

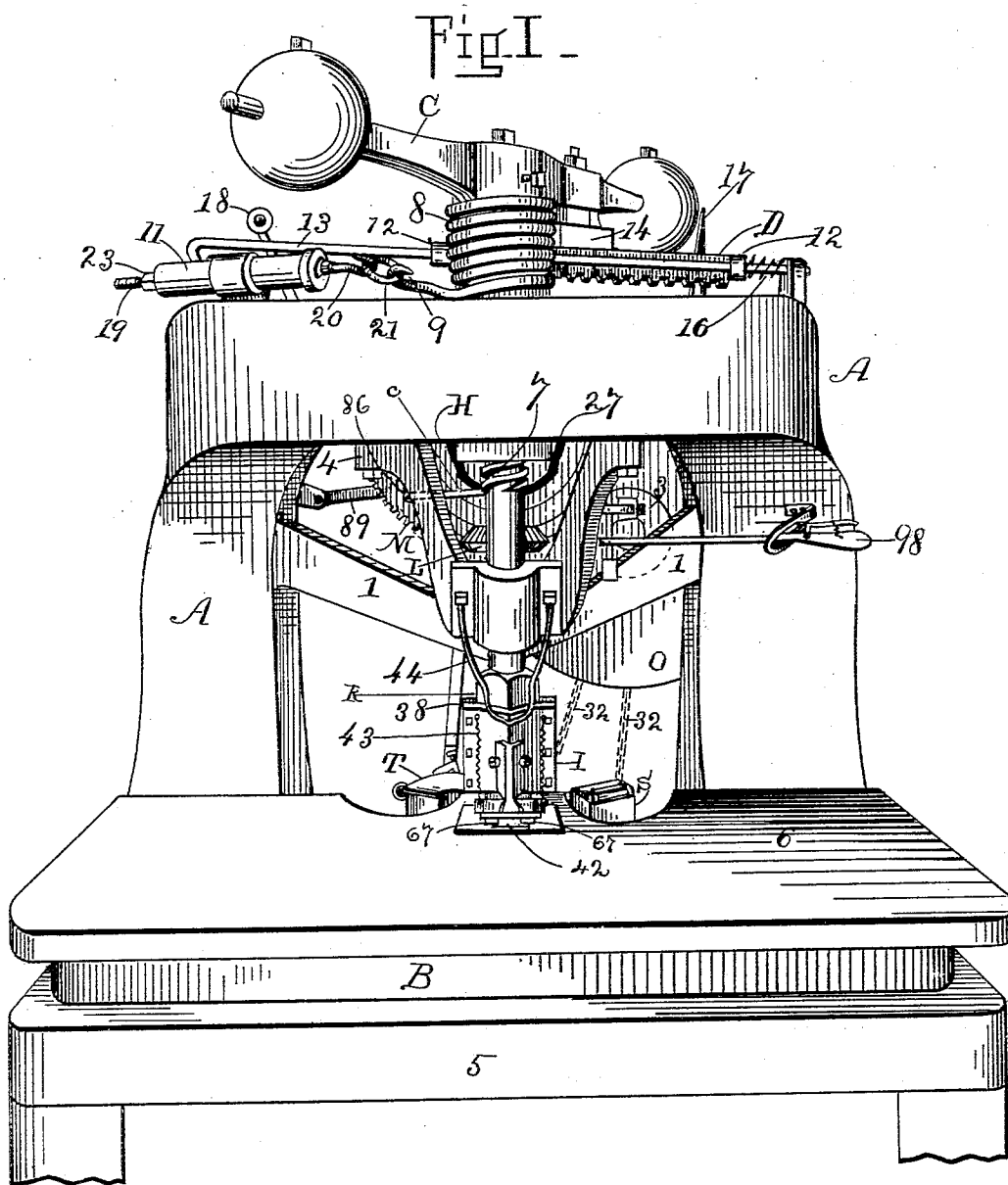
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8 Sheets—Sheet 1.

J. Y. JOHNSTON.
EMBOSSING AND PRINTING PRESS.

No. 504,680.

Patented Sept. 5, 1893.



Witnesses
Thos. Houghton.
Alphonse Lott

Inventor
J. Y. Johnston

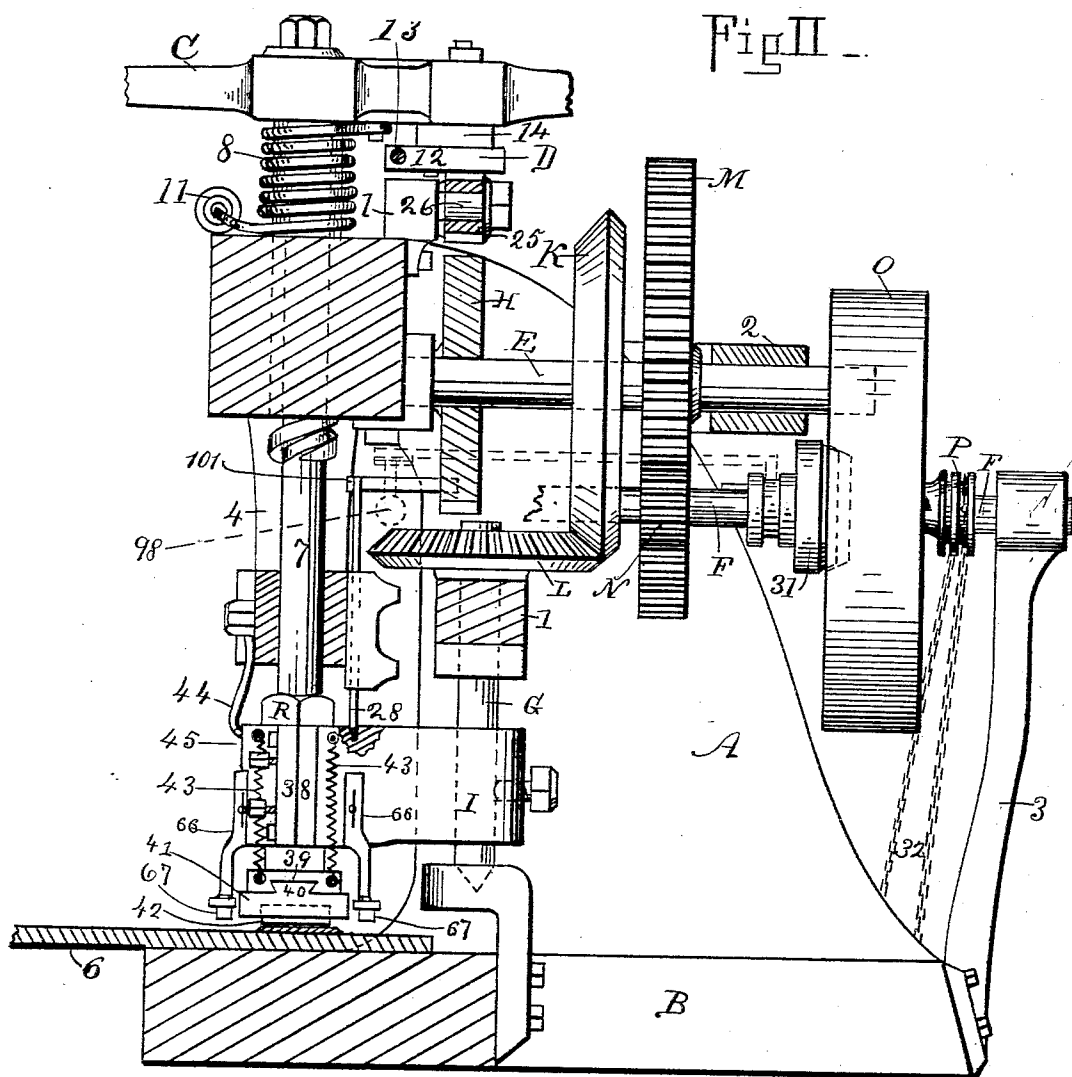
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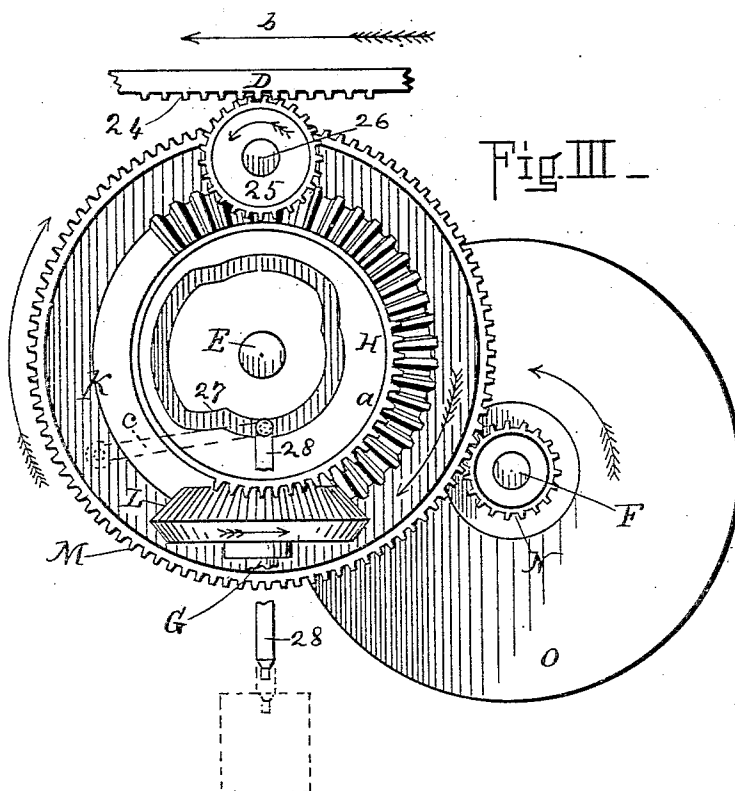
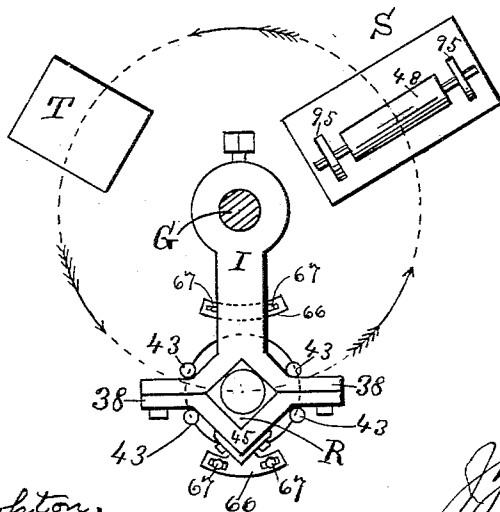


Fig. III -



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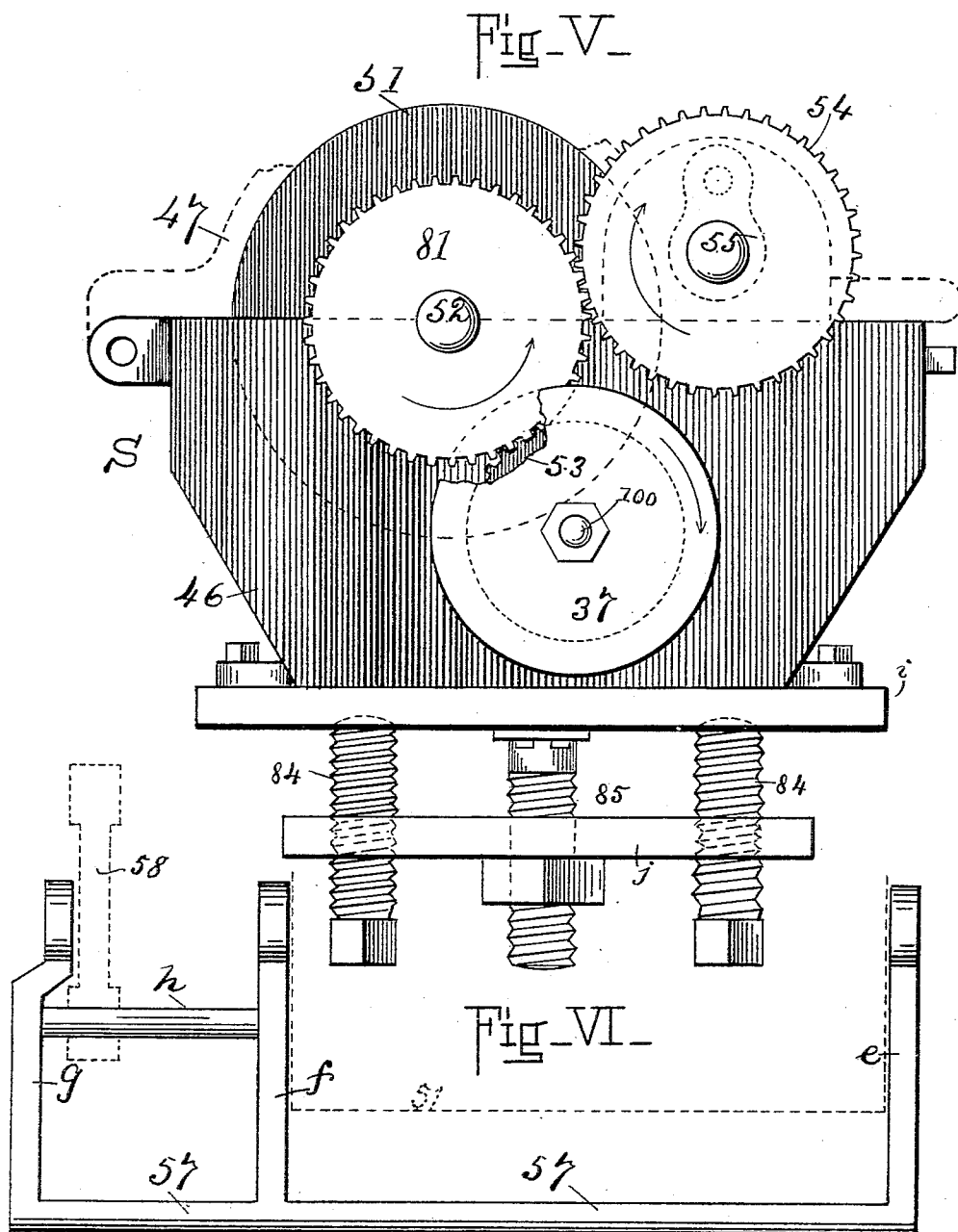
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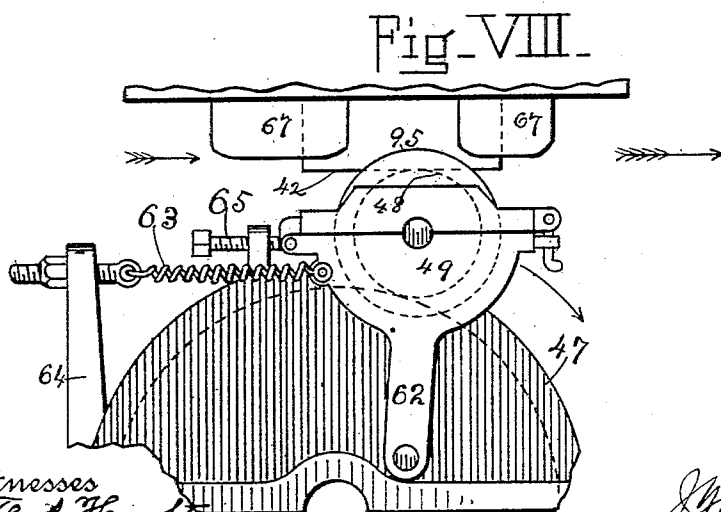
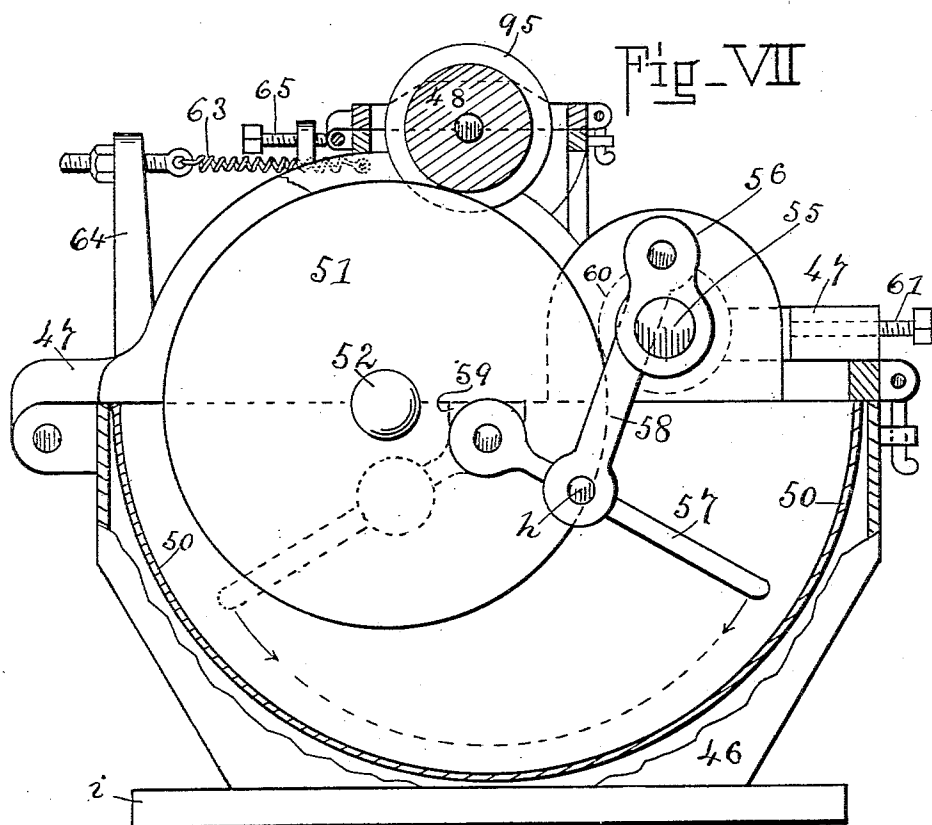
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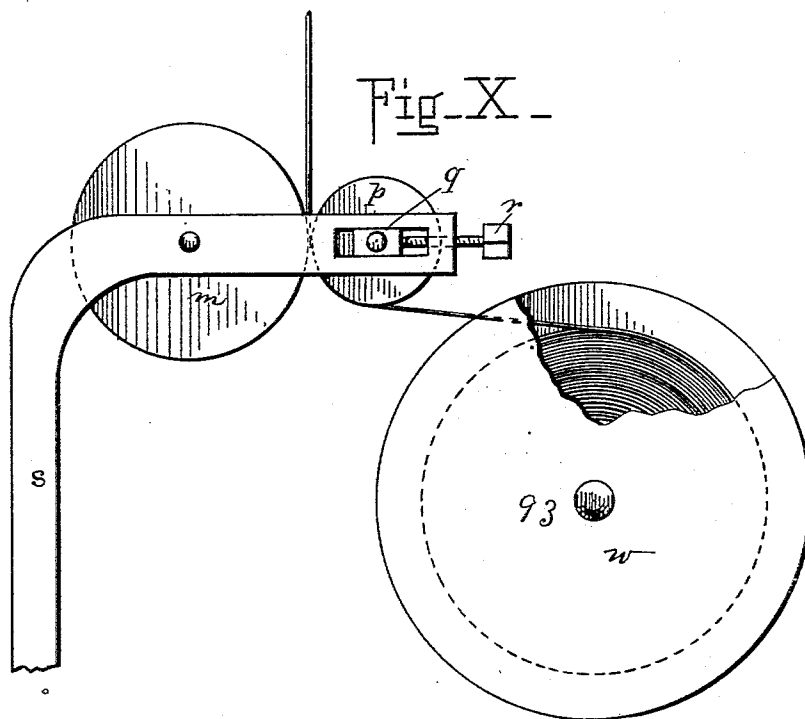
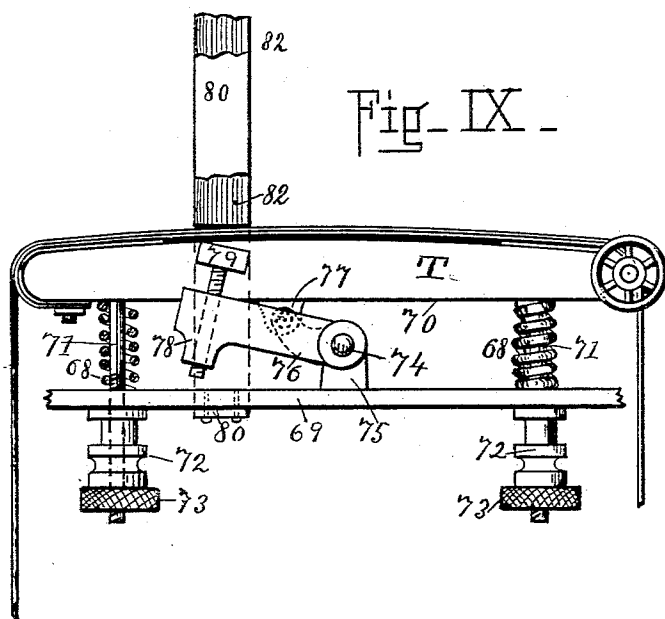
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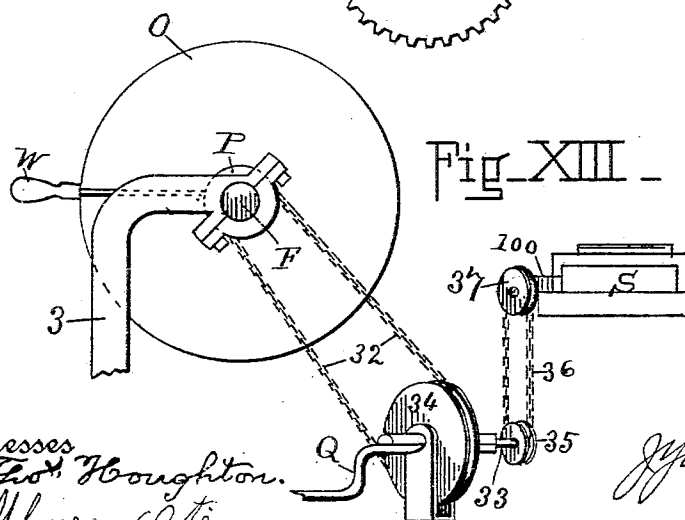
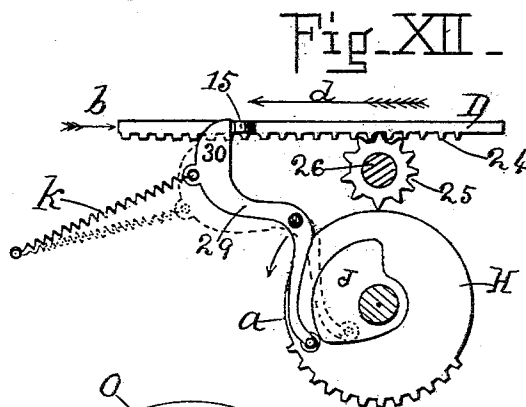
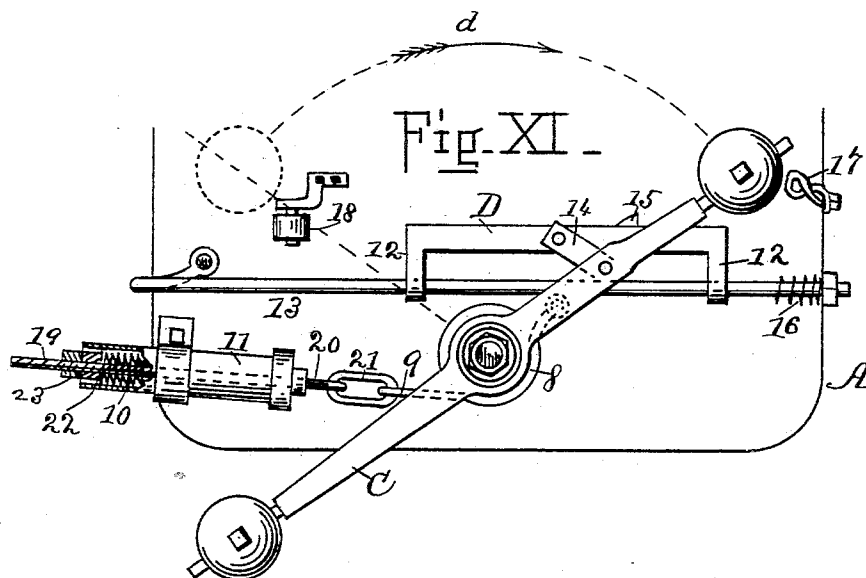
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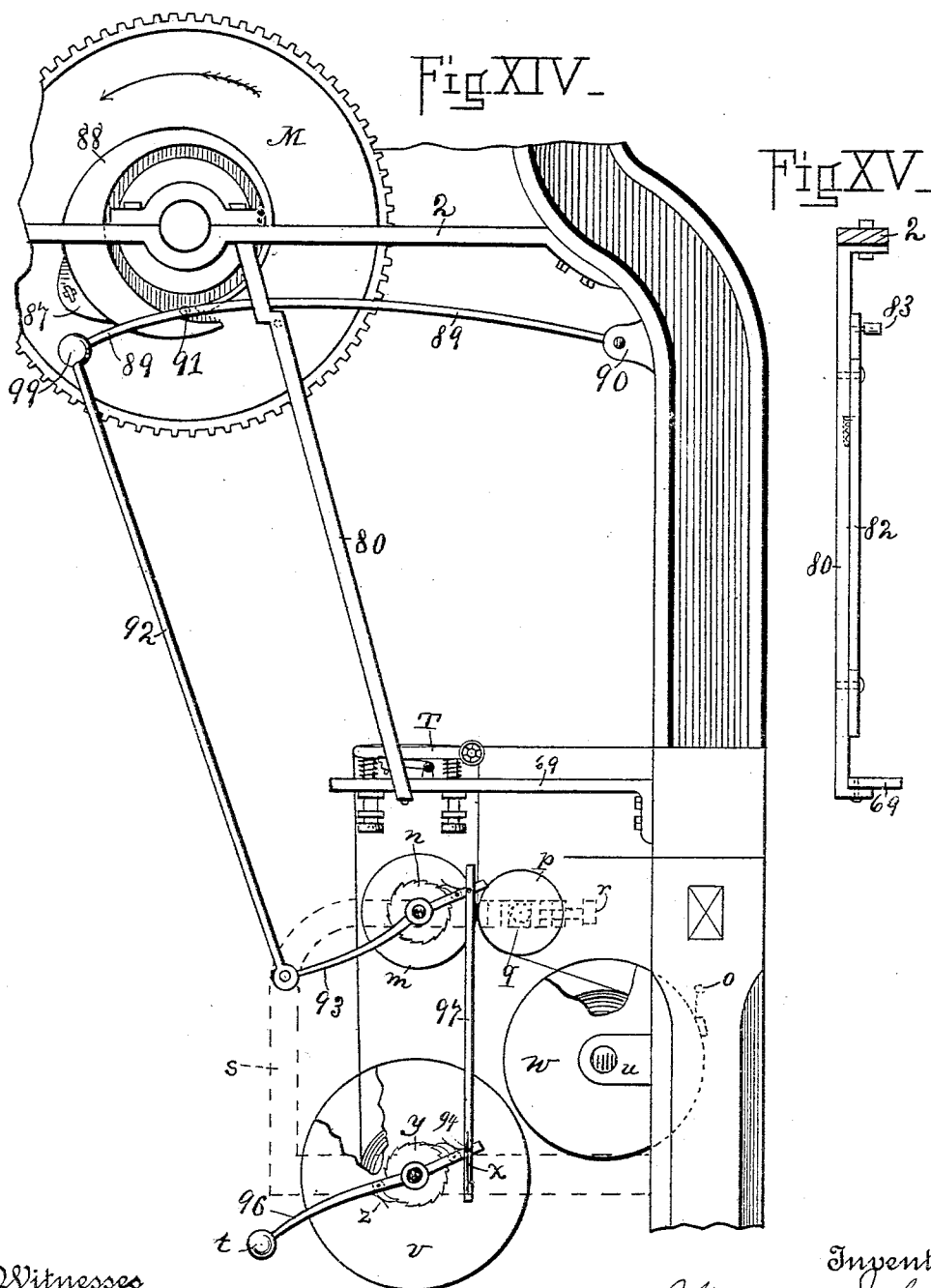
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No. 504,680.

Patented Sept. 5, 1893.



Witnesses

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Arthur S. K. K. K.

Inventor

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UNITED STATES PATENT OFFICE.

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BY MESNE ASSIGNMENTS, TO THE JOHNSTON EMBOSSING MACHINE
COMPANY.

EMBOSSING AND PRINTING PRESS.

SPECIFICATION forming part of Letters Patent No. 504,680, dated September 5, 1893.

Application filed September 10, 1892. Serial No. 445,534. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH YARDLEY JOHNSTON, a citizen of the United States, residing at Montclair, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Embossing and Printing Presses; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in presses for embossed printing, and it consists in the construction, combination, and arrangement of the several parts as hereinafter fully described and specifically pointed out in the claims.

In the drawings, Figure I is a front perspective view of an embossed printing press embodying my invention. Fig. II is a central vertical section from front to rear of the frame, showing the principal parts of the driving mechanism. Fig. III is a front elevation of the gearing for operating the various parts of the press. Fig. IV is a plan diagrammatic view of the revolving die-carrying arm, and the inking and wiping devices. Fig. V is an end elevation of the gearing and principal roller of the die inking device. Fig. VI is a front view of the ink agitator or stirrer. Fig. VII is a vertical cross section of the inker, showing an end elevation of the ink agitator. Fig. VIII is an end elevation of a portion of the cover of the inker, showing the die inking roller and its operating mechanism. Fig. IX is a side view of the die wiping device, partly broken away. Fig. X is an end elevation of the wiping-paper supply roll and adjoining tension and feed rolls. Fig. XI is a plan view of the ball lever, springs, and contiguous parts of the screw plunger mechanism. Fig. XII is a detail view of the stop mechanism of the ball lever. Fig. XIII is a detail view of the mechanism connecting the inker with the main shaft. Fig. XIV is a detail, in elevation, of the wiper, the paper rolls, and a portion of the large spur gear, with its two cams for operating the wiper and paper-feeding device. Fig. XV is a side elevation

of the supporting bar of the wiper, with its sliding bar.

A is the frame of the press, provided with arms 1 and 2, standard 3, and hanger 4, supporting the various shafts and driving mechanism, as shown in Figs. I, II and XIV.

B is the base of the press, which is mounted on a suitable bench, 5, and is provided with a table or platform, 6, upon which rests the counter, or counter die, whereon the paper to be embossed is laid.

E is the main shaft, and F the driving shaft. The main shaft is located centrally and near the top of the press, and the driving shaft lies in a parallel plane, but to one side of the press. On shaft E is the large spur wheel M, which is driven by pinion N on shaft F, (Figs. II and III).

O is the driving pulley, which is loosely mounted (but without lateral play) on shaft F, to which it communicates motion by means of friction-clutch 31, which is operated by lever 98 from the front of the press.

R is a square die plunger, supported in the outer end of the revolving die-carrying arm I, as shown in Figs. I, II and IV. Said plunger is adapted to move easily and steadily, up and down, within box 38 at the outer end of die carrier I.

42 is the die, which is secured to a die box, 41, on the top of which is a dove-tailed projection, 40, fitting into a similarly-shaped groove, 39, in the face of the die plunger. Four spiral springs, 43, connected as shown in Figs. I and II, serve to retract the die plunger with its die from the paper, or other material, as soon as the impression is made. A check spring, 44, is secured to the lower part of hanger 4, and thence depends, so as to engage with the outer corner, 45, of die plunger box 38. Die carrier I is secured to and revolved by shaft G, on the top of which is mounted pinion L, which engages with mutilated bevel gear wheel K, secured to main shaft E of the press. Gear wheel K is provided with teeth on two-thirds of its circumference only, (Fig. III,) which cause a complete revolution of pinion L and of die carrier I with each revolution of the main shaft,

and which are so disposed that the blank space, in connection with locking pin 28 and check spring 44, produces a cessation or pause in the revolution of the die carrier from the instant that the die comes over the counter until the impression blow has been struck.

28 is a locking pin, which is bent near its upper end and pivotally attached at 101 (Fig. II) to a steadying rod *c*, pivoted to hanger 4 at 86, (Fig. I,) and which is actuated by cam groove 27, on the front face of wheel H, (Fig. III,) in which the upper end of the pin moves, its lower end entering a hole in the top of die carrier I and locking it while the impression blow is being struck. The revolving die thus described is an important feature of the improved press, resulting in the simplicity of its construction, in the rapidity of its operation, and in the perfect inking and wiping of the die.

C is the ball or weighted lever, secured to the top of a screw plunger, 7, which, actuated by springs 8 and 10, strikes the impression blow, as shown in Figs. I, II and XI. Coil spring 8 surrounds the upper part of screw plunger 7, one end being rigidly attached to lever C, and the other end terminating in hook 9, which link 21 connects to hooked end 20 of piston rod 19, within cylinder 11, secured to the top of the press. An auxiliary spiral spring, 10, plays freely on piston rod 19 within the cylinder, and when coil spring 8 is wound up, its tension, which determines the force of the impression blow, is regulated by nuts 22 and 23, a tension and a jam nut. Lever C is moved into position to strike the impression blow (see dotted lines, Fig. XI) by rack bar D, to which it is pivotally connected by a short connecting block, 14. Rack bar D is provided with two projecting arms, 12, perforated near their ends so as to slide freely to and fro on guide rod 13, which is secured to the top of the press underneath lever C and parallel to the front of the press. Rack bar 45 D is also provided with teeth 24, which mesh with pinion 25, rotating loosely upon a stud or pin, 26, secured in standard I, as shown in Figs. II, III and XII. Main shaft E carries near its front end a mutilated spur wheel, H, 50 provided on one-third of its periphery with teeth *a*, which engage once during each revolution of the main shaft with pinion 25, and thereby move rack bar D and lever C in the direction indicated by arrow *b*, thus winding up coil spring 8.

18 is a small wheel or roller, suitably attached to the top of the press, under which rack bar D securely rides. The toothed portion of spur gear H is so disposed that lever C is brought into position to strike the impression blow at the instant that die carrier I has been locked, as hereinbefore described; the blank portion of gear H then releases pinion 25, springs 8 and 10 throw lever C and rack bar D in the direction indicated by arrow *d*, screw plunger 7 descends, automatically adapting itself to the varying thick-

nesses of counter, paper, and die, and the impression is made. Link 21 connecting springs 8 and 10 is of such length that there is no tension on these springs, at the instant of the impression blow, and there is therefore a rebound of screw plunger 7. When necessary, springs 16 and 17 (Figs. I and XI) are attached to the press so as to catch lever C and rack bar D at the instant that the impression blow is being struck, and their resiliency aids and increases the rebound of screw plunger 7; and the quick and complete removal of the die from the paper, so essential to the clearness and perfection of the impression, is thus insured. Spring 16 may be omitted if spring 17 is made proportionately stronger. When the counter is high and elastic, springs 16 and 17 are unnecessary.

To prevent the recoil of lever C, after its rebound, cam J, secured to the rear face of gear H, (Fig. XII,) engages with the lower end of dog 29, and throws its upper end, 30, across the path of stop 15, projecting from rack bar D, (Fig. XI.) By the further revolution of gear H and cam J, dog 29 pushes rack bar D a suitable distance in the direction indicated by arrow *b*, and there holds it until teeth *a* have again engaged with those of pinion 25, and have begun to wind up lever C for the next impression blow, as hereinbefore described, when it is released by cam J, and is retracted by spring *k*, suitably attached to the press, and the reverse movement of rack bar D, indicated by arrow *d*, is unobstructed.

S is the die inker, which is stationary, its location being shown in Figs. I and IV, and its construction in Figs. V, VI, VII and VIII. It consists of a rectangular box or casing, 46, provided with a hinged cover, 47, secured to plate *i*, which is adjustably supported by four screw bolts, 84 and 85, passing through a fixed base plate, *j*, which is suitably secured to bench 5.

50 is a semi-cylindrical ink reservoir within the casing.

51 is the collecting ink roller, mounted near one side of the reservoir.

60 is the evening roller, acting also as a scraper and regulating the supply of ink, which is adjustable by means of set screws 61 in the usual manner, and 48 is the die inking roller.

57 is the ink agitator, consisting of a rod extending from end to end of the ink reservoir, and provided with three upwardly projecting arms, *e*, *f* and *g*, by whose upper ends it is pivotally suspended from lugs 59.

On one end of shaft 52 of roller 51, and outside of the casing, is a spur gear, 81, which receives motion from a similar gear, 53, on stud 100, and which imparts motion to spur gear 54, mounted on a short shaft, 55. Shaft 55 carries a crank, 56, which is connected at *h*, to agitator 57 by connecting rod 58, the motion of the ink agitator being shown by dotted lines in Fig. VII. Crank 56 and rod 58 work between arms *f* and *g*, and roller 51

between arms *e* and *f*, of the ink agitator. Stud 100 receives motion from the sprocket wheel, 37, on its outer end, which is driven as shown in Figs. II and XIII.

5 Mounted loosely on driving shaft F is a combined sprocket wheel and friction clutch, P, which is operated by lever W, and is connected by chain 32 with sprocket wheel 34, mounted on one end of short shaft 33, carried by bracket Q, which is secured to any convenient part of bench 5. Shaft 33 carries on its other end a second sprocket wheel, 35, which is connected by chain belt 36 with the inker sprocket wheel, 37. By virtue of the mechanism described, the inking device is in continual motion, even when the press is temporarily stopped, and the uniform consistency and gloss of the ink, so essential to the perfection of the work, is thereby maintained.

20 The inking roller 48 is mounted on an oscillating frame, 49, which is pivotally supported on arms 62, and it is held in position by springs 63, adjustably secured to standards 64 on the back part of cover 47. Its pressure on roller 51 is regulated by set screws 65. At each end of roller 48 are flanges, or disks, 95, somewhat greater in diameter than said roller. At two points on die carrier I are two cam holders, 66, each carrying two adjustable cams, 67, which are so constructed that, in the revolution of the die holder, each pair of cams will impinge on disks 95, the space between the respective pairs being adjusted to the width of the engraved part of the die, (see Figs. IV and VIII.) The first pair of cams, as the die carrier passes over roller 48, pressing upon disks 95, push the roller backward and downward, and thus prevent the inking of the front edge of the die plate. When these cams have passed the disks, springs 63 cause a forcible upward movement of roller 48 against the die, which thoroughly inks every letter. The second pair of cams also depress roller 48 in passing, as above described, which prevents the inking of the rear edge of the die plate; and the conjoint action of both pairs of cams causes the engraved surface only of the die to be inked. As the thickness, the irregularities of surface, and the space occupied by the engraving vary in different dies, this mechanism is of great importance. It is obvious that the disks may be dispensed with if the cams are enlarged so as to impinge upon the inking roller.

60 T is the ink wiper, and it is stationary, its location being shown in Figs. I and IV. It is rectangular in form, in plan, and has rounded ends and a substantially flat top, as shown in Fig. IX. Its upper surface is covered with a layer of felt, under which is placed a packing of cardboard, about double the width of the die, and over which a strip of wiping paper is fed. It is supported on four adjustable springs, 68, which regulate its upward pressure, and which are in turn supported on a

fixed base plate, 69. The bottom plate, 70, of the wiper rests upon the tops of pins 71, within springs 68. The upper ends of pins 71 are secured to the bottom plate of the wiper, and their lower ends are screw-threaded and provided with an adjusting nut, 72, and a lock nut, 73. Any one or more of four points of the wiper may be raised or lowered as required, and the wiper automatically adjusts itself to the varying thicknesses of the dies and to irregularities in their surfaces.

74 is a tilting or rocking shaft, supported at each end by lugs 75 on base plate 69, and connected by a short upwardly curved arm, 76, (shown by dotted lines in Fig. IX,) to lug 77 on the bottom plate of the wiper. An arm, 78, provided with an adjusting screw, 79, is on one end of shaft 74. A depending bar, 80, having an offset near its upper end (above which lever 89 plays), is securely fastened at its upper end to arm 2 of the press, and at its lower end to base plate 69 of the wiper, the base plate being also secured to the frame of the press, as shown in Figs. XIV and XV.

On the front surface of bar 80 is a sliding bar, 82, shorter than bar 80, carrying roller 83 near its upper end, its lower end being a short distance above set screw 79, (Fig. IX.) Roller 83 lies within range of adjustable cam 87 on the rear face of spur gear M, and, during the revolution of the spur gear, cam 87 engages with roller 83, depressing bar 82, which impinges on set screw 79, which forces arm 76 downward, which carries down the wiper as the inked die is approaching it by the revolution of die carrier I. Cam 87 is held in place by a bolt passing through a slot in wheel M, and it has a curvilinear movement along the outer edge of cam 88, being moved forward and backward, so as to catch roller 83 sooner or later, as the card-board packing is made wider or narrower to accommodate the die. Cam 87 releases bar 82 at the instant that the lettered surface of the die reaches a point above the forward end of the cardboard packing or wiping surface of the wiper, springs 68 simultaneously throw the wiper forcibly against the die, and hold it there until the die has passed over the wiping surface of the wiper, and the surplus ink is wiped off by the continued revolution of die carrier I. The wiper, operating as herein described, simulates the method of wiping by hand in use with the ordinary hand press, in which the whole inked surface of the die is dropped with some force at once and squarely upon the wiping paper, preparatory to the sliding motion which completes the operation. It avoids the very common imperfection in wiping devices in embossed printing presses, whether so constructed that the die travels across the wiper or the wiper travels across the die, namely, a mere sliding motion as one moves over the other, resulting from the presentation of the edge of the die or of the lettered surface to the edge of the wiping surface, and resulting in scraping the

ink out of the engraving, or in destroying that gloss which is so essential to a handsome impression.

The paper feeding device is shown in Figs. X and XIV. On the rear face of spur gear M is a cam groove, 88, in which moves pin or roller 91 of lever 89, which is pivotally attached at 90 to the frame of the press. Connecting rod 92 is attached at its upper end to the free end of lever 89 by the ball and socket joint 99, and its lower end is pivotally attached to the longer arm of the pawl lever 93 of feed roller *m*, carried by frame *s*, and to one end of which is secured ratchet wheel *n*.

15 A pressure roller, *p*, is mounted in sliding boxes *q*, and is regulated by screw *r*. *w* is the paper spool, checked by brake *o*, and supported by arms *u*, secured to bench 5, from which the paper is fed to wiper T, passing between rollers *m* and *p*, and, after usage, being wound up on waste-paper roller *v*. Roller *v* carries at one end ratchet wheel *y*, detent *z*, and pawl lever 96, to the longer arm of which is attached weight *t*, which actuates roller *v*. The shorter arms of levers 93 and 96 are connected by rod 97, the upper end of which is pivotally attached to lever 93, the lower end having slot *x*, through which pin 94 of lever 96 loosely passes, and of a suitable length to allow its free play. The top of the slot is so disposed that the short arm of lever 96 about touches it when there is no waste paper on roller *v*, and as rod 97 descends it always raises weight *t* to the same level.

35 In operation, when lever 89 drops to the position shown in Fig. XIV, pawl lever 93 will have turned roller *m* so as to feed to the wiper the amount of fresh paper required, and simultaneously the same quantity of waste paper will have been taken up by roller *v*, actuated by weight *t*, which sinks downward to a proportional extent. If roller *v* has little or no paper on it, weight *t* sinks down to a great extent; if the roller has much paper on it, the weight sinks down very little. As lever 89 is raised by the further revolution of cam 88, the short arm of lever 93 is correspondingly depressed, carrying with it rod 97, which depresses the short arm of lever 96, and raises weight *t* into position to wind up the waste paper again. The mechanism described renders the bulk of waste paper on roller *v* immaterial, the winding motion of the roller being always just sufficient to take up the quantity fed to the wiper and used.

It is obvious that if the inking, wiping and feeding devices were omitted, the machine would do plain stamping or embossing.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination of an operating lever 98, friction clutch 31, loose pulley O, pinion N on driving shaft F, gear wheel M, main shaft E, and mutilated bevel wheel K with bevel pinion L, shaft G, and die carrier I, substantially as and for the purposes described.

2. The combination of main shaft E and mutilated bevel wheel K with bevel pinion L, shaft G, and die carrier I, substantially as and for the purposes described.

3. The combination of main shaft E, mutilated bevel wheel H, pinion 25, rack bar D, connecting block 14, and lever C, with a spring-actuated screw plunger, substantially as and for the purposes described.

4. The combination of spring-actuated screw plunger 7, lever C, connecting block 14, rack bar D, spur pinion 25, mutilated spur wheel H, shaft E, mutilated bevel wheel K, bevel pinion L, shaft G, die carrier I, die plunger R, and die 42, with a die inking device, substantially as and for the purposes described.

5. The combination of the die of an embossing and printing press with die carrier I, shaft G, pinion L, mutilated gear K, shaft E, cam 27, locking pin 28, and check spring 44, substantially as and for the purposes described.

6. The combination of a revolving die carrier with a cam-actuated locking pin, substantially as and for the purposes described.

7. The combination of a revolving die carrier with a die plunger, a die, a die inking device, and a die wiping device, substantially as and for the purposes described.

8. The combination of a revolving die with an inking device, a wiping device, and a spring-actuated screw-plunger, substantially as and for the purposes described.

9. A revolving die carrier, provided with a die plunger and a locking mechanism, in combination with a spring-actuated screw plunger, substantially as and for the purposes described.

10. The revolving die plunger R, carrier I, and adjustable cams 67, in combination with die 42, disks 95, and inking roller 48, supported on rocking arms 62, and held in position by springs 63, substantially as and for the purposes described.

11. The combination of a die plunger with a spring-actuated screw plunger, substantially as and for the purposes described.

12. In an embossing and printing press provided with a screw plunger, the combination of a ball lever C, connecting block 14, rack bar D, guide rod 13, and stop 15, with dog 29 and cam J, substantially as and for the purposes described.

13. The combination of coil spring 8 actuating screw plunger 7 with a tension-adjusting auxiliary spring substantially as and for the purposes described.

14. The combination of die plunger R and spring-actuated screw plunger 7 with ball lever C and rebounding spring 17, substantially as and for the purposes described.

15. In an embossing and printing press, an inking device consisting of an ink reservoir, a collecting and an evening roller, an ink agitator, and a die inking roller mounted on a rocking frame and provided with adjusting

springs, substantially as and for the purposes described.

16. In the inking device of an embossing and printing press, an ink agitator 57 in combination with connecting rod 58, crank 56, shaft 55, and gear wheels 54, 81, and 53, substantially as and for the purposes described.

17. The combination of a shaft F, pulley O, clutch and sprocket wheel P, chain 32, sprocket wheels 34 and 35 on shaft 33, chain 36, and sprocket wheel 37 on stud 100, with the fountain and the rollers of an inking device, substantially as and for the purposes described.

18. A die and a die inking device in combination with a cam and spring actuated die wiper, substantially as and for the purposes described.

19. The combination of a revolving die with an adjustable wiper T, provided with springs 68, base plate 69, arm 76, rock shaft 74, sliding bar 82, and adjustable cam 87, substantially as and for the purposes described.

20. The combination of a traveling die with a stationary die wiping device consisting of a wiper and mechanism adapted to move its

wiping surface instantly against the entire lettered surface of the die and to hold the two together, substantially as and for the purposes described.

21. The combination of a die with a die wiping device consisting of a wiper and mechanism adapted to move its wiping surface instantly against the entire lettered surface of the die and to hold the two together while the one moves over the other, substantially as and for the purposes described.

22. A revolving die, a die inker, and a die wiper, in combination with a paper feeding device consisting of cam-actuated lever 89, connecting rod 92, pawl lever 93, ratchet *n*, feeding roller *m*, adjustable tension roller *p*, connecting rod 97 provided with slot *x*, weighted pawl lever 96, detent *z*, ratchet *y*, and waste paper roller *v*, substantially as and for the purposes described.

In testimony whereof I affix my signature in presence of two witnesses.

J. YARDLEY JOHNSTON.

Witnesses:

ALPHONSE OXTE,

LINA C. GROLL.