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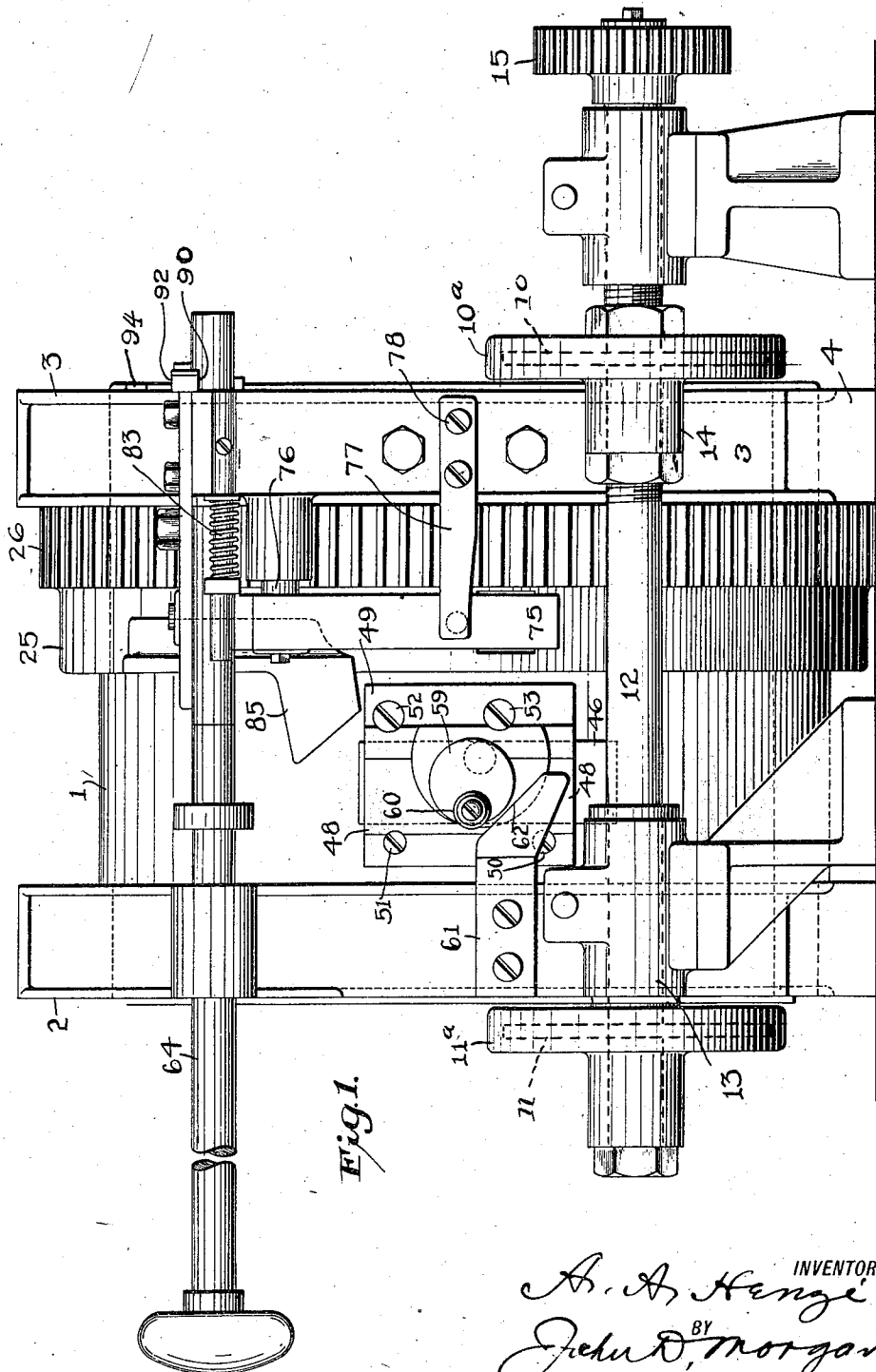
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1,610,219

STEREOTYPE PLATE FINISHING MACHINE

Filed Sept. 10, 1920

4 Sheets-Sheet 1



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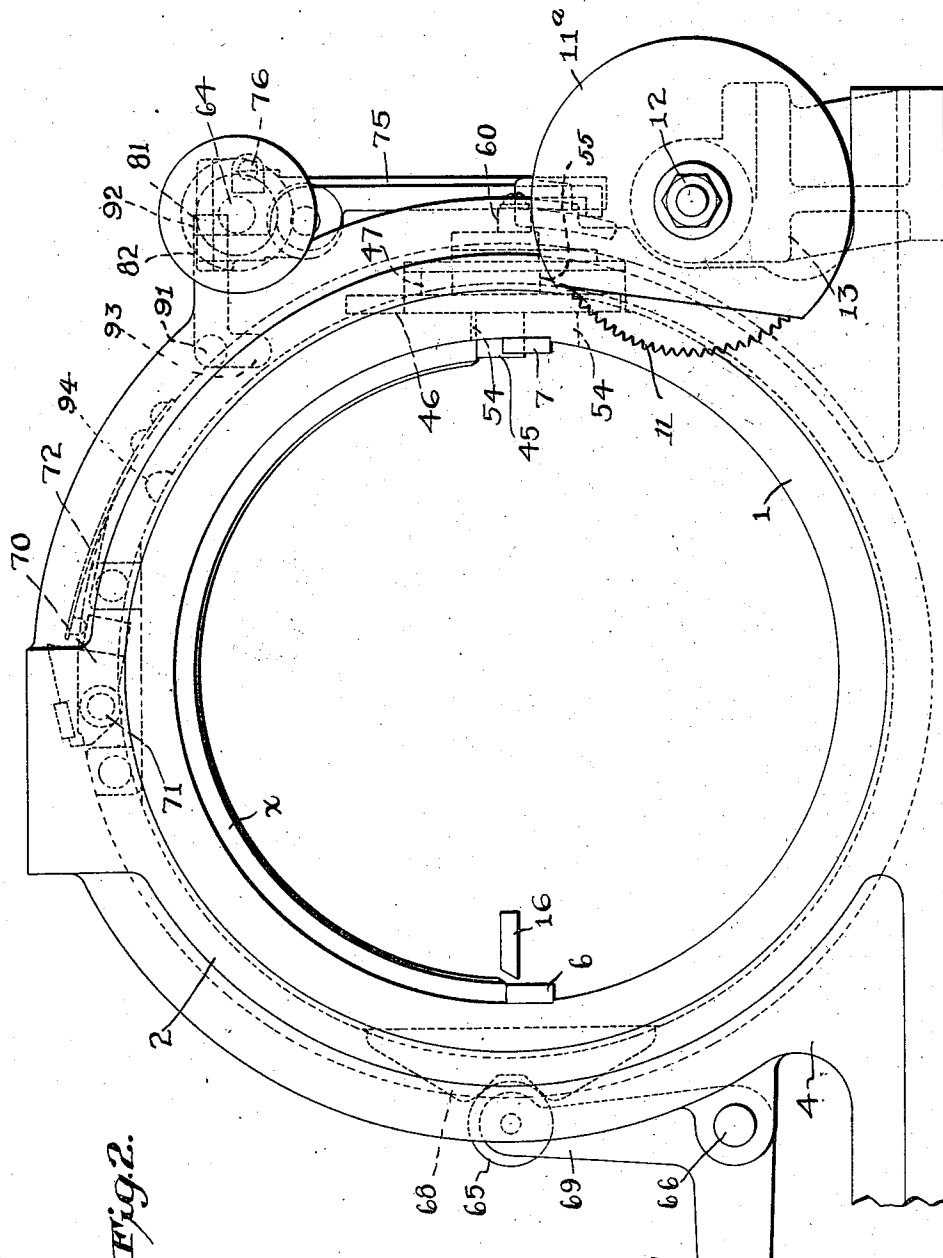
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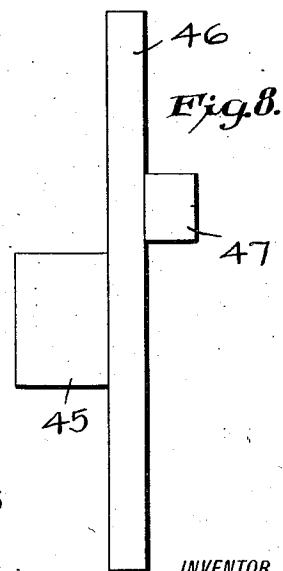
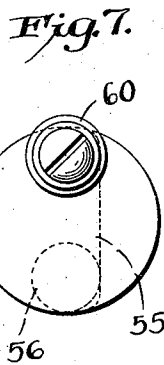
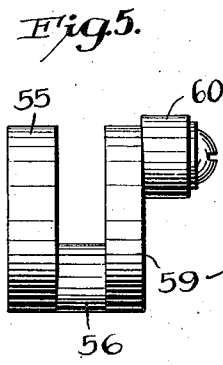
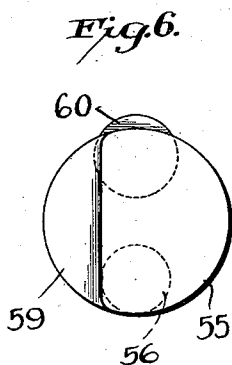
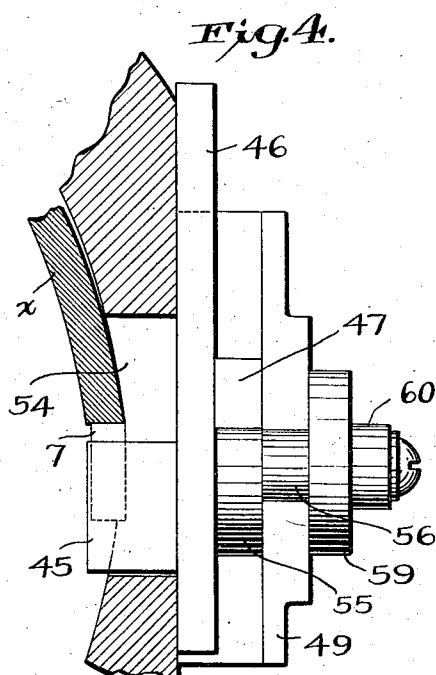
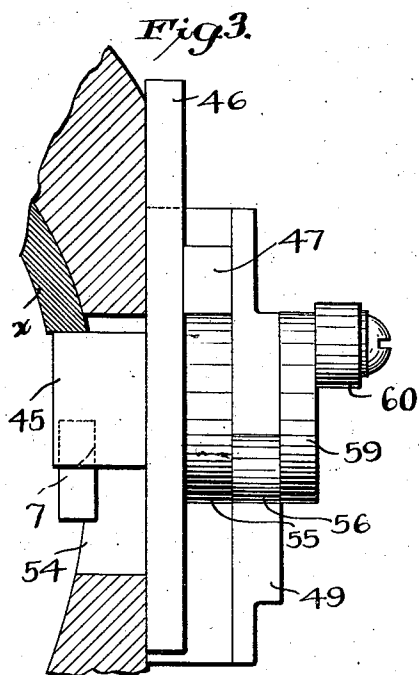
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Fig. 9.

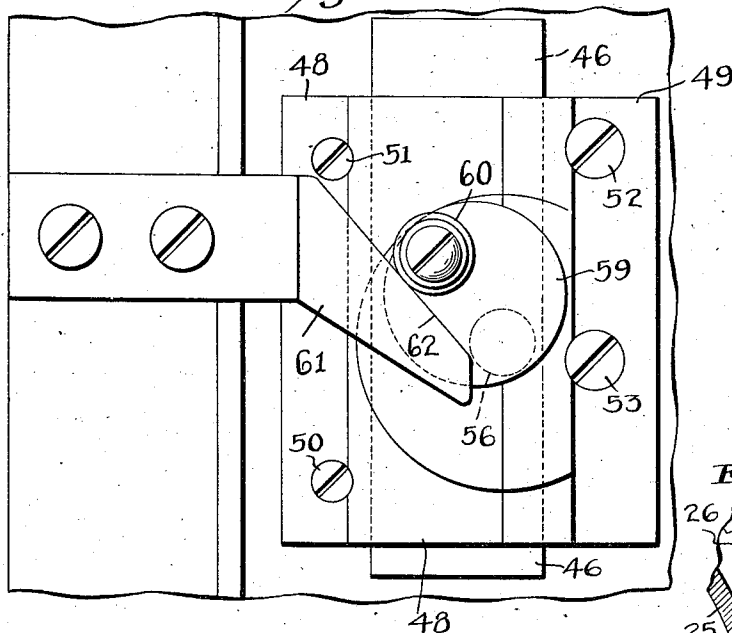


Fig. 10.

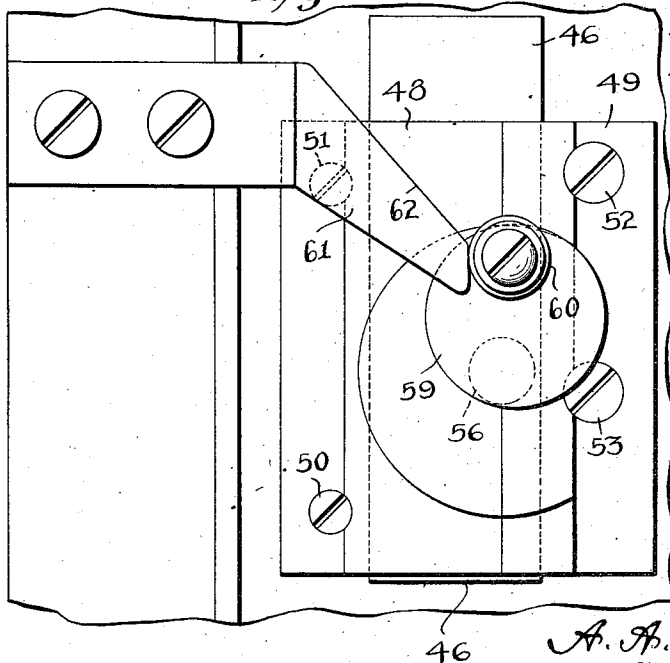
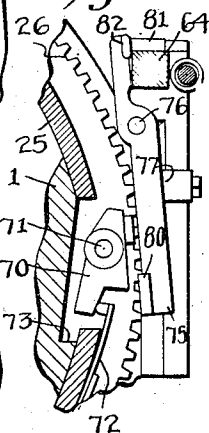


Fig. 11.



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UNITED STATES PATENT OFFICE.

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STEREOTYPE-PLATE-FINISHING MACHINE.

Application filed September 10, 1920. Serial No. 409,354.

The invention relates to machines for finishing stereotype plates, and more particularly to a novel automatically operating means for clamping and unclamping the plates within the finishing machine prior and subsequently to the finishing operation. In one of its leading features, the invention relates to novel automatically operating means for locking the plate in the machine preparatory to the finishing operation.

In the exemplarily illustrated embodiment this last-mentioned feature is shown as applied to, or as an improvement upon, the machine shown and described in our copending application Ser. No. 354,982, filed January 29, 1920.

Certain advantages of the present invention will be stated hereinafter, or will be obvious herefrom, or may be ascertained through practice with the invention; the same being realized, and attained through and by means of the instrumentalities and combinations pointed out in the appended claims.

The invention consists in the novel parts, constructions, arrangements, combinations and improvements, herein shown and described.

The accompanying drawings, referred to herein and constituting a part hereof, illustrate one embodiment of the invention, and together with the description, serve to explain the principles of the invention.

Of the drawings:—

Fig. 1 is a side elevation of a machine embodying the invention, and showing the mechanism in the plate locking position;

Fig. 2 is an end elevation looking at Fig. 1 from the left;

Fig. 3 is a fragmentary elevation of the plate clamping mechanism which is shown near the center of Fig. 1 (and looking at Fig. 1 from the left) and at the right center of Fig. 2, showing the parts in plate locking position;

Fig. 4 is a similar view but showing the mechanism in the position wherein the plate is unlocked or unclamped and resting on the guideways in position to be slid out of the trimming machine;

Fig. 5 is a detail of the operating member for the locking means removed from the machine, and looking thereat as shown in Fig. 3 and looking from the left in Fig. 1;

Fig. 6 is a detail looking at Fig. 5 from the left;

Fig. 7 is a detail looking at Fig. 5 from the right;

Fig. 8 is a detail of the plate locking device as shown in Fig. 3;

Fig. 9 is a fragmentary detail, corresponding to the central part of Fig. 1, showing the mechanism midway between the unlocking position of Fig. 1 and the locking position of Fig. 10;

Fig. 10 is a view like Fig. 9 but showing the parts in plate locking position; and

Fig. 11 is a fragmentary sectional detail of the hand operated mechanism for starting the rotation of the trimming machine.

The invention in certain of its aspects is directed to a rotary stereotype plate finishing machine wherein the stereotype plate is rotated in the machine past stationary rotating trimming saws and past stationary shaving knives or cutters. Certain novel features of the invention are directed toward mechanism operating automatically as the machine begins rotating to lock or clamp the plate firmly in the machine preparatory to the operation thereon of the trimming and shaving devices.

As herein exemplified, the invention is embodied in a machine wherein the stereotype plate is slid or placed freely within the cylinder with its straight edges resting on horizontally disposed tracks or guideways, the cylinder thereupon being called into rotation by hand operated means. As the cylinder begins to rotate, the mechanism locks or clamps the plate firmly within the cylinder and so holds the plate as it passes the trimming and shaving devices. The trimming and shaving are completed on a single revolution of the cylinder, and as the cylinder comes to rest on the completion of such revolution, the stereotype plate is unlocked or unclamped, preferably by automatically operating devices, preparatory to its removal from the machine, either by hand or by mechanical means. It will be

understood, however, that in certain of its features or aspects the invention is applicable to other forms of machines than the one briefly described above and hereinafter described in detail as the present preferred embodiment.

Referring now in detail to the exemplification of the accompanying drawings, the invention is shown applied to and constituting a part of a stereotype plate trimming machine, in which machine the cast plate is received with the tail or riser attached thereto, and forming or projecting from one of the arcuate ends of the plate, just as it comes from the casting machine. This plate is slid endwise into the interior of the cylindrical body of the trimming machine, the plate sliding upon its straight edges upon tracks or guides located longitudinally and very nearly centrally within the cylinder. As the plate runs or slides in upon the guides, it fits loosely within the cylinder, the convex or printing surface on the exterior of the plate being thus and thereby out of contact with the inner surface of the cylindrical body of the machine.

Preparatory to starting the machine on the trimming operation, the stereotype plate x is raised from the guides and is clamped firmly and closely against the inner surface of the cylinder. After the plate is so clamped, the cylinder makes a rotation, and during such rotation the two ends of the plate are carried past rotating saws, located at either end of the cylindrical body of the machine, and the head of the plate is thereby trimmed and the tail thereof is severed from the plate, and that end of the plate also properly trimmed. At the same time, the concave back of the plate is carried past one or more fixed shaving knives, which shave the surface of the concave ribs on the back of the plate in a wall known manner.

The plate is then unclamped, and as so finished or perfected drops to and rests on its straight edges upon the tracks or guideways within the machine body. It is then slid along the tracks or guideways out of the machine, passing out in the same direction but at the opposite end from which it came in. The plate is usually conveyed out of the trimming machine proper, as just described, by automatically operating mechanism, but such mechanism is not shown or described in the present case, as any form of withdrawing means may be employed so far as the present invention is concerned.

The present invention as applied to such a machine, relates primarily to novel means operating automatically to clamp the stereotype plate, as already described, preparatory to trimming or finishing, and secondarily to means cooperating therewith for effecting other functions, such as automatic means for unlocking the plate after it has been

trimmed or finished and means for effecting and controlling the rotation of the cylinder, together with the other mechanisms herein described or referred to. The cooperating automatic plate unclamping or unlocking means herein shown and described is similar to or the same as that shown in our copending application Ser. No. 354,982 already referred to.

Referring now to the details of construction of the embodiment illustrated in the accompanying drawings, a plate carrying cylinder 1 is arranged preferably horizontally, and is supported in a pair of annular frames or bearings 2 and 3, within which frames the cylinder is rotatable. The annular bearing frames 2 and 3 are mounted upon a suitable machine base 4. The trackways or guides 6 and 7 are arranged within and nearly centrally and longitudinally of the interior wall of the cylinder 1, very nearly a semi-circumference apart, so that as the plate x is slid into the machine, its straight edges will rest upon and slide along the guides 6 and 7 with the convex character-bearing surface of the plate x out of contact with the interior of the cylinder 1.

The stereotype plates x are usually pushed into the machine by the hands of the operator, a suitable table or support being usually positioned in front of the machine to aid in this operation.

The embodied form of means for trimming the head and cutting off the tail of the plate x comprises rotary saws 10 and 11, at the opposite ends of the cylindrical body 1 of the machine. The saws 10 and 11 are fixed upon a shaft 12 mounted in bearings 13 and 14 carried upon the machine base 4. The saws 10 and 11 may be protected by casings 10^a and 11^a respectively secured to the bearings 14 and 13. The shaft 12 is driven in any suitable manner, as by gear 15 driven by any suitable devices, not shown.

The shaving of the concave inner ribs of the stereotype plates is effected by one or more shaving knives or blades 16, indicated conventionally in the drawing.

A machine of the general type so far described is shown and described in Patent No. 1,126,741 to Wm. Evensen dated Feb. 2, 1915.

In the present preferred embodiment of the stereotype plate holding and clamping means, it is designed and constructed to operate in conjunction with the machine starting and machine stopping devices or mechanisms, that is the devices for starting and stopping the rotation of the cylinder 1 to effect the finishing of the plate and thereafter to leave it in position to be withdrawn or discharged upon the completion of the finishing operation.

In the embodied and exemplified form of means for rotating the cylinder 1, a gear

ring 26 encircles the cylinder 1, and has fixed thereto a hub 25 carrying certain of the connections and controls for the operation of the cylinder 1 from the gear as will be later described.

The gear ring is loose on the cylinder and is driven by suitable means not shown. The gear ring 26 is connectable to and disconnectable from the cylinder 1, to effect the rotation of the cylinder together with effecting certain other functions, as will hereinafter appear.

Referring now to the embodied form of plate clamping means, mechanism is provided adapted to engage with one of the straight edges of the plate, to lift it off the guide 6 or 7 and to press the plate firmly and solidly, and yet without too much pressure, against the interior of the cylinder 1.

In the embodied form, this means is positively acting, but this is non-essential so far as concerns many features of the present invention.

As embodied, one or more positively actuated clamping blocks 45 are provided, mounted on the cylinder 1 and located in breaks or interruptions in the guideway or track 6 or 7, and are slidable to and fro to clamp and to unclamp the plate. The clamping block 45 as shown has its upper surface even with or just below the top of the track 7 while the plate is being fed in, and is pressed upwardly by mechanism set in motion by the operator in starting the machine. In its upward movement it lifts the plate from track 7 (as shown in Fig. 2) and presses the plate against the interior of cylinder 1, preparatory to the finishing operation. Block 45 is moved downwardly automatically by the machine to free or unclamp the plate after the completion of the finishing operation, permitting its straight edge to rest upon the track or guideway 7, preparatory to the feeding out or discharge of the finished plate.

As embodied, the clamping block 45 is fixed to a slide 46, and fixed to the slide 46 is a block 47, with which block the actuating means for the clamping device cooperates. Suitable supporting and guiding means for the members 45, 46 and 47 are provided, and as embodied guides or brackets 48 and 49 are mounted or supported upon the exterior of the cylinder 1 by suitable means such as screws 50, 51, 52 and 53. The slide 46 and actuating block 47 move to and fro within the guiding brackets 48 and 49, the clamp block 45 extending through a slot 54 into the interior of the cylinder 1 and into the relation to the trackway 7 which has already been described.

The actuating devices for the clamping block 45 and its slide 46 and actuating block 47 are also mounted in the guiding and supporting brackets 48 and 49. As em-

bodied, a cam 55 of approximately somewhat more than semi-circular shape is adapted to engage with the actuating block 47 to slide the block in guides 48 and 49 to effect the movement of the clamping jaw 45 which has already been described. Fixed to cam 55 is a shaft 56, located substantially at one end of the flat or diametrical part of the cam. The shaft 56 is journaled in a cylindrical opening 57 in the guide brackets 48 and 49. Fixed also to shaft 56, and if desired integral therewith is an actuating member 59, preferably of circular form. This member 59 is thus located just exteriorly to the supporting brackets 48 and 49. Journaled on the exterior side of the actuating member 59 is a contact or cam roller 60, located preferably a semi-diameter apart from the shaft 56. Means or devices are provided which, as the cylinder 1 begins to rotate, engage with cam roller 60 to impart rotative movement to cam 55, and thereby cause block 45 to move up to clamp the stereotype plate, and which, when the rotation of cylinder 1 is completed, engage cam roller 60 to cause block 45 to move down to release or unclamp the plate and permit it to drop or move downwardly until its straight edges rest on the guideways ready to be slide from the machine.

When the plate clamping device is in clamping position, that is, the position of Fig. 10, it automatically locks itself in that position, due to the fact that the reactive force of the clamping on cam 55 is directly in line with the shaft 56; the device will therefore of itself remain in that position until positively moved to the unclamping position, by means that will be described below.

As embodied, the actuating means for the plate clamping device comprises a cam 61 fixed on the machine frame, and so located and shaped, that as cylinder 1 begins to rotate it will engage with the surface 62 of the cam and will ride therealong, thereby being given a partial rotation in a clockwise direction from the position of Fig. 1 to that of Fig. 10. Fig. 9 shows an intermediate position of the mechanism between those of Figs. 1 and 10, as the cam roller is part way down cam surface 62 and consequently part way through its rotary movement. In Fig. 10 the parts are shown in the plate locking or clamping position.

The positions of the cam 55 corresponding to the two positions of the cam roller 60 in Figs. 1 and 10, are shown in Figs. 4 and 8, respectively, and the lifting action on block 45 will also be noted by comparing these two figures.

In the embodied form of means for unclamping the plate such means operate automatically upon the completion of the trimming operation. Devices are provided upon

the gear ring 25, or fixed thereto or moving or cooperating therewith, for engaging the cam roller 60 and reversing the movement effected through the cam arm 61 as already described, and thereby unclamping or releasing the plate preparatory to the discharge thereof.

The embodied form of such mechanism is substantially the same or similar to that shown in the Evensen Patent No. 1,126,741 already referred to. As stated, gear ring 26 and its hub 25 are mounted upon and rotate loosely around cylinder 1. Cylinder 1 is normally held in plate-receiving position by a detent roller 65 (Fig. 2), carried on a bent lever 69, which lever is pivoted at 66 on the machine frame and pressed by a spring 67. Roller 65 cooperates with a detent 68 formed on cylinder 1. The cylinder is thus positioned as shown in Fig. 2, with the guides 6 and 7 horizontal or level with respect to each other. Gear ring 26 thus rotates idly upon the cylinder 1 as a support, the cylinder being at rest.

Pivoted at 71 on the hub 25 of gear ring 26 (Figs. 1, 2 and 11) is a detent 70, which is pressed inwardly by a spring 72, which spring is mounted on hub 25. In the cylinder 1 (Fig. 11) is provided a recess 73, and lug 70 is pressed by spring 72 toward the left in Fig. 11 to engage recess 73 when passing by.

If detent 70 did so engage with recess 73 it would lock cylinder 1 to gear ring 26 and cause them to rotate together. This is not desired, however, except when a plate is to be trimmed.

Means are therefore provided for automatically swinging detent 70 backwardly, to the ring in Fig. 11, so that it will miss recess 73 and cylinder 1 will be left stationary. Therewith are provided means whereby the operator can cause the detent 70 to lock in recess 73 and thereby effect a single revolution of cylinder 1 with gear ring 26.

As embodied, the hook 75 is pivoted at 76 on the machine frame. Hook 75 is pressed inwardly into the path of detent 70 by a spring 77, which spring is mounted on the machine frame at 78 and has its free end pressing against the hook 75. The end 80 of hook 75 thus engages with and swings detent 70 to the right against spring 72, causes it to escape recess 73, and cylinder 1 is left stationary as gear ring 26 rotates.

The cylinder is started rotating by manipulation of a handle; mechanism is provided for automatically stopping the rotation after one revolution has been completed.

As embodied, a cam 81 is fixed on starting rod 64 and the movement of rod 64 by the operator to the right against springs 83 causes cam 81 to engage the top end 82 of lever 75, and to thereby swing lever 75 to the position shown in Fig. 11.

In this position of lever 75 it does not catch detent 70 and the detent, impelled by spring 72, engages recess 73, and cylinder 1 starts into rotation with gear ring 26, carrying the plate *x* past the trimming and shaving knives as already described. When cylinder 1 starts, the operator releases rod 64, which is then restored to the left by spring 83. On the next revolution, hook 75 catches detent 70, cylinder 1 and gear ring 26 are disconnected, and cylinder 1 is stopped and positioned by detent roll 65.

As soon as the cylinder 1 starts to rotate, the plate clamping mechanism is actuated to move the plate to the clamped position of Fig. 3, by the cam 61 engaging the cam roll 60 and moving it to the position of Fig. 10 corresponding to the clamped position of the plate shown in Fig. 3.

The automatic means for unclamping plate *x* comprises a cam 85 fixed on hub 25 of the gear ring. This cam 85 engages cam roll 60, rotates it in the counter-clockwise direction, and moves the plate clamping mechanism from the position of Figs. 2, 3, 5, and 10, to the unclamped position of Figs. 4, and 9, which movements of the clamping mechanism have already been described.

Means are provided, if desired, for locking the lever 64 after it is moved into the "start" position, and for releasing it after the machine is started. As embodied (Figs. 1 and 2), the longitudinally slidable rod 64 is provided with a notch 90 formed at the rear end and upon the top side thereof. Pivoted at 91 upon the machine frame 3 is a lever 92, the end of which is adapted to drop into notch 90. Lever 92 has a bent tail 93 lying in the path of a cam lug 94 fixed on the cylinder 1 at the rear end thereof just outside the annular frame member 3. When the rod 64 is pushed to the right in Fig. 1, lever 92 drops into notch 90 and the rod 64 is thereby held in that position against its spring 83. After the cylinder 1 starts rotating, cam 94 trips the tail 93 of lever 92 and spring 83 restores rod 64 to the position of Fig. 1.

The invention in its broader aspects is not limited to the details of construction shown and described, but departures may be made therefrom within the scope of the accompanying claims without departing from the principles of the invention and without sacrificing its chief advantages.

What I claim is:—

1. A stereotype plate finishing machine including in combination a rotating plate carrier, means for holding the plate loosely therein, means movable to clamp the plate within the carrier and self locking so as to remain in clamping position, and a device for moving said plate clamping means to clamping position.

2. A stereotype plate finishing machine

including in combination a rotating plate carrier, means for holding the plate loosely therein, means movable to clamp the plate within the carrier and self locking so as to remain in clamping position, and a device operating automatically by the plate carrier beginning to rotate for moving said plate clamping means to clamping position.

3. A stereotype plate finishing machine including in combination a rotating plate carrier, means for holding the plate loosely therein, means movable to clamp the plate within the carrier and self locking so as to remain in clamping position, and a device for moving said plate clamping means to clamping position, and means for unclamping said plate clamping means.

4. A stereotype plate finishing machine including in combination a rotating plate carrier, means for holding the plate loosely therein, means movable to clamp the plate within the carrier and self locking so as to remain in clamping position, a device for moving said plate clamping means to clamping position, and means operating automatically after the plate carrier has completed a revolution for unclamping said plate clamping means.

5. A stereotype plate finishing machine including in combination a rotating plate carrier, means for holding the plate loosely therein, means movable to clamp the plate within the carrier and self locking so as to remain in clamping position, and a cam for moving said plate clamping means to clamping position.

6. A stereotype plate finishing machine including in combination a rotating plate carrier, means for holding the plate loosely therein, means movable to clamp the plate within the carrier and self locking so as to remain in clamping position, and a cam operating automatically by the plate carrier beginning to rotate for moving said plate clamping means to clamping position.

7. A stereotype plate finishing machine including in combination a rotating plate carrier, means for holding the plate loosely therein, means movable to clamp the plate within the carrier and self locking so as to remain in clamping position, a device for moving said plate clamping means to clamping position, and a cam for unclamping said plate clamping means.

8. A stereotype plate finishing machine including in combination a rotating plate carrier, means for holding the plate loosely therein, means movable to clamp the plate within the carrier and self locking so as to remain in clamping position, a device for moving said plate clamping means to clamping position, and a rotating cam operative after the plate carrier has completed a revolution for unclamping said plate clamping means.

9. A stereotype plate finishing machine including in combination a rotating plate carrier, means for holding the plate loosely therein, means on the carrier movable to clamp the plate within the carrier and self locking so as to remain in clamping position, a fixed device engageable with the said plate clamping means on the carrier at the beginning of the rotation of the plate carrier for moving said plate clamping means to clamping position, and means for unclamping said plate clamping means.

10. A stereotype plate finishing machine including in combination a rotating plate carrier, means for holding the plate loosely therein, means movable to clamp the plate within the carrier and self locking so as to remain in clamping position, a device operating automatically by the plate carrier beginning to rotate for moving said plate clamping means to clamping position, and means operating automatically by the plate carrier coming to rest for unclamping said plate clamping means.

11. A stereotype plate finishing machine comprising a rotating plate carrier, means for holding the plate loosely therein, a device which is movable in one direction for clamping the plate within the carrier and movable in the opposite direction for releasing it, and means controlled by the movement of the plate carrier, for moving said device to clamping and releasing positions.

12. A stereotype plate finishing machine comprising a rotating plate carrier, means for holding the plate loosely therein, a device movable with the carrier for clamping the plate therein and a fixed cam engageable with said device as it passes by, for moving it to the clamping position.

13. A stereotype plate finishing machine comprising a rotating plate carrier, means for holding the plate loosely therein, a device movable with the carrier for clamping the plate therein and a rotatable cam engageable with said device after a revolution has been completed, for moving it to the unclamping position.

14. A stereotype plate finishing machine, comprising a rotating plate carrier, means for holding the plate loosely therein, a device movable with the carrier for clamping the plate therein, a fixed cam engageable with said device as it passes by for moving it to the clamping position, and a rotatable cam engageable with said device after a revolution has been completed, for moving it to the unclamping position.

15. A stereotype plate finishing machine, comprising a rotating plate carrier, means for holding the plate loosely therein, a device movable with the carrier which is rotatable in one direction for clamping the plate within the carrier and rotatable in the opposite direction for unclamping it, and a

fixed cam engageable with said device as it passes by for moving said device to the clamping position.

16. A stereotype plate finishing machine, comprising a rotating plate carrier, means for holding the plate loosely therein, a device movable with the carrier which is rotatable in one direction for clamping the plate within the carrier and rotatable in the opposite direction for unclamping it, and a rotatable cam engageable with said device after a revolution has been completed, for moving it to the unclamping position.

17. A stereotype plate finishing machine, comprising a rotating plate carrier, means

for holding the plate loosely therein, a device movable with the carrier which is rotatable in one direction for clamping the plate within the carrier and rotatable in the opposite direction for unclamping it, a fixed cam engageable with said device as it passes by for moving said device to the clamping position, and a rotatable cam engageable with said device after a revolution has been completed, for moving it to the unclamping position.

In testimony whereof, I have signed my name to this specification.

ALBERT A. HENZI.