

UNITED STATES PATENT OFFICE.

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MACHINE FOR CROWNING FLOOR-JOISTS.

SPECIFICATION forming part of Letters Patent No. 580,485, dated April 13, 1897.

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To all whom it may concern:

Be it known that I, JOSEPH FRIEDRICH, a citizen of the United States, residing at the city of St. Louis, State of Missouri, have invented a certain new and useful Improvement in Machines for Crowning Floor-Joists, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, wherein—

Figure 1 is a side elevational view of a portion of a planing-machine, showing my invention in position. Fig. 2 is a sectional view on line 2 2, Fig. 1. Fig. 3 is a top plan view. Fig. 4 is a detail view of the laterally-movable frame in which the cutter-head is mounted. Fig. 5 is a detail view showing the rocking frame in a dead-central position. Fig. 6 is a rear elevational view of the track-carriage. Fig. 7 is a sectional view showing the spring-points in the end of the arm extending up from the rocking frame.

This invention relates to a new and useful improvement in machines for crowning floor-joists; and it consists, generally stated, in the provision of means for moving the cutter-head laterally relative to the path of the traveling joist, so that said cutter-head will effect the crown of the joist. The mechanism for effecting this lateral movement of the cutter-head consists, essentially, of a traveling templet, which is driven by mechanism receiving power, preferably, from contact with the traveling joist, said mechanism being reversed as the cutter-head reaches the limit of its lateral movement, or when a half-crown has been finished.

In the drawings, A indicates the frame of an ordinary planing-machine; B, the feed-rollers thereof, and C the cutter-head. This cutter-head is mounted in a laterally-movable frame D, which is mounted upon a suitable guiding-rail D', while a rod E extends laterally beyond the frame of the machine and has mounted upon its end a grooved roller or head E'.

F indicates a lever of the first order having one end embracing or connected to the rod E, while its other end carries a roller F'. This roller F' fits between two tracks G, adjustably mounted upon a traveling track-carriage H, said tracks being susceptible of being bent

to effect a greater or less movement of the lever F, depending upon the crown it is desired to give joists of different lengths. For instance, if it is desired to give a thirty-foot joist a three-quarter-inch crown the parts would be so adjusted relative to each other that the cutter-head would be caused to make one complete vibration during the travel of the joist through the machine. If it is desired to crown a joist thirty feet long with a five-eighths of an inch crown, the track would be so adjusted that such distance would be traveled by the cutter-head in its lateral vibration. For crowning a fifteen-foot joist with a three-quarter-inch crown it necessarily follows that if these joists were fed to the cutter-head at the same rate of speed as the thirty-foot joists the cutter-head would have to make twice as many vibrations as it had to make with a thirty-foot joist. To meet this requirement—in fact, to meet all requirements demanded by the different lengths of joists to be crowned, say from ten to thirty feet in length, and the different crowns for each, say from one-eighth to three-quarters of an inch—these tracks G have to be made laterally adjustable, so as to impart a given lateral movement to the cutter-head upon a given longitudinal movement being imparted to the carriage carrying the tracks from the traveling joists.

To cause the travel of the track-carriage, I mount at some suitable point in the machine, and preferably below the path traveled by the joists to be crowned, a toothed wheel I, which is adapted to receive motion from said traveling joists and transmit said motion to a pinion I' through the medium of a chain J, which passes over sprockets on the shafts of the wheel I and pinion I', respectively. In the drawings I have shown this gearing as three to one—that is, three revolutions of the toothed wheel I will impart one revolution to the pinion I'; but it is obvious that this ratio could be changed as circumstances require.

Mounted in a rocking frame K is a pinion L, which is in constant mesh with the pinion I'. A pinion M, also mounted in the rocking frame K, but on the other side of its pivotal point, is in mesh with the pinion L. These three pinions I', L, and M are preferably of the same diameter, and one of the pinions,

L or M, is adapted to mesh with a rack N on the bottom of the track-carriage H whenever the rocking frame is in one of its two positions.

5 Extending up from the rocking frame is an arm K', which carries in its end oppositely-disposed yielding points *k*, which are held in their projected positions by a spring *k'*, interposed therebetween, as shown in Fig. 7.

10 Two springs could be employed, if desired, but I find that one will answer.

g and *g'* indicate two projections adjustably mounted on the carriage H and adapted to cooperate with the spring-points *k* and the arm K' of the rocking frame K.

15 The operation of the device, as above described, is as follows: Assuming that the joists to be crowned are of a given length, say twenty feet, and the crown of each is to be three-quarters of an inch, the tracks G are so adjusted that as the toothed wheel I travels over a distance of ten feet on the joists being fed to the cutter-head the cutter-head will be made to move laterally three-quarters of an inch to effect the crown. This travel of the wheel I will crown but half a joist, and in order to reverse the lateral movement of the cutter-head to effect the crowning of the other half of the joist it is necessary to reverse the direction of travel of the track-carriage. This is effected by adjusting the stops *g* and *g'* so that they will engage the arm K' at the proper time and throw the rocking frame from one position to another or throw the pinion L out of and the pinion M into engagement with the rack N, or vice versa. In Fig. 1 the track-carriage is shown as just reversing from its movement to the left. When the carriage reaches the limit of the desired movement—that is, when the cutter-head has been forced in or out the required distance, it being forced in in this instance—the stop *g'* contacts with one of the spring-points *k* and forces said point within its housing. The pinion M will remain in mesh with the rack during this operation, and a continued rotation of the pinion will force the rack and stop to the left until both pinions M and L are out of engagement with the rack, as shown in Fig. 5.

20 Depending from the rocking frame is a weight-track O, in which runs a weighted roller O', which tends to hold the pinions L or M up against the rack when the frame K is in either of its two operative positions. When the stop forces the arm K' to one side to disengage the pinions from the rack, this weight, by reason of a slight curve being given to the track O, occupies a dead-central position, as shown in Fig. 5. The spring-point *k* now acts against the stop *g'* and forces the arm K' beyond dead-center, and as soon as such is done the weight will carry it the rest of the way and throw the pinion L into engagement with the rack, as shown in Fig. 1.

25 In order to prevent the rack from moving in either direction during the operation of

the spring-points *k* against the stops *g* or *g'*, I connect a link P to the rocking frame, the other end of the link being connected to a lever Q, which carries at its upper end two oppositely-disposed pawls *q* and *q'*. These pawls when the rocking frame is in its dead-central position both engage the rack N, and when said frame is rocked, say from the position shown in Fig. 5 to the position shown in Fig. 1, the pawl *q* is thrown out of engagement with the rack, which permits the rack to travel to the right. The pinion M will now be thrown into engagement with the rack, and the rack will travel to the right until the stop *g* comes in contact with its spring-point *k*, when it will force said spring-point within its housing, move the arm K' to a vertical position, where the weight will occupy a central position, both pinions L and M will be out of engagement with the rack N, and both pawls *q* and *q'* will be thrown into engagement with the rack N to lock the same in its stationary position. The spring *k'* and the weight will now act to throw the rocking frame so that the pinion M will be thrown into engagement with the rack and the pawl *q'* out of engagement.

I am aware that many minor changes may be made in the construction, arrangement, and combination of the several parts of my device and substituted for those herein shown and described without in the least departing from the nature and principle of my invention.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In a machine for crowning floor-joists, the combination with a laterally-movable cutter-head, of a laterally-traveling carriage for moving said cutter-head, a lever engaging said carriage, a longitudinally-traveling carriage which is adapted to rock said lever, connected mechanism driven by the joist to be, or being, crowned, for driving said last-mentioned carriage, and means for reversing the direction of travel of said carriage, substantially as described.

2. In a machine for crowning floor-joists, the combination with a cutter-head mounted in a laterally-traveling carriage, of a lever which engages said carriage, a longitudinally-traveling carriage provided with a cam-groove, for operating said lever, connected mechanism driven by the joist to be, or being, crowned, for driving said last-mentioned carriage, and means for automatically reversing said mechanism when a half crown has been effected, thereby reversing the direction of travel of said carriage; substantially as described.

3. In a machine for crowning floor-joists, the combination with a laterally-movable cutter-head, of a traveling carriage for moving said cutter-head laterally, a rocking frame carrying two pinions which are adapted to alternately drive said carriage, mechanism driven by the joist to be, or being, crowned, for driving said pinions in opposite directions, and

means on the carriage for rocking the frame carrying said pinions; substantially as described.

4. In a machine for crowning floor-joists, the combination with a laterally-movable cutter-head, of a traveling carriage for moving said cutter-head laterally, a rocking frame carrying two pinions which are adapted to alternately drive said carriage, mechanism driven by the joist to be, or being, crowned, for driving said pinions in opposite directions, an arm extending up from said rocking frame, projections on the carriage for cooperating with the arm, and a weighted roller operating on a track depending from said rocking frame; substantially as described.

5. In a machine for crowning floor-joists, the combination with a laterally-movable cutter-head, of a traveling carriage for moving said cutter-head laterally, a rocking frame carrying two pinions which are adapted to alternately drive said carriage, mechanism driven by the joist to be, or being, crowned, for driving said pinions in opposite directions, an arm extending up from said rocking frame, projections on the carriage, for cooperating with the arm, and pawls which are adapted to be thrown into or out of engagement with the carriage upon the movement of the rocking frame; substantially as described.

6. In a machine for crowning floor-joists, the combination with a laterally-movable cutter-head, of a traveling carriage for moving said cutter-head laterally, a rocking frame carrying two pinions which are adapted to alternately drive said carriage, mechanism driven by the joist to be, or being, crowned, for driving said pinions in opposite directions, an arm extending up from said rocking frame, spring-points in said arm, and projections on the carriage for cooperating with said spring-points and the arm, for throwing the rocking frame; substantially as described.

7. In a machine for crowning floor-joists, the combination with a laterally-movable cutter-head, of a traveling carriage for moving said cutter-head laterally, a rocking frame carrying two pinions which are adapted to alternately drive said carriage, mechanism driven by the joist to be, or being, crowned, for driving said pinions in opposite directions, an arm extending up from said rocking frame, spring-points in said arm, projections on the carriage for cooperating with said spring-points and the arm, for throwing the rocking frame, and pawls which are adapted to be thrown into or out of engagement with the carriage upon the movement of the rocking frame; substantially as described.

8. In a machine for crowning floor-joists, the combination with a laterally-movable cutter-head, of a traveling carriage, an adjustable track on said carriage, mechanism operated

by said track for moving the cutter-head, mechanism operated by the joist being crowned, for causing the travel of said carriage, and means for reversing the direction of travel of said carriage, when a half crown has been effected; substantially as described.

9. In a machine for crowning floor-joists, the combination with a laterally-movable cutter-head, of a traveling carriage, an adjustable track on said carriage, a lever having one end cooperating with the track, the other end of said lever moving the cutter-head laterally, mechanism operated by the joist being crowned, for causing the travel of the carriage, and means for automatically reversing the direction of travel of the carriage when a half crown has been effected; substantially as described.

10. In a machine for crowning floor-joists, the combination with a laterally-movable cutter-head, of a traveling carriage, an adjustable track on said carriage, a lever having a roller on one end which runs in said track, the other end of said lever moving the cutter-head laterally, a rack on said carriage, oppositely-rotating pinions which are adapted to alternately engage the rack, and means for throwing said pinions into or out of engagement with the rack; substantially as described.

11. In a machine for crowning floor-joists, the combination with a laterally-movable cutter-head, of a traveling carriage, an adjustable track on said carriage, connected mechanism, operated by said track, for moving said cutter-head toward, or from, the joist being crowned, when the carriage is traveling in one direction, and means for reversing the direction of travel of said carriage, when a half crown has been effected, and adjustable projections or stops on said carriage for controlling the reversing mechanism; substantially as described.

12. In a machine for crowning floor-joists, the combination with a laterally-movable cutter-head, of a traveling carriage, an adjustable track on said carriage for moving the cutter-head laterally, a rack on the carriage, oppositely-rotating pinions which are adapted to alternately engage said rack, means for driving said pinions from the joist to be, or being, crowned, and adjustable projections on said carriage for throwing said pinions into, or out of, engagement with the rack; substantially as described.

In testimony whereof I hereunto affix my signature, in presence of two witnesses, this 21st day of October, 1896.

JOSEPH FRIEDRICH.

Witnesses:

F. R. CORNWALL,
HUGH K. WAGNER.