(No Model.)

3 Sheets—Sheet 1.

J. E. CRISP.

TACK DRIVING MACHINE.

No. 500,319. Patented June 27, 1893.

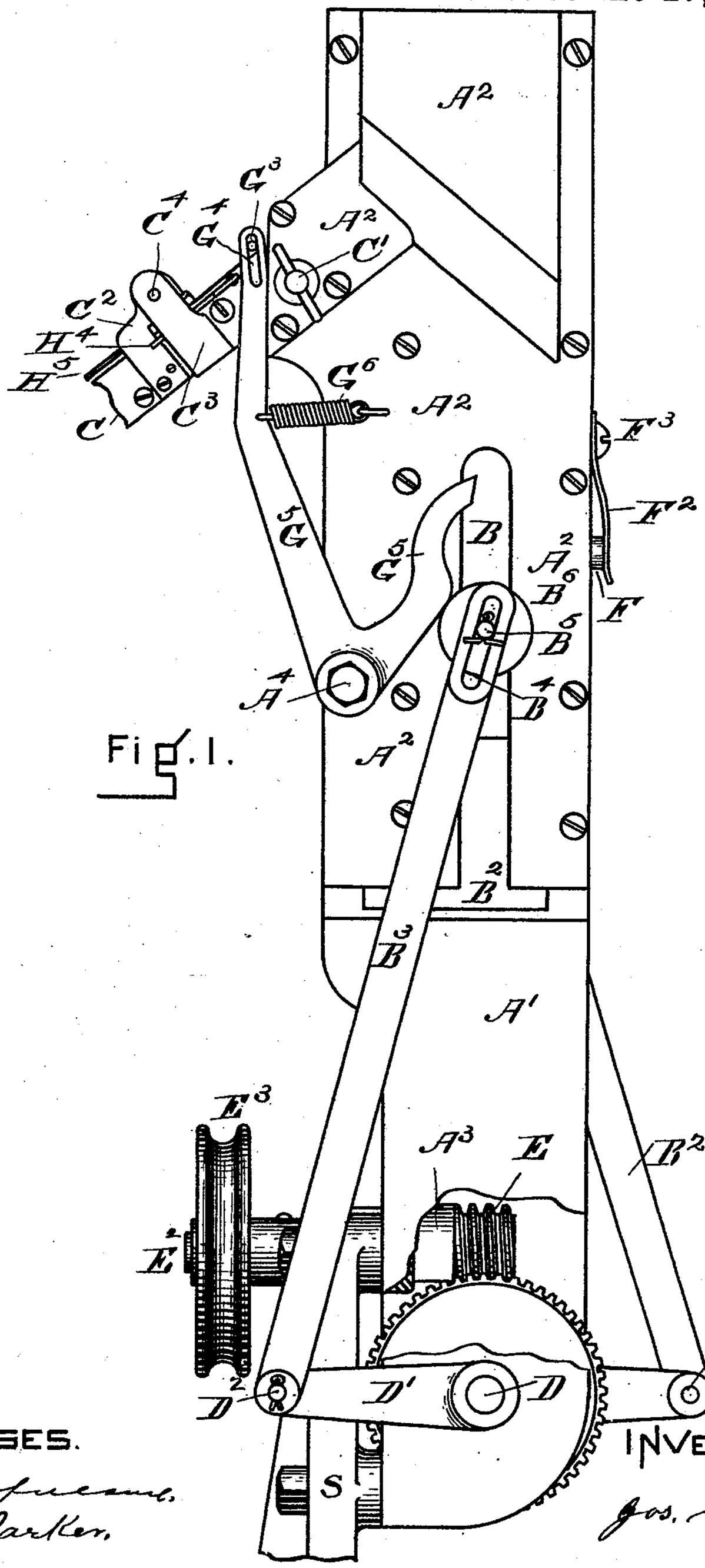

Fig. 1.

WITNESSES.

F. E. Coupernall.

Frank G. Parker.

INVENTOR

Jos. E. Crisp.

(No Model.) 3 Sheets—Sheet 2.

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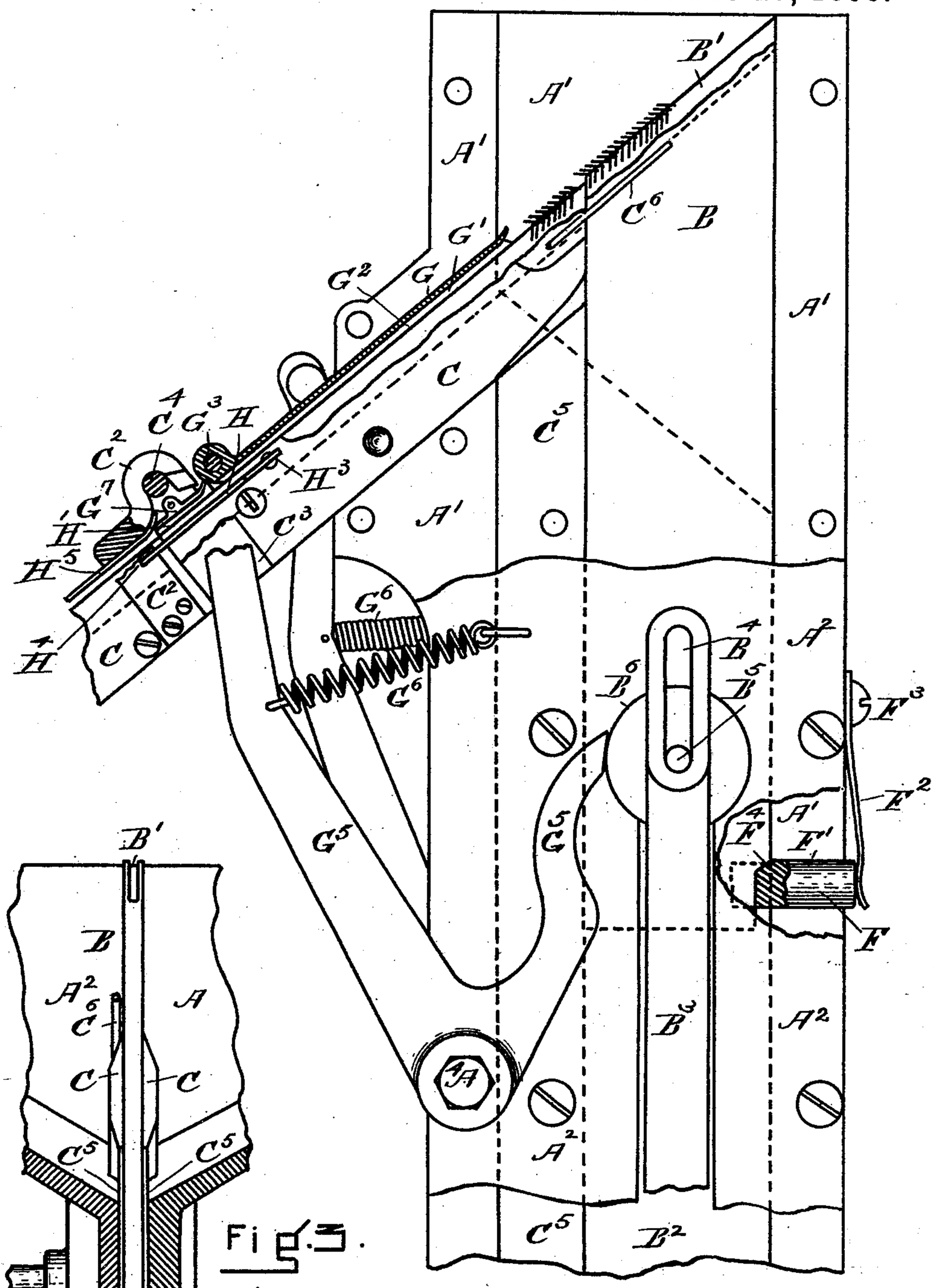

Fig. 2.

Fig. 3.

WITNESSES.

W. C. Dodge

Frank G. Parker

INVENTOR

Jos. E. Crisp

(No Model.) 3 Sheets—Sheet 3.

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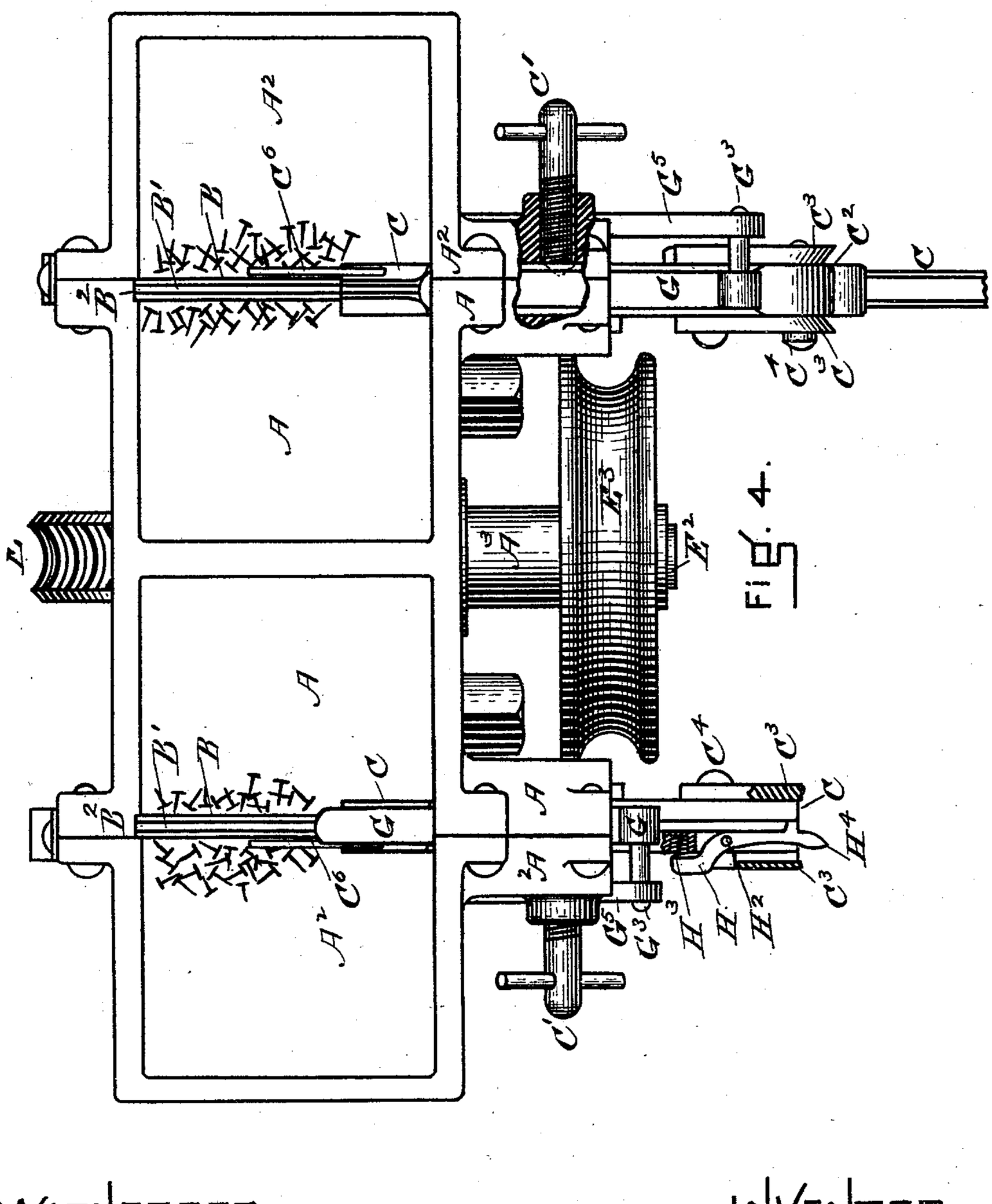

Fig. 4.

WITNESSES.

Frank G. Parker

INVENTOR

Jos. E. Crisp

UNITED STATES PATENT OFFICE.

JOSEPH E. CRISP, OF SOMERVILLE, MASSACHUSETTS, ASSIGNOR TO THE COPELAND RAPID LASTER MANUFACTURING COMPANY, OF PORTLAND, MAINE.

TACK-DRIVING MACHINE.

SPECIFICATION forming part of Letters Patent No. 500,319, dated June 27, 1893.

Application filed December 27, 1892. Serial No. 456,369. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH E. CRISP, a citizen of the United States, residing at Somerville, in the county of Middlesex and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Tack-Driving Machines; and I do declare the following, with the accompanying drawings, to be a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements upon the tack arranging mechanism shown and described in United States Patent No. 446,631, of February 17, 1891, and to the means for connecting the two parts of the separable tack-chute shown and described in United States Patent No. 455,174, of June 30, 1891, both granted to George W. Copeland and Joseph E. Crisp for improvements in tack driving machines.

It consists in providing two adjoining sets of track-arranging mechanism with a common power operating mechanism. Also in improved connections and gates between the two parts of the separable tack-chutes, and in improved means to preserve the continuity of flow down the part of the chutes attached to the loader. Also in improved means to insure the quick delivery of tacks from the elevator into the arranging chute, and in constructing said chutes so that they can be readily disconnected from the hoppers for inspection.

In the drawings: Figure 1 is a side elevation of the machine with a portion of the frame removed to show the mechanism operating the crank-shaft. Fig. 2 is an enlarged side elevation of a part of Fig. 1, with portions of the side removed, showing the friction device for the elevator slides, and the reciprocating covers or slides, which operate to keep clear the upper ends of the chutes, in which the tacks are arranged. Fig. 3 is a sectional elevation of one of the tack-hoppers looking from the rear, and showing details of construction to be referred to hereinafter. Fig. 4 is a plan of the tack-hoppers and chutes, with parts of the same in section, showing the manner of attaching the chutes to the hoppers, and the automatic gates at the lower ends of the chutes.

The inner and adjoining parts of the two tack-hoppers A, are formed upon or secured to the stand, A′, and the outer parts of the tack-hoppers, A^2, when secured to the inner parts by suitable screws, complete the hoppers and also form the caps which retain in position the elevator-slides and the removabe inclined tack-chutes.

The elevator-slides, B, provided with the inclined groove, B′, are fitted to reciprocate in the slideways, B^2, formed in the outer faces of the stand, A′, and hoppers, A. The tack-chutes, C, are also fitted to inclined slideways formed part in the hoppers, A, and part in the caps, A^2, where they are retained in position by the pointed thumb-screws, C′.

In bearings formed upon or attached to the frame, A^2, is mounted the crank-shaft, D, having the cranks, D′, fixed to its outer ends, so that the crank-pins, D^2, will be diametrically opposite each other. On these crank-pins, D^2, the lower ends of the connections, B^3, are fitted, and the upper ends of the connections are connected to, and reciprocate alternately, the elevator-slides when the crank-shaft, D, is revolved. The worm-gear, E, is fixed to the crank-shaft, between the two sides of the stand, A′. The worm, E′, is fixed upon the shaft, E^2, and said shaft is fitted to a bearing, A^3, formed upon or attached to the stand, A′, so that the worm, E′, will intermesh with the teeth of the worm-gear, E. The pulley, E^3, is fixed to the outer end of the worm-shaft, E^2, and when said pulley is connected by a belt to a motor, the crank-shaft will revolve, as will be understood by reference to Fig. 1.

It is important that the tension of the driving-belt should be just enough to revolve the crank-shaft, when the elevator-slides more freely, otherwise some of the tacks would be crooked and rendered unfit for use, should they from any cause clog in the hoppers.

The elevator-slides, B, are fitted to slide free in the slideways, B^2, which are formed as hereinbefore described and it is necessary that said slides have a period of rest at their highest elevation, so that the tacks within the groove, B′, will all be delivered into the

fixed part of the chute, C. This is accomplished by making the slot, B^4, in the upper ends of the connections, B^3, which engage with the pins, B^5, fixed in the elevator-slides. This slot, B^4, reciprocates upon the pins, B^5, when the slides, B, reach their highest and lowest positions, and the periods of rest of said slides are governed by the length of said slots. The slides, B, as fitted, would drop as soon as the connections, B^3, commenced to descend unless means were provided to prevent such action, and it is also desirable that said slides reach their highest altitude with a slight jump and jar, in order to start the flow of the tacks from the groove, B′. The short round slides, F, Fig. 2, fitted to reciprocate in the bearing, F′, formed part in the stands and part in the caps, are designed to produce both of the desired results. The inner ends of the slides, F, are slotted so as to pass over the sides of the elevator-slides, as shown by the dotted lines. The bottom of this slot bears on the edge of the elevator-slides and the springs, F^2, secured as shown, to the rear of the stand by the screws, F′, press the two together and give sufficient friction to prevent the elevator-slides from dropping faster than the motion of the cranks calls for. The upper corners of the bottom of the slots in F are inclined at F^4, and when the elevator-slides are at their highest altitude, their edges are cut in about one-eighth of an inch and inclined to match the incline, F^4. When one of the elevator-slides is being raised by one of the slotted connections, B^3, and just before it reaches its highest point, the two inclines contact and the action of the spring, F^2, on that side causes the slide, F, to move the elevator-slide quickly to the limit of its upward motion, and the bottom of the slot in F strikes the edge of the elevator-slide with some force. This combined jump and jar cause the tacks in the groove, B′, of the elevator-slide to start and run freely into the fixed part of the tack-chute as desired, and the contact of the two inclines prevents the dropping of the elevator-slides until the tops of the slots in the connections, B^3, contact with the pins, B^5, when the elevator-slides will commence their descent. The tack-chutes, C, are fitted to the inclined slide-ways in the hoppers, so that they can be removed therefrom, by withdrawing the thumb-screws, C′, and cleared from any obstruction which would prevent the free flow of tacks into the separable part of said chutes.

A description of the connecting and operating parts of one of these chutes will suffice for either. To the sides of the upper end of the separable part of the chute, C, there is secured the hook, C^2, so that the cover of said chute can pass under said hook as shown by Fig. 2. The hook, C^2, is made quite wide, as shown by Fig. 4, and has its point and sides inclined. Secured to the sides of the lower end of the fixed part of the tack-chute, C, are the stands, C^3, whose upper ends are far enough apart to receive the sides of the hook, C^2, and the inner sides of these standards are inclined to facilitate the entrance of the sides of the hook therein. Through the top of the standards, C^3, there is fixed the pin, C^4, which engages with the hook, C^2, and, in combination with the sides of the standard, align the two parts of the chute when they are thus connected, as shown by Figs. 2, and 4. The fixed part of the chute is extended into the hopper as shown by Figs. 2 and 4 and to form a perfect joint with the under part of said chute, the gib, C^5, somewhat wider than the elevator-slide, B, is fitted into the frame and cap, as shown by Figs. 2 and 3 and there secured by the cap screws which pass through it. The upper end of this gib is inclined to the angle of the bottom of the chute, and the sides of the chute are beveled down to the thickness of the gib to remove any chance of the tacks catching against the under side of the chute. The top sides of the part of the chute within the hopper are inclined, as shown by Fig. 3, to allow tacks which are raised by the elevator, and which are not correctly positioned in the groove, B′, to fall off and not prevent the flow of those which are correctly positioned therein. The small wire, C^6, is fixed in the end of the chute, as shown by Figs. 2 and 4, so that the upper end of the elevator will reciprocate past it, and the wire acts to remove such tacks as may be raised by the elevator balanced crosswise thereon.

Tacks are liable to be raised upon the heads of other tacks correctly positioned in the groove of the elevator, with their shanks parallel with said groove and their points toward the chute. When such tacks retain their position and run down the incline, they form a wedge under the cover of the chute which will prevent the flow of tacks without they are removed. In order to remove these obstructing tacks, the cover of the tack-chute is formed in two parts and the upper of these parts is reciprocated, so that its upper end will move from the side of the hopper to a little beyond the end of the part of the chute that is extended within said hopper, as shown by Fig. 4. The reciprocations of the movable part of the cover, G, are made elastic toward the hopper, by the action of a spring in order to prevent injury to tacks or mechanism. The cover, G, is made narrower than the top of the tack-chute upon which it rests, and it is provided with the groove, G′, in its under side, through which the heads of the tacks pass, and its sides and top are fitted free to the guideway, G^2, formed over that in which the chute is secured. The lower end of this cover is enlarged and fixed therein is the pin, G^3, which engages with the slot, G^4, on the long arm of the bell-crank-lever, G^5, and transmits the motions of said lever to the cover. The bell-crank-lever, G^5, is hung upon the bolt, A^4, fixed in the frame, A^3, and the pull spring, G^6, acts to draw the cover, G, inward. The short arm of the bell-crank-lever, G^5, is formed as

shown by Fig. 2, and contacting with the roll, B^6, which is mounted on the pin, B^5, (between the connection, B^3 and the cap, A^2) causes the bell-crank-lever, G^5, to make three distinct backward movements against the action of the spring, G^6 at each full reciprocation of the elevator-slide, B. When the elevator-slide is at its highest point of rest, the position of the parts is as shown by Fig. 2, and the tacks in the groove of the elevator will run into the chute, without said chute is full, in which case the tacks correctly positioned in the elevator will not flow, but those resting upon the heads of said tacks will run down over the heads of those resting in the chute.

Formed upon or attached to one of the standards, C^4, is the short fixed part, G^7, of the cover of the tack-chute which completes the continuity of the cover when the part, G, is fully back, and gives the tacks in the lower part of the chute no chance to bulge up by the impact of tacks delivered by the elevator as they strike the upper end of the column. Should any cause bulge the tacks up in the opening made between the two parts of the cover when the part G, is at its upper position, a thin piece of suitable metal can be secured to the part, G^7, and extended enough into the groove in the part, G, to bridge the opening and obviate the trouble. This bridge would be necessary also with a very steep angle of tack-chute such as might be required to cause very light tacks to flow.

To automatically open and close the lower end of the fixed part of the tack-chute, C, the gate, H, Figs. 2 and 4, is fitted to a suitable slot, H′, formed through one of the sides of the chute near the top thereof. This gate is hung upon the pin, H^2, so that it can be swung to and from the groove through which the shanks of the tacks move, and the spring, H^3, presses it toward the inner side of said groove.

To open the gate, H, it is provided with the extension, H^4, which engages with the separable part of the chute, when the two parts are connected.

The upper end of the cover of the separable part of the chute, H^5, is made thin and elastic and is extended to engage with the top of the cover, G^7, as shown by Fig. 2. When in that position, the tacks will flow from the fixed into the separable part of the chute, and when said parts are separated, the elasticity of the end, H^5, of the cover causes it to close the rear end of that part of the chute and retain the tacks therein.

Having thus described my invention, its construction and operation, I claim and desire to secure by Letters Patent—

1. In tack-driving mechanism of the class described, the combination with the elevator-slides, B, of the pins, B^5, the slotted connections, B^3, the cranks, D′, and suitable operating mechanism therefor, substantially as described and for the purpose set forth.

2. In tack-driving mechanism of the class described, the combination with the elevator-slide, B, of the slide, F, and the spring, F^2, substantially as shown and described.

3. In tack-driving mechanism of the class described, the combination with the tack-hopper of a removable chute, secured in a suitable slideway, by the pointed thumb screws C′ substantially as described and for the purpose set forth.

4. In tack-driving mechanism of the class described, the combination with the tack-arranging chute, of the reciprocating cover, G, the pin, G^8, the lever, G^5, and suitable operating and connecting mechanism, substantially as shown and described.

5. In tack-driving mechanism of the class described, the combination with the elevator-slide of the pin or wire, C^6, fixed in the tack chute, substantially as and for the purpose set forth.

6. In tack-driving mechanism of the class described, the combination with the fixed and separable parts of the tack chute of the hook, C, the standards, C^3, the pin, C^4, gate, H, cover, G^7, and cover, H^5, all arranged and operating substantially as shown and described.

JOSEPH E. CRISP.

Witnesses:
W. C. COPELAND,
FRANK G. PARKER.