

(No Model.)

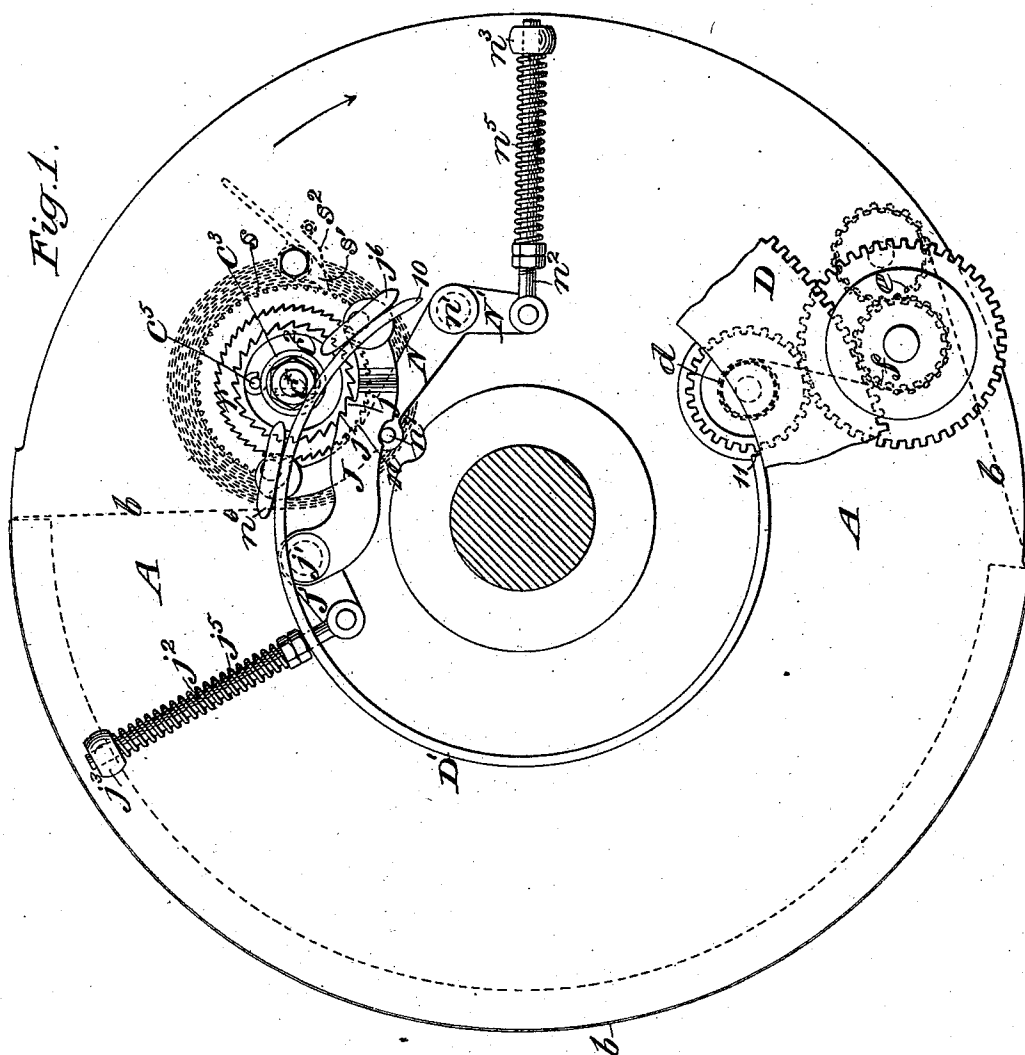
2 Sheets—Sheet 1.

E. H. COTTRELL.

OFFSET MECHANISM FOR PRINTING MACHINES.

No. 527,774.

Patented Oct. 23, 1894.



Witnesses:
O. Lundgren
George Barry.

Inventor:
Edgar H. Cottrell
by attorneys
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(No Model.)

2 Sheets—Sheet 2.

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Fig. 2.

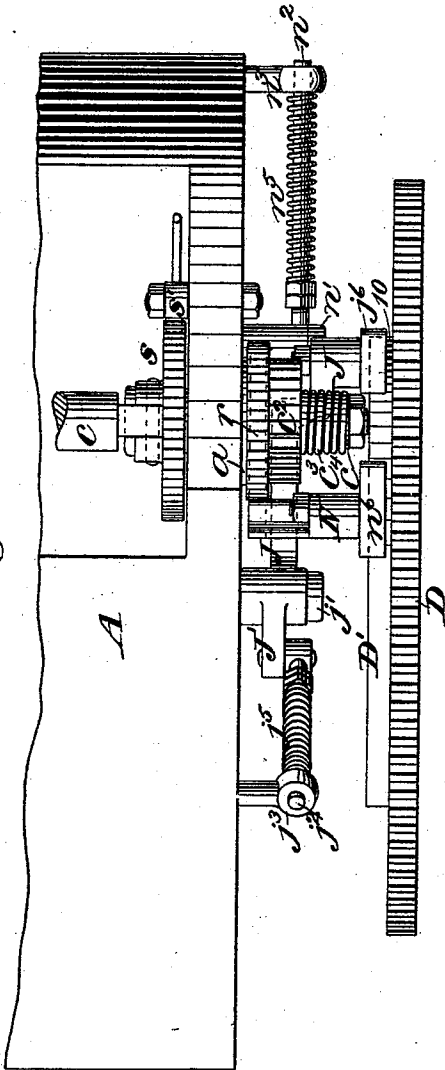


Fig. 4.

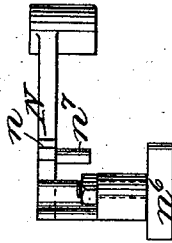


Fig. 5.

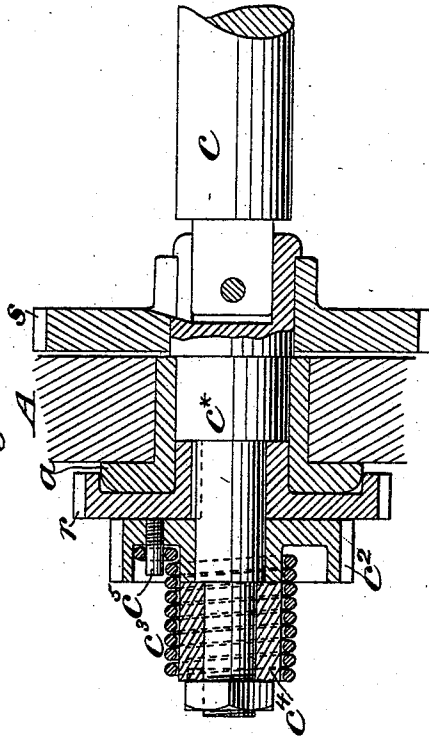
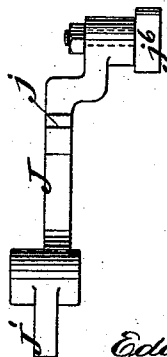


Fig. 3.



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UNITED STATES PATENT OFFICE.

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OFFSET MECHANISM FOR PRINTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 527,774, dated October 23, 1894.

Application filed January 31, 1894. Serial No. 498,593. (No model.)

To all whom it may concern:

Be it known that I, EDGAR H. COTTRELL, of Stonington, in the county of New London and State of Connecticut, have invented a new and useful Improvement in Offset Mechanism for Printing-Machines, of which the following is a specification.

This invention relates to mechanism for automatically shifting the tympan on the impression cylinder of a printing machine while the machine is in operation, such mechanism consisting principally of a supply-roller and feed and take-up rollers arranged within the impression cylinder and means for producing the necessary movements of the feed and take-up rollers and for permitting, controlling and stopping the movements of the supply-roller. In such mechanism as heretofore constructed, a ratchet-wheel and pawl have been employed for locking the supply-roller during the intervals between the shiftings of the tympan, the said ratchet-wheel having been loose on one of the journals of the supply-roller and a spring having been interposed between the said ratchet-wheel and journal for the purpose of producing a tension on the tympan after the ratchet-wheel is locked by the pawl. An example of such mechanism is illustrated in Patent No. 467,637, dated January 26, 1892.

The spring hereinabove mentioned is more or less effective in producing tension on the tympan according as there is a less or greater length or quantity of tympan upon the roller and the consequence is that when there is a less quantity of tympan on the said roller, the tension of the spring is apt to overcome the resistance of that roller and draw back the tympan on to the supply-roller during the operation of printing, and when there is a greater quantity of tympan on the said roller, the drag of the impression will at times draw the tympan away from the supply-roller. Although the irregularity of action of the said spring is very slight, it is desirable to overcome the effect of it, and to accomplish this is the object of the present improvement which I will now proceed to describe with reference to the accompanying drawings and the novelty of which I will afterward point out in claims.

Figure 1 represents an end view of an impression cylinder and of parts attached and

contiguous thereto necessary to illustrate my invention. Fig. 2 is a plan view of one end of the cylinder and attached and adjacent parts, corresponding with Fig. 1. Figs. 3 and 4 are top views of some of the details of Fig. 2 which are partly obscured in that figure. Fig. 5 represents a longitudinal view, on a larger scale than Figs. 1 and 2, of one end of the supply-roller and its journal and a section of the ratchet-wheel and spring hereinbefore referred to, and of certain parts constituting my invention in connection with said ratchet-wheel and spring.

Similar letters and numerals of reference designate corresponding parts in all the figures.

A is the impression cylinder and *b* the tympan.

c is the supply-roller the journal *c** of which is represented in Fig. 5 as fitted to a bearing *a* in the end of the cylinder A, the roller *c* itself being made removable from said journal for the purpose of putting on a new tympan.

d is the take-up roller and *e f* are the feed rollers.

c² is a ratchet-wheel loose on the supply-roller journal *c**.

J J' is a locking pawl consisting of a lever which is pivoted at *j'* to the cylinder. The form of this lever is shown in Figs. 1 and 3, the latter being a top view of it. The arm J of the said lever has teeth *j j* which engage with the said ratchet-wheel, the said teeth and those of the ratchet-wheel *c²* being set in a direction to hold the supply roller against any tendency to unwind the tympan. Between the said ratchet-wheel and the said journal *c** there is interposed a spring *c³*, the said spring having one end secured to a collar *c⁴* (see Fig. 5) fast on the journal and the other end secured to the said ratchet-wheel by a pin *c⁵* and being so coiled that when the said ratchet wheel is locked by the teeth *j j* of the pawl J J', the spring will tend to turn the journal in a direction to wind or hold back the tympan on the supply-roller *c*, and the said ratchet-wheel and the pawl lever will constitute a yielding stop to the tympan. The arm J' of the said lever J J' has connected with it a rod *j²* which passes through a guide *j³* on the cylinder and to which is applied a

coiled spring j^5 which operates to press the lever into engagement with the ratchet-wheel c^2 . The arm J of the pawl lever J J' has pivoted to its outer end a switch-piece j^6 which is capable of running against either the inner or the outer periphery of a stationary interrupted circular track D' which projects from the stationary gear D through which the feed and take-up rollers derive motion, the said track being concentric with said gear and with the cylinder. When the switch-piece j^6 is on the outer periphery of the track D' as shown in Fig. 1, the pawl lever is in engagement with the ratchet-wheel c^2 and when the said switch-piece is against the inner surface of the track D', the pawl lever is held positively out of engagement with the ratchet-wheel. The said ratchet-wheel, spring, locking pawl and circular track are like the corresponding parts described in Patent No. 467,637, hereinbefore referred to.

r is a second ratchet-wheel provided on the supply-roller journal c^* outside of the cylinder. This ratchet-wheel has its teeth set in the same direction as those of the ratchet-wheel c^2 , but instead of being loose on the said journal, is fast upon it.

N N' designate a pawl lever pivoted to the cylinder at n^7 . This lever is shown in Figs. 1 and 4, the latter being a top view of it. The said lever has on its arm N, teeth $n n$ for engaging with the ratchet-wheel r and acting thereon as a positive stop to prevent the turning of the supply roller in a direction to unwind the tympan. The arm N' of the said pawl lever has attached to it a rod n^2 which passes through a guide n^3 on the cylinder and to which is applied a coiled spring n^5 for the purpose of forcing the pawl teeth $n n$ into engagement with the ratchet-wheel r . At the end of the arm N is pivoted a switch-piece n^6 like that j^6 hereinbefore described, which is capable of running either on the inside or on the outside of the track D', the pawl teeth $n n$ being engaged with the ratchet-wheel r when the switch-piece n^6 is on the outside of the track D' and being held positively out of engagement with the said wheel when the said switch-piece is inside the said track. The arm N has on its outer side a stud or projection n^7 which projects at the back of the arm J of the pawl lever J J'.

s is a ratchet-wheel fast on the supply roller journal c^* inside of the cylinder. This ratchet-wheel has its teeth set in the opposite direction to the teeth of c^2 and r , and it has applied to it a pawl s' which is held in engagement with it by a spring s^2 .

As the feed and take-up mechanism to be employed in connection with the present invention may be of any suitable kind no further description of it is necessary, but it may be mentioned that it may be the same as that described in Patent No. 467,637.

In carrying out this invention any suitable means may be employed for the purpose of throwing the switch-piece j^6 to the inside of

the circular track at the proper times for disengaging the pawl lever J J' from the ratchet-wheel c^2 and liberating the supply-roller preparatory to the shifting of the tympan and for re-engaging the said pawl lever with the said ratchet-wheel for stopping the said roller after the shifting, but I propose generally to employ for these purposes the mechanism which is fully illustrated and described in Letters Patent No. 467,637 hereinbefore mentioned and which therefore need not be herein described. No additional or other mechanism beyond that is required to operate the pawl lever N N', that lever being operated by or through the pawl lever J J' as I will now proceed to describe.

The cylinder rotating in the direction of the arrow shown upon it in Fig. 1, I will first suppose the switch-pieces j^6 and n^6 of the two pawl levers to be running on the outside of the circular track D' as they will continue to do, keeping both ratchet-wheels c^2 and r engaged, until the time arrives for shifting the tympan, when the pawl levers J J' and N N' will be automatically disengaged from the ratchet-wheels c^2 and r , the said disengagement being permitted by the opening 10, 11, in the track which allows the switch-pieces j^6 and n^6 to enter and run on the interior of said track. The pawl lever J J' is disengaged by the same means described in Patent No. 467,637, but that disengagement does not occur until the switch-piece n^6 of the pawl lever N N' has passed the point 10 of the opening in the track and leaves the latter lever also free to be disengaged at the same time by the action of J J' on its projection n^7 . While the switch-pieces j^6 , n^6 remain inside the track, the ratchet-wheels c^2 and r remain free and the turning of the supply-roller c is permitted while the feed and take-up rollers operate to shift the tympan, but just before the shifting of the tympan is completed the switch piece j^6 running on the inside of the track D' passes the point 10 and permits the spring j^5 to produce automatically the re-engagement of the pawl lever J J' with the loose ratchet-wheel c^2 . A short interval of time then elapses before the switch-piece n^6 passes the point 10 and permits the spring n^5 to produce automatically the re-engagement of the pawl lever N N' with the fast ratchet-wheel r and positively lock the supply-roller. The stoppage of the feed and take-up occurs during this interval but during the first part of the interval and before this stoppage occurs, the draft produced on the tympan causes the supply-roller to wind up the spring c^3 between the loose ratchet-wheel c^2 and the supply-roller. This winding up of the spring gives it a tension which, while it permits a slight further movement of the supply-roller, so holds back the said roller as to produce and maintain a tension on the tympan until the said roller is positively locked by the pawl lever N N' engaging the ratchet-wheel r . The said spring c^3 besides thus giving a necessary tension to

the tympan, prevents any tendency to tear the tympan which would be unavoidable in case only a positive stop should be provided for the supply-roller; yet owing to the impracticability of giving a spring the varying tension which would be necessary, its being on the one hand so powerful as to overcome the function of the take-up roller and pulling back the tympan and on the other hand not being strong enough to resist the tendency of the drag of the impression to unwind the tympan, it is necessary to have positive stops acting both ways on the supply-roller. The ratchet-wheel *s* and the pawl *s'* which is always in engagement with it, constitute the positive stop against the spring pulling the tympan back from the feed roller and the ratchet-wheel *r* and pawl lever *N N'* constitute the positive stop to resist the tendency of the drag of the impression to unwind the tympan.

What I claim as my invention is—

1. The combination with the impression cylinder and a tympan supply roller therein, of a yielding stop applied to said supply roller to control the letting off of the tympan therefrom and a positive stop to stop such letting off, substantially as herein set forth.

2. The combination with the impression cylinder and a tympan supply roller therein, of two ratchet-wheels one fast and the other loose on said roller and both having their teeth set in one direction, a spring applied between said loose ratchet-wheel and said roller, pawls one for each ratchet-wheel attached to said cylinder, and means for automatically engaging said pawls with and disengaging them from said ratchet-wheels by the revolution of the cylinder, substantially as herein set forth.

3. The combination with the impression cylinder and a tympan supply roller therein, of two ratchet-wheels one fast and the other loose upon said roller and having their teeth set in opposite directions, a pawl attached to

said cylinder for engaging with said loose ratchet-wheel, a pawl attached to said cylinder in permanent engagement with the fast ratchet-wheel, a spring between said loose ratchet-wheel and the said roller, and means for automatically engaging its respective pawl with and disengaging it from said loose ratchet-wheel by the revolution of the cylinder, substantially as herein set forth.

4. The combination with the impression cylinder and a tympan supply roller therein, of two ratchet-wheels one fast and the other loose on said roller and both having their teeth set in the same direction, a spring between said loose ratchet-wheel and said roller, a third ratchet-wheel on said roller having its teeth set in the opposite direction, pawls attached to the cylinder for engagement with said two ratchet-wheels having their teeth set in the same direction, a pawl attached to said cylinder for permanent engagement with said ratchet-wheel having its teeth set in the opposite direction, and means for automatically engaging their respective pawls with and disengaging them from said first mentioned two ratchet-wheels by the revolution of the cylinder, substantially as herein set forth.

5. The combination with the impression cylinder and a tympan supply-roller therein, of a ratchet-wheel loose on said roller and a ratchet-wheel fast on said roller both having their teeth set in one direction, a spring between said loose ratchet-wheel and said roller, two pawls one for each ratchet-wheel pivoted to the cylinder, a stationary interrupted circular track concentric with the cylinder, and switch-pieces attached to said pawls for running outside and inside of said track for maintaining the engagement of said pawls with said ratchet-wheels and their disengagement therefrom, substantially as herein set forth.

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Witnesses:

A. R. STILLMAN,
B. FRANK LAKE.