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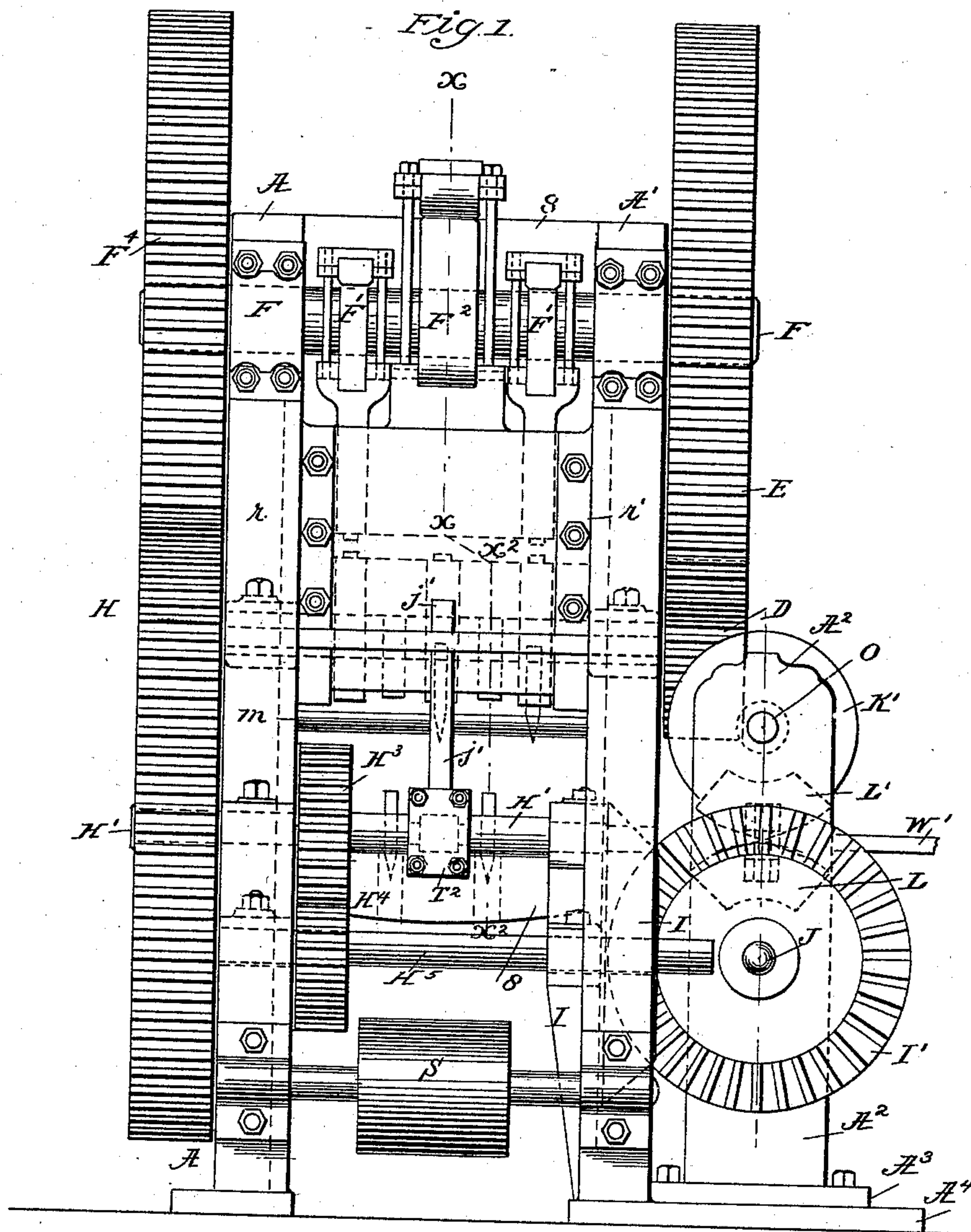
4 Sheets—Sheet 1.

J. S. PASSENGER.

MACHINE FOR FORGING SPIKES AND NAILS.

No. 540,364.

Patented June 4, 1895.



WITNESSES:
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Joseph Kelly.

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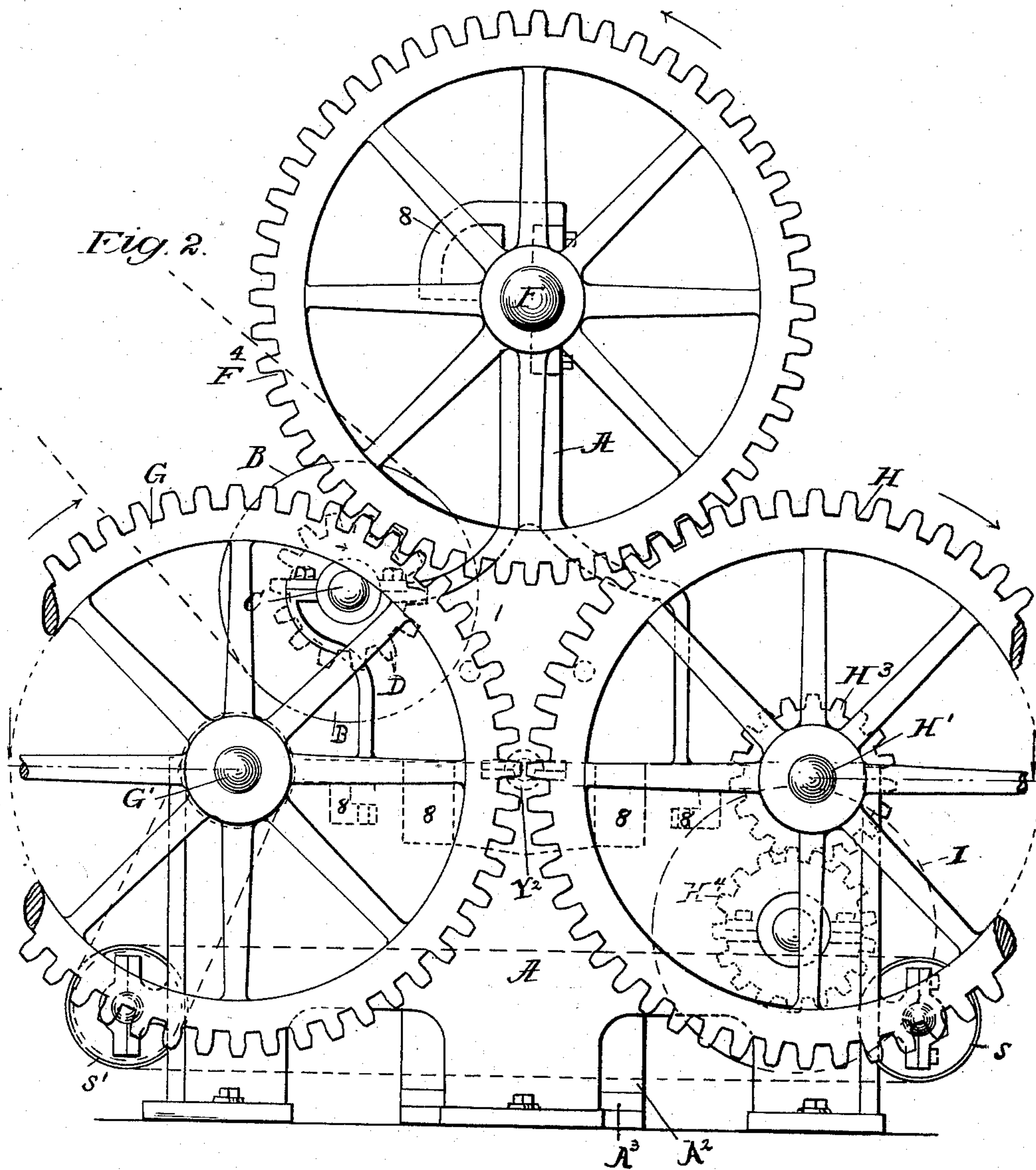
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4 Sheets—Sheet 3.

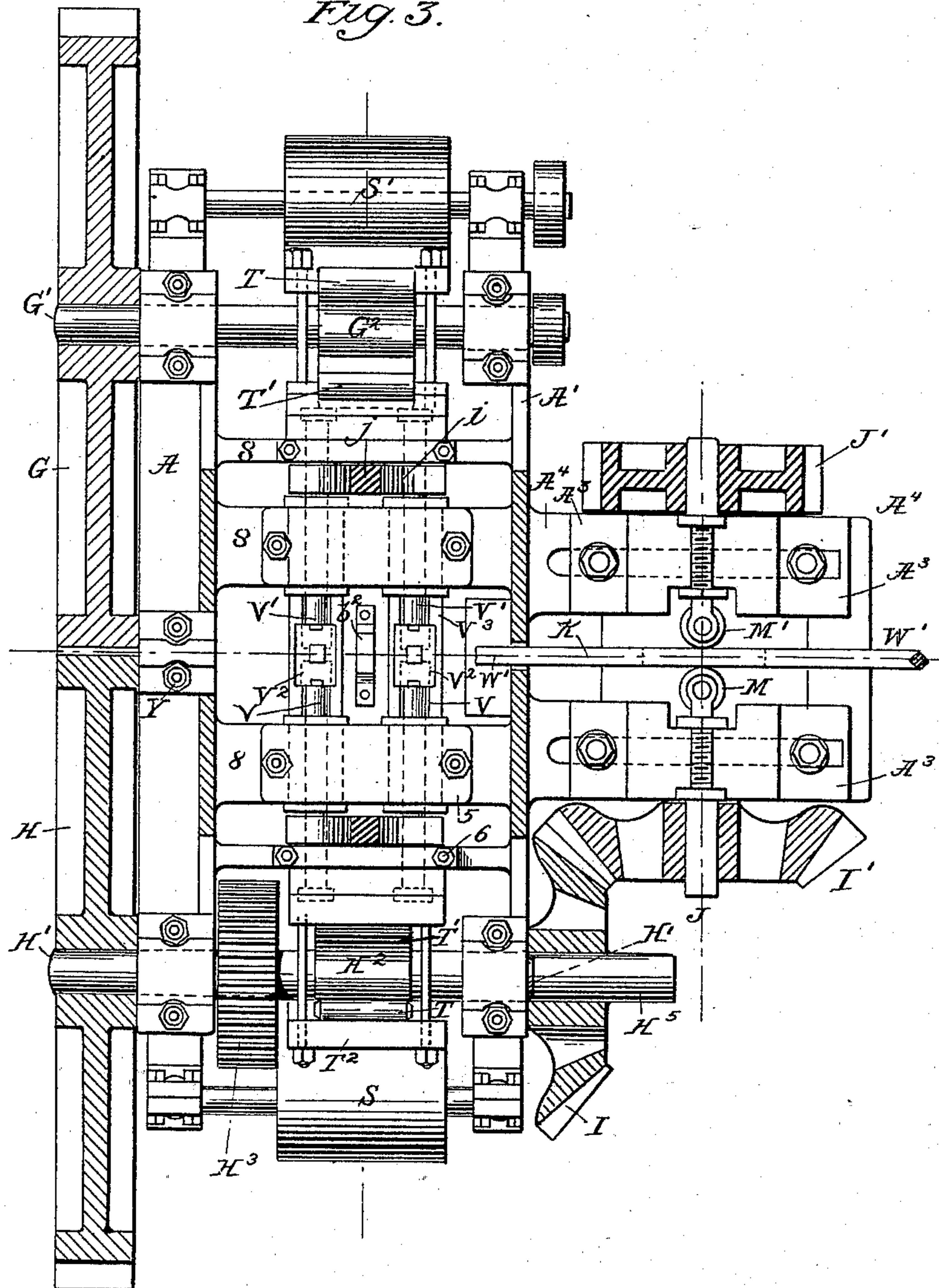
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Fig. 3.



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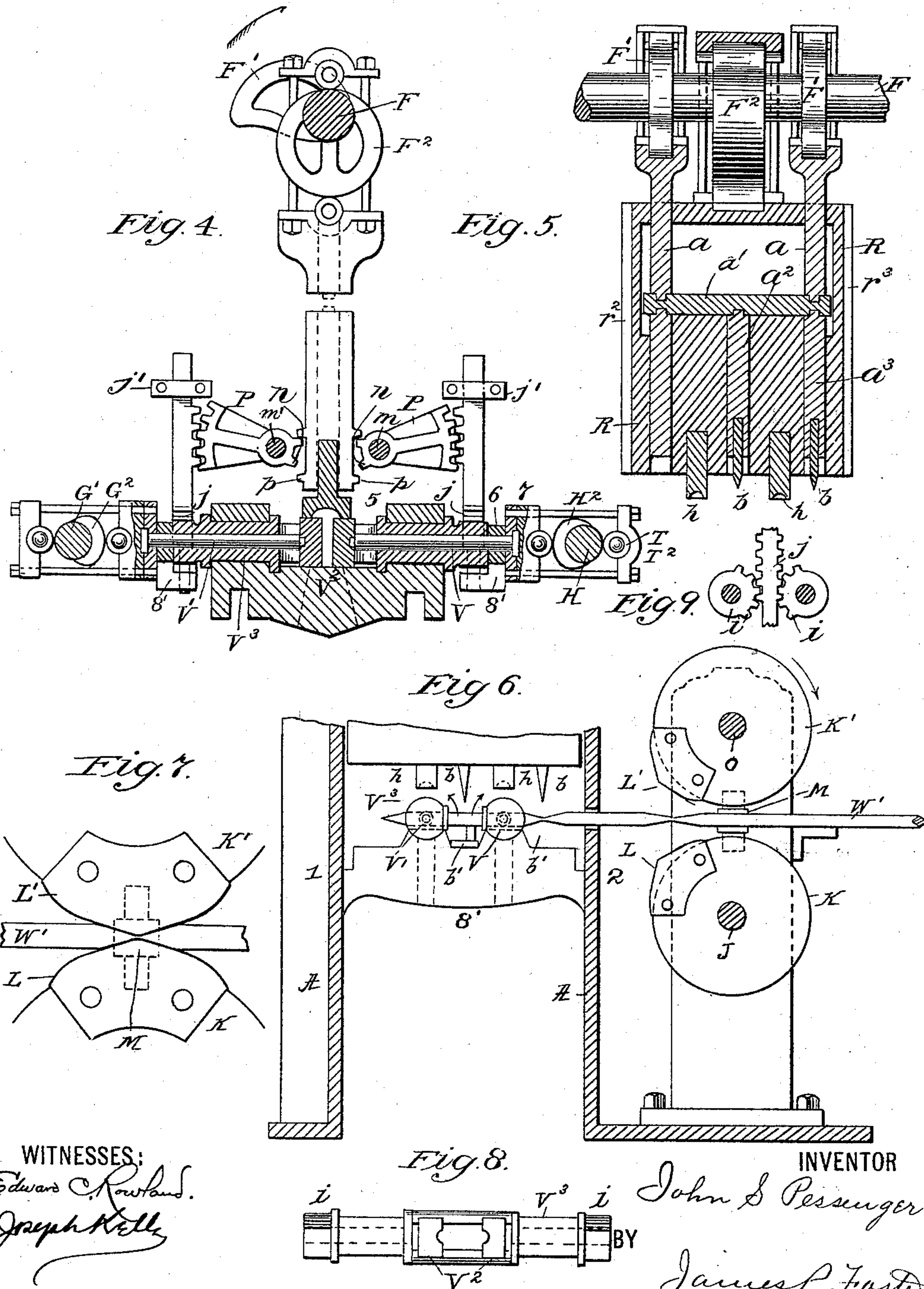
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UNITED STATES PATENT OFFICE.

JOHN S. PESSENGER, OF BROOKLYN, NEW YORK.

MACHINE FOR FORGING SPIKES AND NAILS.

SPECIFICATION forming part of Letters Patent No. 540,364, dated June 4, 1895.

Application filed June 23, 1894. Serial No. 515,549. (No model.)

To all whom it may concern:

Be it known that I, JOHN S. PESSENGER, a citizen of the United States, and a resident of Brooklyn, county of Kings, and State of New York, have invented new and useful Improvements in Machines for Forging Spikes and the other Indicated Products in Metal, of which the following is a specification.

This invention relates to a machine for forging spikes, nails, bolts, rivets, pins, clips, staples, fish-plates and other like products in metal, and so constructed that more than one such product complete may be made in a single operation of the machine.

Reference is made to the drawings hereto annexed as a part of this specification.

Figure 1 is a front elevation of the machine, so constructed as to yield two finished spikes or other such products in one complete operation. Fig. 2 is a left-side elevation of the same. Fig. 3 is a plan view of the same on the plane of about the top of the spikes seen in Fig. 1. Fig. 4 is a detached vertical section along the lines X and X², respectively, of Fig. 1, showing the cutting and heading mechanisms with their associate gripping and quarter-turning mechanisms and section of grip-rods, grip-dies, and die-bed resting on the anvil-block 8'. Fig. 5 is a front detached vertical section of the alternately cutting and heading mechanism worked, in a manner common in mechanics, by cams secured on the one revolving shaft. Fig. 6 is a front detached vertical section showing the rollers K K' revolving the dies L L' to seize and swage and deliver the stock W' to the gripping-dies V² of Fig. 4, these swaging-dies L L' being of no greater width across their face than the width of the stock used. Fig. 6 shows, also, end sections of two parallel die-beds shown in Fig. 3, only one of which die-beds V³ appears in Fig. 4, which die-beds quarter-turn upward the two spikes as soon as sheared apart by the dies b b', Fig. 6, and hold the spikes vertically beneath the heading-dies h until headed and released. Fig. 7 is a front view of the swaging-dies L L' completing a swaging of the stock W' for two spikes, one of the two vertically-set lateral rollers M and its shaft appearing in dotted outline, which lateral rollers M M', shown in section in Fig. 3, prevent the spreading of the stock laterally

while being swaged. Fig. 8 is a detached plan view of a die-bed V³, showing the top of the gripping-dies V² open and set in and over the slot of the die-bed to move backward and forward longitudinally on the quarter-turning die-bed resting on the anvil-block, Fig. 4, the dotted lines in Fig. 8 marking the removed grip-rods and the letter i indicating the spur-segments shown in transverse section, Fig. 9. Fig. 9 is an end view of two parallel die-beds with spurs meshing in the spurs j of the rack j', Fig. 4, by which in the operation of the rack-segment P the heading mechanism quarter-turns and returns the die-beds opportunely.

In all the drawings each of the several parts of the machine is designated by one and the same letter or figure.

Figs. 1, 2, and 3 show a vertical frame formed of two uprights A, A' extending rearward to support the requisite revolving-shafts and gearing and cross-tied as indicated by the numbers 8. The top cross tie is looped rearward to allow the play of the top cams. The two central cross ties 8 shown in Fig. 3, beginning on the plane W' and extending downward are themselves cross-tied in the center a little below that plane so as to form the anvil-block, of which a section appears in Figs. 4 and 6 numbered 8', cored out to permit the fall of the finished spikes.

In Fig. 1, I show the face of a pinion D terminating the driving-shaft, not shown, which crosses the frame showing its head C in Fig. 2; which driving-shaft C bears between the uprights A, A' a fixed pulley marked B in Fig. 2 for the driving-belt and a loose pulley on which to shift the belt for stopping. This driving-pinion D meshes in the main gear-wheel E secured on the shaft F bearing the fixed cams F' to work the cutters and the fixed cam F² to work the headers, and which shaft projecting through the upright A bears the gear-wheel F⁴ meshing in the gear-wheels G and H as shown in Fig. 2.

Referring next to the plan Fig. 3 viewed with the lower section of Fig. 4, I show the gear-wheels G and H secured respectively on the shafts G', H' bearing respectively between the uprights A, A' the cams G², H² which revolve between the rollers T, T', in a manner common in mechanics, to thrust and

withdraw the grip-rods V, V' carrying the dies V² to grip the stock as received from the swaging-dies L, L', hold it under the cutters, turn in the die-beds with it for heading and releasing the finished product when complete, which may drop upon a conveying-belt stretched over the pulleys S, S' Fig. 3. Immediately after the releasing of the finished product, the heading mechanism lifting the heading-dies engages the lugs *p* with the lugs *n* on the rack-segment P and thereby returns the die-bed V³ for the next reception of the stock W' from the swaging-dies L, L' Fig. 6.

In the plan Fig. 3, I locate in the frame the die-bed V³, and its parallel duplicate, showing the spurs *i* on the ends of each which mesh in the rack-spur *j*, Figs. 4 and 9, to quarter-turn the die-beds opportunely, the ends of the four grip-rods maintaining the grip-dies in their hold of the two spikes vertically under the heading-dies until complete. Corresponding ends of these parallel die-beds V³ appear in Fig. 6 in position of having just received the stock from the swaging-dies for shearing and immediately thereafter to quarter-turn upward with the severed spikes for their heading and release.

In Figs. 1 and 3, I show on the revolving-shaft H' the pinion H³ meshing with the pinion H⁴ on the shaft H⁵ bearing the beveled pinion I meshing with the vertical beveled pinion I' to revolve the shaft J on which is secured the roller K, Fig. 6; and on the other end of this shaft J is secured the gear-wheel J' meshing with a pinion (not shown) secured to the shaft O to revolve the roller K', Fig. 6, opportunely.

As further details of the machine shown, although not restricted to particular details of well-known construction, I locate:

In Figs. 3 and 4 are shown the caps 5 and 6 and their duplicates in the rear which complete the bearings for the die-beds and grip-rods, and the clutches 7 which hold the quarter-turning grip-rods in the gripping mechanism operated by the cams G², H²; also the cap b² which secures the central shearing-die b' of Fig. 6.

In Figs. 1 and 4, is shown the rod *m* which with its rear duplicate *m'* are merely bearings for the rack-segments P.

In Figs. 1 and 5 are shown the caps *r*, *r'* upon extensions inward of the frame A, A' to form a loose rabbet-joint with the rabbets *r*², *r*³ of the heading die-gate as vertical bearings for this gate or block R. The pitmen *a* on which are hung the cross-bar *a'* bearing the cutting die-rods *a*² *a*³, are thrust and withdrawn by the cams F'.

In Figs. 1, 2, 3 and 6, A² is one of the twin-uprights supporting between them the rollers K, K' on the shafts J, O operated as hereinbefore described, and the lateral rollers M, M'. The base-plate A³ of each of these uprights is shown in Fig. 1 to be adjustable to the base-plate A⁴ of the machine, and may be other-

wise made adjustable to the frame A', so as to be set far or near according to the length of the product desired.

The dies L, L', Fig. 6, may be inserted in or form a part of the rollers K, K'; and if swaging is not a requisite of the operation desired the lateral rollers M, M' may be omitted and the face of the dies or seizing-surface of the rollers K, K' may be wider than the width of the stock used.

In Fig. 1, I locate in the frame the front vertical rack *j'* with the end view of the plate T² which carries the roller T of the gripping mechanisms, this rack and plate appearing in vertical section in Fig. 4, a plan view of this plate T² appearing in Fig. 3.

It is to be noted that the three gear-wheels F⁴, G and H are of like diameter, and the pinions H³ and H⁴ are of like diameter; also beveled pinions I and I' are of like diameter; and the gear-wheel J' and the duplicate above it on the shaft O are of like diameter. With the several gear-wheels and pinions thus mutually related and the cams F' and F² and the gripping-cams G², H² justly related, the operation of the machine will be timed for the following five consecutive motions duly, namely: first, seizing, swaging and delivering the stock to the gripping-dies; second, gripping the stock thus delivered; third, thrusting the cutting-dies to shear the stock in two; fourth, quarter-turning the die-beds containing the gripped and severed stock to be held under the heading-dies; fifth, thrusting the heading-dies to finish the product complete. At this point the repetition of these five motions begins, the grip-rods are withdrawn to release the finished product followed by returning the die-beds back to position for next receiving and gripping more stock.

Having thus described my invention, what I claim, and desire to secure Letters Patent for, is—

1. The combination, with the revoluble swaging dies L L', the two pivoted pairs of separable gripping dies V², the two vertically reciprocating heading dies *h* arranged over the gripping dies, and the two vertically reciprocating cutters *b* arranged respectively in front of and between the said heading dies; of driving mechanism operating the said dies and cutters, substantially as set forth.

2. The combination, with the two pivoted pairs of separable gripping dies V², the two vertically reciprocating heading dies *h* arranged over the gripping dies, and the two vertically reciprocating cutters *b* arranged respectively in front of and between the said heading dies; of driving mechanism operating the said dies and cutters, substantially as set forth.

3. The combination, with the revoluble die beds V³ provided with pinion teeth, and the racks *j* engaging with the pinion teeth; of the pivoted segments P provided with lugs *n* and teeth engaging with teeth on the said racks; the reciprocating heading mechanism pro-

vided with heading dies h and lugs p for operating the said segments; the grip rods carrying the dies V^2 and splined in the said die beds, and means for reciprocating the grip rods in the die beds, substantially as set forth.

4. The combination, with the revoluble die beds, and means for turning them in their supports; of the grip rods carrying the dies V^2 and splined in the said die beds, the frames carrying the rollers T and connected to the ends of the grip rods, and the revoluble cams G^2 and H^2 arranged between the rollers T and operating to open and close the grip dies, substantially as set forth.

5. The combination, with the shaft F , and the cams F' and F^2 secured thereon; of the block R sliding in vertical guides, provided

with the two heading dies h , and operatively connected to the cam F^2 ; the crossbar a' operatively connected to the cams F' , and the die rods carried by the said crossbar, sliding in openings in the block R and provided with the two cutters b arranged respectively in front of and between the dies h , substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name hereto, in the presence of two witnesses, this 16th day of June, 1894.

JOHN S. PESSENGER.

Witnesses:

EDWARD J. PHILLIPS,
FREDERICK D. IVES.