

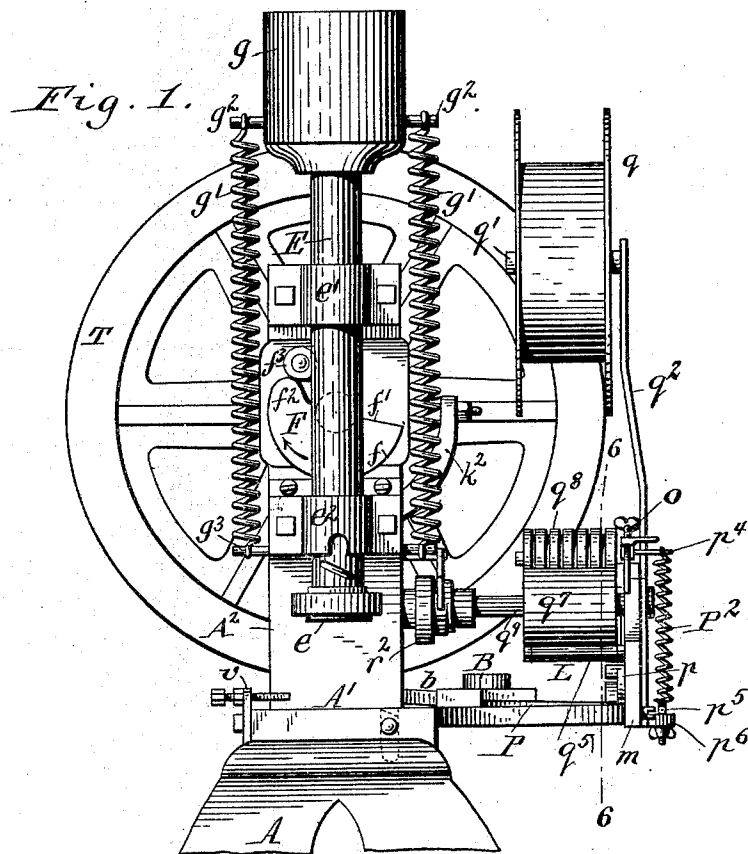
(No Model.)

5 Sheets—Sheet 1.

R. S. ANDERSON.
EMBOSSING MACHINE.

No. 502,342.

Patented Aug. 1, 1893.



Witnesses:
F. Gustav Wilhelm.
Chas. F. Burkhardt.

Robt. S. Anderson Inventor.
By Wilhelm Pomeroy
Attorneys.

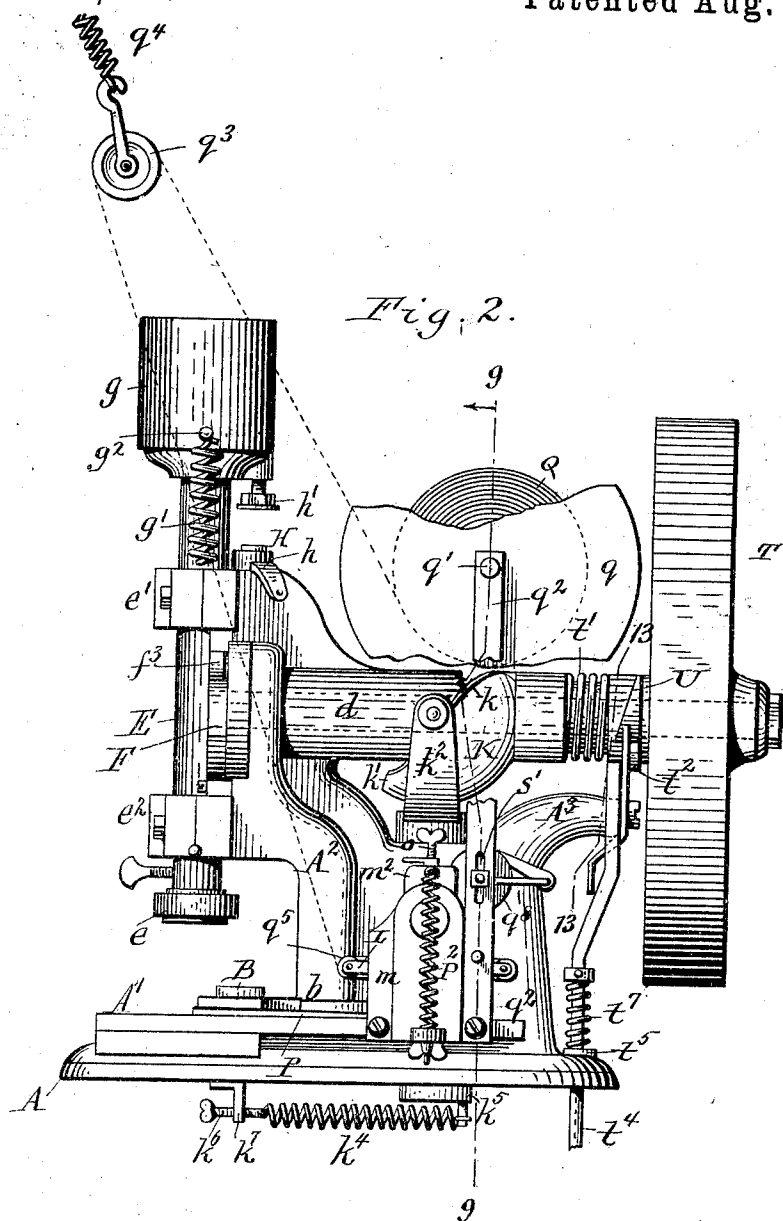
(No Model.)

R. S. ANDERSON.
EMBOSSING MACHINE.

5 Sheets—Sheet 2.

No. 502,342.

Patented Aug. 1, 1893.



Witnesses:

F. J. Gutzwiller,
Chas. F. Buehler.

Robt. S. Anderson—Inventor.

By Wilhelm Bonner.

Attorneys.

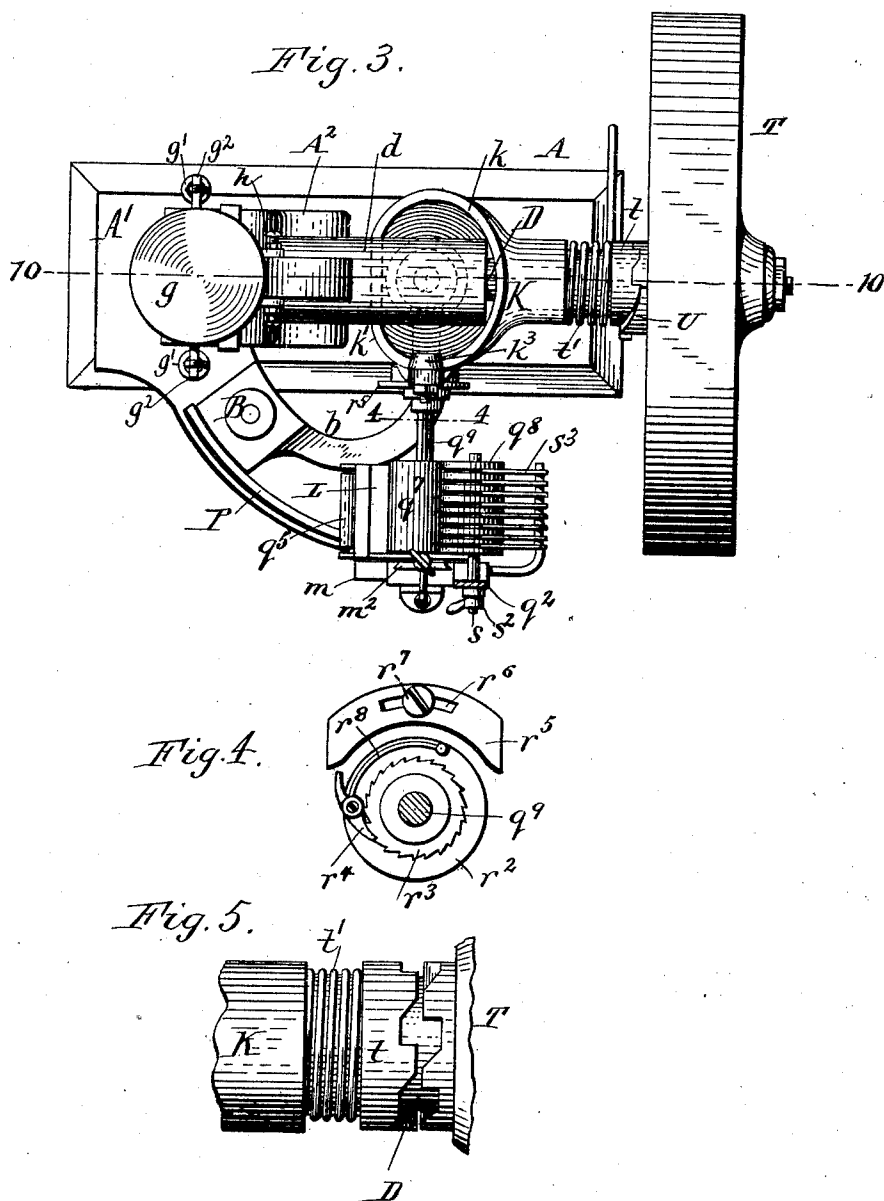
(No Model.)

R. S. ANDERSON.
EMBOSSING MACHINE.

5 Sheets—Sheet 3.

No. 502,342.

Patented Aug. 1, 1893.



Witnesses:

F. Gustav Wilhelm.

Chas. F. Burkhardt.

Robt. S. Anderson Inventor.

By Wilhelm Rönner.

Attorneys.

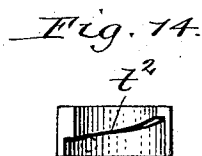
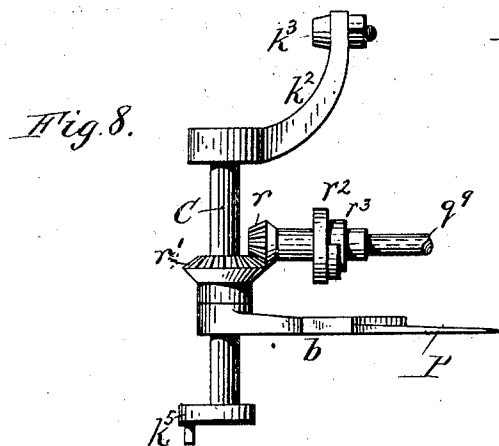
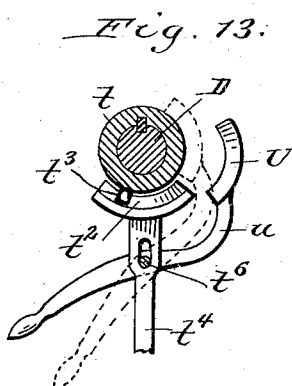
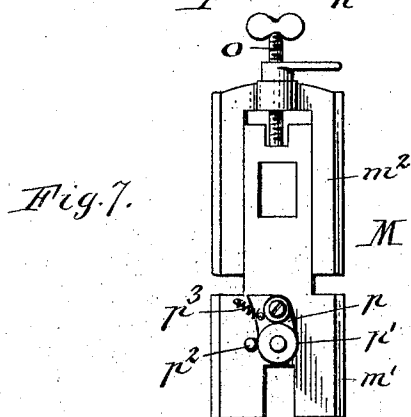
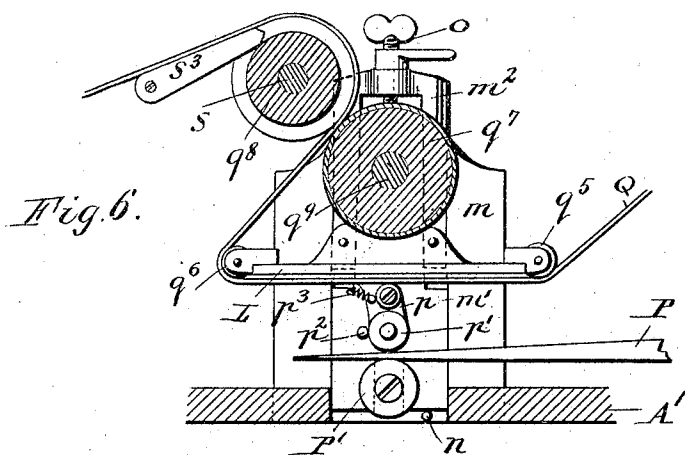
(No Model.)

5 Sheets—Sheet 4.

R. S. ANDERSON.
EMBOSSING MACHINE.

No. 502,342.

Patented Aug. 1, 1893.



Witnesses:

F. Spitzer, Wilhelm.

Chas. F. Burkhardt.

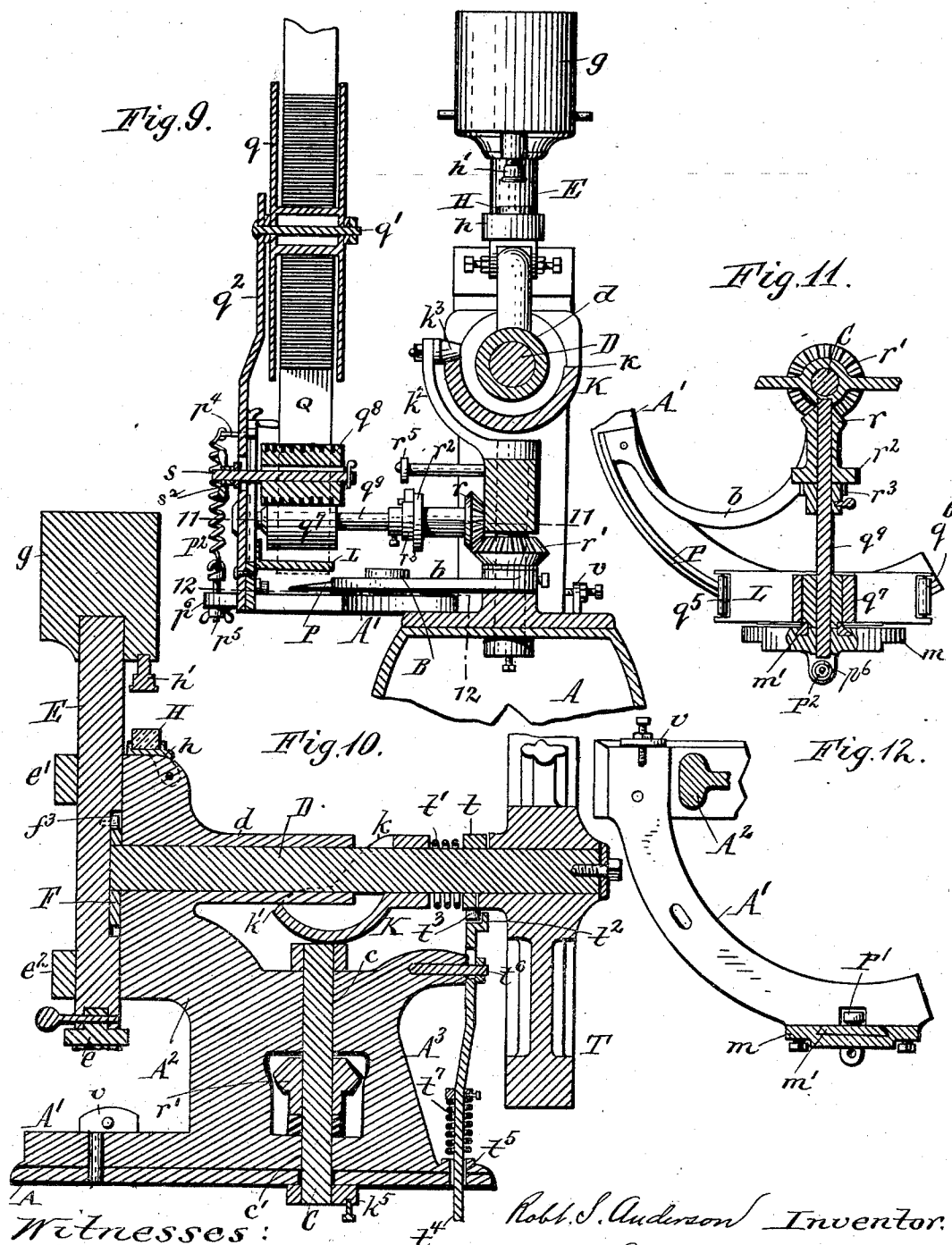
Robt. S. Anderson Inventor.

By Wilhelm Donner
Attorneys.

R. S. ANDERSON.
EMBOSSING MACHINE.

No. 50^o2,342.

Patented Aug. 1, 1893.



Witnesses: C C
Chas. F. Burkhardt
F. Gustav Wilhelm.

Robt. S. Anderson Inventor.
By Wilhelm Ponnus
Attorneys.

UNITED STATES PATENT OFFICE.

ROBERT S. ANDERSON, OF TORONTO, CANADA.

EMBOSSING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 502,342, dated August 1, 1893.

Application filed October 16, 1891. Serial No. 408,880. (No model.)

To all whom it may concern:

Be it known that I, ROBERT S. ANDERSON, machinist, a subject of the Queen of Great Britain, and a resident of the city of Toronto, in the county of York, in the Province of Ontario, Canada, have invented certain new and useful Improvements in Embossing-Machines; and I hereby declare that the following is a full, clear, and exact description of the same.

This invention relates to machines for embossing or stamping paper, particularly envelopes and other stationery.

The object of this invention is to produce a machine of this character which is simple in construction, accurate in operation, easy of manipulation and which will permit the embossing of paper more expeditiously than has been possible heretofore.

In the accompanying drawings consisting of five sheets: Figure 1 is a front elevation of my improved embossing machine with the base partly broken off. Fig. 2 is a side elevation of the same. Fig. 3 is a top plan view of the same. Fig. 4 is a section, on an enlarged scale, in line 4—4, Fig. 3. Fig. 5 is a fragmentary side view of the clutch. Fig. 6 is a longitudinal section of the wiper mechanism, on an enlarged scale the section being taken in line 6—6, Fig. 1. Fig. 7 is an inside elevation of the slide supporting the wiper. Fig. 8 is an elevation showing the rock shaft for oscillating the die and connecting parts. Fig. 9 is a vertical transverse section in line 9—9, Fig. 2, looking forward. Fig. 10 is a vertical longitudinal section in line 10—10, Fig. 3. Figs. 11 and 12 are fragmentary horizontal sections in lines 11—11 and 12—12, Fig. 9 respectively. Fig. 13 is a vertical transverse section in line 13—13 Fig. 2. Fig. 14 is a top plan view of the main cam for uncoupling the clutch.

Like letters of reference refer to like parts in the several figures.

The main frame of the machine consists essentially of an upright base A, a horizontal table A' arranged upon the base and projecting toward one side thereof and front and rear standards A² A³ projecting upwardly from the table. The table forms an anvil which sustains the embossing die B, and re-

ceives the impact during the operation of embossing. The die is provided on its upper surface with the design which it is desired to emboss on the paper, and is secured to the outer free end of a horizontal carrying arm b. The latter is arranged above the table and is secured with its inner end to a vertical rock shaft C, journaled with its upper portion in a bearing c formed between the standards A² A³ and with its lower portion in a bearing c', formed in the table, as shown in Fig. 10.

D represents a longitudinal driving shaft arranged horizontally above the upper end of the vertical rock shaft and journaled in an elongated bearing d formed on the upper portion of the front standard.

E represents a vertically movable plunger whereby a blow is delivered upon the die and the design of the die is stamped upon the paper placed upon the die. The lower end of this plunger is provided with a counter e, which conforms to the design upon the die. The plunger is secured to the overhanging portion of the front standard by upper and lower guides e' e².

F represents a lifting cam whereby the plunger is raised after each embossing operation. This cam is arranged in rear of the plunger and is secured to the front end of the driving shaft. The lifting cam is provided with a concentric face f, an abrupt face f' following the concentric face and a lifting nose f² arranged between the rear end of the abrupt face and the beginning of the concentric face. A portion of the rear side of the plunger is preferably flattened and provided with a roller f³ which rests upon the lifting cam. As the driving shaft revolves, the nose of the cam engages under the roller and raises the plunger. The plunger remains elevated while the roller rests upon the concentric face of the cam and until the rear end of the concentric face clears the roller when the plunger drops and delivers a blow upon the die. After the plunger strikes the die, the nose of the lifting cam engages again with the roller of the plunger and raises the same upon the concentric face of the cam. The downward movement of the plunger may be effected solely by gravity and its weight may be increased

by a head *g* secured to its upper end. The weight of this head is determined by the amount of force necessary to properly emboss the paper upon the die. In order to increase the effectiveness of the blow of the plunger without materially adding to the weight of the machine a set of springs *g'* are arranged on opposite sides of the plunger and secured with their upper ends to laterally projecting arms *g²* secured to the head *g* and with their lower ends to laterally projecting pins *g³* secured to opposite sides of the front standard. Upon raising the plunger these springs are strained and when the plunger is released from the lifting cam their resilience increases the force of the blow of the plunger. Upon striking the die the plunger rebounds and tends to descend again, but it is prevented from striking the die a second time, by a buffer mechanism which is constructed as follows:—H represents a buffer block of rubber or similar flexible material which is arranged in a movable socket plate *h* resting upon the front standard in rear of the plunger and pivoted thereto so as to swing rearwardly. The rear portion of the weight head overhangs this buffer block and is provided with a depending buffer head *h'* which is adapted to strike the buffer block during the last portion of the downward movement of the plunger. The buffer head is provided with an upwardly extending screw stem which engages with a screw threaded opening in the weight head. When the plunger descends its momentum is sufficient to cause its buffer head to overcome the tension of the elastic buffer block and compress the same thereby effecting a full blow upon the die. After the blow has been delivered upon the die, the plunger rebounds a short distance, and the tendency of the plunger to descend a second time is resisted by the buffer block, the latter being sufficiently rigid to overcome the downward movement of the plunger after its rebound. In fitting the counter of the plunger to the die, the plunger must rest upon the die until the counter is set. In order to permit the plunger to remain in its lowest position and rest upon the die the socket plate supporting the buffer block is swung rearwardly from underneath the buffer head so that no resistance is offered to the descent of the plunger.

When it is desired to emboss a design upon the paper in colors a quantity of ink of any desired color is placed upon the face of the die by the operator, and the die is carried rearwardly beneath a wiper for removing the surplus ink from the die, and then forwardly to a position below the plunger by mechanism which is constructed and operated as follows:—K represents a spherical shaped head secured to the driving shaft in rear of the bearing *d*, and provided around its periphery with an inclined cam face *k*, and at its front end with a concentric face *k'*. *k²* represents

a curved actuating arm secured with its lower end to the upper end of the rock shaft C, and provided at its upper end with a roller *k³*, which engages with the cam face *k*, and concentric face *k'*, of the spherical head. The roller *k³* is held against the concentric face *k'*, and the cam face *k* by a spiral spring *k⁴*, which is attached with one end to an arm *k⁵*, secured to the lower end of the rock shaft C and with its opposite end to an adjusting screw *k⁶*, secured in a hanger *k⁷* on the main frame. Upon rotating the driving shaft the cam face *k*, engaging with the roller *k³* of the curved arm of the rock shaft C, actuates the latter, and imparts a backward and forward movement to the die, and during this movement the inking and wiping of the die are effected. At the end of the forward movement of the die the roller *k³*, has arrived at one end of the cam *k*, and engages with the concentric face *k'*. While the roller is engaged with the concentric face *k'*, the die remains stationary in its forward position below the plunger and while in this position the plunger is released from the cam F and strikes the die.

L represents a vertically movable wiper bracket arranged over the path of the die and which is provided on its under side with a pad of rubber or similar flexible material, whereby the face of the die is wiped. This pad is held in a raised position during the backward movement of the die and pressed down upon the die during the forward movement of the same.

M represents a vertically movable slide which supports the wiper bracket and which is guided in a standard *m* secured to the side of the table. This slide consists of a lower section *m'* and an upper section *m²*. The upper portion of the lower slide section is contracted and is guided in the bifurcated lower portion of the upper slide section. The two sections of the slide are adjustably connected with each other by a vertical screw *o* and a jam nut holding the screw in its adjusted position. The wiper bracket is secured to the upper section of the slide, and the downward movement of the same is limited by a pin *n* secured to the side standard and engaging with the lower end of the lower slide section.

P represents an oscillating lifting wedge which is secured to the die carrying arm and whereby the slide and wiper are raised. This wedge is curved concentric with the rock shaft C and its face inclines from its front end downward to its rear end.

p represents a hanger pivoted at its upper end to the inner side of the lower slide section and provided at its lower end with a roller *p'*. The hanger is free to swing forwardly but its backward movement is limited by a pin *p²* secured to the inner side of the lower slide section and the hanger is yieldingly held against said pin by a spring *p³* attached with its ends to the hanger and the lower slide section. During the backward

movement of the lifting wedge its inclined face engages against the under side of the hanger roller, while the latter is held against backward movement, thereby raising the slide and wiper pad attached thereto. At the end of the backward stroke of the die and the lifting wedge the front end of the latter has passed in rear of the hanger roller which permits the wiper pad to drop upon the die. During the subsequent forward movement the lifting wedge strikes the hanger roller and swings it forwardly and upwardly so that the wiper is not raised but remains resting upon the die. Upon turning the adjusting screw of the wiper pad can be raised or lowered according to the height of the die.

P^1 represents a roller pivoted in the side standard below the hanger roller. This roller supports the lifting wedge during its oscillating movement under the wiper and reduces the friction.

P^2 , Figs. 1, 2 and 9, represents a spring whereby the wiper is caused to drop instantly upon the die when the front end of the lifting wedge clears the roller hanger of the slide. This spring is arranged outside of the side standard and connects with its upper end to a pin p^4 on the upper slide section and with its lower end to an adjusting screw p^5 arranged in a perforated lug p^6 on the lower portion of the side standard. By means of the screw p^5 the tension on the spring P^2 can be adjusted to regulate the pressure of the wiper pad upon the die.

Q represents a wiping tape or band of paper or similar material which is fed across the under side of the wiper pad and removes the surplus ink from the die as the latter passes forwardly underneath the depressed wiping pad. This tape is rolled upon a spool q , arranged above the wiper mechanism and journaled on an arbor q^1 , which latter is supported by an upright bar q^2 attached to the side standard. From the spool q , the tape passes over a tension roller q^3 , which is suspended by a spring q^4 attached to a support arranged above the machine. From the tension roller q^3 the tape passes downwardly around a roller q^5 , at the front end of the pad carrying bracket, thence underneath the pad and upwardly around a roller q^6 at the rear end of said bracket, and between a feed roller q^7 , and a pressure roller q^8 arranged transversely over the bracket, thence upwardly and rearwardly around the pressure roller. The downward movement of the wiping pad is so regulated that it moves but slightly downward after the die moves from underneath the same and the rollers upon the ends of the pad carrying bracket are arranged a short distance above the face of the pad so that the die will not come in contact with the same. The feed roller is mounted on a transverse shaft q^9 which passes through a slot in the slide and is journaled with its ends in bearings formed respectively on the main frame and in the side standard.

The wiping tape is fed intermittently across the face of the pad so as to present a new portion to the die during each forward stroke of the latter, by means of a ratchet mechanism which is constructed and operated as follows:— r represents a bevel gear wheel mounted loosely on the inner end of the shaft of the feed roller, and meshing with a bevel gear wheel r' , secured to the vertical rock shaft C , between its bearings c c' . r^2 is a disk arranged on the bevel gear wheel r' . r^3 is a ratchet wheel secured on the transverse feed shaft. r^4 is a pawl which is pivoted to the outer side of the carrying disk and which has its front end engaging with the teeth of the ratchet wheel. During each backward movement of the die and its actuating shaft C , the pawl is moved forwardly thereby turning the ratchet wheel and feed roller and shifting the tape on the under side of the wiping pad.

In order to enable the feed of the tape to be regulated according to the amount of ink which must be wiped from the die, the effective forward movement of the pawl is varied, by a trip cam r^5 arranged above the ratchet wheel. This cam is provided with a slot r^6 curved concentric with the feed shaft and is secured to a stud on the main frame by a screw r^7 passing through said slot. This cam bears against the tail of the pawl r^4 during the last portion of its backward movement, and thereby disengages the pawl from the ratchet wheel. This causes the pawl, during the first portion of the forward movement, to be held out of engagement with the ratchet wheel by the trip cam r^5 . The instant the tail of the pawl has passed said trip cam the pawl is moved into engagement with the ratchet wheel by a spring r^8 , secured to the carrying disk and bearing against the under side of the pawl, thereby causing the ratchet wheel to be turned during the last portion of the forward movement of the pawl. Upon shifting the trip cam circumferentially with reference to the ratchet wheel, the pawl may be thrown out of engagement at any point during its backward movement, thereby regulating the feed of the tape. The pressure roller q^8 is journaled upon an arbor s which passes through a slot s' in the bar supporting the tape spool and is adjustably secured thereby to a clamping nut s^2 .

In order to prevent the tape, which passes with its freshly inked surface around the pressure roller, from clinging to the latter, a number of stripping fingers s^3 are provided, which strip the tape from the pressure roller. These fingers are arranged with their free ends in circular grooves formed in the pressure roller and secured with their rear ends to a rod which is hung upon the side standard.

T represents the driving wheel or pulley which is mounted loosely on the rear end of the driving shaft and which is coupled and uncoupled with the latter by a clutch mechanism which is constructed and operated as follows: t represents a clutch sleeve mounted

on the driving shaft, adjacent to the hub of the driving wheel and attached to the shaft by a suitable feather which permits the clutch to move lengthwise on the shaft but compels it to rotate therewith. The rear end of the clutch sleeve is provided with clutch teeth which are yieldingly held in engagement with similar clutch teeth formed on the front side of the hub of the driving wheel by a spring t' surrounding the driving shaft and bearing against the cam head K and the clutch sleeve. t^2 is the main uncoupling cam whereby the clutch is automatically uncoupled from the driving wheel at each revolution of the shaft. This cam is arranged underneath the clutch sleeve and when it is in its raised or normal position it extends across the path of a laterally projecting pin t^3 arranged on the clutch sleeve. When the plunger has been raised to its highest position by the lifting cam, the pin of the clutch sleeve engages against the main uncoupling cam and moves the clutch sleeve out of engagement with the driving wheel, thereby arresting the movement of the driving shaft. The parts of the machine are so timed that when the clutch is uncoupled by the main cam the die is arranged on one side of the plunger to permit the operator to apply ink thereto. The main uncoupling cam is secured to the upper end of a vertically movable guide rod t^4 which slides with its lower portion in a guide t^5 arranged on the rear side of the table and provided near its upper end with a slot which receives a pin t^6 on the rear standard. The main uncoupling cam is yieldingly held in its raised or normal position by a spring t^7 surrounding the guide rod t^4 and bearing with its ends against the table, and a collar secured to said rod below the pin t^6 . The lower end of the guide rod t^4 is connected with a treadle arranged on the lower part of the machine, which treadle is not shown in the drawings. Upon depressing the treadle the clutch sleeve is released from the uncoupling cam and moves into engagement with the continuously revolving driving wheel whereby the machine is set in motion.

U represents an auxiliary uncoupling cam whereby the machine is stopped when the plunger is in its lowest position for the purpose of renewing or setting the counter on the plunger. This cam is arranged in advance of the main uncoupling cam and is secured to the free end of a shifting lever u , which latter is pivoted on the pin t^6 of the rear standard. Upon moving the auxiliary cam into its operative position it stands in the path of the pin of the clutch sleeve, as represented in dotted lines, Fig. 13, and uncouples the latter during its rotation with the driving wheel. When the machine is in operation the auxiliary cam remains in its inoperative position as shown in full lines, Fig. 13. When the machine is at rest the plunger and wiping pad are raised and the die is arranged between the plunger and the wiping

mechanism as represented in Figs. 1, 2 and 3. After the die has been inked by hand, the clutch sleeve is released from the uncoupling cam by depressing the treadle connected with the uncoupling cam whereby the driving shaft is coupled with the driving wheel and the machine is set in motion. The cam face k on the spherical head engaging with the actuating arm of the rock shaft C, moves the die rearwardly underneath the wiper, and at the end of its rearward movement the wiper is pressed upon the die to remove the excess of ink from the die. During the subsequent forward or return movement of the die the tape wipes off the face of the die. When the die has reached the limit of its forward movement it is arranged immediately below the plunger in correct register with the plunger, and while the die is in this position it is momentarily held at rest when the plunger is released from the lifting cam and descends upon the die and embosses the paper previously placed over the die by the operator. After the plunger has dropped upon the die, the plunger and wiper are again raised and the die moves backwardly until it again occupies a position at one side of the plunger. Immediately after the machine is started the treadle is released and the uncoupling cam is returned to its raised position by the spring t^7 and when the driving shaft has about completed a single revolution the pin on the clutch sleeve again engages with the uncoupling cam and uncouples the shaft from the driving wheel and stops the machine.

The top of the anvil is preferably provided with a stop v against which the die carrying arm bears at the end of its forward movement.

I claim as my invention—

1. The combination with the die, the frame supporting the die and a vertically movable plunger guided in said frame, of a driving shaft, a lifting cam secured to said shaft and engaging with said plunger whereby the plunger is raised and permitted to drop when released by the cam, a yielding buffer block arranged on the frame and a buffer head attached to the plunger and adapted to engage with said buffer block upon the descent of the plunger, substantially as set forth.

2. The combination with the main frame, the die and the vertically movable plunger guided in said frame, of a lifting cam whereby the plunger is raised and permitted to drop on the die, and a buffer mechanism which resists the downward movement of the plunger and which can be shifted out of engagement with the plunger, substantially as set forth.

3. The combination with the main frame, the die and the vertically movable plunger guided in said frame, of a lifting cam whereby the plunger is raised and permitted to drop on the die, a buffer block arranged on the main frame, a buffer head arranged on the plunger over the buffer block and adapted

ed to strike the same and a carrying plate supporting the buffer block and pivoted to the main frame whereby the buffer block can be moved from underneath the buffer head, substantially as set forth.

4. The combination with the vertically movable plunger, the driving shaft and mechanism for actuating the plunger from the driving shaft, of a die, a rock shaft arranged below the driving shaft and provided with an oscillating arm carrying said die, a cam secured to the driving shaft, and an actuating arm secured to the rock shaft and engaging with said cam, substantially as set forth.

5. The combination with the vertically movable plunger, the driving shaft and mechanism for actuating the plunger from the driving shaft, of a die, a vertical rock shaft arranged below the driving shaft and provided with an oscillating arm carrying the die, a cam secured to the driving shaft and engaging with an actuating arm on the rock shaft, and a spring whereby the actuating arm of the rock shaft is held in engagement with said cam, substantially as set forth.

6. The combination with the vertically movable plunger, the driving shaft and mechanism whereby the plunger is actuated from the driving shaft, of a die, a wiper, a rock shaft arranged below the driving shaft and provided with an arm carrying the die, a cam secured to the driving shaft, and an actuating arm secured to the rock shaft and engaging with said cam, whereby the die is oscillated back and forth beneath the plunger and wiper, substantially as set forth.

7. The combination with the vertically movable plunger, and the driving shaft provided with a lifting cam whereby the plunger is actuated, of a movable die, a rock shaft provided with an arm carrying said die, an actuating arm secured to said rock shaft and a cam secured to the driving shaft and engaging with the actuating arm of the rock shaft, substantially as set forth.

8. The combination with the vertically movable plunger, the driving shaft and mechanism for actuating the plunger from the driving shaft, of a movable die, a rock shaft provided with an arm carrying said die, a head secured to the driving shaft and provided with a cam face and a concentric face, an actuating arm secured to the rock shaft and provided with a roller engaging with the cam face and concentric face of the head, substantially as set forth.

9. The combination with the vertically movable plunger, the driving shaft, and mechanism for actuating the plunger from the driving shaft, of a movable die, a rock shaft provided with an arm carrying said die, a head secured to the driving shaft and provided with a cam face and a concentric face, an actuating arm secured to the rock shaft and provided with a roller, and a spring whereby the roller is held against the cam and concentric faces of the head, substantially as set forth.

10. The combination with the vertically movable plunger, the driving shaft, and mechanism for actuating the plunger from the driving shaft, of a movable die, a wiper, a rock shaft provided with an arm carrying the die, an actuating arm secured to the rock shaft, a cam arranged on the driving shaft and engaging with said actuating arm whereby the die is oscillated below the wiper and the plunger, and mechanism for moving the wiper toward and from the die, substantially as set forth.

11. The combination with the plunger, the movable die and the wiping pad, of a wiping tape arranged on the pad, a feed roller whereby the tape is fed across the pad, a shaft supporting the feed roller and provided with a ratchet wheel, a disk mounted loosely on said shaft and provided with a pawl adapted to engage with the ratchet wheel, and an adjustable trip cam whereby the pawl is disengaged from the ratchet wheel, substantially as set forth.

12. The combination with the plunger, the movable die, and the wiping pad, of a wiping tape arranged on the pad, a feed roller whereby the tape is fed across the face of the pad, a shaft supporting the feed roller and provided with a ratchet wheel, a disk mounted loosely on said shaft and provided with a pawl adapted to engage with the ratchet wheel, a carrying arm adjustably mounted on the shaft, and a trip cam secured to the carrying arm and adapted to disengage the pawl from the ratchet wheel, substantially as set forth.

13. The combination with the main frame, the movable plunger, the movable die, and the wiping pad, of a wiping tape arranged on the under side of the pad, a feed roller whereby said tape is shifted, a shaft supporting the feed roller and provided with a ratchet wheel, an oscillating disk mounted loosely on the shaft and provided with a pawl engaging with said ratchet wheel, a carrying arm mounted loosely on said shaft and provided with a trip cam whereby the pawl is disengaged from the ratchet wheel, and a rod pivoted with one end to the carrying arm and adjustably connected with its opposite end to the main frame, substantially as set forth.

14. The combination with the plunger, the movable die, and the wiping pad, of a tape arranged on the under side of the pad, a feed roller whereby the tape is shifted on the pad, a pressure roller pressing against the feed roller and provided with grooves in its periphery, and stripping fingers, extending into said grooves, substantially as set forth.

15. The combination with the plunger, the movable die, and the wiping pad, of a wiping tape arranged on the under side of the pad, a spool carrying the supply of tape, a feed roller whereby the tape is shifted, a tension roller supporting the tape between the spool and the pad, and a spring yieldingly supporting the tension roller, substantially as set forth.

16. The combination with the driving shaft,

the driving wheel and the clutch adapted to couple the driving shaft and wheel, of a movable die, a plunger, a lifting cam which is secured to the driving shaft and which raises
5 the plunger and permits the same to drop on the die, a main cam whereby the clutch can be disengaged when the plunger is raised and an auxiliary cam whereby the clutch can be

disengaged when the plunger has dropped, substantially as set forth.

Toronto, August 21, 1891.

ROBERT S. ANDERSON.

In presence of—

CHARLES H. RICHES,
M. E. ANGELL.