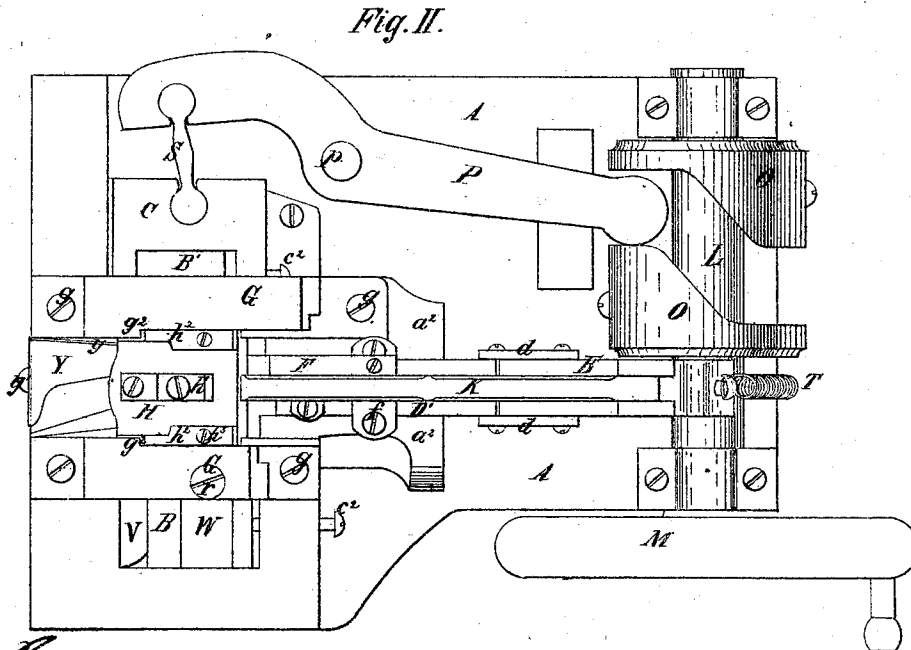
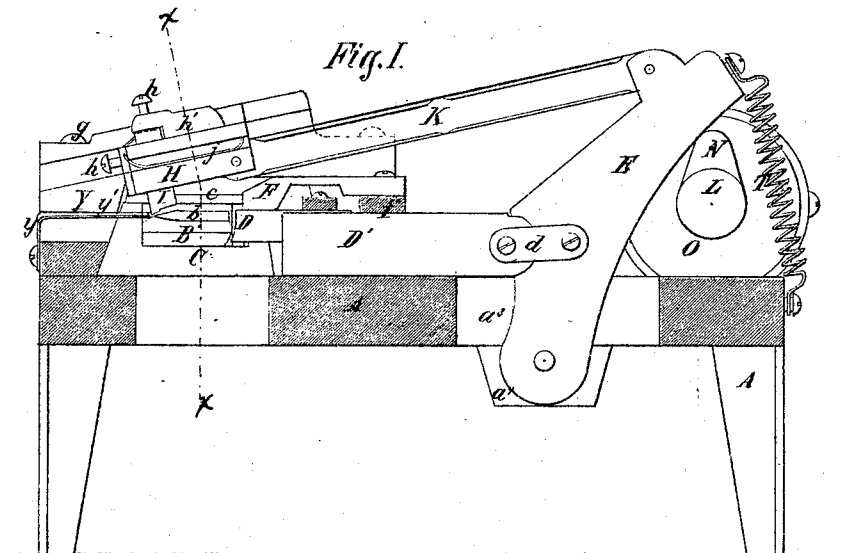


Frederick Bruso.

Imp'd Spike Machine.

No. 118,429.

Patented Aug. 29, 1871.



Frederick Bruso
by Jay H. Hyatt
Samuel Smith
John J. Connor.

Inventor.

Witnesses.

Imp'd. Spike Machine.

Fig. III

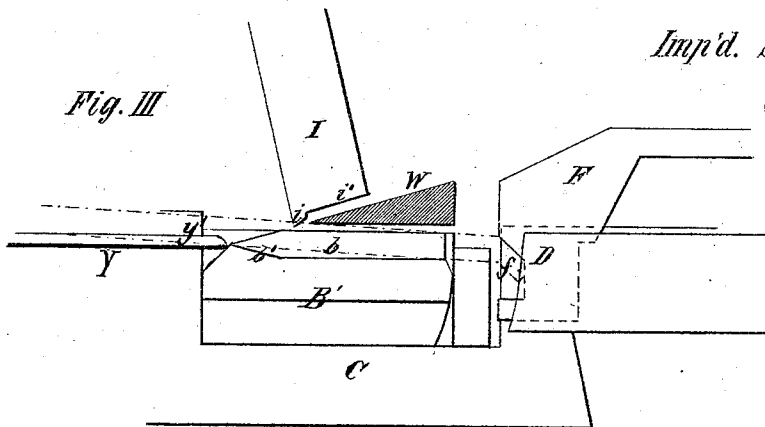


Fig. IV

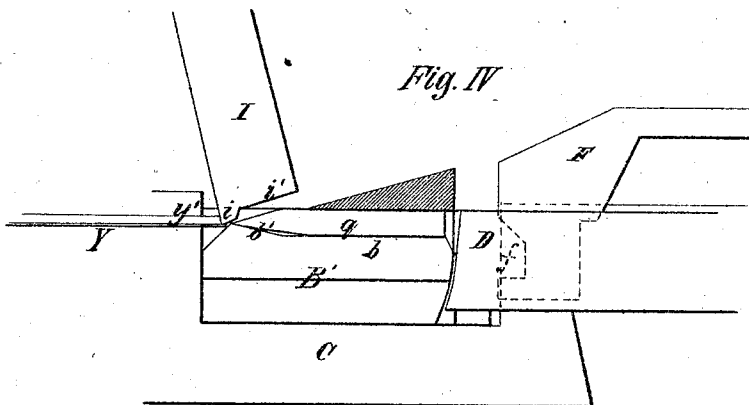


Fig. VI

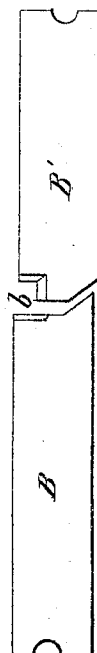


Fig. V

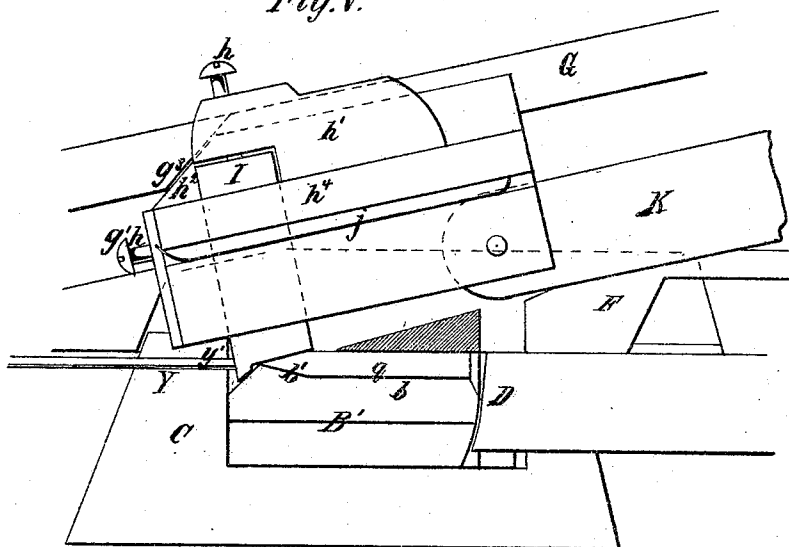
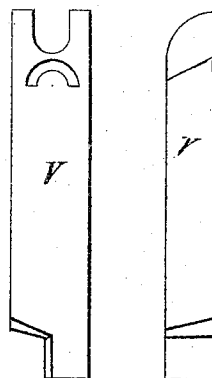


Fig. VII



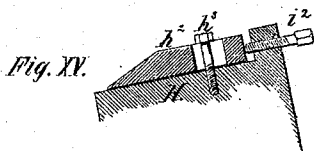
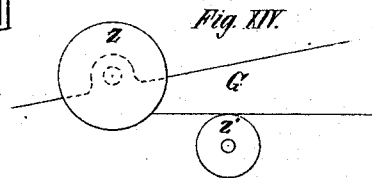
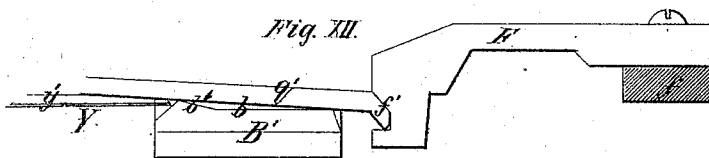
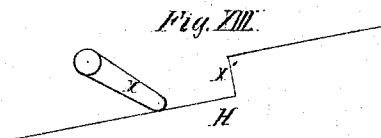
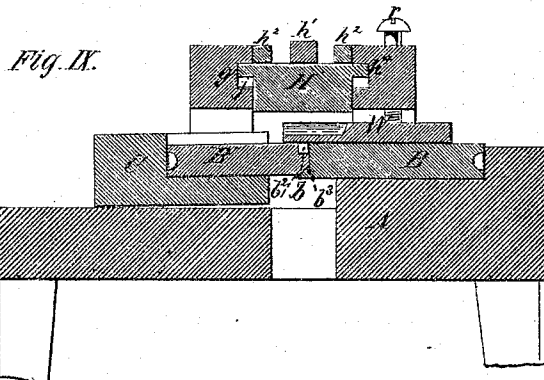
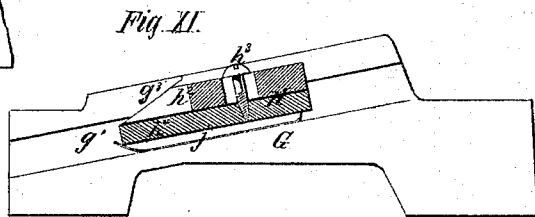
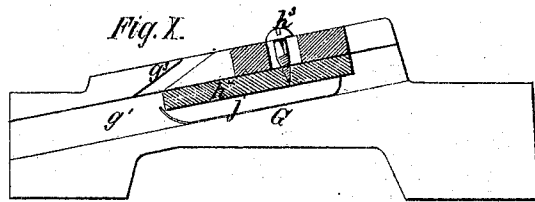
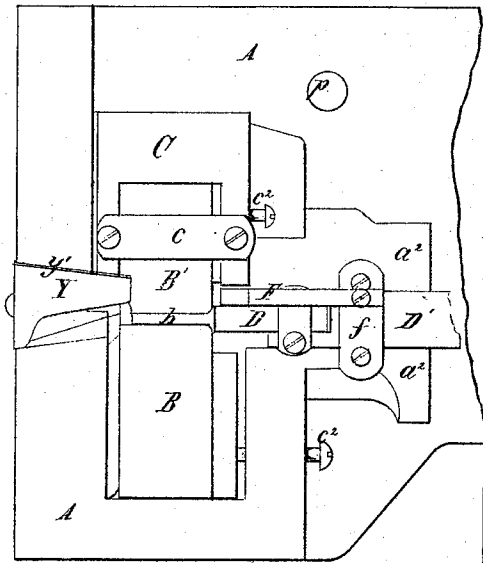
Samuel Smith
Geo. J. Connor } *Witnesses.*

Frederick Bruso *Inventor*
by Jay Nyatt Atty.

No. 118,429.
Fig. VIII.

Patented Aug. 29, 1871:
Frederick Brusco.

Imp'd Spike Machine.



Samuel Smith.
Geo. J. Bonner. } WITNESSES.
Frederick Brusco. }
By J. J. Hyatt }
Atty. }
Inventor

UNITED STATES PATENT OFFICE.

FREDERICK BRUSO, OF BUFFALO, NEW YORK.

IMPROVEMENT IN SPIKE-MACHINES.

Specification forming part of Letters Patent No. 118,429, dated August 29, 1871.

To all whom it may concern:

Be it known that I, FREDERICK BRUSO, of the city of Buffalo, in the county of Erie and State of New York, have invented certain Improvements in Spike-Machines, of which the following is a specification:

My improvements relate to a class of machines in use for making iron spikes, in which the heated rod is grasped and held between a stationary and a movable jaw or die and the head upset on the inner end, while the rod is obliquely cut off at a suitable distance from the end and one of the beveled sides of the point of the spike formed by a movement of a reciprocating knife. My invention consists: First, in the combination with the gripping-dies and a cross-head and ways, in which the latter reciprocates, of a cutting and swaging-tool fixed in the cross-head, and inclined ways and guide-pieces, or equivalent mechanism, whereby a downward and swaging movement is imparted to the cross-head and tool after the blank is severed from the rod, and the point of the spike formed in the most perfect manner. Second, in the arrangement of suitable springs in the grooves of the ways underneath the tongues of the cross-head, so as to keep the tongues pressed against the upper sides of the grooves, except when forced downward by the action of the wedge-shaped guide-pieces and inclined ways. Third, of a recess formed with an inclined upper side arranged to receive the end of the heated rod as it is inserted in the machine and bend it slightly downward, and, preparatory to upsetting it, in forming the head of a spike. Fourth, the arrangement of a guide-plate for directing the heated rod into the machine. Fifth, in the arrangement of a plate above, and with the gripping-dies so as to form an upper die or clamping-plate for the rod during the formation of a spike. Sixth, in the combination, with the head-upsetting die and the cross-head which carries the cutting and swaging-tool, of a lever-cam and reacting spring, by which the cross-head and heading-die are both operated.

In the accompanying drawing, Figure I is a longitudinal vertical section, and Fig. II a plan of of my improved machine. Fig. III is a sectional elevation of a portion of the machine, showing the knife in the position for severing the iron rod from which the spikes are to be made. Fig. IV is a similar view, showing the position the knife is in just after it has severed the rod. Fig. V is a view, show-

ing the position the knife is in after its swaging action in forming the point of the spike. Fig. VI is a rear-end view of the dies for forming the head of a spike. Fig. VII are detached views of the bolt-cutter. Fig. VIII is a plan of the front portion of the machine with some of the parts removed, showing the dies in a closed position. Fig. IX is a vertical cross-section in line *x x*, Fig. I. Figs. X and XI are fragmentary views, showing the knife-head and the ways in which it reciprocates. Fig. XII is a detached view, showing the manner in which the end of the rod is bent for forming the head of the spike. Figs. XIII and XIV are diagrams, showing modifications of the means for producing the pressure of the knife in swaging the end of the spike after it has been severed from the rod. Fig. XV is a fragmentary view, showing the manner of securing and adjusting the wedge-blocks of the knife-head.

Like letters designate like parts in each of the figures.

A is the bed and frame of the machine, of any suitable construction for supporting the parts. B represents the stationary gripping-die or jaw, secured in a suitable recess or depression in the bed of the frame, as will be presently explained. B' is the movable die, secured in a frame, C, by cross-piece *c*, Figs. I and VIII, and set-screw *c*², Fig. II.

My improved machine in its general construction being adapted not only for making spikes, but also round-headed bolts, according to Letters Patent No. 107,160, granted to me September 6, 1870, the gripping-dies B B' are constructed with dies on each end adapted to these different purposes.

For making spikes the stationary die B is formed with a ledge, *b*³, projecting from the lower portion of the face, having an inclined upper surface, as shown in Fig. IX, while the face at the opposite end is formed with a semicircular groove to receive the round rod when the machine is employed in making bolts. V is the cutter, (also described in my said patent,) fitted in the recess alongside of the die B, but not used except for making bolts or rivets. The face of the die B is formed with a rectangular recess or rabbet, *b*, of a size sufficient to receive the square rod from which the spike is to be formed, and clamp it (the whole length of the spike) against the stationary jaw, as shown most clearly in Figs. VIII and IX. The front portion of the bottom of the die or re-

cess in which the rod rests inclines upward to correspond with the bevel on one side of the point of the spike, as shown at b^1 , Figs. III and XII. The under side is beveled off at b^2 to correspond with the bevel b^3 of the die B. D is the upsetting-die for forming the head of the spike. It is secured in a head or stock, D' , which reciprocates between ways $a^2 a^2$ cast with or secured to the bed of the machine. The stock or shank D' is coupled by straps $d d$ to a lever, E, the lower end of which passes through a slot, a^3 , in the bed of the frame, and is pivoted between two downwardly-projecting lugs, $a^4 a^4$, underneath the bed, as shown in Fig. I. F is a bar secured to a cross-piece, f , fastened to the top of the ways $a^2 a^2$. Its forward end is constructed, as shown in Fig. XII, with a notch, f' , the upper side of which inclines or widens upward. This bar is arranged so that the front end will be alongside of the head-forming die on the side of the movable jaw B' , and so that the notch will be in line with and immediately back of the bed b , on which the heated rod q' is placed preparatory to forming the spike. As the end of the heated rod is inserted in the machine the end strikes against the upper inclined side of the notch f' , and is by it bent or deflected downward, as shown in Fig. XII, this bent portion forming the head of the spike when upset by the die D. G G are two cross-pieces which span the gripping-dies, and are secured on either side of the latter by bolts $g g$, Fig. II. The inner edges of these cross-pieces are constructed with channels or grooves g^1 , and form ways, in and between which a cross-head, H, reciprocates. I is the bar which forms the knife and swaging-tool, by which the spike-blank is severed from the rod and pointed. It fits in a hole in the cross-head H, and is secured and adjusted by set-screws $h h$, one in front abutting against the edge of the bar, and the other passing downward through a bearing-arm, h^1 , of the cross-head, so as to press against the end of the said bar, as shown in Figs. I and V. The upper overlapping edges of the ways G G are formed with a jog, so as to leave a portion, g^2 , Fig. II, overlapping further than the rest. These portions g^2 from the jog incline downward so as to form a way, g^3 . To the upper side of the cross-head H are secured guide-pieces h^2 , by set-screws h^3 passing through slots in the said guide-pieces, so as to enable them to be adjustable lengthwise. The forward ends of these guide-pieces are beveled off on the upper side to correspond with the inclined ways g^3 , with which the said guide-pieces are so arranged that the beveled ends thereof, as the cross-head moves forward, will engage under the inclined ways g^3 that operate to force downward the cross-head, as will be presently more fully explained. The grooves g^1 of the ways G are made wider than the portions h^4 of the cross-head projecting therein, so as to allow the cross-head to be depressed when the guide-pieces strike the inclined ways g^3 . In these grooves underneath the portions h^4 are arranged elliptical springs j , which operate to keep the slide portions h^4 in contact with the upper side of the groove, except when depressed by the inclined ways g^3 , as above described. The tool I is constructed, as most

clearly shown in Figs. III, IV, and V, with a front cutting-edge, i , and a swaging-face, i' , back of the cutting-edge. The cross-head H is connected with the upper end of the lever E by a connecting-rod, K, Fig. I, pivoted to each. L is the driving-shaft, and M a fly-wheel, connecting with the motive-power in any suitable manner. N is a cam on this shaft, by which the lever E and, through it, the cross-head H and head-upsetting die which connect therewith, are operated. O is a grooved cam, also on the shaft L, in which works the end of the long arm of a lever, P, that is pivoted at p to the bed of the machine, the short arm being connected to the frame C by a coupling-bar, S, Fig. II, by which the movable gripping-die B' is operated. W, Figs. II and IX, is a plate secured on top of the stationary die B, by means of a screw, r , screwing downward through one of the blocks G and onto the plate W, which also serves to hold the die B down in place. The plate W overlaps the edge of the jaw B' and forms the upper plate of the die for the spike. When the movable die B' is separated from the stationary die B the space between the under surface of the top plate W and the bottom of the die b is sufficient to permit the easy insertion of the rod from which the spikes are to be formed; but as the die B' closes the beveled surface b^2 rides up the inclined ledge b^3 , so as to clamp the rod against the under side of the plate W, as well as between the faces of the dies B B' . Y is a guide-plate, secured to the front edge of the bed A by screws y , and is bent over backward above the same, and arranged so as to connect with the inclines b^1 when the jaw B' is open and the die b in line with notch f . This guide-plate, on the side next to the movable jaw B' , is formed with an upturned flange, y' , and serves to guide the end of the heated rod onto the die or ledge b .

The operation of my improved machine, constructed as hereinbefore described, is as follows: The movable jaw B' being open so as to bring the die b in line with the bar and notch f' , the end of the heated iron rod is placed on the plate Y, which guides it onto the die and into the notch f' , the inclined side of which bends the end downward, Fig. XII, as hereinbefore described. As the movable jaw closes, the die and rod are carried laterally so as to remove the end of the rod from the notch f' and the rear end of the guide Y and bring it in front of the head-upsetting die D. The rod being now grasped and firmly held between the clamping-dies, the cam N forces forward the lever E, and with it the heading-die D and cross-head H, with its cutting and swaging-tool I, which severs the rod as the head of the spike is being upset, as shown in Figs. I and IV. The wedge-shaped guide-pieces h^2 of the cross-head, meeting the inclined guide g^3 just after the knife i has passed the point of the severed spike, the said inclined guides force downward the cross-head and tool I, and the face i' of the latter against the beveled surface of the point of the spike cut off by the knife i , pressing and swaging the same with a downward and forward movement, as represented in Figs. V and XI. The rod from which the spike is formed resting on the front and raised

portion of the die b^1 , the pressure of the knife in severing the rod is insufficient to force the latter into the angle of the die beneath, and leaves the spike g imperfectly formed on the under side of its point, as shown in Fig. IV. The pressure of the swaging-face i' forces the metal into the angle of the die on the under side of the spike, thereby producing a spike the point of which is uniformly beveled on both sides, as clearly represented in Fig. V. A spike being thus formed, and the cam N disengaged from the lever E , a spiral spring, T , Fig. I, which connects the upper end of said lever with the bed of the machine, pulls downward the lever and draws back the cross-head H and head-upsetting die D at the same time that the lever P has withdrawn the movable jaw B' , and releases the spike, which is dislodged by any of the ordinary means employed for the purpose, leaving the parts again in the position first described, and ready for a repetition of the operation.

In Fig. XIII, X represents an arm pivoted to the way G , and arranged so as to engage with a shoulder or stop, X' , formed on the upper side of the cross-head H , in place of the guide-pieces h^2 . This device may be substituted for the inclined ways g^3 for depressing the cross-head, which result will be obviously effected by the arm x engaging with the stop X .

Fig. XIV represents another modification of the means for producing this downward and swaging movement of the cross-head and tool I . In this figure, Z is a roller arranged in place of the way g^3 , while Z' is a similar roller mounted in suitable bearings in the cross-head, so as to engage with the roller Z at the required point, and thus cause the necessary depression of the cross-head. I prefer, however, the wedge-shaped guides and inclined ways first described for the purpose.

To adapt the machine for making bolts, the cross-head H and connecting-rod K are removed, a suitable heading-die substituted for the die D , and the dies B B' and cutter V reversed, and the parts arranged as shown in my patent hereinbefore referred to.

The advantages of my improvements are obvious from the foregoing description.

I claim as my invention—

1. The inclined ways g^3 g^3 and wedge-shaped stop or guide-pieces h^2 h^2 , or equivalent mechanism, in combination with the ways G G , cross-head H , cutting and swaging-tool I , and griping-dies B B' , as hereinbefore set forth.

2. The arrangement of the springs j j with the grooves g^1 , inclined ways g^3 , and guides and tongues h^2 h^4 of the cross-head H , as hereinbefore set forth.

3. The recess f' of the bar F , constructed and arranged with head-upsetting die D and movable griping-die B' b , and stationary die B , as hereinbefore set forth.

4. The arrangement of the guide-plate Y with the movable die B' b^1 and bar F provided with recess f' , as hereinbefore set forth.

5. The arrangement of the upper die-plate W with the inclined ledge b^3 of the stationary die B and the rabbet-die b , and beveled surface b^2 of the movable griping-die B' , as hereinbefore set forth.

6. The combination of the lever E , cam N , and reacting-spring T with the cross-head H , connecting-rod K , and heading-die and stock D D' , as hereinbefore set forth.

FRED. BRUSO.

Witnesses:

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JNO. J. BONNER.