No. 644,279. Patented Feb. 27, 1900.

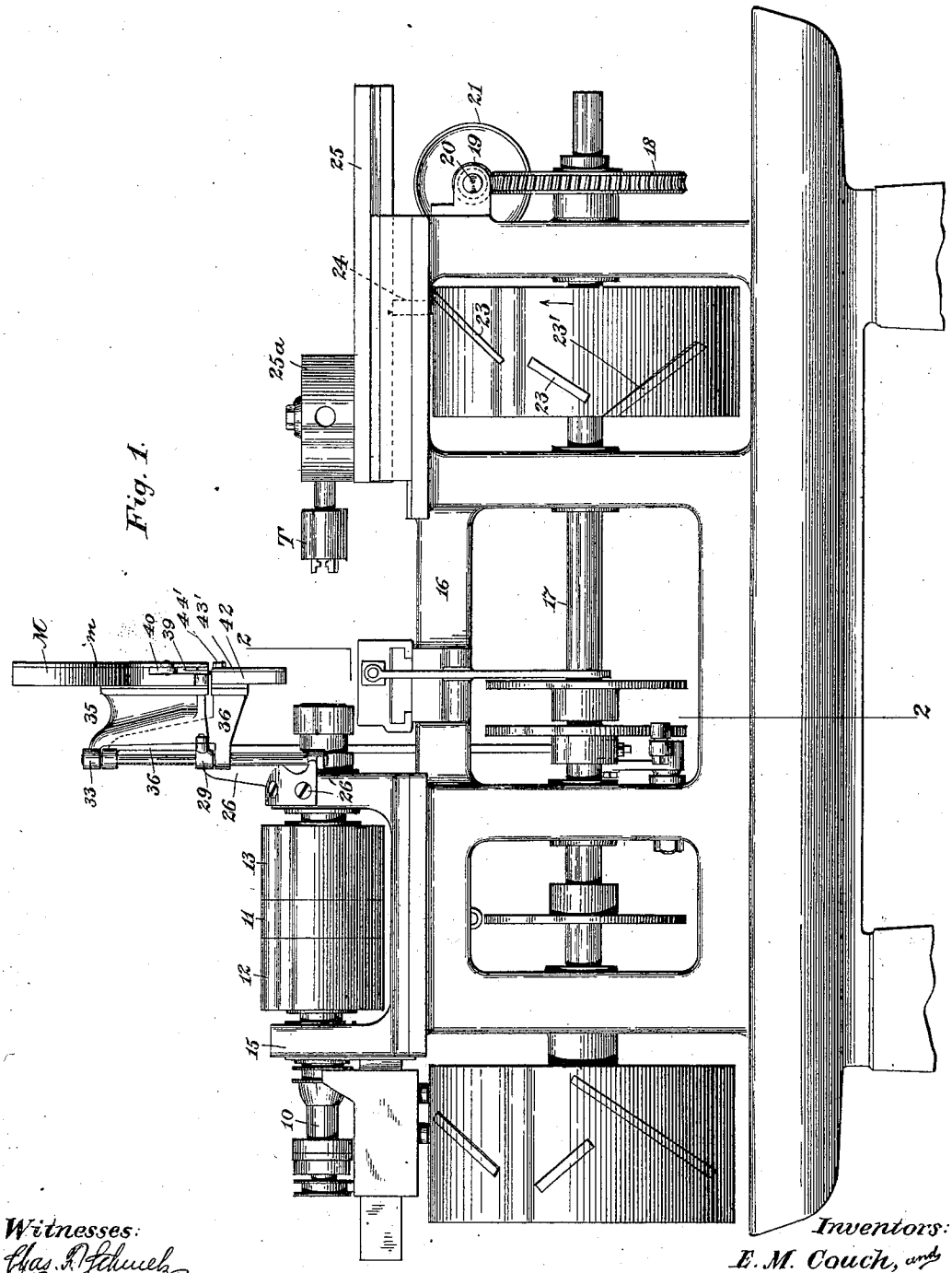
E. M. COUCH & F. HARRINGTON.

FEED ATTACHMENT FOR SCREW OR ANALOGOUS MACHINES.

(Application filed Jan. 11, 1899.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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Fig. 3.

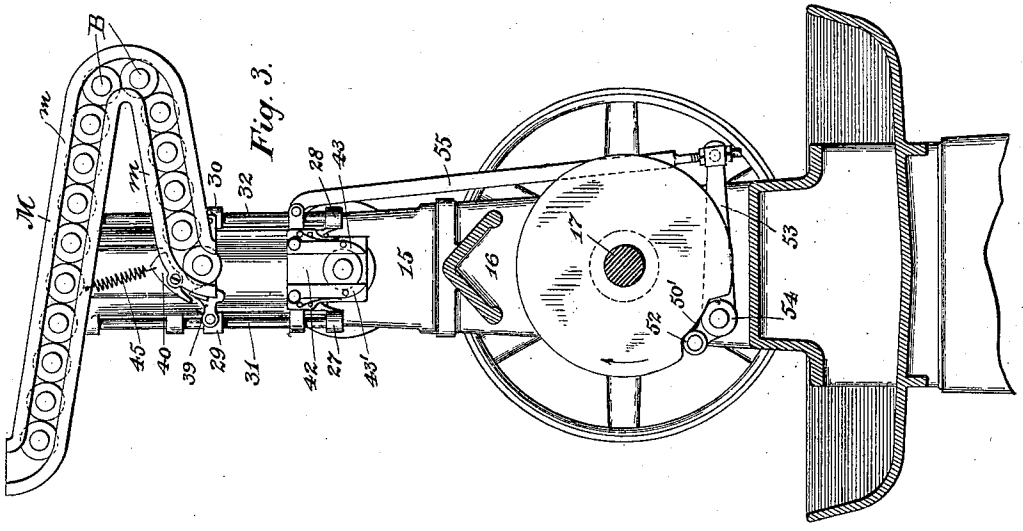
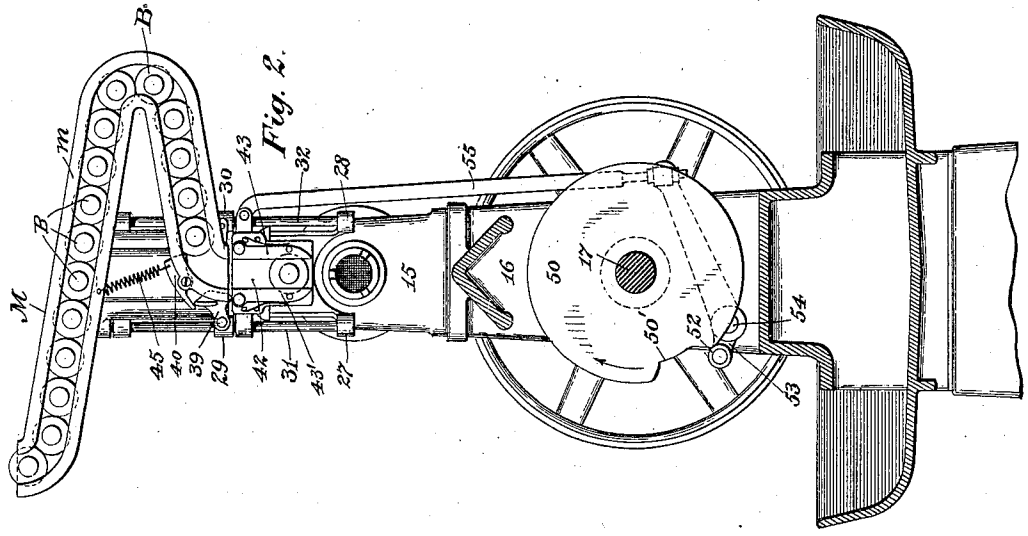


Fig. 2.



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3 Sheets—Sheet 3.

Fig. 4.

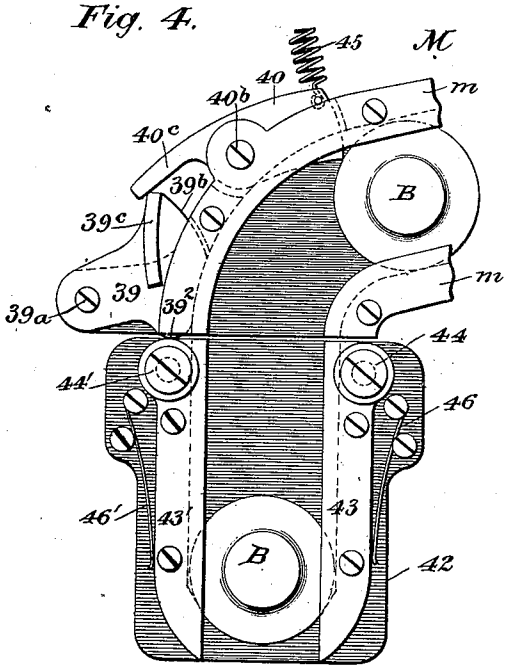


Fig. 5.

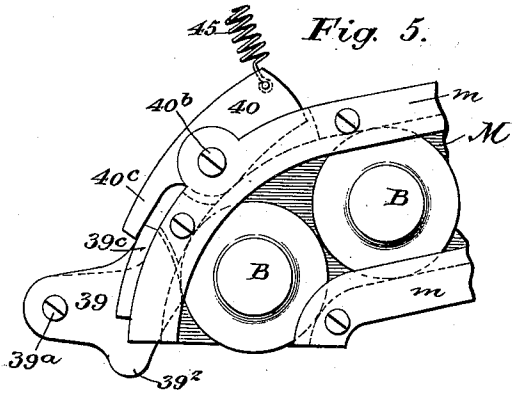


Fig. 6.

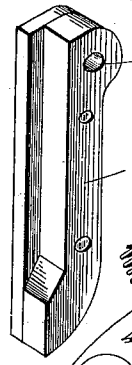


Fig. 7.

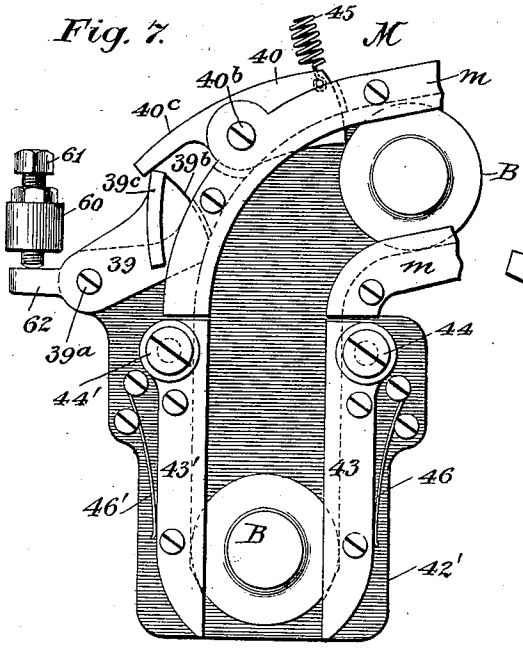
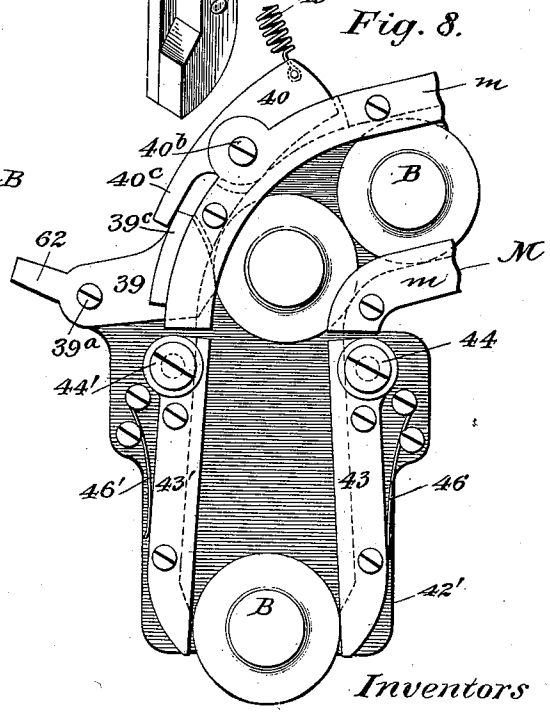


Fig. 8.



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UNITED STATES PATENT OFFICE.

ELBERT M. COUCH AND FRANK HARRINGTON, OF HARTFORD, CONNECTICUT, ASSIGNORS TO THE PRATT & WHITNEY COMPANY, OF SAME PLACE.

FEED ATTACHMENT FOR SCREW OR ANALOGOUS MACHINES.

SPECIFICATION forming part of Letters Patent No. 644,279, dated February 27, 1900.

Application filed January 11, 1899. Serial No. 701,809. (No model.)

To all whom it may concern:

Be it known that we, ELBERT M. COUCH and FRANK HARRINGTON, citizens of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Feed Attachments for Screw or Analogous Machines, of which the following is a specification.

Our invention relates to an improvement in feed attachments for screw or analogous machines, and particularly to that class thereof containing a device for holding a series of tools which operate consecutively upon the blank; and it has for its object improved means comprehending a magazine for containing the blanks *en masse*, from which magazine said blanks are to be delivered *seriatim* to the work-holding chuck carried by the live-spindle and there subjected to the action of the various tools for operating upon the same, as above mentioned.

In the embodiment of our invention herein illustrated and described a movable carrier is employed for removing the blanks one by one from the magazine to a position in alinement with the work-holding chuck, and each blank is transferred from said carrier to the chuck by a device mounted on the tool-holding slide of the machine, which device is adapted to seize and withdraw the blank from the carrier and to advance and force the same within the jaws of the chuck in the live-spindle. Heretofore various devices have been employed for accomplishing this object, but they have been unsatisfactory, owing either to complication of structure or to the fact that the blank to be inserted in the chuck of the live-spindle is not brought into perfect alinement therewith prior to its insertion. In the preferred form of our invention the magazine for containing the blanks is stationary and a series of detents is employed for permitting the entrance of one blank at a time into the movable carrier located below such magazine, the construction being such that when one detent is withdrawn to release the lowermost blank another is thrown in to stop the passage of the column of blanks within the chute or magazine. Preferably the movable carrier is equipped with yielding jaws which hold the blank to be delivered to the chuck with sufficient friction to transfer the same and yet permit of its ready delivery when desired; but in some instances the jaws may be dispensed with.

In another embodiment of our invention the carrier and the magazine constitute practically a single structure movable to bring the lowermost blank of the column into alinement with the chuck-spindle, said structure being also provided with detents for releasing a single blank and detaining the column of blanks.

This feed attachment may be employed with any machine of the type shown or other types to which it is applicable, and it is distinctly to be understood that the invention is not limited to the character of machine hereinafter described.

In the accompanying drawings, in which like characters of reference are employed to designate like parts in all the figures, Figure 1 is a side elevation of an ordinary "turret type" of screw-machine, to which our invention may be attached. Fig. 2 is a transverse vertical section of the machine, taken on line 2 2, Fig. 1, and showing the preferred form of carrier in its elevated position. Fig. 3 is a similar view illustrating the carrier in its lower position and showing a blank held by the jaws thereof in line with the axis of the chuck, into which it is to be delivered. Fig. 4 is a detail, on an enlarged scale, of the magazine and chute and the carrier, the latter being represented in its highest position. Fig. 5 is a detail, also on an enlarged scale, representing the end of the chute and the positions of the several detents or retaining devices after the carrier has descended. Fig. 6 is a view in perspective showing the holding-surface of one of the retaining-jaws of the carrier. Figs. 7 and 8 are views of a modification in which the chute and carrier are united and move together, Fig. 7 representing such parts in their highest positions, and Fig. 8 the same parts in their lowest positions.

As above stated, an ordinary type of ma-

chine is illustrated, and in such machine the framework is indicated by the numeral 16, the cam-shaft journaled in said framework by 17, the usual drum, having cam-strips 23 and 23′, by 22, and the common means for turning said shaft 17, consisting in this case of a worm-wheel and worm, driving-pulley, and shaft, by the numerals 18, 19, 20, and 21. Usual means are also illustrated for actuating the parts governing the action of the chuck and of the feed-tube and for rotating the live-spindle, said parts being designated, respectively, by the numerals 10, 11, 12, and 13, the spindle being indicated by 10 and being mounted in the head-stock 15. Opposite to the head-stock is the turret-slide 25, having the depending stud 24, which is to be actuated in the usual manner by the cam-strips 23 and 23′, and carried by said turret-slide is the tool-holding turret 25^a, shown as equipped in the present instance with what will be hereinafter termed the "transfer-chuck" T, having yielding jaws adapted to seize the stem of a blank and to deliver it to the work-holding chuck of the live-spindle.

Attached by screws 26′ to one of the bearing posts or standards of the head-stock 15 is a bracket 26, having a series of lugs 27, 28, 29, and 30, which receive and hold guide-rods 31 and 32, the upper ends of which are secured in lugs 33, formed on a frame or casting 35, which is represented (see Fig. 1) as firmly fastened at its lower end to the lugs 29 and 30, above mentioned.

Mounted on the guide-rods 31 and 32 by loops or eyes fitting over the same is a sliding frame or casting 36, carrying the plate 42, to which the jaws 43 and 43′ for receiving and temporarily retaining the lowermost blank from the magazine are pivoted at 44 and 44′, said jaws being caused to grasp the blank by springs 46 and 46′. This plate or carrier 42 is actuated by means of a cam 50, carried by the shaft 17, a two-armed lever 53, pivoted at 54 to the machine-frame and provided with the roller 52 in contact with the periphery of the cam 50, and a pitman 55, connected to the long arm of said lever at one end and at its opposite end to one of the lugs of the sliding carrier. As will be observed, the periphery of the cam 50 is concentric to the axis of said cam for the greater portion of its length, and the cam is provided with a short cut-away portion or cam-surface proper, 50′, for actuating at the proper time the lever which controls the movement of the sliding carrier.

Mounted above the carrier in the preferred form of the invention (shown in Figs. 1 to 6, inclusive) is a stationary magazine or hopper M, which is to be suitably formed to accord with the shape of the blanks to be operated upon. In the present instance this carrier is provided with flanges *m*, which overlap the heads of the blanks and serve as guides to permit them to roll downward in their passage to the machine. Pivoted to one wall of said magazine, as at 40^b, is a detent 40, normally held out of contact with the blanks by a spring 45, and this detent has an arm or tailpiece 40^c, subserving a purpose hereinafter described. Below this detent and also pivoted to the chute, as at 39^a, is a second detent 39, which is normally in contact with the lowermost blank of the column, and therefore prevents the column of blanks from descending in the magazine. As will be observed, the detent 39 is provided with a curved stop-face 39^b, concentric with its pivot 39^a, whereby on the downward movement of said detent the stop-face will be projected within the chute or magazine and against the lowermost blank of the column contained therein. When, however, the detent is raised to withdraw the curved stop-face from within the magazine, such stop-face is immediately freed from contact with the blank, and all wedging or crowding of the same is thereby avoided. The second detent 39 has a wing or lug 39^c, against which the tailpiece 40^c of the detent 40 rests and which also serves as a means for limiting the downward movement of the same. In this form of our invention the blanks descend by gravity until the lowermost blank of the column is stopped by the detent 39, which, as will be observed, has a projection, shown as a rounded protuberance 39^2. When both detents 39 and 40 are in the positions represented by Figs. 2 and 4, the carrier 42 is in its elevated position and in contact with the protuberance 39^2 of the detent 39, the curved face of which is withdrawn from the line of passage of the blanks. Consequently said detent 39 is raised, and during its rising movement the wing or projection 39^c in contact with the arm or tailpiece 40^c of the detent 40 forces the nose of said detent within the chute or magazine proper, causing the same to detain the column of blanks. In the meantime the lowermost blank has been released from the column by the movement of the detent 39 and has dropped to the position shown in Figs. 2 and 4 within the yielding jaws 43 and 43′ of the carrier 42, by which it is retained until said carrier is lowered by the instrumentalities above described to a position where the blank is in alinement with the axis of the chuck of the live-spindle. In this position the carrier is temporarily held—that is, long enough to enable the tool-slide to advance and the chuck T thereof to grasp the shank of the blank and retain the same while the carrier returns to its elevated position—thereby stripping the blank from the jaws of said carrier. After this action has taken place the tool-holding slide continues to advance and deposits the blank within the jaws of the chuck of the live-spindle.

In the modification represented by Figs. 7 and 8 the principle of operation is the same, but the chute and carrier are united and are moved bodily on the guide-rods to bring the blank into alinement with the axis of the chuck of the work-holding spindle. To permit of this action, means must be provided to

effect the release of the lower detent 39, which in this case is provided with an extension 62. To accomplish the withdrawal of said detent, we have illustrated a convenient means for this purpose consisting of an adjustable screw 61, held in a bracket 60 of the machine-frame. In this modification of the invention when the chute and its connected blank-carrier 42' are elevated the projection 62 of the detent will come into contact with the end of the screw 61 and the forward end of the detent will thereby be raised to release the lowermost blank held thereby, and simultaneously therewith the upper detent will be thrown into position to block or intercept the movement of the column of blanks in the same manner as in the preferred form of the invention above described.

While we have shown preferred forms of detents or holding devices for restraining the movement of the selected blank and of the column of blanks in the magazine, yet it is to be understood that the invention is not limited to the precise details illustrated and described. Furthermore, various forms of jaws or holding devices could be mounted on the blank-carrier as a substitute for those shown without departing from our invention.

Having described our invention, we claim—

1. In a machine of the class specified, the combination, with a magazine for containing blanks, of independently-mounted detents one of which acts primarily to stop the column of blanks and another to stop said column when the blank to be delivered therefrom has been released part of one of said detents overlapping the other detent; a movable carrier for holding the selected blank; a spindle carrying a chuck; and means for withdrawing the blank from the carrier and depositing the same in the chuck of said spindle.

2. In a machine of the class specified, the combination, with a magazine for containing blanks, of a carrier movable with reference to said magazine; an independently-mounted detent for primarily stopping the column of blanks; a second independently-mounted detent for stopping said column when the first-named detent is actuated to release a selected blank, one of said detents being actuated on the movement of the carrier and one detent controlling the movement of the other detent; a chuck-spindle; and means for withdrawing a selected blank from the carrier and depositing the same in said spindle.

3. In a machine of the class specified, the combination, with a stationary magazine for containing blanks, of a movable carrier; independently-mounted detents for stopping the column of blanks at different points, one of said detents being actuated by the other, and both detents being controlled by the movement of the carrier; and means for withdrawing a selected blank from said carrier and depositing the same in the chuck-spindle of the machine.

4. The combination, with a stationary magazine for containing blanks, of independently-mounted detents located at intervals on said magazine for restraining the column of blanks and permitting the selection of an individual blank therefrom; and a movable carrier having jaws for temporarily holding the selected blank, said carrier actuating one of said detents and, through said detent, the other detent.

5. The combination, with a magazine for containing blanks, of two detents located at intervals, one of which is provided with an arm or tailpiece overlapping a projection on the other; and means for actuating one detent to withdraw the holding-surface thereof from contact with the blank to be selected, thereby throwing in the other detent to detain the column of blanks.

6. The combination, with a magazine for holding blanks, of a detent having an arm or tailpiece; and a second detent actuated by the first-named detent, said detents being located at intervals and acting, respectively, to release a selected blank and to restrain the movement of the column of blanks, and a device for actuating one detent and, through the same, the other detent.

7. The combination, with a magazine for holding blanks, of a detent having a rounded stop-surface adapted to bite against a blank; and means for actuating said detent to withdraw the same from the blank with which it is in contact.

8. The combination, with a magazine for holding blanks, of two detents, the upper one of which has an arm or tailpiece overlapping a flange on the lower detent, one of said detents being formed with a curved stop-face concentric with its axis of movement; and means for actuating one detent, and through the same the other detent.

9. The combination, with a magazine for holding blanks, of a pivoted detent provided with an arm or tailpiece; a spring for normally withdrawing said detent from the path of movement of the blanks; a second pivoted detent having a curved stop-surface concentric with its axis of movement, and also having a flange or projection in engagement with the arm or tailpiece of the first detent; and means for actuating said second detent to withdraw the same from contact with the lowermost blank of the column and to force the first detent within the path of the blanks to retain said column when the selected blank has been released.

10. The combination, with a chute down which blanks are adapted to roll by gravity, of a movable blank-carrier; independent detents located at intervals on the chute for controlling the entrance of blanks to said carrier, one of said detents being actuated by the other detent; and guides upon which the blank-carrier is mounted.

11. The combination, with a chuck-spindle, of guides disposed with relation thereto; a

magazine for containing blanks; a blank-carrier movable upon said guides; independent detents the action of which is controlled by the blank-carrier; means actuated from the cam-shaft of the machine for operating said carrier; and a transfer device for withdrawing a blank from said carrier and inserting it within the jaws of the chuck-spindle.

12. In a machine of the class specified, the combination, with a chuck-spindle, of a magazine for containing blanks; fixed guides; a blank-carrier having yielding jaws mounted for sliding movement upon said guides; detents for controlling the movement of the blanks into said carrier one of said detents being actuated by the blank-carrier; a cam; devices actuated by said cam for reciprocating the carrier; and a device for transferring a selected blank from the jaws of the carrier and inserting the same within the chuck.

13. The combination, with a magazine for containing blanks, of a movable blank-carrier for temporarily retaining a selected blank; independently-pivoted detents, one of which is actuated by said blank-carrier, for controlling the movements of the blanks; a pitman connected to the blank-carrier; a lever for actuating said pitman; and a cam for operating said lever.

14. The combination, with a magazine for containing blanks, of two detents, one of which acts to stop the column of blanks and the other to release the blank selected from said column, one of said detents having an arm or tailpiece overlapping the other; a movable blank-carrier for actuating one of said detents, and thereby, through the same, the other detent; means for moving said blank-carrier to a position in line with the axis of the chuck; and means for transferring a blank held by said carrier to said chuck.

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