

H. C. GAMMETER.  
 RIBBON FEEDING MECHANISM.  
 APPLICATION FILED JAN. 27, 1906.

997,286.

Patented July 11, 1911.

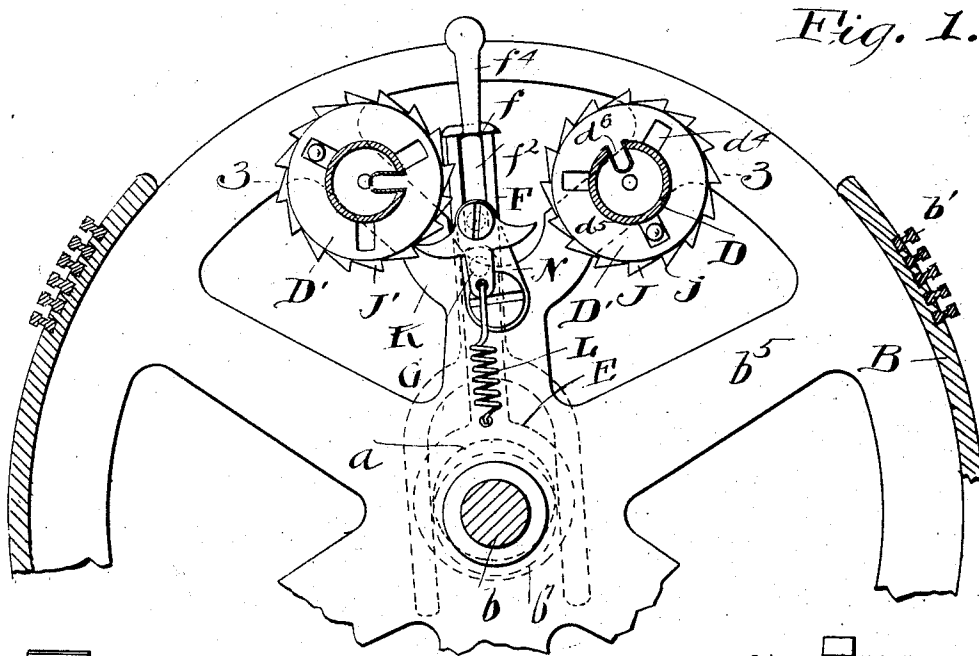


Fig. 1.

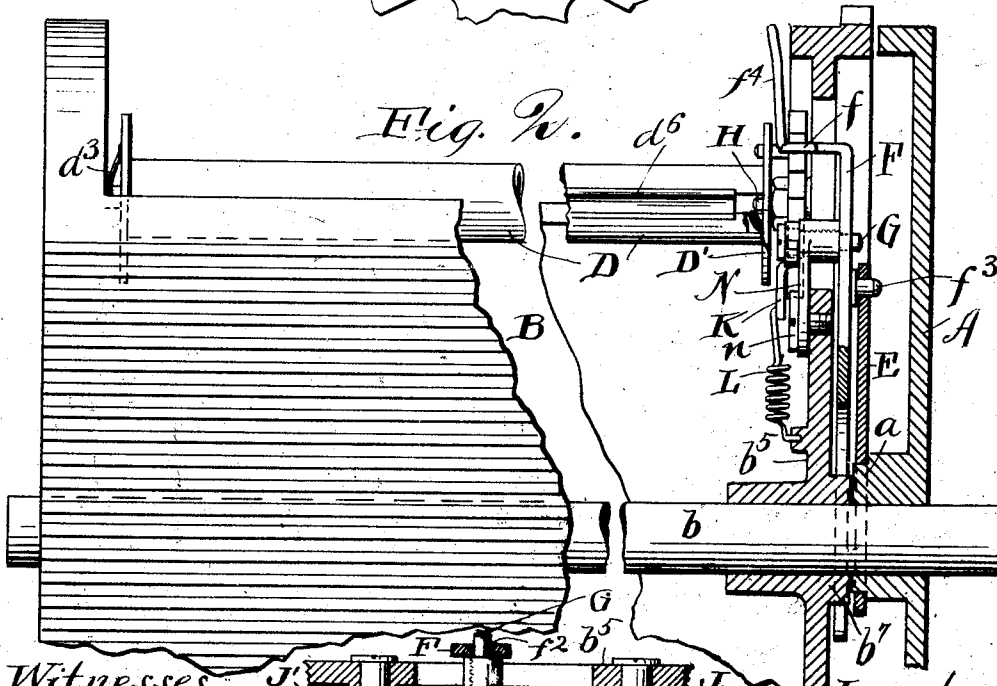


Fig. 2.

Witnesses:  
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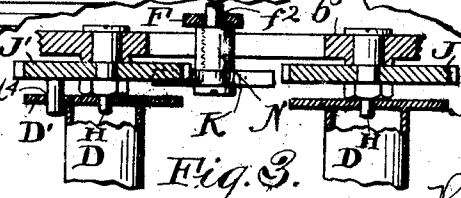


Fig. 3.

Inventor:  
 Harry C. Gammeter,  
 By his Attorneys,  
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# UNITED STATES PATENT OFFICE.

HARRY C. GAMMETER, OF CLEVELAND, OHIO, ASSIGNOR TO THE AMERICAN MULTI-GRAPH COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

## RIBBON-FEEDING MECHANISM.

997,286.

Specification of Letters Patent. Patented July 11, 1911.

Application filed January 27, 1906. Serial No. 298,122.

To all whom it may concern:

Be it known that I, HARRY C. GAMMETER, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Ribbon-Feeding Mechanism, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

The object of this invention is to provide a simple and efficient mechanism for feeding the inking ribbon of rotary printing machines so as to present a fresh portion of the ribbon to the printing surface.

The invention is particularly adapted to printing mechanisms of the type shown in my Patent No. 722,404 and my application No. 196,840, wherein there is a rotatable drum having on its surface longitudinal type holders by which individual type are adapted to be carried. The ribbon passes around the drum and has its ends secured to a pair of spools set into a recess in the drum.

The mechanism constituting this invention, which is hereinafter more fully described and definitely set out in the claims, operates automatically to rotate one spool or the other to wind in the ribbon,—the mechanism being conveniently shifted when either spool becomes empty to change the direction of winding.

The drawings clearly illustrate my invention.

Figure 1 is a vertical section through a printing drum of the character shown in my said patent and application, looking toward the right. Fig. 2 is a front elevation of such drum partly broken away. Fig. 3 is a section through the studs supporting the spools, being substantially on the line 3—3 of Fig. 1.

As shown in the drawings, A represents a frame standard. Journaled in this and another standard (not shown) is a shaft *b* on which is mounted a drum B. On this drum are longitudinal rails *b'* which provide channels between them adapted to carry the type. Within a recess in the drums are mounted a pair of spools D and D', which carry the ribbon which is passed around the

drum from one spool to the other. The drum is rotated by suitable means and thereby prints on paper drawn between it and a suitable impression platen—not shown.

The spools D and D' are journaled at one end on studs H mounted in the end member *b<sup>s</sup>* of the printing drum B. Springs *d<sup>s</sup>* bearing against the other ends of the spools normally maintain them in such position, but either spool may be removed by pressing it to the left sufficiently to release its connection with its stud H. Journaled on the studs H are ratchet wheels J and J', each of which carries a pin *j* adapted to occupy one of the openings *d<sup>a</sup>* in the flange *d<sup>s</sup>* of the spool, whereby the ratchet may drive the spool. Either ratchet is adapted to be engaged and rotated to wind up the corresponding spool D and D',—the other spool being free to unwind. The body of each spool is shown as a metal tube, the ribbon being secured to it by means of a sheet metal channel shaped member *d<sup>o</sup>*, which is sprung into a longitudinal slot in the spool, biting the ribbon between it and the spool.

The mechanism for rotating the ratchet wheels comprises an eccentric strap E mounted on a stationary eccentric *a* carried by the frame member A, the shaft *b* of the drum passing through this eccentric. This eccentric strap connects with the slidable bar F, which is bent over to pass through an opening in the end member of the drum and present a double-faced pawl *f*, which is adapted to engage with either ratchet according to the position of the bar. A stud *f<sup>o</sup>* on the bar extends into an opening in the eccentric strap. The bar F is forked at its lower end, the fork passing around a boss *b<sup>r</sup>* on the hub of the drum. A slot *f<sup>o</sup>* is formed in the bar in which takes a pin G. The bar being guided by its fork and slot is caused to reciprocate toward and from the shaft *b* as the drum rotates to partially rotate one or the other spool, the eccentric giving the driving action.

The broad idea of driving the spool ratchets on the drum by a strap extending around a stationary eccentric is shown, described

and claimed in my prior application Serial No. 240,167. The present invention is concerned principally with the mechanism for conveying motion from the strap to the ratchets, with the detent mechanism and with the shifting arrangement.

The guiding pin G is carried by an arm N which is pivoted by a screw *n* to a spider *b*<sup>5</sup> of the drum. The pin G is screwed into this arm N and projects beyond the same. Journaled on the pin between its head and the arm is a double-faced detent pawl K. This pawl has an arm extending toward the shaft *b*, and secured to this arm and to the spider *b*<sup>5</sup> is a spring L under tension. The result of the construction described is that the tension of the spring holds the detent pawl in engagement with one ratchet or the other and thereby holds the pin G in position to guide the bar F so that its pawl *f* engages the teeth of the same ratchet. The bar F has a portion *f*<sup>1</sup> extending upward, as a handle, from the pawl *f*. By means of this handle, the bar may be shifted into cooperation with the other ratchet, the spring extending sufficiently to allow the pin G to swing past the dead center around the pivot of the arm N as a center, into the corresponding position on the opposite side of the plane passing through that pivot and the anchor of the spring. The engagement of the other tooth of the detent pawl K defines the position of the bar in this direction and holds it so that, as it reciprocates, it cooperates with the ratchet wheel on this side.

It will be seen that a very simple mechanism is thus provided, which causes the intermittent rotation of one ribbon spool as long as desired, and then a simple pressure on the handle *f*<sup>1</sup> shifts the mechanism to wind the ribbon onto the other spool. The parts are so proportioned that the pawl *f* is performing its effective action in turning a ratchet wheel, while the recess in the printing drum which contains the spools, is moving past the impression platen (not shown) with which the drum cooperates. While the printing impression is being made, the bar is moving either away from the ratchet or idly toward it, taking up clearance allowed for this purpose.

Having thus described my invention, I claim:

1. In a ribbon feeding mechanism, the combination of a movable printing member, a pair of spools mounted therein and adapted to carry the ribbon, a ratchet for driving one of said spools, a suitably guided bar carrying a pawl adapted to engage such ratchet, an eccentric, and an eccentric strap therefor connected with said bar.

2. In a ribbon feeding mechanism, the combination of a rotatable drum, a pair of spools mounted therein, a pair of ratchets

connected with said spools respectively, a bar guided to reciprocate toward or from the axis of the drum, an eccentric, an eccentric strap surrounding the same and connected with said bar, and means for shifting said bar so that a pawl carried thereby may engage either ratchet.

3. In a ribbon feeding mechanism, the combination of a rotatable drum, a pair of spools mounted therein and adapted to carry the ribbon, wheels on said spools, a bar mounted on the drum and guided to reciprocate toward or from the axis of the drum, means for causing such reciprocation as the drum rotates, and a pawl carried by said bar and adapted to engage either wheel.

4. In a ribbon feeding mechanism, the combination of a pair of spools adapted to carry the ribbon, wheels connected with the respective spools for driving them, a reciprocable bar having two guides one of which is movable, a spring tending to move said movable guide into an extreme position, a pawl on the bar adapted to engage the wheel corresponding to the position of said movable guide, and a movable member carrying the two spools and the movable guide.

5. In a ribbon feeding mechanism, the combination of a rotatable drum, a pair of ribbon spools mounted therein, wheels on said spools respectively, a bar mounted on the drum, a pivoted arm, means carried thereby and engaging the bar to guide it, a spring acting on said arm to hold it in an extreme position, a detent pawl carried by said arm adapted to engage the corresponding wheel according to the position of the arm, and means carried by said bar for driving either wheel.

6. The combination of a rotatable drum, a pair of ribbon spools mounted therein, a ratchet wheel for each spool, a bar mounted on the drum and guided by forking around the shaft of the drum, a pivoted arm, and a pin carried thereby and engaging a slot in the bar, said bar carrying means for engaging either ratchet.

7. The combination with a movable type-holding member, of a pair of ribbon spools mounted thereon, a wheel for each spool, a bar, means for reciprocating it, a pivoted arm, a pin carried thereby and engaging a slot in the bar, said bar carrying means for engaging either wheel, and a handle on said bar for shifting it.

8. The combination of a rotatable drum, a pair of ribbon spools mounted therein, a ratchet wheel for each spool, a bar mounted on the drum, a pivoted arm, a pin carried thereby and engaging a slot in the bar, said bar carrying means for engaging either ratchet, and a double-faced detent pawl mounted on said pin and adapted to engage either ratchet.

9. The combination with means for carrying an assembled form of type, of a pair of ribbon spools, ratchet wheels therefor, reciprocable mechanism for driving them, a pivoted arm adapted to guide said mechanism, a double-faced detent pawl mounted on said arm and adapted to engage either ratchet, and a spring connected with the detent pawl and serving to hold the detent pawl in engagement with its ratchet.
10. The combination of a rotatable drum, a pair of ribbon spools mounted therein and adapted to carry the ribbon, a ratchet wheel on each spool, a bar mounted on the drum and guided by forking around the shaft of the drum, a pivoted arm, a pin carried thereby and engaging a slot in the bar, said bar carrying means for engaging either ratchet, and a double-faced detent pawl mounted on said pin and adapted to engage either ratchet, and a spring connecting the detent pawl and drum, serving to hold the detent pawl in engagement with its ratchet and the guiding pin in an extreme position.
11. In a ribbon feeding mechanism, the combination with means for carrying an assembled form of type, of a pair of spools adapted to carry the ribbon, a ratchet for driving one of said spools, a bar carrying a pawl for operating said ratchet, an eccentric, an eccentric strap surrounding the same and pivotally connected with said bar, and movable means carrying the spools, ratchet and bar.
12. The combination of a movable printing member, a pair of spools mounted therein, an eccentric, an eccentric strap, a slidable bar mounted on said member and operated by said eccentric strap to rotate one of said spools, and means for shifting said bar from one spool to the other.
13. In a ribbon feeding mechanism, the combination of a rotatable drum having a recess, a pair of spools mounted in said recess and adapted to carry the ends of the ribbon and means for feeding said ribbon in either direction, said means comprising ratchets on the spools, means for engaging them, a radial bar mounted on the end member of the drum and adapted to move the last mentioned means in and out, and a spring for holding said last mentioned means in position to engage the corresponding ratchet teeth.
14. In a ribbon feeding mechanism, the combination of a rotatable drum having a recess and having an end member, spools mounted in said recess, a stationary eccentric beyond the end member and located around the axis of said drum, an eccentric strap surrounding said eccentric, a movable bar on the outer side of the end member connected with said strap, said bar passing through an opening in the end member and carrying a pawl on the inner side of the end member, and a wheel connected with one of the spools which is adapted to be engaged by said pawl.
15. The combination of a rotatable drum, a pair of spools mounted therein and adapted to carry the ribbon, a pair of ratchet wheels for said spools, a radial bar, means carried thereby adapted to engage the teeth of either ratchet, an eccentric, and connecting mechanism between the same and said bar adapted to operate the bar as the drum rotates.
16. The combination of a movable type-holding member, a shiftable bar carried thereby, a stationary eccentric, an eccentric strap surrounding the same and connected with said bar, a pair of ratchet wheels, a pair of spools adapted to be driven thereby respectively, means on the bar to engage either wheel according to the position of the bar, a guiding arm for the bar, a double-faced detent pawl carried by the arm, and a spring performing the double service of holding the arm in position and the detent pawl in engagement with the corresponding ratchet.
17. The combination of a movable type-carrying member, a pair of spools mounted therein, a pair of ratchets connected with the spools respectively, mechanism for operating either ratchet, detent mechanism for holding either ratchet, and a single spring adapted to hold the operating mechanism in the path of either ratchet and the detent engaging the corresponding ratchet.
18. The combination of a movable type-carrying member, a pair of ribbon spools mounted therein, a pair of ratchets for said spools respectively and means for operating either ratchet comprising a shiftable bar having at one end a guide yoke, at the other an operative handle, and intermediately a pair of pawl shoulders.
19. The combination of a movable type-carrying member, a pair of ribbon spools mounted therein, a pair of ratchets for said spools respectively and means for operating either ratchet comprising a shiftable bar having at one end a guide yoke, at the other an operative handle and intermediately a pair of pawl shoulders, a stationary eccentric, a strap surrounding the same and pivotally connected with said bar, a shiftable arm, and means carried thereby having a sliding connection with said bar.
20. The combination of a rotatable drum, a pair of ribbon spools carried thereby, ratchet wheels connected with said spools respectively, a shiftable mechanism adapted to be positioned to engage either ratchet, a radial member carrying such mechanism, means for guiding said member, and an eccentric strap for operating said member.

21. The combination of a type-carrying member a pair of spools carried thereby and each comprising a hollow tube, a spring channel-shaped member adapted to seat in an opening in the tube to clamp the end of the ribbon thereto, a pair of ratchet wheels adapted to be connected with said spools respectively, a bar slidably guided on the drum at one end and having a slot, an arm carrying a pin occupying said slot, a spring tending to hold said arm in either extreme position, a stationary eccentric, and an eccentric strap connected with said bar.
22. The combination of a rotatable drum, a pair of ratchet wheels carried thereby, a bar mounted on the drum, a pivoted arm, said bar and arm having a slidable engagement, means carried by the bar for engaging either ratchet, a double-faced detent pawl mounted on said arm, and a spring acting on said pawl.
23. The combination of a movable printing member, a pair of spools mounted therein, an eccentric, an eccentric strap, a slidable bar mounted on said member and operated by said eccentric strap to rotate one of said spools, a movable arm for guiding said bar, detent mechanism mounted on the arm, and a spring acting on the detent mechanism.
24. The combination of a rotatable type-carrying drum, a pair of spools mounted in a recess therein, a stationary eccentric, an eccentric strap, a slidable bar mounted on the drum and operated by said eccentric strap to rotate either spool, means for shifting said bar from one spool to the other, detent mechanism for the two spools, and a spring operating co-jointly to hold the bar in either of its active positions and to hold the detent mechanism in cooperation with the corresponding spool.
25. The combination of a pair of spools, a pair of ratchets for driving them respectively, driving and detent pawls therefor, driving mechanism for the driving pawls, a single spring for holding the driving and detent pawls in cooperation with either ratchet, a movable printing member on which the parts mentioned are mounted, and means for automatically moving the driving mechanism as the printing member moves.
26. The combination of a pair of spools, a pair of ratchet wheels for driving them, a reciprocating bar carrying means adapted to engage either ratchet, a double faced detent adapted to engage either ratchet, a movable printing member on which all of such parts are mounted and means for shifting said bar and detent.
27. The combination with means for carrying a page form for printing, of a pair of spools, a pair of ratchet wheels for driving them respectively, a reciprocating member adapted to engage either ratchet, a shiftable arm, a double faced detent mounted on said arm, and a single spring acting on said detent.
28. The combination with a movable printing member of a pair of spools mounted thereon, a pair of ratchet wheels for driving them respectively, an eccentric, a bar driven thereby, means carried by the bar adapted to engage either ratchet, and a spring adapted to hold the same in engagement therewith.
29. The combination of a pair of spools, driving and detent mechanism therefor, a single spring for both, a movable printing member on which the parts mentioned are mounted, and means for automatically moving the driving mechanism as the printing member moves.
30. The combination of a movable printing member, a pair of ratchet wheels mounted thereon, driving and detent mechanism therefor, and a handle for simultaneously shifting both the driving and detent mechanisms out of engagement with one ratchet and into engagement with the other.
31. The combination with means for carrying an assembled form of type of a shiftable bar, a pair of ratchet wheels, a pair of spools driven thereby, means on the bar to engage either wheel according to the position of the bar, a guiding arm for the bar, a double-faced detent pawl, and a spring performing the double service of holding the arm in position and the detent pawl in engagement with the corresponding ratchet.
32. The combination with means for carrying a page form for printing of a pair of spools, a pair of ratchets connected with the spools respectively, mechanism for operating either ratchet comprising a movable bar and pawls carried thereby, detent mechanism for holding either ratchet, a support for the detent mechanism, a guide for the bar carried by the support for the detent mechanism, and a single spring adapted to hold the operating mechanism in the path of either ratchet.
33. The combination with means for carrying an assembled form of type, of a pair of ribbon spools, a pair of ratchets for said spools respectively, and means for operating either ratchet comprising a shiftable bar having near one end a guiding portion, at the other an operating handle, intermediately a pair of pawl shoulders, and a movable guide for the intermediate portion of the bar.
34. The combination of a pair of ratchet wheels, a driving bar, a pivoted arm, said bar and arm having a slidable engagement, means carried by the bar for engaging either ratchet, a double-faced detent pawl mounted on said arm, a spring acting on

- said pawl, and a movable printing member on which all of said parts are mounted.
35. The combination of a rotary drum, a pair of spools mounted thereon, an eccentric, and eccentric strap, a slidable bar operated by said eccentric strap to rotate one of said spools, a movable arm for guiding said bar, detent mechanism mounted on the arm, and a spring acting on the detent mechanism and holding both it and the bar in position.
36. The combination of a rotatable drum, a pair of spools mounted therein, means for feeding said spools, said means comprising ratchets on the spools and shoulders for engaging them, a reciprocating bar for moving such shoulders, a stationary eccentric member, and means connecting with said said bar.
37. The combination of a rotatable drum, a pair of spools mounted therein and adapted to carry the ribbon, a pair of ratchet wheels for said spools, a shiftable bar having means adapted to engage the teeth of either ratchet, a stationary eccentric driver and means carried around by the drum in contact with said driver and adapted to operate the bar as the drum rotates.
38. The combination of a spool, a ratchet for rotating it, a driving member for the ratchet, means for operating the driving member, a detent for the ratchet, a spring holding both the driving member and the detent in position, a movable printing member on which the parts mentioned are mounted, and means for automatically moving the driving mechanism as the printing member moves.
39. A rotatable drum adapted to carry a printing surface, a pair of ribbon spools carried thereby, a pair of ratchets carried by the drum for driving said spools respectively, a reciprocating bar mounted on the drum, means carried by the bar for operating one or the other ratchet, a stationary eccentric member, and a driving connection between said member and said bar.
40. The combination of a rotatable drum adapted to carry a printing surface, a pair of ribbon spools carried thereby, a pair of ratchets carried by the drum for driving said spools respectively, a reciprocating bar mounted on the drum and yoking around the shaft thereof and guided at another point, and means for driving the bar as the drum rotates.
41. The combination of a pair of ratchet wheels, a slidably guided reciprocating bar, means carried thereby for operating either wheel, a movable printing member carrying the parts mentioned, a stationary eccentric member, and connecting mechanism between the same and said bar.
42. The combination of a rotatable drum, a pair of ratchet wheels carried thereby, a radial bar slidably mounted on an end member of the drum, a stationary eccentric, an eccentric strap surrounding the same and pivoted to said bar for reciprocating said bar as the drum rotates, and means moved by the bar for driving one of the ratchet wheels.
43. The combination of a printing member mounted to turn on an axis, a ratchet wheel carried thereby, a radial bar slidably mounted on said member, a stationary driver, a member for engagement therewith pivoted to the bar for moving said bar as the member turns, and means moved by the bar for driving said ratchet.
44. The combination of a movable type-carrying member, a pair of spools mounted therein, a pair of ratchets connected with the spools respectively, mechanism for operating either ratchet, comprising means carried by a movable bar which is slidably guided near its opposite ends, and means for automatically moving the bar as the type-carrying member moves.
45. The combination of a movable printing member, a pair of spools mounted therein, an eccentric, an eccentric strap, a slidable bar mounted on said member and operated by said eccentric strap, and means carried by the bar and shiftable to drive one spool or the other as desired.
46. The combination of a movable printing member, a pair of spools mounted thereon, a pair of ratchet wheels for driving the same, an eccentric member, a slidable bar mounted on the printing member, a driving connection from the eccentric member to said bar, and pawls carried by the bar and shiftable to present one to one ratchet and the other to the other ratchet, as desired.
47. The combination of a rotary printing member, a shaft on which the same is mounted, a pair of ratchet wheels carried by said member, a pair of driving pawls between the wheels, mechanism carrying the pawls and shiftable to present one pawl to one wheel or the other pawl to the other wheel and including a bar yoking around the shaft of the printing member, and means for reciprocating said bar.
48. The combination of a shaft, an eccentric surrounding the same, a movable bar yoking about the shaft, an eccentric strap pivoted to the bar, a printing member on the shaft, and a spool driven by said bar and adapted to carry a wound up portion of an inking ribbon for the printing member.
49. The combination of a shaft, a printing drum having an end member mounted on the shaft, ribbon spools carried by the drum, mechanism on the inner side of the drum end for driving one of said spools, a

driver carried by the frame beyond the drum end, and a reciprocable radially extending bar lying partly on the inner side and partly on the outer side of the drum  
5 end, passing through an opening in said end, said bar on the inner side of the drum end carrying the mechanism mentioned and on the outer side connected with said driver.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses. 10

HARRY C. GAMMETER

Witnesses:

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