I. P. BARROWS.

PHOTOGRAPHIC PRINTING MACHINE.

APPLICATION FILED OCT. 26, 1916.

1,276,476.

Patented Aug. 20, 1918.

3 SHEETS—SHEET 1.

FIG. 1.

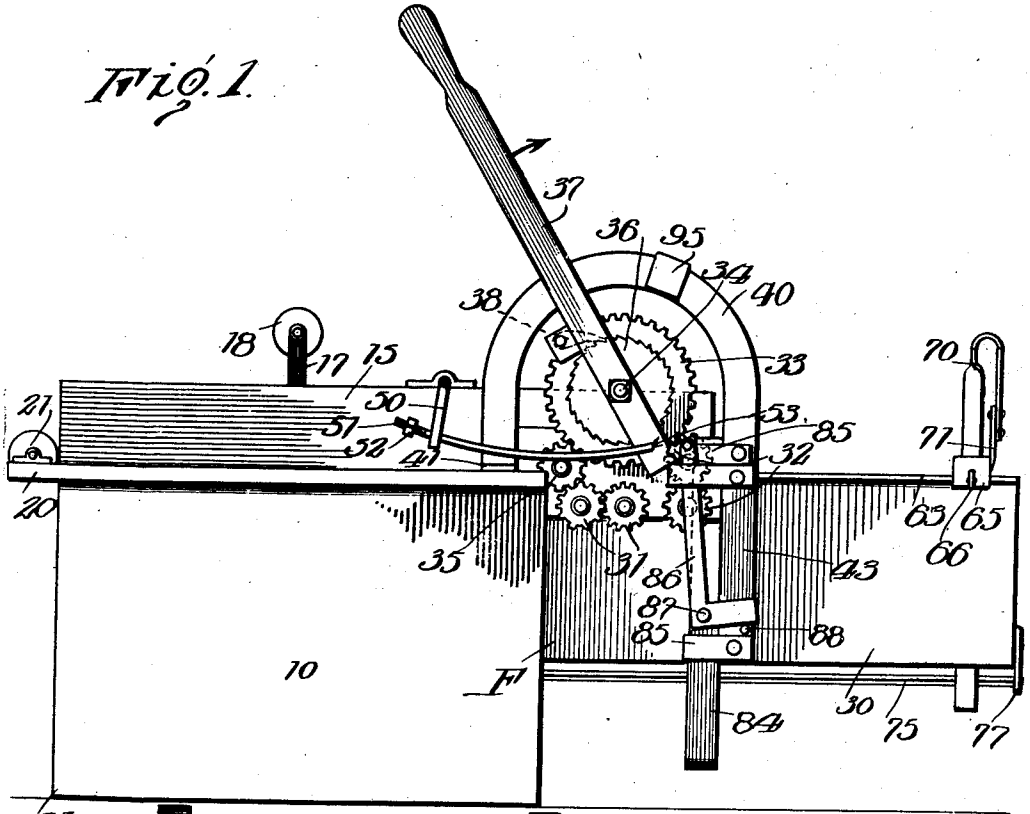


FIG. 3.

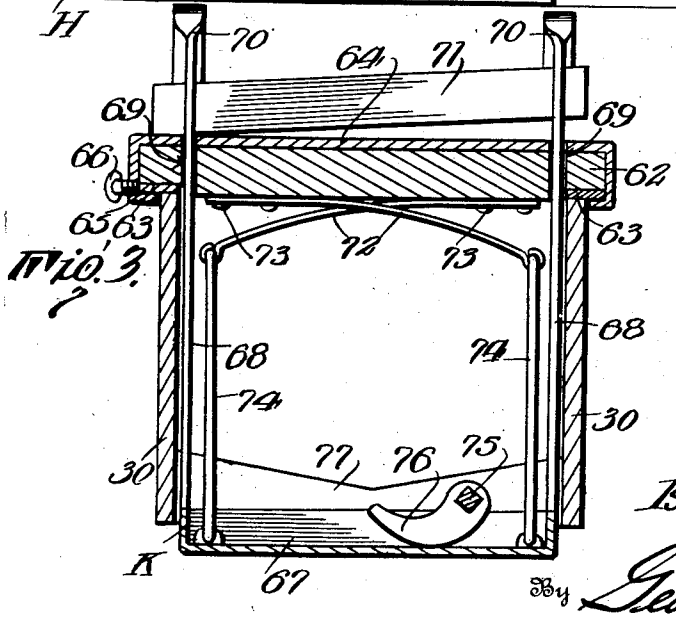
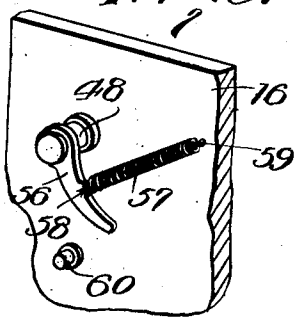


FIG. 8.



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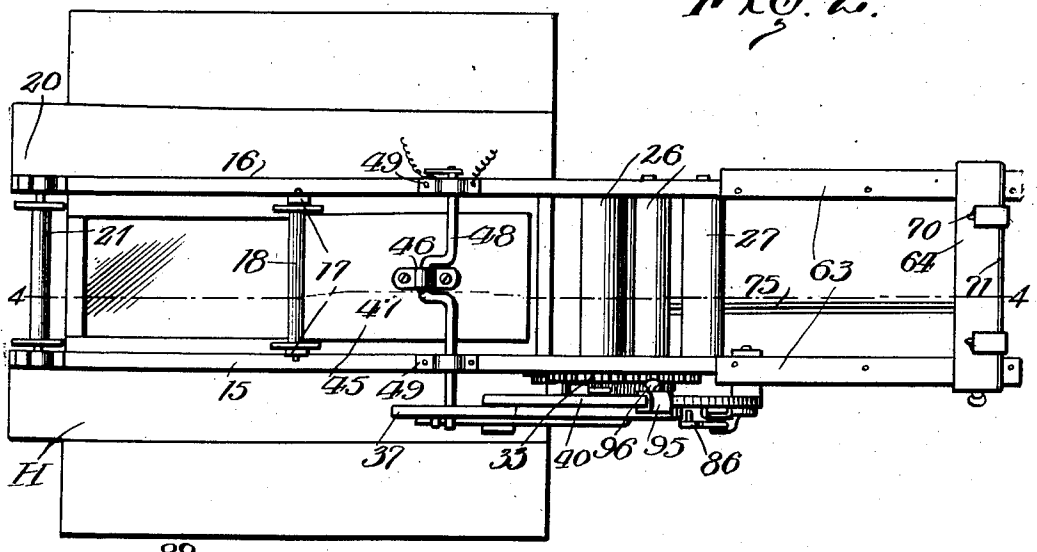
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3 SHEETS—SHEET 2.

FIG. 2.



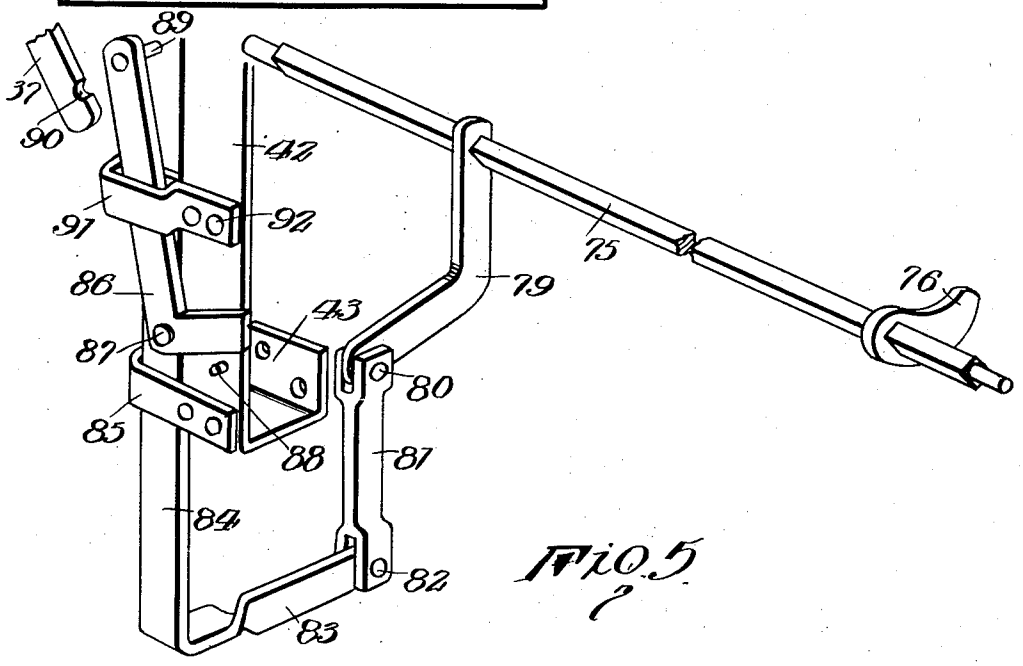


FIG. 5.

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3 SHEETS—SHEET 3.

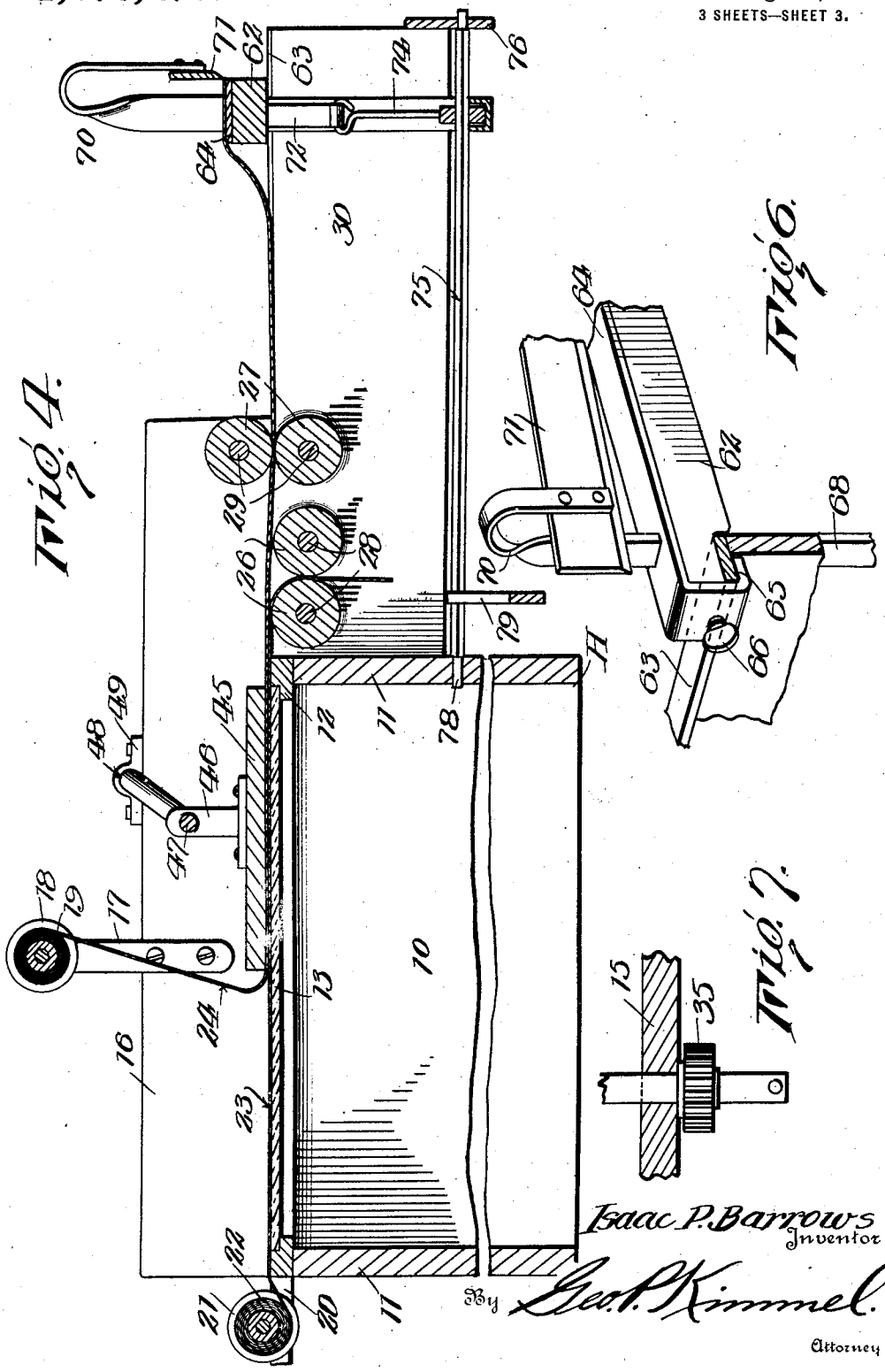


Fig. 4.

Fig. 6.

Fig. 7.

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UNITED STATES PATENT OFFICE.

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PHOTOGRAPHIC-PRINTING MACHINE.

1,276,476. Specification of Letters Patent. Patented Aug. 20, 1918.

Application filed October 26, 1916. Serial No. 127,930.

To all whom it may concern:

Be it known that I, ISAAC P. BARROWS, a citizen of the United States, and resident of Mount Hope, in the county of Fayette and State of West Virginia, have invented certain new and useful Improvements in Photographic-Printing Machines, of which the following is a specification.

The present invention relates to the art of photography and has particular reference to new and useful improvements in photographic printing machines.

The primary object of my invention is to provide a printing machine having simultaneously operable feeding means for the sensitized paper and films when in a roll or strip, means being provided for automatically applying a light to the film and sensitized paper to print upon the latter.

Another object of my invention is to provide a machine of the class described having automatic means for simultaneously feeding sensitized paper and a film, and means for bringing said paper and films into relatively close proximity for printing, cutting means being automatically operable by the feeding mechanism.

A further object of my invention is to provide a machine of the class described which is simple in construction, effective in operation, strong and durable and cheap to manufacture.

Other objects and advantages to be derived from the use of my improved photographic printing machine will appear from the following detailed description and the claims, taken with an inspection of the accompanying drawings, in which:

Figure 1 is a side elevational view of a photographic printing machine embodying the improvements of my invention.

Fig. 2 is a top plan view of the same;

Fig. 3 is a vertical sectional view of the cutting mechanism;

Fig. 4 is a longitudinal sectional view taken on the line 4—4 of Fig. 2;

Fig. 5 is an enlarged detached perspective view of the cutter operating mechanism;

Fig. 6 is a fragmental detached perspective view of the cutting element and adjustable supporting frame therefor;

Fig. 7 is an enlarged sectional view of a shiftable gear for driving the film rollers; and

Fig. 8 is an enlarged fragmental perspective view of the circuit closing element for supplying light to the film.

Referring more particularly to the drawing wherein similar characters of reference designate like and corresponding parts throughout the various views, H designates in its entirety the light housing in which is contained a suitable light source, preferably electrical (not shown).

The housing H is provided with side and end walls 10 and 11, the same supporting a top frame 12 in which is mounted a transparent plate 13.

A pair of side flanges 15 and 16 are arranged along the top frame 12, said flanges supporting bearing arms 17 on which is revolubly mounted the roller 18, said roller serving to carry the sensitized paper designated 19. A pair of arms 20 extend from the rear end of the housing 8 to support a roller 21 on which is arranged the roll film 22, the web 23 of said film being drawn across the plate 13. The web 24 of the sensitized paper is drawn across the plate 13 above the film for the printing operation to be described in detail hereinafter.

I provide means for feeding the film and sensitized paper, said means including two sets of feeding rollers 26 and 27 arranged preferably in pairs on shafts 28 and 29, said shafts being journaled in the side portions 30 of a frame F. The free ends of the shafts 28 and 29 extend beyond one of the sides 30 and carry pinions 31 and 32, the pinions 31 being in relative meshing engagement as are the pinions 32.

I provide means for imparting intermittent movement to the pinions 31 and 32, said means including a relatively large gear wheel 33 journaled at 34 to the flange 15. The gear 33 is in meshing engagement with the uppermost of the pinions 32, said gear also being in meshing engagement with a sliding pinion 35, said pinion being in turn meshed with the innermost pinion of the set 31. A ratchet wheel 36 is formed integrally with the gear 33, a lever 37 being journaled on the bearing 34 and provided with a pawl 38 for engagement with said ratchet wheel. A semi-circular guiding frame 40 is mounted on the housing 8 as at 41, the free end of said frame being formed with a leg 42 set as at 43 to embrace the under marginal edge of one of the side portions 30 of the frame F and being perma-

nently secured thereto. The leg 42 forms a cross-head guide for a purpose which will hereinafter appear.

In order to bring the film and sensitized paper into relatively close proximity with each other and said plate 13, I provide a presser 45 arranged above said film and sensitized paper. A bearing block 46 is carried by the platen in which is journaled the crank portion 47 of a crank shaft 48, said crank shaft being journaled in bearings 49 mounted on the flanges 15 and 16. The free end of the crank shaft 48 is bent downwardly as at 50, a curved bolt 51 passing through said portion 50, one end of the bolt having a nut 52 mounted thereon and the other end of the bolt being pivotally connected at 53 with the lower free end of the lever 37. It will thus be seen that when the lever 37 is oscillated in the direction of the arrow in Fig. 1, the pawl 38 will engage the ratchet wheel imparting rotary movement thereto which will in turn be imparted to the rollers 26 and 27 through the medium of the pinions 31, 32 and 35. The free end of the paper and film is engaged between the rollers 27 and 26, respectively, and it will thus be seen that when movement is imparted to said rollers the paper and film will be fed therethrough. An arm 56 is mounted on the free end of the crank shaft 48, a coil spring 57 being connected at 58 to said arm, the free end of the spring being anchored at 59 to the flange 16. A circuit terminal 60 is arranged within the path of movement of the arm 56 so that when said arm engages said circuit terminal a circuit (not shown) will be closed to energize a light source (not shown) within the housing H.

I provide means for cutting the sensitized paper after the same is printed, said cutting means including a bar 62 arranged on top of the sides 30 of the frame F, a pair of strips 63 mounted on said sides serving as track-ways for said bar. The bar is provided with a reinforcing strip 64 bent on its free ends to form flanges 65 for engagement with the track-ways 63, a set screw 66 serving to lock said bar 62 in adjusted position on said track-ways.

A knife-frame K is provided U-shaped in configuration and including a channel base portion 67 and parallel vertical arms 68, said arms extending through openings 69 in said bar 62 and strip 64, the upper free ends of arms 68 being twisted as at 70 and bent upon themselves to form supports, an inclined knife blade 71 being carried thereby. The knife blade is adapted to co-act with one of the marginal edges of the strip 64 to perform a cutting operation. The frame K is maintained out of cutting position normally by means of a pair of flat springs 72 anchored at 73 to the under surface of the bar 62, said springs extending in opposite directions and connecting to the channel member section 67 by means of links 74.

The mechanism for vertically reciprocating the knife blade includes a rocker shaft 75 preferably polygonal in cross section and carrying a cam 76, said cam being located within the channel member 67. Said cam is freely slidable on the shaft 75 but turns with the shaft. One end of the shaft 75 is mounted in a bearing plate 76 carried by the free end of the frame F, the opposite end of the shaft being journaled at 77 in one of the end walls 11 of the housing H. The shaft 75 carries a crank arm 79 preferably right-angular in configuration, the free end of the arm being pivotally connected at 80 with a link 81, said link having its free end pivotally connected at 82 with the arm 83 of the cross-head 84, said cross-head being slidably mounted on the leg 42 in straps 85. A bell crank lever 86 is pivotally mounted at 87 on the cross-head 84, the shorter arm of the bell crank lever being adapted to engage a pin 88, at times, for a purpose which will hereinafter appear. The upper free end of the bell crank lever is provided with a pin 89 engageable, at times, in the recess 90, formed in the lower free end of the lever 37. A loop 91 riveted or otherwise secured to the leg 42 embraces the longer arm of the bell crank lever 86 to limit the movement of the same.

A block 95 adjustably held by a set screw 96 is mounted upon the curved guiding frame 40 to limit the movement of the lever 37 and hence limit the length to which the film and paper are moved.

In use a movement of the lever 37 will impart motion to the rollers 26 and 27 causing the film and sensitized paper to be drawn over the face of the transparent top of the housing H. The sensitized paper, after being printed, is drawn over the strip 64 to meet the knife 71, and as the lever returns to normal position the pin carried by the bell crank lever 86 engages the recess in the lower free end of the said lever causing a vertical reciprocation of the cross-head 84 which in turn causes oscillation of the shaft 75. This movement in turn causes the cam 76 to engage the knife blade, moving the same downwardly to sever the paper. If it is desired to make a plurality of prints of one section of the film, the pinion 35 is shifted out of engagement with the pinion driving the film rollers leaving said rollers at rest while the rollers 27 move the sensitized paper over the film on each printing process.

It will be readily seen that the pin 88 when engaged by the short arm of the bell crank lever 86 will cause the long arm of said lever to be moved outwardly on the pivot into the path of movement of the lever

37 so that when said lever is again oscillated said long arm will be engaged thereby. The nut 52 on the bolt 51 serves to engage the arm 50 formed on the crank shaft 48 to bring the presser member 45 into engagement with the film and sensitized paper during a printing operation. This action also moves the arm 56 into engagement with the pin 60 closing the circuit to the light source. From an inspection of Fig. 4 it will be seen that the knife frame may be readily adjusted longitudinally of the frame F so that the length of the cut may be readily varied.

I desire to lay particular stress on the extreme simplicity of the various parts of my improved printing machine, and it will be apparent that after an operator has become entirely familiar with the capabilities of the machine the rapidity with which photographic prints may be produced will be materially increased. If desired, the rollers 26 and 27 may be made of rubber or may be yieldably mounted in order to vary under different thicknesses of paper used.

From the above description taken in connection with the accompanying drawing, it is thought that a clear and comprehensive understanding of the construction, operation and advantages of my invention may be had, and while I have shown and described the device as embodying a specific structure, I desire that it be understood that such changes may be made in said structure as do not depart from the spirit and scope of the invention as claimed.

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

1. In a photographic printing machine, the combination of a housing having a transparent top, a presser member arranged above said top for bringing the paper and film into relative proximity and into proximity with said top, means associated therewith for feeding the paper and film including a lever, feeding rollers, said lever actuating said rollers.

2. In a photographic printing machine, the combination of a housing having a transparent top to receive a film and paper, a presser member for bringing the paper and film into relative proximity and into proximity with said top, means associated therewith to control a light source, a lever, feeding rollers, said lever actuating said feeding rollers.

In testimony whereof, I affix my signature hereto.

ISAAC P. BARROWS.