

(No Model.)

2 Sheets—Sheet 1.

J. J. HAYES.
FEEDER FOR NAILING MACHINES.

No. 543,683.

Patented July 30, 1895.

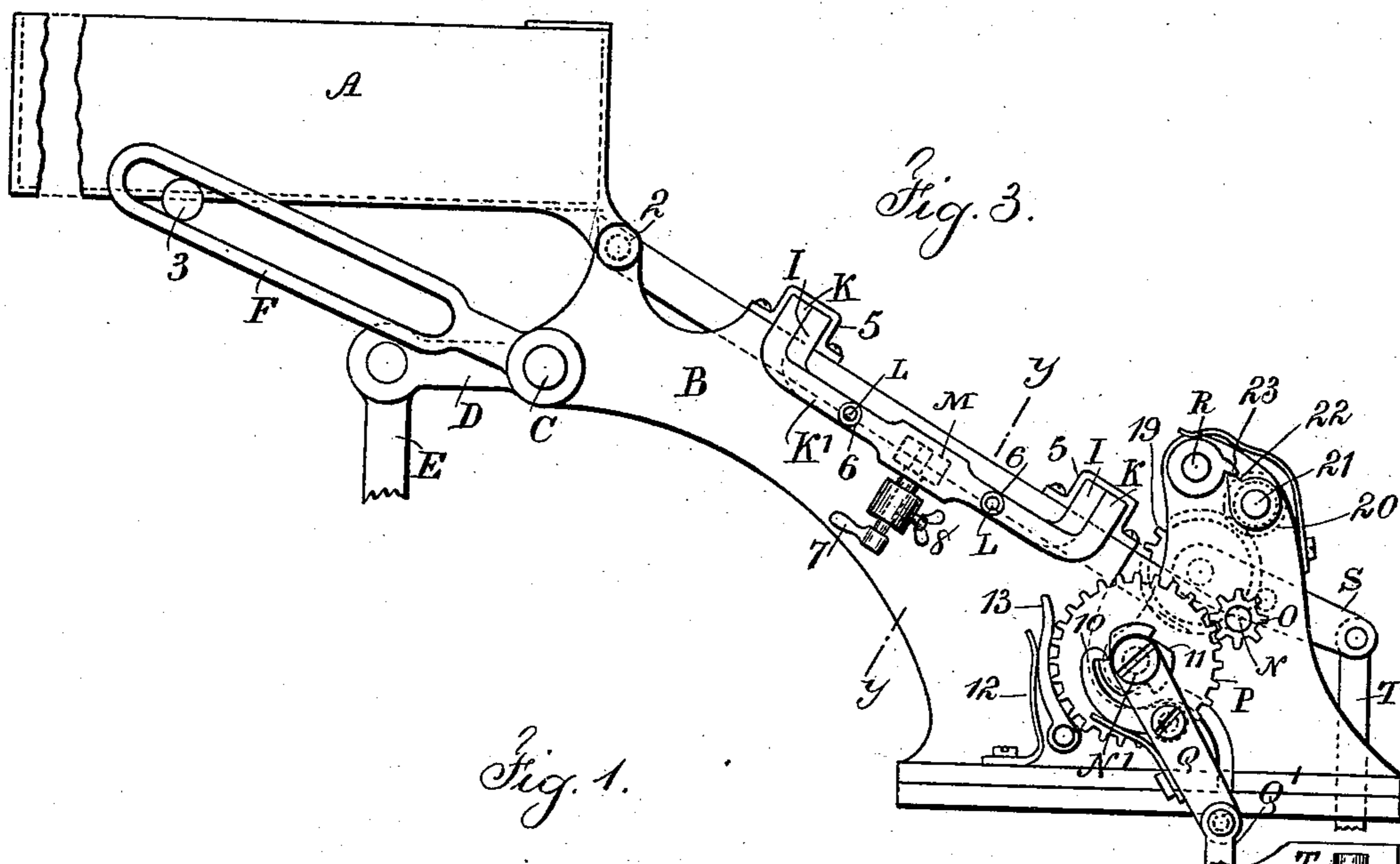
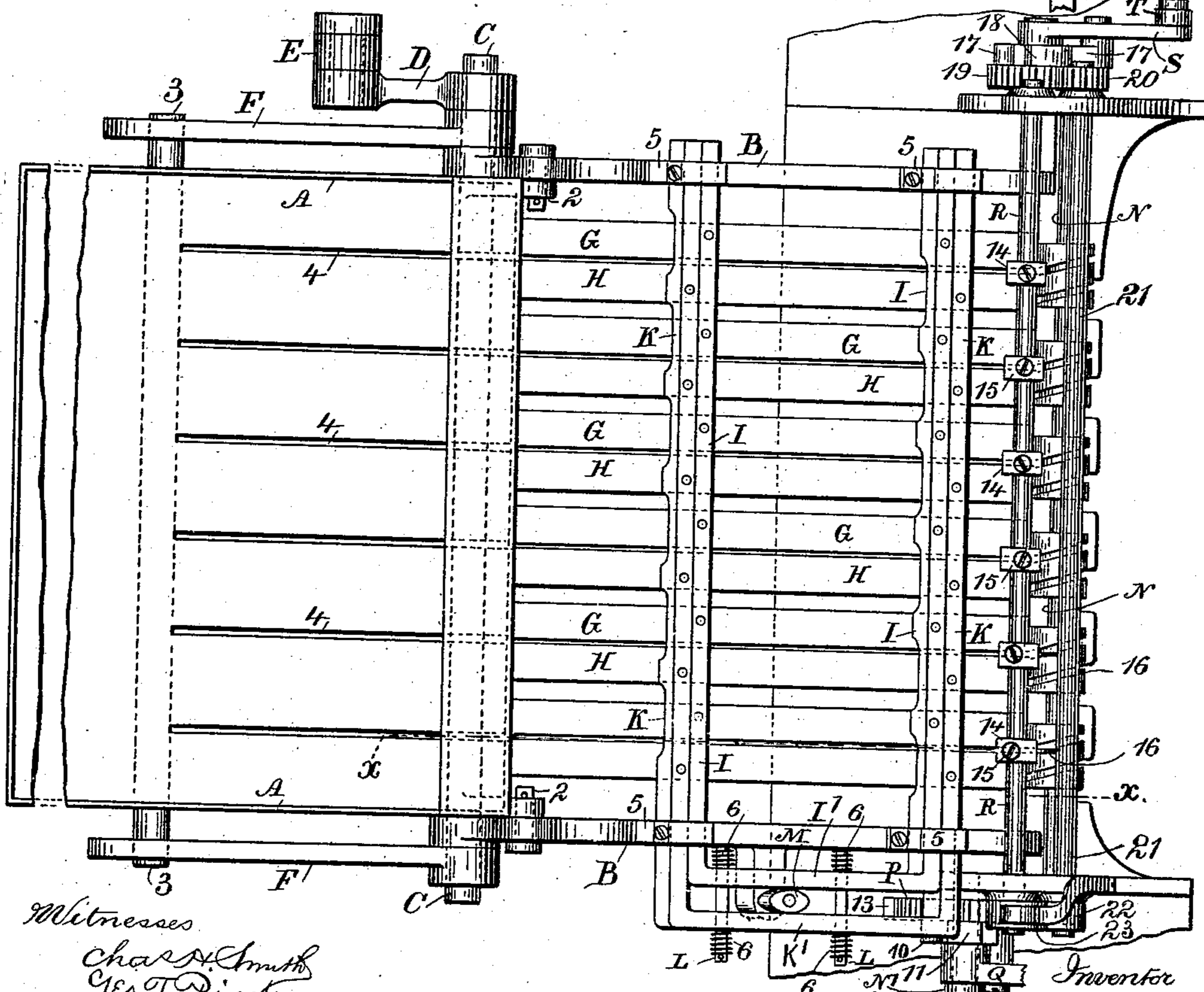


Fig. 1.



Witnesses

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Geo. T. Pinckney

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John J. Hayes
per Lemuel W. Farrell
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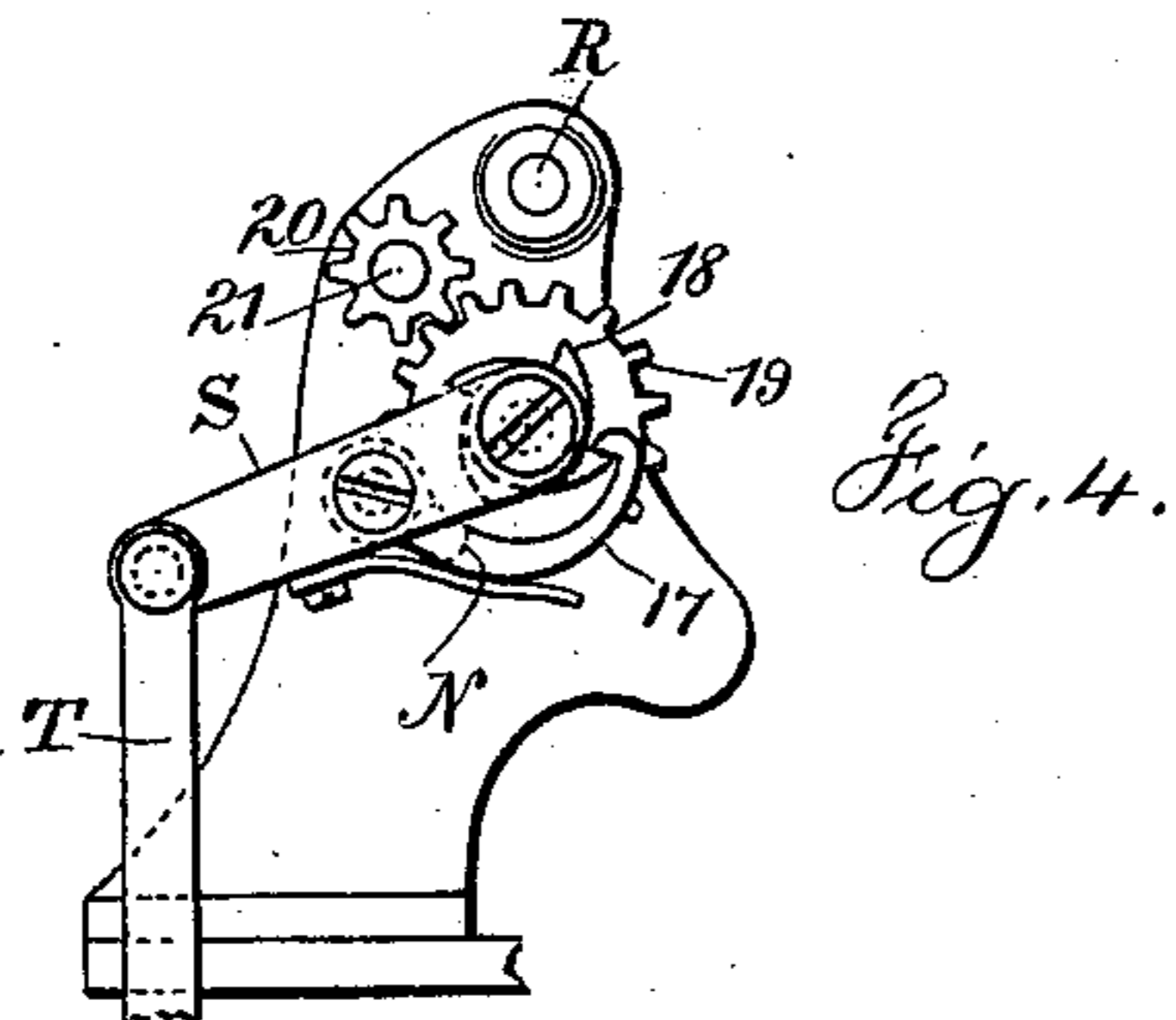
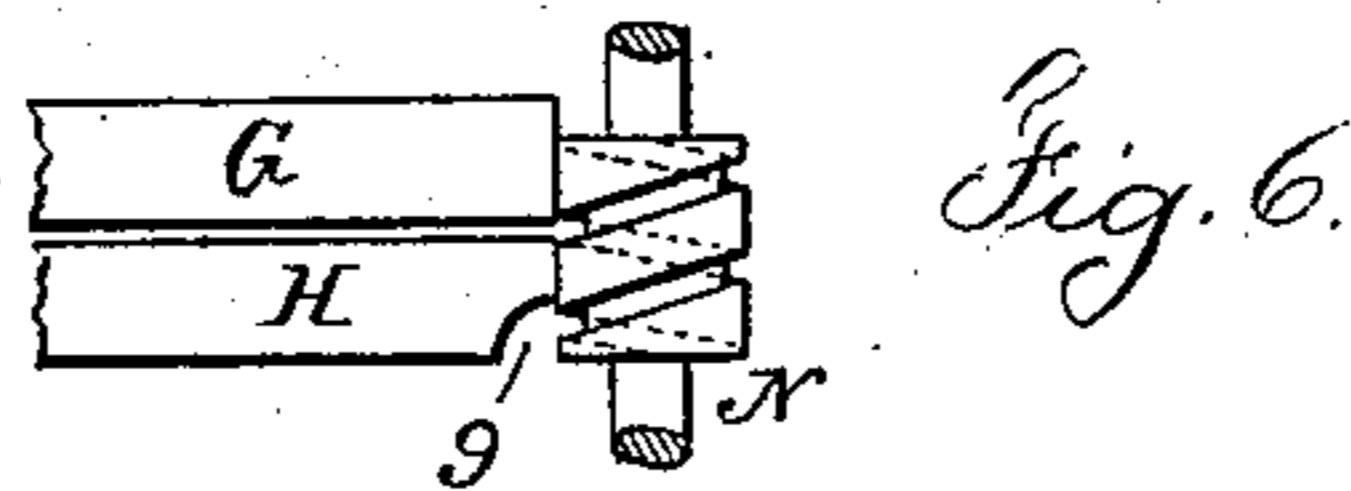
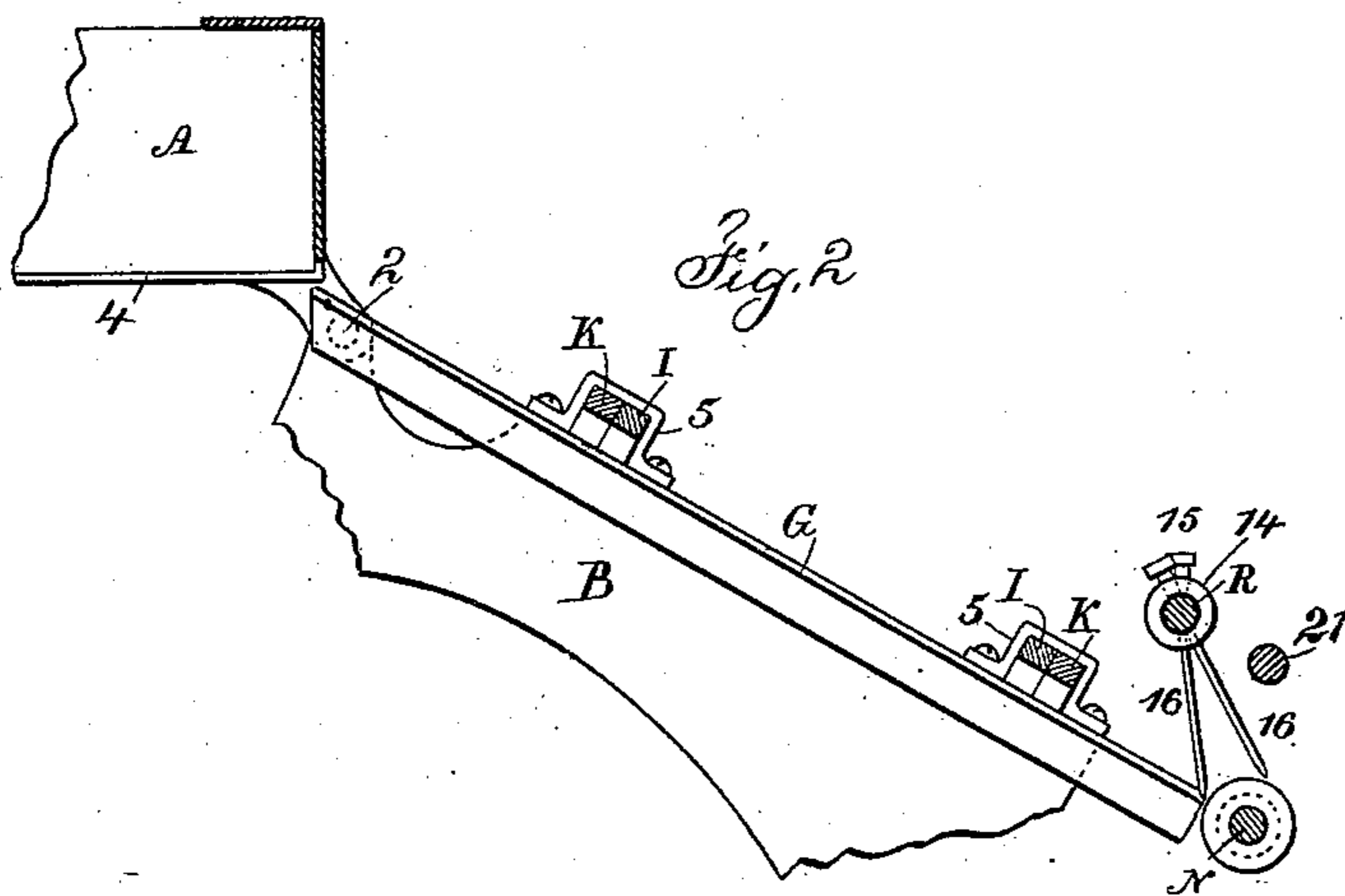
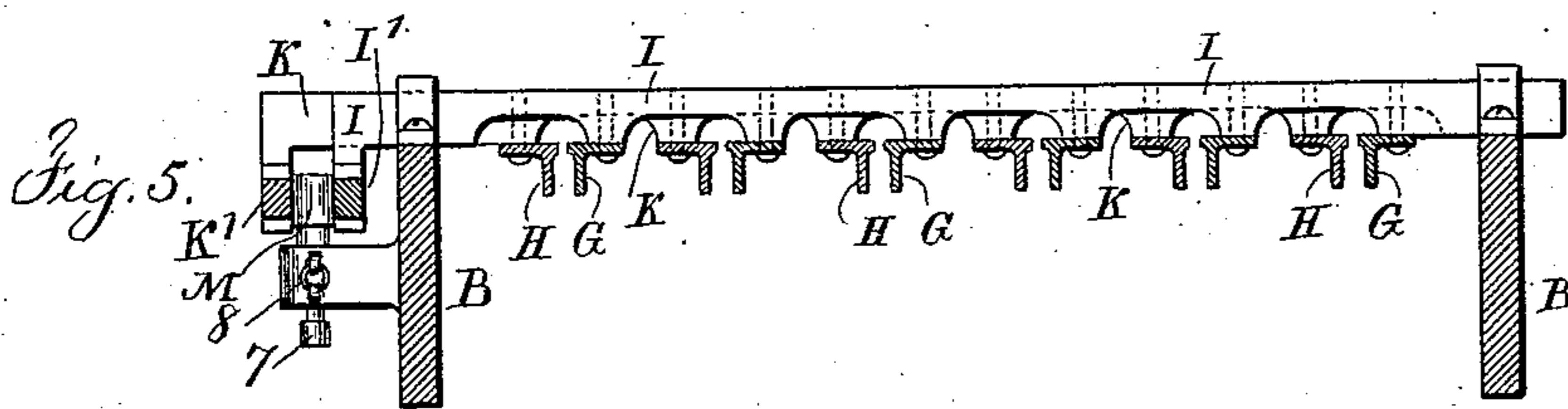
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UNITED STATES PATENT OFFICE.

JOHN J. HAYES, OF FLUSHING, NEW YORK.

FEEDER FOR NAILING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 543,683, dated July 30, 1895.

Application filed September 19, 1894. Serial No. 523,468. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. HAYES, a citizen of the United States, residing at Flushing, in the county of Queens and State of New York, have invented an Improvement in Feeders for Nailing-Machines, of which the following is a specification.

In nailing boxes and other articles reciprocating-plungers have been made use of acting to drive the nails through divided dies or boxes into the wood, and the present improvement applies to the means for feeding the nails down into the divided boxes or dies to be acted upon by the plungers, and as nailing-machines of this character are well known I have not represented herein the plungers or the dies or divided boxes into which the nails are received, but only the means for separating the masses of nails into line and discharging such nails one at a time from the lower ends of the inclined raceways, so that they fall into the divided boxes or dies in the nailing-machine.

Heretofore difficulty has been experienced in accurately adjusting the openings in the inclines or raceways down which the nails pass, and also in removing one nail at a time from the lower end of each of the inclined raceways.

My present improvements are specially intended to overcome the difficulties that have heretofore existed in this class of nail-feeding machines.

In the drawings, Figure 1 is a plan view of the machine. Fig. 2 is a vertical section at the line *xx*. Fig. 3 is an elevation of the machine, showing the gearing at one end. Fig. 4 is an elevation of the gearing at the other end. Fig. 5 is a section at the line *yy*, showing the connecting-bars. Fig. 6 is a diagram showing the screw at the lower end of the raceway.

The nail-receiving box A is generally quadrangular and hinged at 2 to the frame B of the machine, and there is a cross-shaft C, that is oscillated by a crank D and connecting-rod E to any suitable actuating device—such, for instance, as a shaft and crank upon the machine that drives the nails—and the slotted arms F upon the cross-shaft C act upon a bar 3, that is across below the nail-box A, so that as the cross-shaft C and slotted arms F are

oscillated the nail-box A is tipped or swung up and down upon its hinges 2, and in so doing the nails are shaken and spread upon the bottom of the box, and such nails fall into the slots 4 in the bottom of the box, and the nails are suspended by the heads, and when the box is tipped into an upwardly-inclined position the nails that are in the slots 4, or some of them, slide out into the channels between the bars G and H of the inclined raceways and slide down such raceways to the delivering mechanism hereinafter set forth.

In consequence of the receiving-box A being tipped first one way and then the other the nails are not liable to become wedged in the channels, and one box is adapted to use with several sizes of nails, and the boxes can be changed, if desired, for different sizes of nails, or the slots may be varied in width in any known manner.

It is important to accurately adjust the openings between the inclined bars G and H, so as to adapt them to the sizes of nails that are fed to the nail-driving mechanism; and with this object in view I provide cross-bars I and K, which are notched or made as arches upon their under edges and are connected, the bars G to the cross-bars I and the bars H to the cross-bars K, and the bars I are connected at one end by the end bar I' and the bars K are connected by the end bar K', and these bars I and K slide through bearings or boxes 5 upon the frame B, and in order to accurately adjust the slots between the bars G and H, I act upon the end bars I' K', and through them upon the cross-bars I and K and the bars G and H, respectively, to move the bars G in one direction and the bars H in the other direction in widening or narrowing the slots or channels between the pairs of bars G and H.

To act upon the end bars I' and K' simultaneously and uniformly, any desired mechanism may be made use of. I, however, prefer to provide studs L, passing through holes in the end bars I' and K', and having springs 6 upon the studs tending to force the end bars I' and K' toward each other, and to spread or separate such bars I' and K' more or less I provide a cam M, that can be moved by a lever-handle 7 and act upon such end bars I' K'; and it is advantageous to make

use of a clamping-screw 8 to firmly hold the arbor of the cam M when the same has been adjusted, so as to prevent the same turning and varying the adjustment of the channel 5 between the bars G and H.

By making the lower edges of the cross-bars I and K in the arched form represented in Fig. 5 ample space is given for the passage of the nail-heads and also for the insertion of 10 the finger to act upon the head of any nail should the same become obstructed in its passage down the inclined raceways to the separating mechanism hereinafter described.

Across the lower ends of the bars G and H 15 forming the inclined raceways a shaft N is supported in suitable bearings upon the frame, and such shaft N is screw-threaded, the screw-threaded portions being preferably in sections, so that in the position of rest a 20 screw-thread or screw-formed groove coincides with the channel between each pair of bars G and H. Hence the nails as they run down such raceways are arrested by the shaft N, and one nail from each raceway is received 25 into the screw-thread of the shaft. In order, therefore, to deliver a nail from each inclined raceway it is only necessary to give the shaft N a rotation and carry the nails bodily and laterally from the ends of the channels to the 30 openings 9 at the lower ends of the bars H, which openings 9 are immediately above the tube or opening by which the nail is conveyed to the nail-driving mechanism of any desired character, and it is advantageous that the 35 openings 9 coincide with the screw-thread groove when the shaft N has received a complete rotation. Thereby the nails are allowed to drop out of the screw-thread grooves at the same time that other nails are received into 40 the portions of the screw-thread grooves at the ends of the channels between the bars G and H, and I remark that it is advantageous to make the bars G and H L-shaped, as seen in the section, Fig. 5, so as to form walls to 45 the channels between the bars G and H to aid in keeping the nails substantially vertical and in line with the screw-thread grooves, so that such nails pass directly into the screw-thread grooves without any risk of standing 50 crosswise to such grooves.

To rotate the shaft N any suitable mechanism may be made use of. I, however, prefer to employ a pinion O, gearing into a wheel P, which is moved progressively by the action of 55 a lever Q and pawl 10 upon a ratchet-wheel 11, such ratchet-wheel being upon the shaft or arbor N', there being the proper number of teeth in the ratchet-wheel 11 and the gears being so proportioned that the shaft 60 N will receive one complete rotation every movement of the lever Q, and this lever Q is acted upon by a connecting-rod Q' to a suitable crank or other device upon the nail-driving machine, and I employ a spring 12 55 and brake-segment 13 to apply sufficient friction to the gear-wheel P to prevent the same

turning backwardly by friction as the lever Q is moved for the pawl 10 to take another tooth.

In nailing boxes it is generally necessary 70 to drive a larger number of nails along one side of the box than along another side or end of the box, and with this object in view it is advantageous to feed the nail driving and supplying devices so as to drive the largest 75 number of nails required at any one time and to intercept or stop the supply of nails alternately or every given number of strokes of the driving mechanism, so as to only supply a smaller number of nails every second or 80 other number of strokes in the driving mechanism. I therefore provide a cross-shaft R, upon which are collars 14 with set-screws 15 and fingers 16, so that by loosening one or more of said screws, one or more of the collars 85 and fingers can be turned up and kept out of action, and this cross-shaft R is moved periodically, so as to bring down the fingers that are in position to be operative against the 90 lower nails in the raceways between the bars G and H and thereby stop the nails from passing down such raceways when the fingers are in position, thus lessening the number of nails supplied at any one movement of the nail-driving mechanism. 95

To give the cross-shaft R the proper motions, I provide a lever S with an actuating connecting-rod T, which is moved every stroke of the nail-driving mechanism by any suitable crank or otherwise, and this lever S has a pawl 17, acting upon a ratchet-wheel 18, and a gear-wheel 19, which gives motion to a pinion 20 upon a cross-shaft 21, and there is a toe 22 upon the cross-shaft 21, acting upon a toe 23 upon the cross-shaft R, to give to the cross-shaft R and 105 the fingers 16 a motion that will move the fingers 16 away from the lines of nails and allow such lines of nails to run down into the notches of the screw-shaft N.

It will now be understood that the number 110 of ratchet-teeth and the relative sizes of the gear 19 and pinion 20 can be regulated as desired, so that the shaft 21 may be rotated every one, two, three, or more strokes of the nail-driving mechanism, and when the toe 22 115 acts upon the toe 23 to swing the cross-shaft R and its fingers 16, then nails will be supplied from all the raceways; but when the cross-shaft R is not acted upon the fingers 16 will keep back the nails, so that the number 120 supplied will be less.

Either finger 16 may be brought into or put out of action by slackening the set-screw 15 and turning the collar 14 upon the cross-shaft R, so as to determine which nails are to be 125 supplied to the driving mechanism.

If the shaft N has a screw-thread cut upon it so that the pitch thereof is adapted to the positions of the channels between the bars G and H, the entire screw-thread may be left 130 between the frames of the machine, but usually it is advantageous to turn off the metal,

so as only to leave the screw-threads opposite the lower ends of the pairs of bars G and H.

I claim as my invention—

1. The combination in a nail feeding mechanism, of inclined bars in pairs, sets of crossing bars connecting the respective inclined bars together in two sets, end bars connecting the crossing bars and mechanism acting between the end bars equally in both directions for adjusting the inclined bars to vary the width of the channel between such inclined bars by one adjustment so as not to change the relation of the nail channels to the other mechanism, substantially as set forth.

2. The combination in a nail feeding mechanism, of the inclined bars G and H, the crossing bars I connected to the bars G, the crossing bars K connected to the bars H, the end bar I' connecting the cross bars I, the end bar K' connecting the cross bars K, a shaft with equal cam projections on each side to adjust the inclined bars and vary the width of the nail channels and springs for pressing the parts toward the cam projections, substantially as set forth.

3. The combination in a nail feeding mechanism, of inclined bars in pairs with the channels or raceways for the nails between them, a shaft passing across at right angles to the channels and having a screw threaded groove for each channel and coinciding with the same, means for rotating such shaft progressively to carry the nails laterally from the lower ends of the respective channels and drop the same so as to be conveyed to the nail driving mechanism, substantially as set forth.

4. The combination in a nail feeding mechanism, of inclined bars in pairs with the channels or raceways for the nails between them, a shaft at right angles to the channels, screw thread grooves coinciding with the channels between the pairs of bars, a pinion, gear wheel, ratchet wheel and pawl and means for moving the pawl to give to the screw shaft a rotation for carrying the nails laterally away from the channels and dropping the same, substantially as set forth.

5. In a nail feeding mechanism the combination with inclined bars forming channels or raceways for the nails and a shaft at right angles to the channels and screw thread grooves on such shaft for moving the nails laterally from the lower ends of the raceways

and dropping the same, of fingers, collars and a shaft for supporting the fingers, clamping screws for holding the collars and fingers upon the shaft and mechanism for partly turning the shaft periodically to move the fingers and allow the nails to slide down into the nail delivering mechanism, substantially as set forth.

6. In a nail feeding mechanism the combination with the inclined bars forming channels or raceways for the nails and a shaft at right angles to such channels and screw thread grooves for receiving the nails from the lower ends of the raceways and moving the same laterally for dropping them, of fingers, collars and a shaft for supporting the fingers, clamping screws for holding the collars and fingers upon the shaft, a shaft and toes for giving motion to the fingers and mechanism for rotating the shaft progressively to bring the fingers into action every desired number of strokes of the nail driving mechanism, substantially as set forth.

7. The combination in a nail feeding mechanism, of inclined bars that are L-shaped in section and set together in pairs to form between them the nail channels for suspending the nails by their heads and guiding the same vertically, a shaft at the lower ends of the inclined bars and at right angles to the same, screw thread grooves for receiving the nails and means for rotating the shaft and screw thread grooves to carry the nails away laterally from the inclined bars and dropping the same, substantially as set forth.

8. The combination with the inclined bars having channels between them for the nails, of a shaft at the lower ends of the inclined bars and at right angles to the same, screw thread grooves upon such shaft for the reception of the nails, means for rotating the shaft and screw threads to carry the nails laterally from the channels, there being a notch in the lower end of one bar in each pair of bars through which the nail drops as it is delivered to the nailing machine, substantially as set forth.

Signed by me this 12th day of September, 1894.

JOHN J. HAYES.

Witnesses:

FREDERICH KNOCHER,
ALONZO W. FISK, Jr.