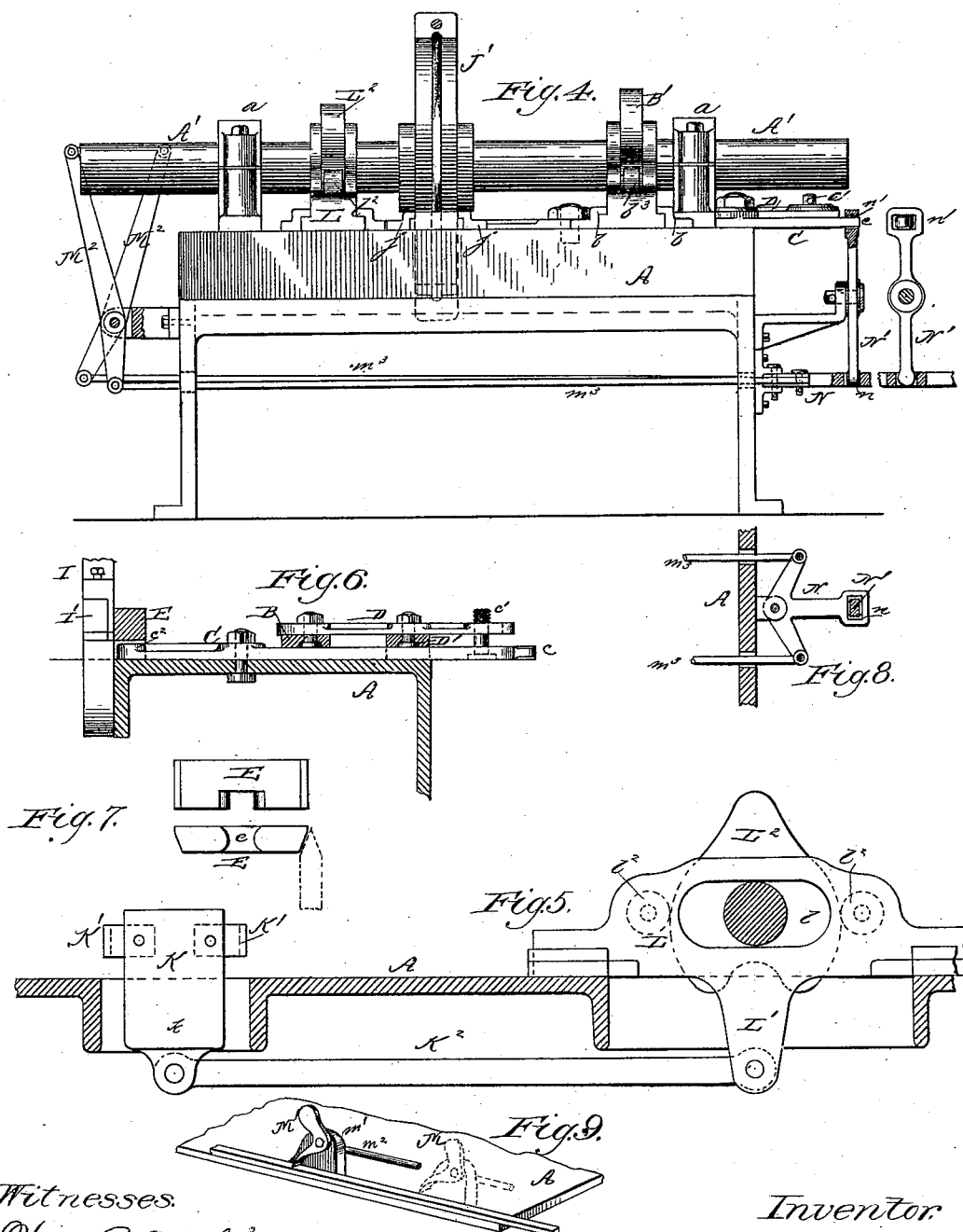
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UNITED STATES PATENT OFFICE.

WILLIAM HULTGRAN, OF PULLMAN, ILLINOIS.

SPIKE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 304,327, dated September 2, 1884.

Application filed September 5, 1883. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HULTGRAN, a citizen of the United States, residing at Pullman, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Spike-Machines, of which the following is a specification, to wit:

This invention relates to an improvement in machines for making spikes; and it consists in certain details of the construction and arrangement of the same, whereby the machine is made simple, strong, and of large capacity, substantially as will be hereinafter more fully described, and pointed out in the claims.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the accompanying drawings, in which—

Figure 1 is a top plan view; Fig. 2, a bottom plan view. Fig. 3 is a longitudinal vertical section. Fig. 4 is an end view; Fig. 5, a detail view of the cutting-dies and their operating mechanism; Fig. 6, a detail view of the levers for operating the pointing-dies. Fig. 7 is a view of the pointing-dies. Fig. 8 represents the manner of operating the feeding devices, and Fig. 9 shows the feeding-dog.

A represents the base or frame of the machine, which is cast in one or more pieces, as may be found most desirable. In boxes *a a*, upon one end of the main frame, is journaled the main driving-shaft *A'*, upon one end of which is the fly-wheel *A²* and upon the other the driving-pulley *A³*.

Upon the upper part of the machine, near its rear side, is placed a reciprocating bar, *B*, sliding back and forth in guides *b b* on the frame, and having one end broadened out and formed with a horizontal slot, *b'*, through which the main driving-shaft passes, and at this point the reciprocating bar is also formed with a vertical slot, *b²*, each end of which is provided with an anti-friction roller, *b³ b³*, against which works the periphery of a heart-shaped cam, *B'*, secured on the driving-shaft and turning in the vertical slot *b²*, by means of which an irregular reciprocating motion is given to the bar *B* to operate most of the mechanism, as will be presently understood.

To the main frame, beneath the sliding bar *B*, a short distance from its outer end, is pivoted

a lever, *C*, the rear or longer arm of which extends over the rear side of the main frame, and its extreme rear end is formed with a nose, *c*, as represented in Figs. 1, 4, and 6. The upper side of this lever, near its rear end, is furnished with a stud, *c'*, engaging with a slot, *d*, in the end of a lever, *D*, above the lever *C*, and fulcrumed upon a bar or frame, *D'*, and having its forward end also formed with a slot, *d'*, engaging with a stud or pin, *b'*, upon the reciprocating bar *B*, from which it receives a rocking motion upon its fulcrum, as will be understood clearly by reference to the drawings. The inner end of the lever *C* is formed with a nose, *c²*, engaging with a semicircular recess, *e*, in the back of the casting *E*, which is provided or formed on each end with a beveled die for forming one side of the point of the spike, and is arranged to have a reciprocating motion longitudinally of the machine in suitable guides or ways.

It is obvious that the casting *E* may be formed of steel, and the dies integral therewith, or it may be provided with removable dies, as may be desired.

To the main frame, opposite each end of the die *E*, are secured two stationary dies, *F F*, which form the other side of the point, as shown in Fig. 1, and the bed or frame *A* of the machine is formed with a slot or opening, *a'*, between the stationary and movable dies, through which the spikes are delivered after being finished.

To the bar *B*, upon either side of the lever *D*, is pivoted one end of a lever, *G*, fulcrumed upon the main frame, and having the forward or shorter arms formed with an angular slot, *g*, which engages with a pin or stud, *g'*, upon one end of a lever, *G'*, fulcrumed on the frame, and its opposite end connected to a sliding head, *H*, which is thereby given a reciprocating motion transversely of the machine in suitable guides, and provided with a hammer, *H'*, which heads the spike, as will be hereinafter explained.

In a slot formed in the center of the bed-plate *A*, just in front of the reciprocating die *E*, is placed an oscillating arm, *I*, pivoted below the bed-plate, and provided on each side with a notched holding-plate, *I'*, adapted to rest upon and hold the spike in position during the operation of heading and pointing it,

and having upon its rear face two pivoted spring-actuated hooks, *i i*, which project beyond its sides, and as it moves from side to side engage with clearing-fingers I², hinged 5 below the bed-plate, and extending up through it in a recess of the die F behind the spike-blank. Each of these clearing-fingers I² is formed at its lower end with an angular arm, *i'*, provided with a spring, *i''*, adapted to return the finger to its normal position as soon 10 as released from engagement with the spring-hook *i*.

Upon the upper end of the arm I is a box, I³, connected by a pitman, J, with a frame, J', 15 sliding in suitable guides, *j*, upon the frame or bed, and surrounding the main driving-shaft, upon which is a segment-cam, J², as clearly shown by Fig. 3.

In front of the oscillating arm I is placed 20 the cutter-head K, arranged to have a longitudinal reciprocating motion upon the bed-plate, and provided with a removable knife-blade, K', upon each end, which cut the blanks against the hammers H', as will be understood 25 by reference to Fig. 1. The head K is formed with a downwardly-projecting arm, *k*, which passes down through the slotted bed-plate, and is connected by a bar, K², with an arm, L', extending downward from a frame, L, sliding 30 in guides upon the bed, and formed with a horizontal slot, *l*, surrounding the main shaft, and with a vertical slot, *l'*, having friction-rollers *l''*, in which works a heart-cam, L², upon the main shaft, to give motion to the cutter-head. 35

In front of the cutter-head the bed-plate is provided or formed with two transverse guides or grooves, *m*, in which work two plates or 40 feeding-heads, M, in close relation to the hammer-heads. These plates are each provided with a projection, *m'*, to which is pivoted a dog, M', adapted, when the slide is drawn back, to slide over the blank rod which lies 45 beneath it, and when the slide is projected forward to bite and feed the blank into the machine a distance sufficient to make a new spike. Each slide M is connected by a rod, *m''*, with a vertical lever, M², fulcrumed on the front of the machine, and connected at 50 their lower ends by rods *m³ m³* with a triple-armed oscillating lever, N, fulcrumed on the rear of the machine beneath the bed-plate. This lever N is formed with one central arm projecting rearward, and two side arms projecting 55 upon either side of its pivoted point, to which latter the bars *m³ m³* are secured. The rear or central arm is formed with an eye, *n*, in which engages the lower end of a lever, N', fulcrumed on the frame, and its upper 60 arm is provided with an eye, *n'*, which engages with the nose *c* of the rocking lever C, which, by the intermediate mechanism just described, imparts an alternate reciprocating motion to the feeders M M.

65 In operation, the blank having been fed into the machine far enough to make a spike, the motion of the main shaft through its

heart-cam B' throws forward the sliding bar B and moves the lever C by means of the lever D to place the hammer-head in position, 70 and then stops. The cam J² now throws over the oscillating arm I to clamp the blank in position in the recessed die F, and the cam L² throws the cutter-head K forward to cut the blank bar, and draws it immediately back 75 again. The bar B is now again started forward, and by the intermediate mechanism the heading-hammer H' is thrown forward and the die E is forced up to point the spike. The two are then drawn back by the reversal of 80 the bar B, and the cam J² draws back the arm I. Its dog or hook *i* being engaged with the clearing-finger I² pulls it outward to clear the spike and deliver it through the bed. The finger is then released, and is thrown back to 85 position by means of its spring *i''*. The reversed motion of the bar B operates the forming-dies upon the other side, and it will thus be seen that two spikes are formed with every revolution of the driving-shaft. 90

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

1. In a spike-machine, a main driving-shaft journaled on the main frame, and provided 95 with two heart-shaped cams, a bar or slide reciprocated by one of said cams, and a system of compound levers connected to and operated by said slide, in combination with a pointing-die, a heading die or hammer, and a 100 cutter connected to said levers, and each adapted to have an irregular reciprocating motion to and from the spike under operation at stated intervals, substantially as and for the purpose set forth. 105

2. In a spike-machine, a main driving-shaft carrying a heart-shaped cam revolving in a sliding frame upon the bed, and a sliding bar connected to said frame, in combination with 110 a series of levers connecting said bar to a reciprocating feeding-block having devices, substantially as herein described, for clutching the blank on its forward motion and freeing it on the backward motion, as shown and described. 115

3. In a spike-machine, a main driving-shaft carrying a cam working in a sliding frame, in combination with an oscillating arm adapted to hold the blank in place during the operation of heading and pointing, and provided with 120 means for discharging the spike after completion, substantially as shown and described.

4. In a spike-machine, a spring-actuated clearing-finger hinged upon the main frame and extending through a recess in one of the 125 dies behind the spike, in combination with a spring-actuated hook or catch adapted at proper intervals to engage the clearing-finger to discharge the spike, substantially as shown and described. 130

5. In a spike-machine, the oscillating lever C, receiving motion from the main shaft by a system of levers, and carrying the double-ended movable die E upon its inner end, in

combination with two stationary dies, F F, each of which is formed with a recess for the reception of the blank, and adapted to shape one side of the point, substantially as shown and described.

5 6. In a spike-machine, the reciprocating cutter-head K, provided with two cutting-blades, K', in combination with the two heading dies or hammers H', adapted to act in conjunction
10 with the cutters in severing the blank, substantially as and for the purpose set forth.

7. In a spike-machine, the bed-plate A, having two stationary dies, F F, adapted to receive the blank, the driving-shaft A', having the
15 heart-shaped cam B', and slotted and reciprocating bar B, in combination with the levers D C and reciprocating double-pointed die E, substantially as and for the purpose set forth.

8. In a spike-machine, the bed-plate A, two

stationary dies, F F, driving-shaft A', having
20 the cam B', and slotted and sliding bar B, in combination with the levers G G, having angular slots in their shorter arms, levers G' G', heads H, and hammers H', substantially as and
25 for the purpose set forth.

9. In a spike-machine, the bed-plate A, dies F F, driving-shaft A', sliding bar B, and levers D C, in combination with the lever N', triple-armed rock-lever N, connecting-bars $m^3 m^3$,
30 levers M², links m^2 , and feeding devices M, substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM HULTGRAN.

Witnesses:

CHAS. KRESSMANN,

FRANK JOHNSON.