

Dec. 9, 1941.

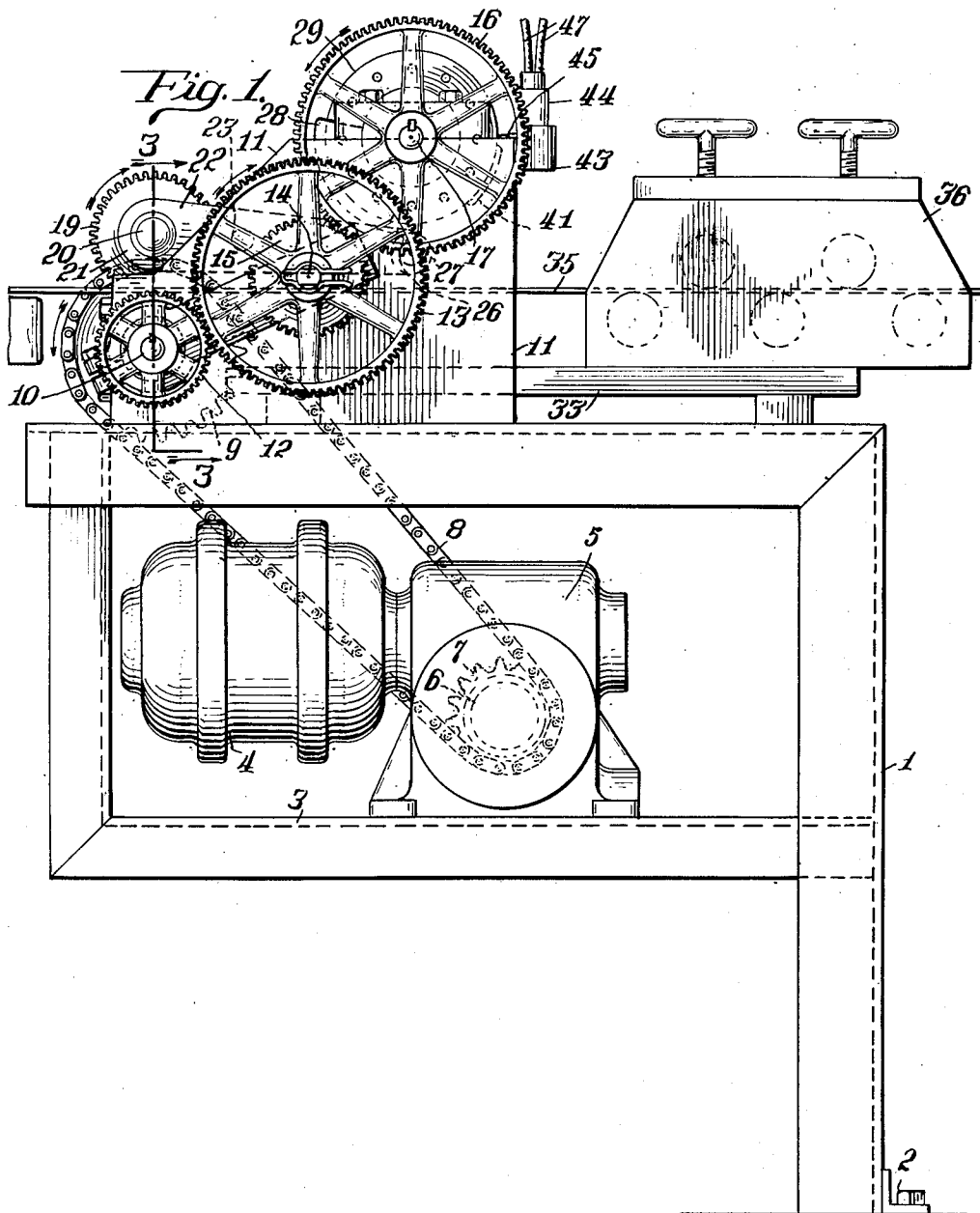
J. N. WOODINGTON

2,265,332

MECHANISM FOR FEEDING STRIP OR ROD STOCK INTO PUNCH PRESSES

Filed July 17, 1939

3 Sheets-Sheet 1



Inventor

J. Norman Woodington

by *Rudolph M. Loeb*
Attorney

Dec. 9, 1941.

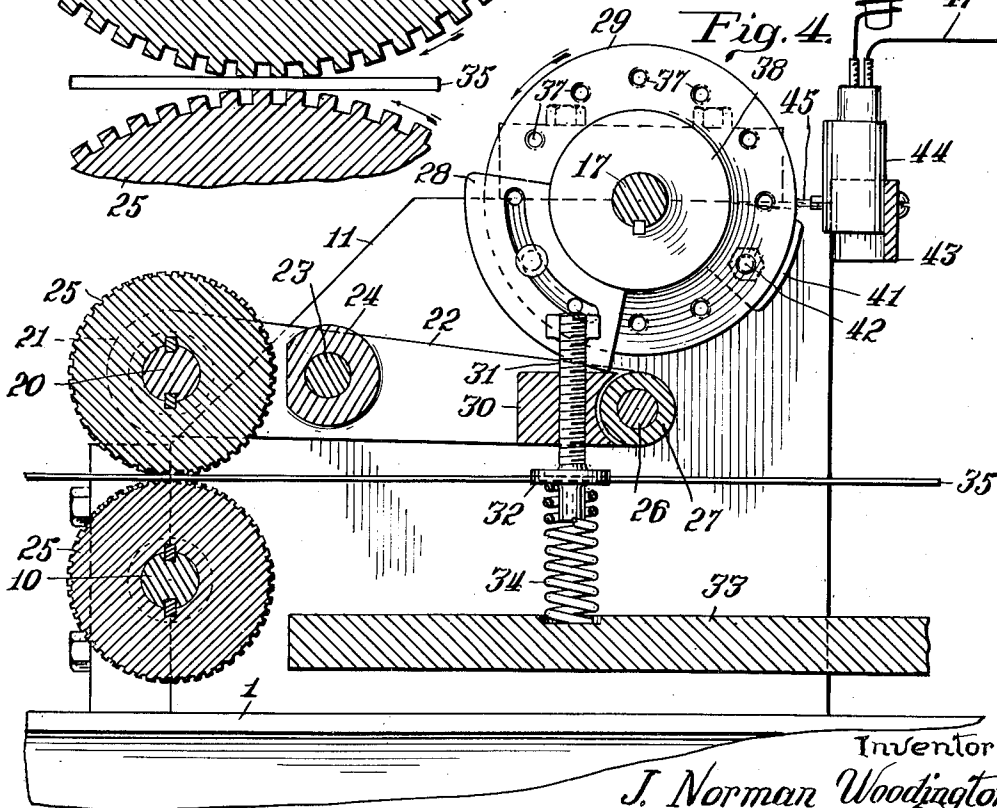
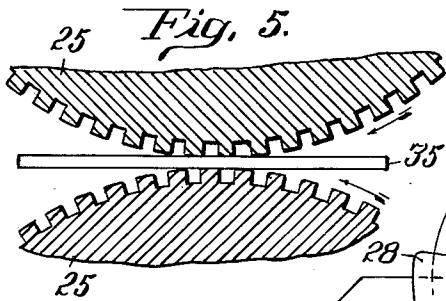
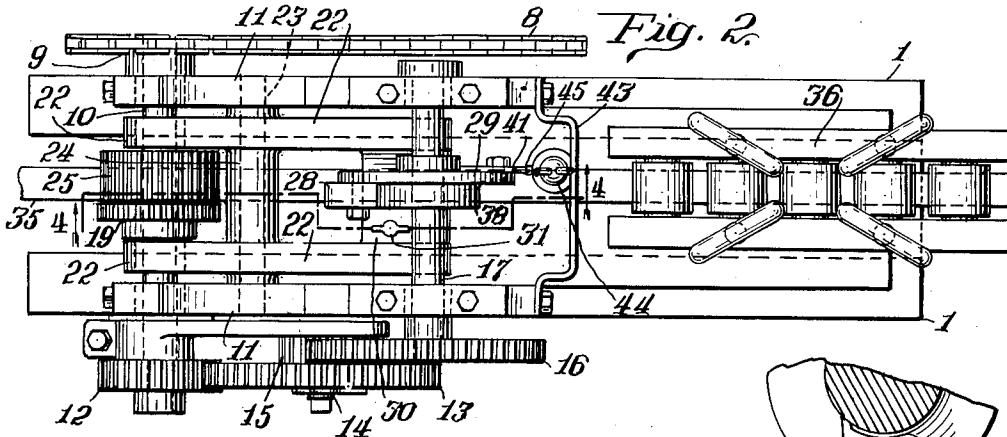
J. N. WOODINGTON

2,265,332

MECHANISM FOR FEEDING STRIP OR ROD STOCK INTO PUNCH PRESSES

Filed July 17, 1939

* 3 Sheets-Sheet 2



Inventor

J. Norman Woodington

Rudolph W. Loeb
Attorney

Dec. 9, 1941.

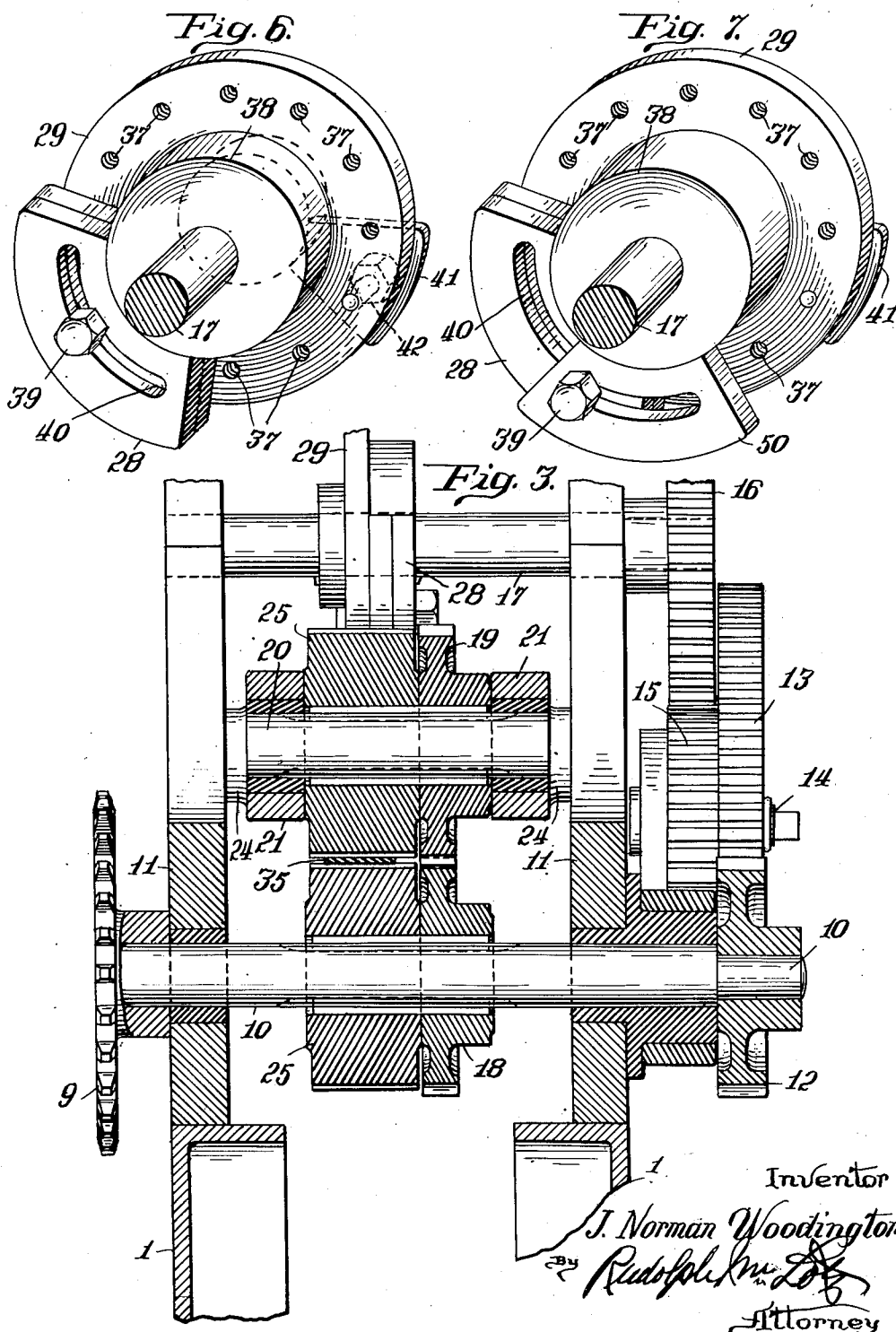
J. N. WOODINGTON

2,265,332

MECHANISM FOR FEEDING STRIP OR ROD STOCK INTO PUNCH PRESSES

Filed July 17, 1939

3 Sheets-Sheet 3



UNITED STATES PATENT OFFICE

2,265,332

MECHANISM FOR FEEDING STRIP OR ROD
STOCK INTO PUNCH PRESSESJohn Norman Woodington, Chicago, Ill., assignor
to Nachman Springfilled Corporation, Chicago,
Ill., a corporation of Illinois

Application July 17, 1939, Serial No. 284,953

4 Claims. (Cl. 164—49)

This invention relates to improvements in a mechanism for feeding strip or rod stock into punch presses in varying lengths and for controlling the operation of the punch press to cause the same to operate only at the end of each feed movement of the mechanism and while the feeding mechanism is idle.

A further object of the invention provides a feed mechanism of the type specified which is driven independently of the punch press so that it may be associated with any type of punch press for the purposes set forth above.

A suitable embodiment of the invention is illustrated in the accompanying drawings, wherein,

Fig. 1 is a side elevation of a punch press feed mechanism constructed in accordance with the invention.

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

Fig. 3 is a vertical transverse sectional view on an enlarged scale taken on the line 3—3 of Fig. 1.

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

Fig. 5 is a fragmentary sectional view, on an enlarged scale, looking through the feed rolls of the mechanism.

Figs. 6 and 7 are perspective views of the cam of the mechanism which controls the length of the stock fed to the punch press and also controls the operation of the latter.

The mechanism of this invention comprises a supporting stand or frame 1 which is mounted upon the floor adjacent the bed of a punch press and which may, of course, be firmly secured to the punch press, if desired, by means of screws 2. Said member 1 includes what may be termed a shelf 3 upon which the motor 4 is mounted, together with the gear casing 5 through which the motor shaft projects and which is suitably geared to a counter shaft 6 carrying a sprocket wheel 7. A sprocket chain 8 gears the sprocket wheel 7 to the sprocket wheel 9 on a shaft 10 mounted in bearings in the side plates 11 of the upper portion of the frame 1 which are spaced apart as shown in Figs. 2 and 3.

Mounted on the shaft 10 is a spur gear wheel 12 which meshes with a spur gear wheel 13 on a shaft 14 which also carries the spur gear wheel 15 which meshes with the spur gear wheel 16 on the shaft 17.

There is also mounted upon the shaft 10 between the side plates 11 a spur gear wheel 18 which meshes with a spur gear wheel 19 on a shaft 20 mounted in bearings 21 carried at the outer end of the arms of a lever 22 which is pivotally supported between its ends upon a cross

pin 23 extending through the bearing 24 integral with the lever 22 and is mounted at its ends in the side plates 11 (see Figs. 2, 3 and 4).

Rigid with the shaft 10 is one of a pair of feed rollers 25, the other of which is rigid with the spur gear wheel 19 on the shaft 20.

Mounted upon the cross pin 26 at the other end of the lever 22 is an antifriction roller 27 which is adapted to be engaged by a cam element 28 carried by a disk 29 mounted upon the shaft 17.

The cross bar 30 at the last-mentioned end portion of the lever 22 is equipped with a threaded opening in which the threaded shank of a set screw 31 is engaged, the latter being equipped between its ends with an annular flange 32 between which and the rigid frame element 33 a compression spring 34 is disposed, the latter acting to maintain the feed rollers 25 in engagement with the material to be fed into the press, shown as a flat metal strip 35 in the instance illustrated.

Disposed behind the side plates 11 on the said frame member 33 is a conventional wire straightening device 36 through which the strip 35 is drawn by the said feed rolls 25 when the latter are maintained in the position shown in Fig. 5.

As shown in Fig. 6, the circular disk 29 mounted on the shaft 17 is equipped with a screw with threaded opening 37 and with a cylindrical hub element 38. Disposed about the hub member 38 is a pair of arcuate cam elements which, in the instance illustrated are disposed with the ends thereof flush with each other and both thereof being held against movement relatively to the disk 29 by means of set-screw 39 extending through arcuate slots 40 in said cam element 28. The latter act in unison as a single cam extensible in length by loosening the set screw 39 and moving one of said cam elements 28 relatively to the other or both relatively to each other and the set screw 39 in a well known manner. The cam elements 28 may be disposed upon any desired part of the disk 29 by changing the set screw to engage in any selected one of the several threaded openings 37.

Also mounted upon said disk 29 against the other face thereof is an adjustable cam 41 equipped with an arcuate slot through which the threaded shank of the set screw 42 projects, said cam 41 being also adjustable arcuately with respect to any selected one of the several openings 37 in which the shank of the set screw 32 may be selectively engaged.

Mounted upon the right hand end of the frame is a cross bar 43 which carries an electric switch

44 which includes a reciprocable operating plunger 45 maintained disposed in the path of the cam 41 by means of a spring within the switch housing. The said switch 44 controls the electric circuit 47 through a solenoid, armature 48 of which is connected with the punch press clutch tripping element or member 49, of conventional type, which causes the operation of the punch press.

As shown in Fig. 7 the cam, such as 28, may include an arcuate element 50 for greater extension of length, if desired, but generally speaking, a pair of cam elements 28 such as are shown in Fig. 6 are ample to feed the longest of stock into the punch press for which the device is adapted.

The operation of the aforesaid mechanism is as follows:

By reference to Fig. 4 it will be noted that the cams 28 are in the same position as that shown in Fig. 6 and when in such position the mechanism is adapted to feed the greatest length of strip 35 into the punch press during each rotation of the disk 29 for which the mechanism is adapted, in the instance illustrated.

When the parts are in the position shown in Fig. 4 the feeding of the strips 35 into the press has been almost concluded and is concluded at the instant that the right hand end of the cam 28 strikes and depresses the rollers 27 to disengage the feed rolls from the strip 35 to interrupt such feeding. At the same instant, or an instant later, preferably, the cam 41 actuates the switch control plunger 45 to close the circuit through the solenoid and thus causes the punch press clutch to be tripped and to operate upon the strip 35 fed into the press, the said punch press operation including the cutting off of strip as a general rule.

While the punch press operation is taking place, the cams 28—41 rotate and after the cam 41 has passed the plunger 45 and cause the circuit through the solenoid to be opened, the left hand end of the cam 28 will pass the roller 27 and thus cause the spring 34 to swing the lever 22 about the pin 23 to cause the upper feed roller 25 to move back to strip feeding position. Feeding of strip 35 now takes place until the cam 28 has again reached the position wherein its right hand end, as shown in Fig. 4, again strikes and depresses the roller 27 to raise the top feed roll 25 and interrupt feed.

By lengthening the cam 28 as hereinbefore described, the amount of stock that is fed into the punch press is decreased in length in direct ratio to the increase in length of said cam 28, it being obvious that in all instances the cam 41 will be so positioned relatively to the right hand end of the cam 28 (shown in Fig. 4) to close the circuit through the solenoid aforesaid, immediately following depression of the roller 27 by said cam 28.

It has been attempted heretofore to operate the feeding mechanism from the punch press mechanism per se, but in instances where any appreciable length of material is to be fed into the press at each punch press operation, such mechanism has proved to be very inefficient and

unsatisfactory. By providing an independently actuated mechanism as above described, the feeding of the lengths successively into the press is accomplished with great efficiency, as is also the punch press operation control means to synchronize with the said mechanism as above particularly pointed out.

I claim as my invention:

1. A strip feed mechanism for a punch press, including a pair of strip engaging rolls, a spring for maintaining the same in engagement with a strip to be fed to the press, a cam operatively associated with said rolls for effecting separation thereof against the action of said spring during predetermined intervals, means on said cam for controlling the duration of each of said intervals, a source of power common to said rolls and said cam operating means independent of the power actuation of said press, means on the latter for controlling the operations thereof, and means on said cam for actuating said press control means during intervals of separation of said feed rolls.

2. A strip feed mechanism for a punch press, including a pair of strip engaging rolls, a spring for maintaining the same in engagement with a strip to be fed to the press, a cam operatively associated with said rolls for effecting separation thereof against the action of said spring during predetermined intervals, means on said cam for controlling the duration of each of said intervals, a source of power common to said rolls and said cam for actuating them independently of the power actuation of said press, means on the latter for controlling the operations thereof, and adjustable means on said cam for actuating said press control means during intervals of separation of said feed rolls.

3. A strip feed mechanism for a punch press, including a pair of strip engaging rolls, a spring for maintaining the same in engagement with a strip to be fed to the press, a rotatable member equipped with adjustable means for effecting separation of said rolls and controlling duration of said separation thereof against the action of said spring, a source of power common to said rolls and said cam operating means independent of the power actuation of said press, means on the latter for controlling the operations thereof, and means on said cam for actuating said press control means during intervals of separation of said feed rolls.

4. A strip feed mechanism for a punch press, including a pair of strip engaging rolls, a spring for maintaining the same in engagement with a strip to be fed to the press, a rotatable member equipped with adjustable means for effecting separation of said rolls and controlling duration of said separation thereof against the action of said spring, a source of power common to said rolls and said cam operating means independent of the power actuation of said press, means on the latter for controlling the operations thereof and adjustable means on said cam for actuating said press control means during intervals of separation of said feed rolls.

J. NORMAN WOODINGTON.