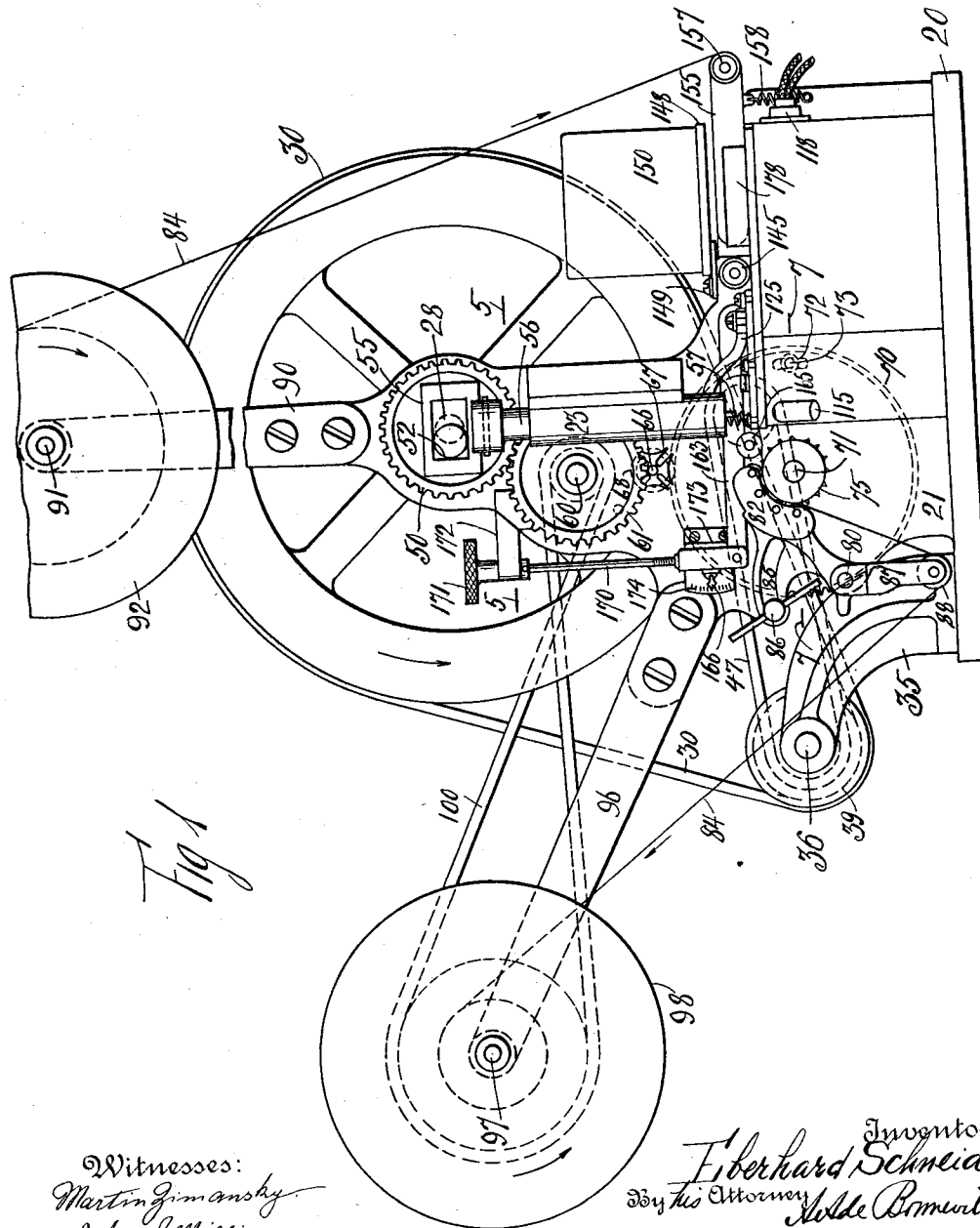


E. SCHNEIDER.
ADJUSTABLE FILM PERFORATING MACHINE.
APPLICATION FILED MAR. 14, 1911.

Patented May 27, 1913.

5 SHEETS—SHEET 1.

1,062,932.



Witnesses:
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John J. Millin

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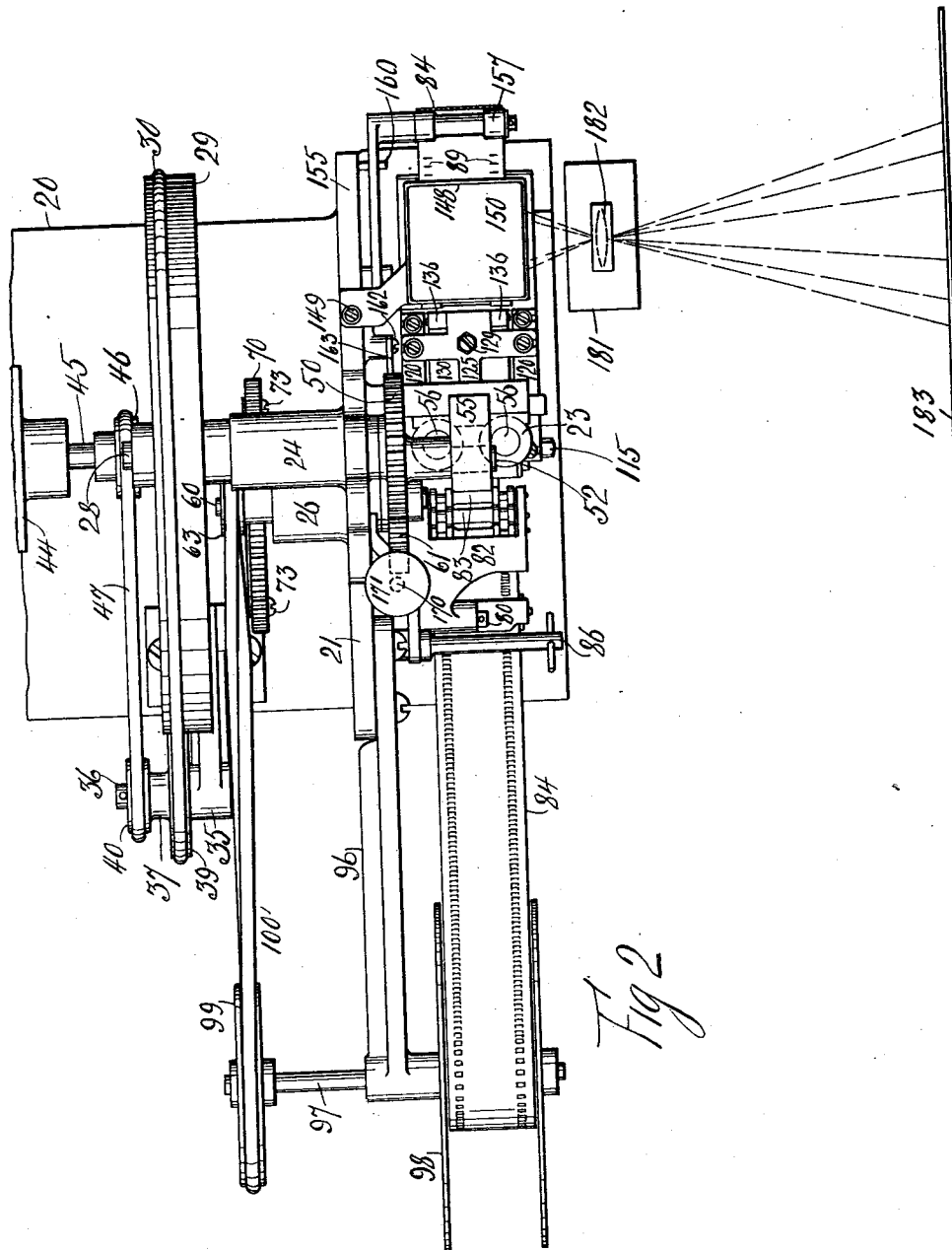


Fig 2

Witnesses:
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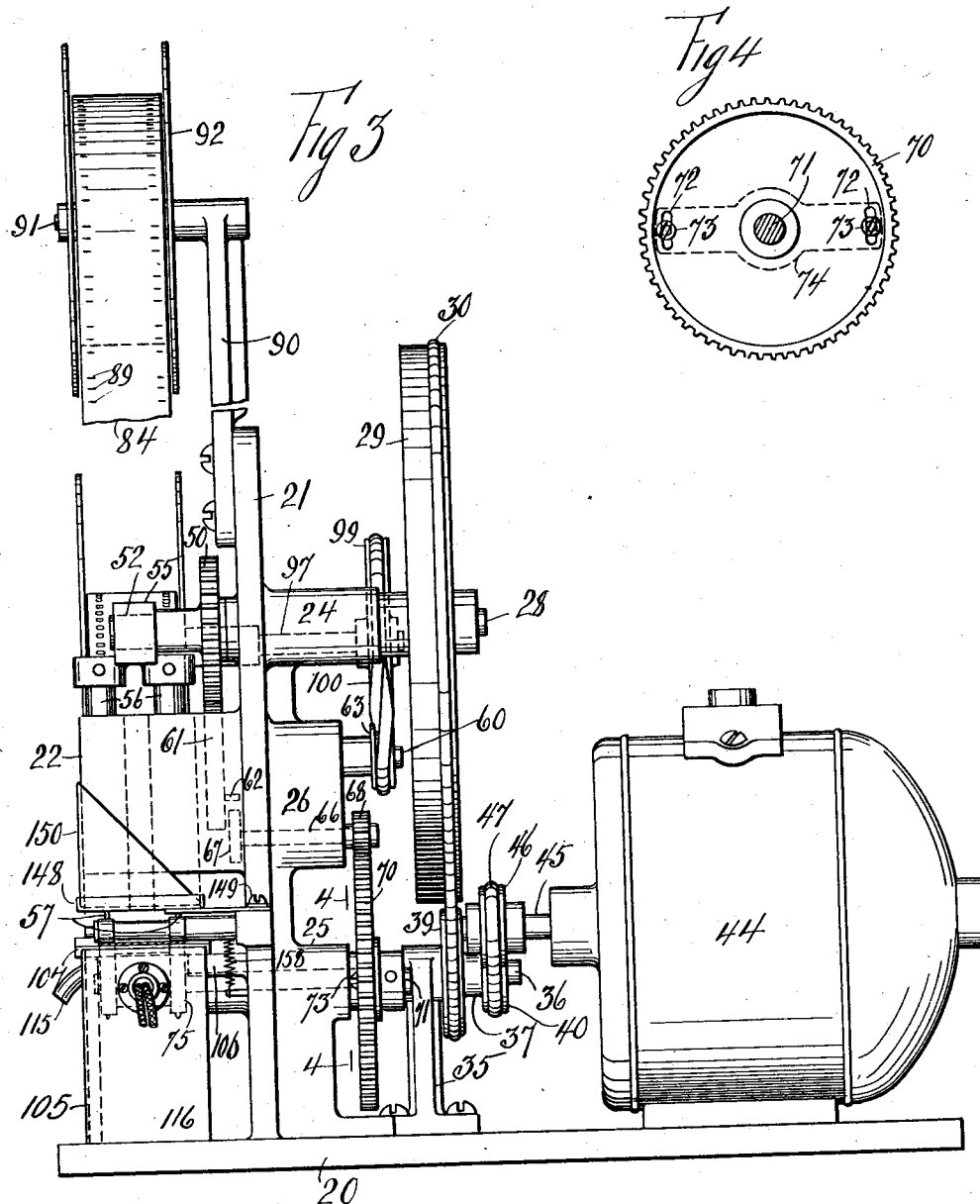
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5 SHEETS—SHEET 3.



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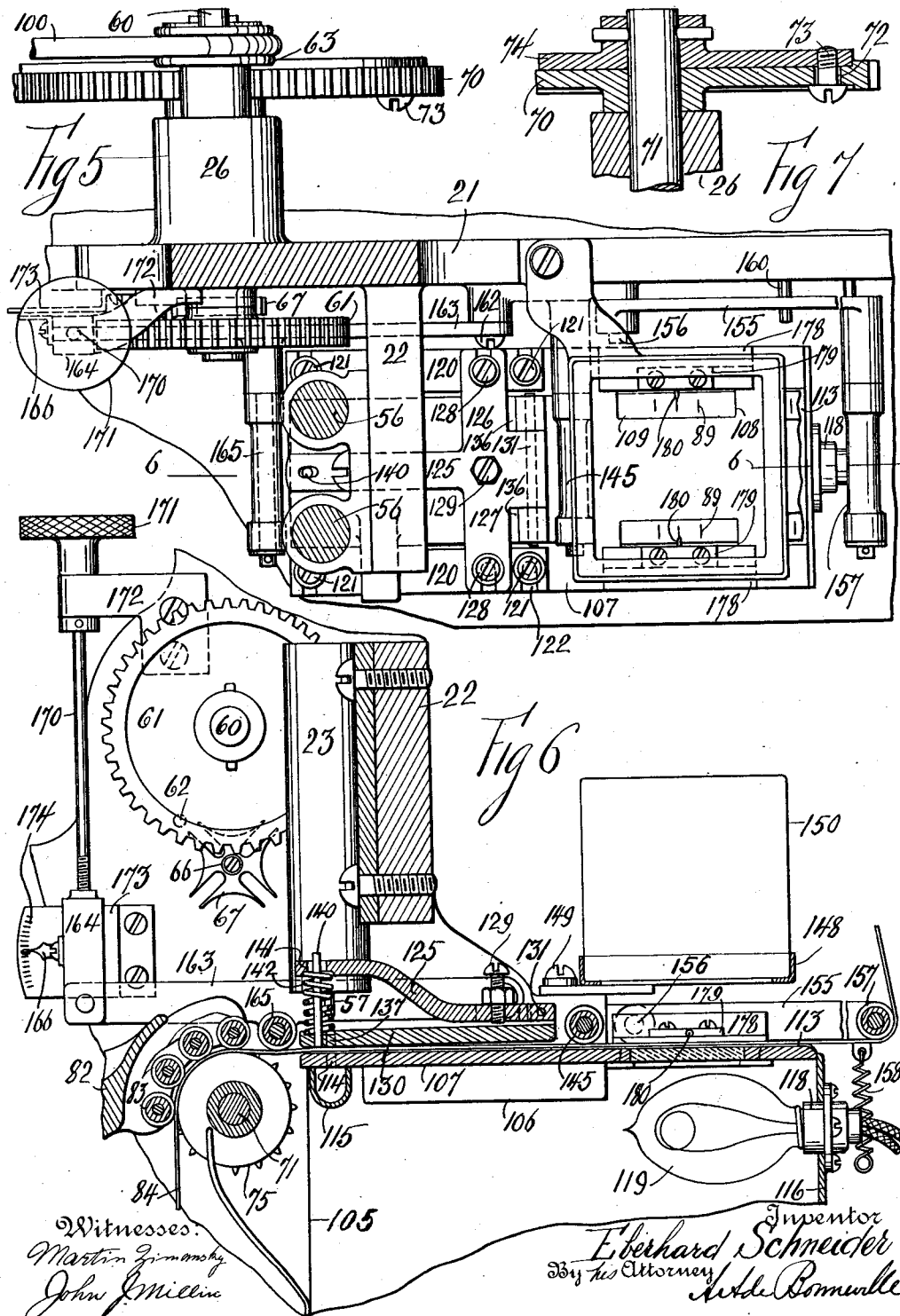
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5 SHEETS--SHEET 4.

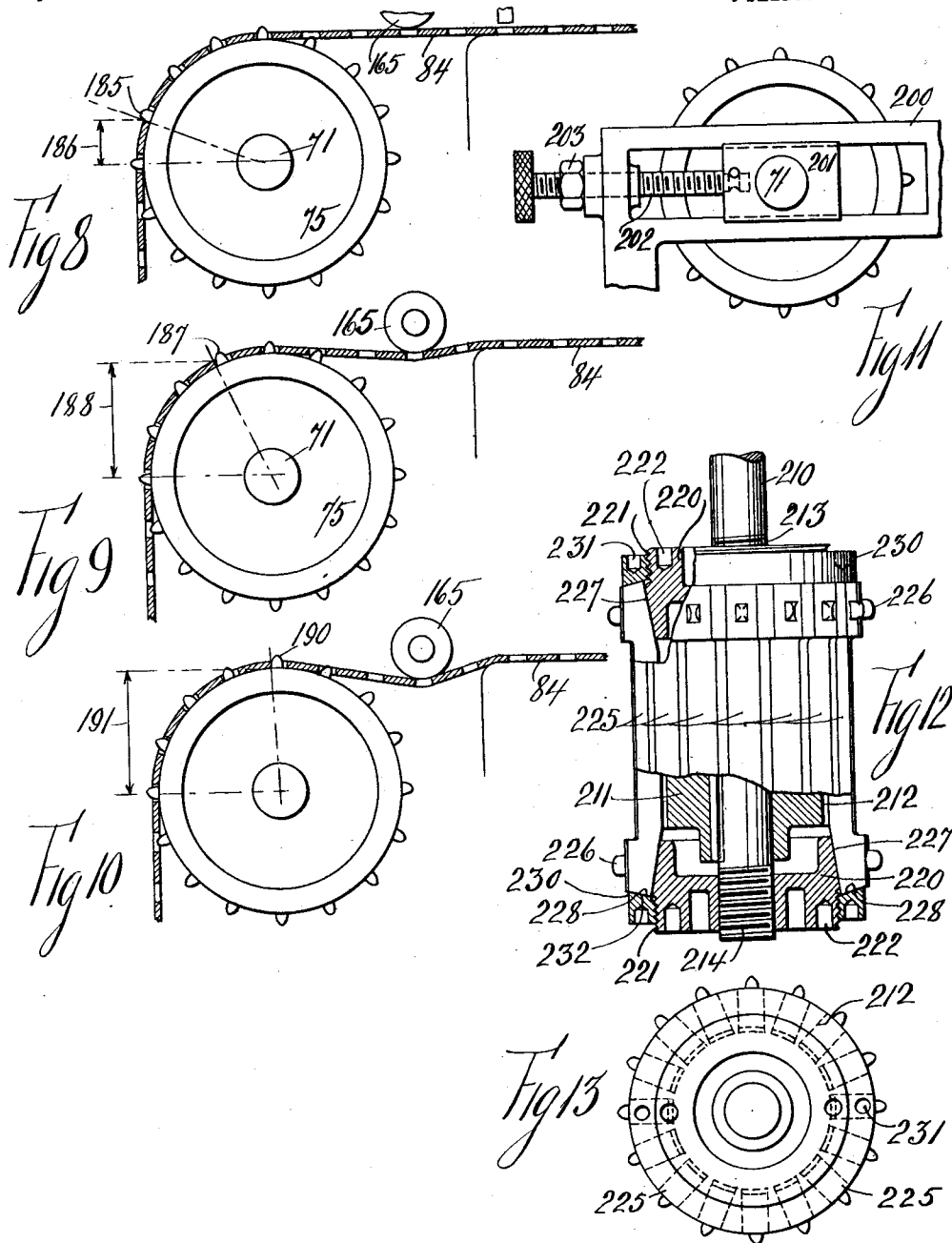


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5 SHEETS—SHEET 5.

1,062,932.



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UNITED STATES PATENT OFFICE.

EBERHARD SCHNEIDER, OF NEW YORK, N. Y.

ADJUSTABLE FILM-PERFORATING MACHINE.

1,062,932.

Specification of Letters Patent.

Patented May 27, 1913.

Application filed March 14, 1911. Serial No. 614,309.

To all whom it may concern:

Be it known that I, EBERHARD SCHNEIDER, a citizen of the United States, and a resident of the borough of Manhattan, in the county of New York and State of New York, have invented certain new and useful Improvements in Adjustable Film-Perforating Machines, of which the following is a specification.

10 This invention relates to an adjustable film perforating machine, which is an improvement of my film-perforating machine described and claimed in my United States Patent No. 788,851 bearing date May 2d, 15 1905. Its principal object is the production of a machine with which perforations that are of different pitches, or different distances apart can be formed in films and particularly picture films. This variation of the 20 pitch can be accomplished while the machine is in operation, and while the punches are perforating the film. The different pitches of the perforations are obtained by locating a film on the driving sprocket drum of the 25 machine so that different teeth of the said drum become effective in propelling said film, for the different pitches while the films are being perforated. The teeth of the sprocket drum extending from the circumferential surface thereof being located at 30 different vertical distances from the axial center of said drum for the various pitches, the horizontal movement of the film, that is its velocity is thereby varied, causing the 35 perforations made by the punches of the machine to vary at the will of the operator.

In the accompanying drawings Figure 1 represents a side view of a film perforating machine exemplifying the invention, Fig. 2 40 is a partial top plan view of Fig. 1, Fig. 3 is a right hand end view of Fig. 1, Fig. 4 is a partial section of Fig. 3 on the line 4, 4, Fig. 5 is a partial enlarged section of Fig. 1 on the line 5, 5, Fig. 6 is a section of Fig. 5 45 on the line 6, 6, Fig. 7 shows a partial enlarged section of Fig. 1 on the line 7, 7, Figs. 8, 9 and 10 show partial end views of the film adjusting mechanism of the invention, Fig. 11 shows a side view of a further modification of the drum adjusting mechanism, 50 Fig. 12 is a top view partially in section of an adjustable sprocket drum, and Fig. 13 is a bottom plan view of Fig. 12.

55 The machine is represented with the bed plate 20 from which extends the frame 21

with the bracket 22 having bolted thereto the guide sleeves 23. Single journal hubs 24, 25 and the double journal hub 26 are formed with the frame 21. In the hub 24 is journaled a driving shaft 28, which at one end carries the fly wheel 29 having a circumferential groove for the belt 30. A bracket 35 extends from the bed plate 20 which has extending therefrom the journal pin 36, on which latter is journaled a double pulley 37 65 with the grooved disks 39 and 40. The belt 30 connects the fly wheel 29 with the grooved disk 39. A motor 44 is supported on the bed plate 20, and on the shaft 45 of the said motor is fastened a grooved pulley 46. A 70 belt 47 connects the latter pulley with the grooved disk 40. The shaft 28 has fastened thereto the gear 50 that has extending therefrom the crank pin 52. A cross head 55 engages the crank pin 52 and has extending 75 therefrom the plungers 56, that carry the punches 57. The said plungers are guided in the guide sleeves 23 of the bracket 22. A spindle 60 is journaled in the hub 26 and carries at one end the gear 61 that carries the 80 pin 62 and meshes with the gear 50. At the other end of the spindle 60 is fastened the pulley 63. A spindle 66 is journaled in the hub 26 and carries at one end the star wheel 67 which latter is operated by the pin 62. 85 The other end of the spindle 66 carries the pinion 68 which meshes with the gear 70, that is journaled on the sprocket drum shaft 71. The gear 70 has a pair of slots 72 through which extend the screw pins 73 that 90 are in threaded engagement with the adjusting support 74 fastened to the shaft 71. The other end of the shaft 71 carries the driving sprocket drum 75.

A pin 80 extends from the frame 21 and 95 carries the adjustable bracket 82 in which are pivoted the guide rollers 83. The said rollers can bear on the film 84 to be described and that is engaged by the pins of the sprocket drum 75. In the bracket 82 is 100 formed a slot 85 which engages a tightening screw 86 that extends from the frame 21, and by means of which the bracket 82 can be locked in different operative positions. 105 From the lower end of the bracket 82 extends the arm 87 in which is journaled the guide roller 88. The film 84 in the present case is a developed negative which has formed near its edges the index marks 89, and in the present instance three such marks 110

are formed on opposite sides of each picture, the central mark of each three being opposite the center of its accompanying picture.

From the upper end of the frame 21 extends the arm 90 that supports the pin 91 on which is journaled the take off reel 92. An arm 96 extends from the frame 21 and carries a spindle 97 on one end of which is fastened the take up reel 98, and on the other end thereof is secured a pulley 99. A belt 100 connects the pulley 99 with the pulley 63 on the spindle 60. A support 105 extends from the bed plate 20 and a bracket 106 extends from the frame 21. A cover plate 107 has openings 108 with the glass covers 109 and the openings 114 for punches 57. The cover plate 107 has a longitudinal depression 113 to avoid frictional engagement with the film 84. A discharge funnel 115 in the support 105 extends under the openings 114. An end plate 116 extends from the support 105 and has an opening for the socket 118 of the electric lamp 119, which latter extends below the glass covers 109. On the upper face of the cover plate 107 are adjustably secured guides 120, by means of the screws 121. Slots 122 in the said guides enable the adjustment thereof on the plate 107. A bracket 125 with the arms 126, 127 is adjustably mounted on the guides 120 by means of the screws 128. A screw 129 with a lock nut is carried on the bracket 125. One end of the bracket 125 has hinged thereto a pressing plate 130 by means of the pin 131, which extends through the lugs 136 of the pressing plate 130. Openings 137 in the said plate 130 allow the punches 57 to pass therethrough and register with the opening 114. A vertical pin 140 is secured in the pressing plate 130 and passes through a slot 141 in the bracket 125. A spring 142 encircles the pin 140 and bears between said bracket 125 and the said pressing plate.

A guide roller 145 extends from the frame 21 adjacent to the cover plate 107 in the path of the film 84. A frame 148 is hinged to the frame 21 by means of the screw pin 149. A prism 150 is supported in the said frame 148 to receive the light rays from the lamp 119 and that pass through the glass covers 109 and the film 84.

A bracket 155 is hinged to the frame 21 on the screw pin 156 and supports on its swinging end the tension roller 157. A spring 158 maintains the said roller 157 in engagement with the film 84, and a pin 160 prevents the bracket 155 lowering too great a distance. On a screw pin 162 is pivoted the adjusting lever 163, which carries an adjusting roller 165 located between the punches 57 and the sprocket wheel 75. On the swinging end of the lever 163 is carried a threaded block 164 having a pointer 166. A threaded spindle 170 with the

knurled head 171 is carried in a support 172 extending from the frame 21 and its lower end is in threaded engagement with the block 164. A bracket 173 with the scale 174 extends from the frame 21 and is located in the path of the pointer 166.

On the cover plate 107 are secured brackets 178 on which are fastened plates 179 with the pointers 180 that extend over the paths of the index marks 89 of the film.

Adjacent to the support 105 is located a support 181 which carries the lens 182. A screen 183 is located in the axial line of said lens to exhibit the film 84 with its index marks 89.

Referring to Fig. 8 the driving sprocket drum 75 engages the film 84 by means of its pins when they reach the location designated by 185, and at which position the distance through which the film is propelled can be represented by the line 186 giving the minimum speed of propulsion to the film 84, by virtue of which the perforations are nearer to each other than what I term standard pitch.

In Fig. 9 the film 84 is engaged by the drum when the pins reach the position 187, and with this engagement the effective speed of propulsion of said film can be designated by the line 188, by virtue of which the film will be perforated with holes that are separated from each other by what I term the standard pitch.

In Fig. 10 the film 84 is engaged or driven when the pins of the sprocket drum reach the positions indicated at 190, and the effective speed of propulsion of said film can then be designated by the line 191, by virtue of which the film will be perforated with holes that are separated from each other by a distance greater than the said standard pitch.

Fig. 11 represents means for horizontally moving the sprocket drum shaft 71, and comprises a pair of frames 200, one of which only is shown in the drawing, and in each of which is located a crosshead 201 for the shaft 71. A screw 202 has one end connected to said crosshead and is in threaded engagement with said frame. A lock nut 203 locks the screw in operative position.

The adjustable sprocket drum shown in Figs. 12 and 13 is represented with the shaft 210 to which is keyed a support 211, that has formed in its circumferential surface guide pockets 212. The shaft 210 is threaded at 213 and 214 for the tapered end supports 220 which have formed therewith the threaded ends 221, and the cavities 222 for a wrench to screw them in place. Adjustable sprocket bars 225 are located in the pockets 212 and have the sprocket pins 226, the inner tapered faces 227, and the end tapered faces 228. Clamping nuts 230 with cavities 231 are in threaded engage-

ment with the ends 221 and have the beveled surfaces 232 that are in engagement with the tapered end faces 228. To use the drum to locate the film in engagement with different pins thereof the operator first disengages the clamping nuts 230 from the sprocket bars 225, and then the end supports are turned to either approach or recede from each other, and finally the clamping nuts are again located to clamp the sprocket bars 225 in operative positions.

To perforate a finished developed film which preferably has index marks with each picture thereon, the said film is mounted on the machine as shown in Fig. 1, extending from the take-off reel 92 to and under the tension roller 157. From thence it extends over the cover plate 107 to and over the sprocket drum 75 extending under the pressing plate 130. From the drum the film extends under the guide roller 88 and finally leads to the take-up reel 98. For the efficient operation of the machine the horizontal distance between the center of the sprocket drum 75 and the line joining the pointers 180 is fixed, so that a film will be punched with perforations of standard gage when the roller 165 slightly depresses the same and the film is propelled when the teeth engage the same as shown at 187 in Fig. 9. The operator thus engages the film with one pair of opposite holes in the same preferably in the position indicated at 187. Then the film is observed through the prism 150 or the projection thereof on the screen 183 and the location of the index marks is noted with reference to the pointers 180. If the index marks are a little to the right of the pointers 180 as seen in Fig. 5 it shows that the pictures have been photographed on the film at too great a distance apart and the machine must be set for a longer pitch of perforations which is accomplished by turning the head 171 to lower the roller 165 until the index marks of the picture of the film coincide with the pointers 180. The film will then be propelled by the sprocket drum with the engagement thereof of the pins indicated at 190 shown in Fig. 10. If in the first instance after a few perforations have been made in the film any of the index marks appear to the left of the pointers 180, it indicates that the pictures have been photographed on the film too close to each other and the film must be perforated for a short pitch which is accomplished by turning the head 171 to raise the roller 165 until the film is engaged by the pins when in the positions indicated at 185 in Fig. 8.

The machine provides a means of perforating a film so that its perforations will be synchronized with the different distances the pictures are apart, obtaining a machine by which pictures different distances apart can be projected from a picture machine

with the same results on a screen as with a film on which the pictures are all the same distance apart.

It will be noted that the variations of pitches of the holes punched in the film is produced by the different locations of the adjusting roller 165, which causes the pins of the sprocket drum to become effective at different angular positions thereof. The engagement of the film with the sprocket drum at these different angular positions thereof can also be accomplished by setting the drum 75 in different angular positions by means of the screw pins 73. A similar result may be obtained by horizontally moving the axial line of the drum, by locating the cross-head 201 in different positions with the screw 202 (Fig. 11.)

When the machine is used for perforating a regular sensitive positive or negative stock, it is engaged with the sprocket drum 75 as shown in Figs. 8, 9 and 10 depending respectively whether perforations of short standard or long pitch are required.

It is to be noted that a perforating machine could be constructed with a moving fork to engage the film so as to vary the speed of travel while being operated upon by the punches. It will also be noted that when the drum is used, if there is a slight creeping of the film thereon, it does not vitiate the operation of the invention.

Having described my invention what I desire to secure by Letters Patent and claim is:

1. In a perforating machine the combination of a driving sprocket drum for a film, means to perforate said film and manually operated means to effectively engage said film at various circumferential positions on said drum.

2. In a perforating machine the combination of a drum for a film, means to maintain said film in tensional engagement with said drum, perforating means adjacent to the drum, a manually adjustable guide roller to bear on the film to maintain said film in various operative positions with the circumferential surface of the drum.

3. In a perforating machine the combination of a drum for a film, perforating means adjacent to the drum, and a manually adjustable guide roller to bear on the film to maintain it in engagement with the drum at various circumferential portions thereof.

4. In a perforating machine the combination of a sprocket drum for a film having index marks, means adjacent to the drum to perforate the same, means to locate the film in effective engagement therewith and at various circumferential portions thereof and an indicator in the machine to indicate the place of engagement of the film with said drum.

5. In a perforating machine the combination of a sprocket drum for a film having

index marks, pins extending from the drum, means in the machine to perforate the film, means to effectively engage one of said pins with the film, and a pointer in the machine
5 to indicate the location of the pin when it engages said film.

6. In a machine of the character described the combination of a drum to engage a film, manually adjustable means to bear on the
10 film to maintain it in different operative positions on said drum, means to turn the drum, a pointer in the machine to indicate the speed of travel of the film and means to perforate the film.

15 7. In a machine of the character described the combination of means to perforate a film, a sprocket drum to engage said film, manually adjustable means to maintain said film in various positions on the drum, a
20 cover plate for the film to travel over, a transparent cover over an opening in said cover plate and a light under said cover plate to bring index marks on the film clearly into view to observe the speed of
25 travel of the film.

8. In a machine of the character described, the combination of means to perforate a film, manually adjustable means to maintain said film in various positions on the drum to

vary the speed of travel of the film rela- 20
tively to the speed of operation of the means to perforate the film, a cover plate having an opening for the film to travel over, a lamp under said cover plate and a prism
35 over the cover plate to observe index marks on the film.

9. In a machine of the character described the combination of means to perforate a film, a sprocket drum to engage the film, manually adjustable means to maintain said
40 film in various positions on the drum to vary the speed of travel of said film relatively, to the speed of the operation of the means to perforate the film, a cover plate having an opening for said film to travel over, a trans- 45
parent cover for said opening, a lamp under the cover plate, a prism over the cover plate and a screen to project thereon index marks of the film, while the film is traveling
50 through the machine.

Signed at the borough of Manhattan in the county of New York and State of New York this 8th day of March A. D. 1911.

EBERHARD SCHNEIDER.

Witnesses:

W. E. DE BONNEVILLE,
A. A. DE BONNEVILLE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."