E. F. MUMM.

DUPLICATING ATTACHMENT FOR CALCULATING MACHINES.

APPLICATION FILED JAN. 2, 1915.

1,157,635.

Patented Oct. 19, 1915.

3 SHEETS—SHEET 1.

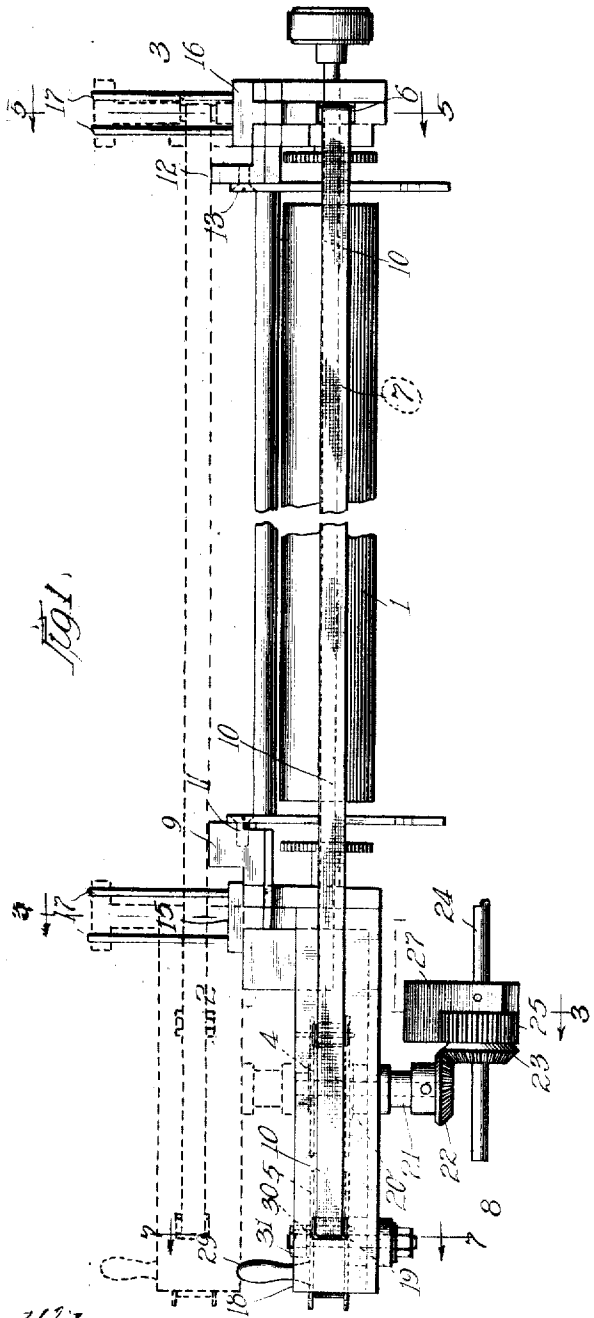


Fig. 1.

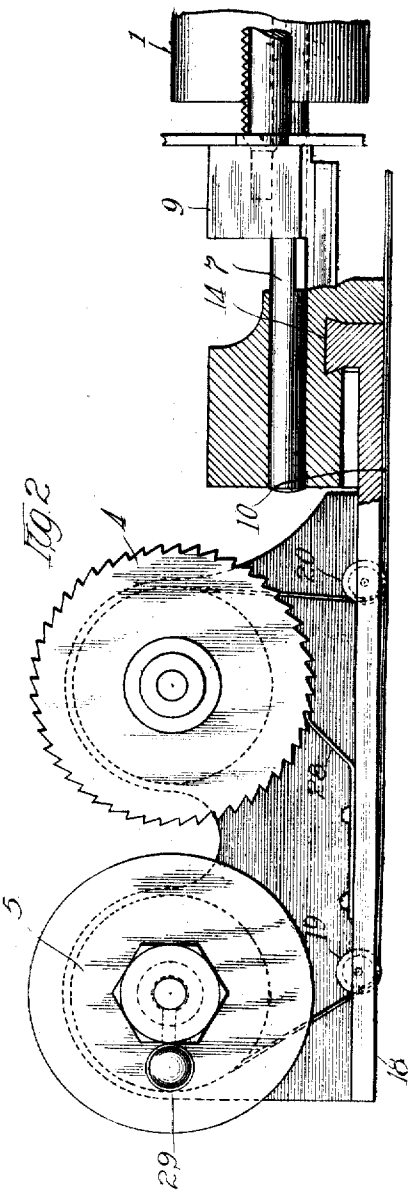


Fig. 2.

Witnesses:
L. C. Schantz

Inventor
Edward F. Mumm
By Edwin B. H. Tower Jr. Atty.

E. F. MUMM.

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3 SHEETS—SHEET 2.

Fig. 3

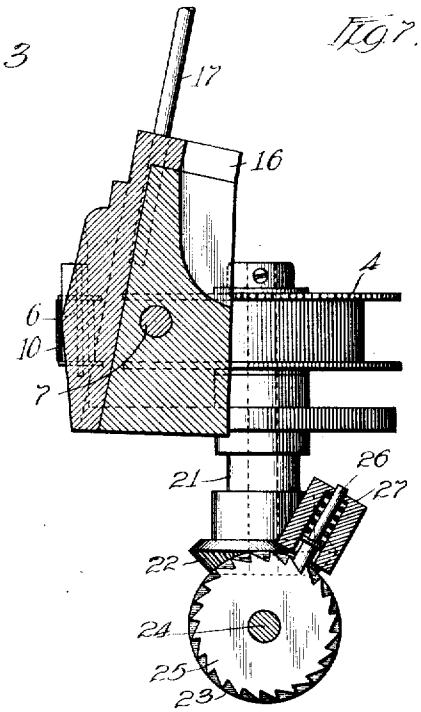


Fig. 7.

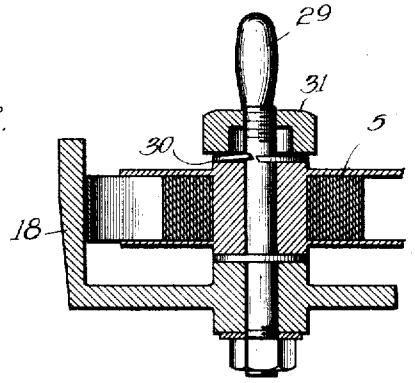


Fig. 5.

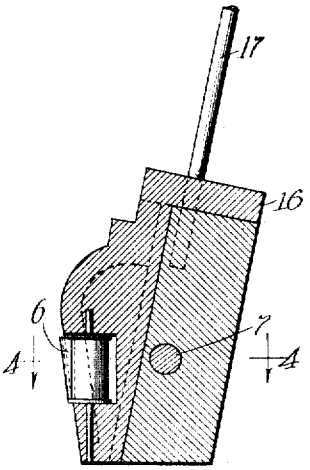


Fig. 4.

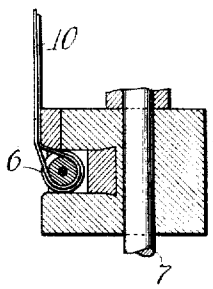
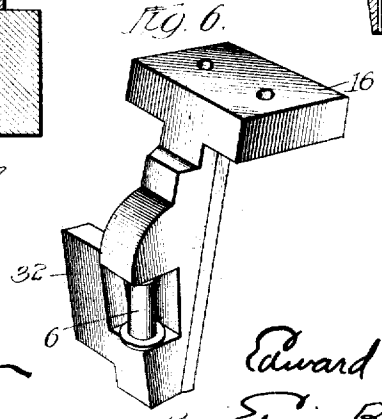


Fig. 6.



Witnesses:
Arthur H. Carlson
L. C. Schantz

Inventor
Edward F. Mumm
By Edwin B. H. Towers Jr. Atty.

E. F. MUMM.

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3 SHEETS—SHEET 3.

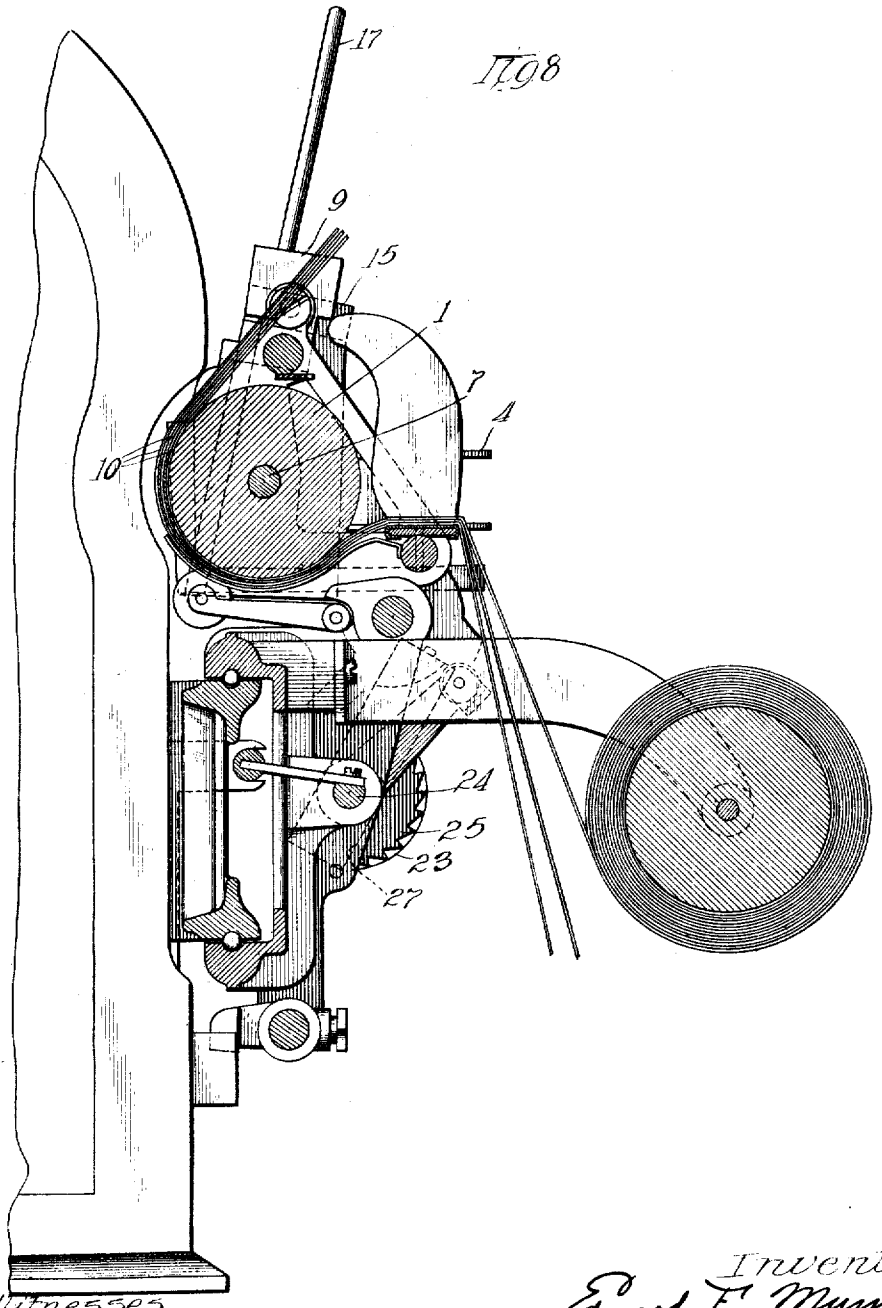


Fig 8

Witnesses
Arthur J. Carlson
L. C. Schantz

Inventor:
Edward F. Mumm
By Edwin B. H. Cowan Jr. Atty.

UNITED STATES PATENT OFFICE.

EDWARD F. MUMM, OF MILWAUKEE, WISCONSIN.

DUPLICATING ATTACHMENT FOR CALCULATING-MACHINES.

1,157,635. Specification of Letters Patent. Patented Oct. 19, 1915.

Application filed January 2, 1915. Serial No. 167.

To all whom it may concern:

Be it known that I, EDWARD F. MUMM, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented new and useful Improvements in Duplicating Attachments for Calculating-Machines, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

This invention relates to duplicating mechanisms.

It is particularly applicable to duplicating mechanisms for adding machines, typewriters and the like.

One of the objects of the invention is to provide an improved duplicating mechanism by means of which a plurality of copies may be simultaneously produced without the use of carbon or other duplicating paper.

Another object is to provide a duplicating mechanism which may be readily attached to standard machines without altering the construction thereof.

Another object is to provide a simple, compact duplicating mechanism which will not interfere with the operation of the machine to which it is attached.

Another object is to provide a duplicating mechanism which may be attached or detached as a unit to a calculating machine or the like without altering either the construction of the machine or the attachment.

A further object is to provide a duplicating attachment in which the main part of the mechanism may be readily removed from the machine at will.

Other objects and advantages of the invention will hereinafter appear.

The accompanying drawings illustrate embodiments of the invention.

The views of the drawing are as follows:

Figure 1 is a rear elevation of the duplicating attachment in position adjacent the platen of a machine. Fig. 2 is a top plan view of the reeling mechanism and a partial cross-section of the supporting means. Fig. 3 is a cross-section of the supporting and of the operating means. Figs. 4 and 5 are sectional views of the suporting means. Fig. 6 is a perspective of the supporting means. Fig. 7 is a section of the unwinding reel showing the tension mechanism. Fig. 8 is a side elevation of the device applied to an adding machine.

The duplicating attachment is adapted to be mounted adjacent the platen 1 of an adding machine or the like and it comprises in general a pair of supports 2 and 3, one of which carries supplementary ribbon reels 4 and 5, and the other of which carries a roller 6, over which the ribbon 7 is wound. Suitable operating mechanism 8 is provided for automatically feeding the ribbon across the platen from one reel to the other. The support 2 has a stationary member 9 mounted on one end of the platen shaft 10 and secured in position by a screw 11 or other suitable means. The member 9 is shaped to fit over the end of the shaft without requiring any alterations in the mechanism. An extension for the shaft 10 may be provided to obtain a suitable bearing. The support 3 has a similar stationary member 12 mounted on the other end of the platen shaft and secured in position by a screw 13 or other means.

Slots 14 of any suitable shape are provided in the stationary members 9 and 12 and slidably mounted in said slots are movable members 15 and 16 carrying the mechanism for supporting and feeding the ribbon. Each of the stationary members 9 and 12 is provided with projecting pins 17 coöperating with holes in the movable members so that the latter may be moved in the slots without being thrown out of alinement. Obviously, pins 17 might be attached to the movable members and cooperate with holes in the stationary members. By means of this structure the movable members which carry the printing ribbon may be moved from operative position without entirely removing the mechanism from the machine. This structure is highly practical and desirable as will be hereinafter pointed out.

The movable member 15 has a horizontal extension 18 upon which the reels 4 and 5 are mounted. The supplementary printing ribbon is wound from reel 5 over a roll 19, along the printing line of the platen, over roll 6 mounted on the movable member 16 and back along the printing line, over a roll 20 to the reel 4. It will thus be seen that a plurality of layers of printing ribbon in addition to the regular ribbon are supported in position on the printing line of the platen where they are available to record the impression of the type.

In order to feed the ribbon across the platen, a driving mechanism is provided.

The shaft of reel 4 has an extension 21 upon which is mounted a beveled gear 22 coöperating with a second gear 23 loosely mounted upon the shaft 24. The shaft 24 is a part of the regular mechanism of the machine which oscillates with each operation of the machine. A ratchet wheel 25 is rigidly connected to gear 23 and coöperating with the ratchet wheel is a spring pressed pawl 26 mounted in a rocker arm 27 fixedly secured to the shaft 24 to oscillate therewith. Movement of the shaft 24 in one direction is transmitted by the pawl 26 to ratchet 25 and through the bevel gears 23—22 to the reel 4 which is thereby turned a predetermined amount with each oscillation of shaft 24. The edge of the reel 4 may be notched as shown and a spring pawl 28 provided which coöperates with the notches to prevent backward movement of the reel. As the reel 4 is moved the ribbon is gradually unwound from reel 5, moved across the platen and rewound upon reel 4. A handle 29 is provided for rewinding the ribbon on reel 5 when it has reached the end of its travel.

The tension of the printing ribbon is governed by means of a spring washer 30, shown in Fig. 7, which is held in engagement with the hub of reel 5 by an adjustable nut 31. By varying the position of the nut 31 the friction of the spring washer 30 on the hub of the reel is varied and the tension of the ribbon is adjusted. The movable member 16 carrying the roll 6 has a flange 32 over which the printing ribbon passes. This flange keeps the printing ribbon out of engagement with the stationary member 12 so that the member 16 and the ribbon may be moved without causing damage to the ribbon by reason of its rubbing on the stationary parts of the support.

The operation of the mechanism is as follows: In order to conveniently insert the paper between the supplementary ribbons the members 15 and 16 are raised to remove the ribbon from the printing line. The pins 17 may be made to fit the members 15 and 16 in such a manner that when the members are in their raised position the weight of the parts throws the members slightly out of alinement so that they project slightly over the edge of the grooves 14 and therefore remain in raised position. With the supplementary printing ribbons in raised position the paper may be easily inserted between them after which the members 15 and 16 are moved to their original position thereby moving the ribbon to the printing line. Each operation of the machine oscillates the shaft 24 whose motion is communicated to the reel 4 which moves the supplementary ribbon across the platen. It is of course obvious that each time the type strikes the platen it makes a plurality of impressions corresponding in number to the number of layers of printing ribbon on the printing line. If erasures become necessary the members 15 and 16 may be raised to remove the supplementary ribbon from the printing line. The erasure may then be made without smearing the paper, after which the members can be moved to their original position to again render the duplicating mechanism operative. If no copies are desired the supplementary ribbon may be allowed to remain in its raised position or it may be entirely removed by simply removing the members 15 and 16 from the stationary members 9 and 12.

It will thus be seen that a duplicating attachment has been provided which may be readily applied to standard machines without requiring reconstruction of the same. The attachment is simple, it comprises a minimum number of parts, and occupies a minimum amount of space. It accordingly does not detract from the appearance of the machine or interfere with the practical operation thereof.

The duplicating mechanism is in the form of an attachment which may be applied as a unit to a standard machine. When applied the supplementary printing ribbon is located along the printing line of the platen and the actuating mechanism for moving the printing ribbon lengthwise coöperates with the mechanism on the machine so that the ribbon is moved as the machine is operated. The supplementary ribbon may be easily removed from the printing line without removing the mechanism from the machine by simply raising the slidable parts. If it is desired to remove the ribbon entirely from the machine this may be easily done by removing the slidable parts, thereby leaving only the stationary members attached to the machine adjacent the platen. The ribbon mechanism may be easily replaced by simply sliding the movable members into place. The entire attachment may be removed from the machine by simply removing a few screws and thereby removing the stationary members as well as the slidable members.

The supplementary ribbon may be easily and quickly removed from the printing line in order to facilitate the insertion of paper into the machine or to enable erasures to be made. The printing ribbon is continuously fed across the platen so that a uniform copy is produced and the wear on the ribbon is distributed uniformly over the entire length thereof. The reels and operating mechanism therefor are mounted near one end of the attachment so that they are readily accessible for adjustment and repair.

The attachment has been shown with an adding machine but it may be applied to other similar machines such as typewriters and the like wherein a type strikes a printing ribbon in front of a platen.

While I have shown and described an embodiment of the invention it should be understood that the structure disclosed is merely for the purpose of illustration and that other structures embodying the invention may be devised, all of which are within the spirit and scope of the appended claims.

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

1. A duplicating attachment adapted to be readily applied to adding machines and the like, comprising stationary members adapted to be readily mounted adjacent the ends of a platen and means slidably mounted on said members for supporting a supplementary printing ribbon adjacent the printing line of the platen.

2. A duplicating attachment for adding machines and the like, comprising stationary members adapted to be readily mounted adjacent the ends of a platen, means slidably mounted on said members for supporting a supplementary printing ribbon adjacent the printing line of the platen and means for automatically moving the ribbon lengthwise.

3. A duplicating attachment for adding machines and the like, comprising stationary members adapted to be readily mounted adjacent the ends of a platen and means slidably mounted on said members for supporting a supplementary printing ribbon in a plurality of layers adjacent the printing line.

4. A duplicating attachment for adding machines and the like comprising stationary members adapted to be readily mounted adjacent the ends of a platen, means slidably mounted on said members for supporting a supplementary printing ribbon in a plurality of layers adjacent the printing line of the platen and means for automatically moving the ribbon lengthwise.

5. The combination with an adding machine of stationary members adapted to be readily attached thereto adjacent the platen thereof and means carried by said members for supporting a supplementary printing ribbon adjacent the printing line of the platen, said means being slidable on said stationary members whereby the ribbon may be removed from the printing line.

6. The combination with an adding machine of stationary members adapted to be readily attached to the machine adjacent the platen thereof, means carried by said members for supporting a supplementary printing ribbon adjacent the printing line of the platen, said means being slidable on said stationary members whereby the ribbon may be readily removed from the printing line and means for automatically moving the ribbon lengthwise independently of the movement of the platen.

7. A duplicating attachment for adding machines and the like, comprising stationary members adapted to be mounted adjacent the ends of a platen, movable members slidably mounted on said stationary members, a plurality of ribbon reels carried by one of said movable members, a roller carried by the other of said members, a supplementary printing ribbon carried by said reels and said roller so that it is movably and removably supported along the printing line of the platen.

8. A duplicating attachment for adding machines and the like, comprising stationary members adapted to be mounted adjacent the ends of a platen, movable members slidably mounted on said stationary members, a plurality of ribbon reels carried by one of said movable members, a roller carried by the other of said movable members, a supplementary printing ribbon wound on said reels and over said roller, whereby it is removably supported adjacent the printing line of the platen and means for automatically moving the ribbon lengthwise as the machine is operated.

9. A duplicating attachment for adding machines and the like, comprising stationary members adapted to be mounted adjacent the ends of a platen, movable members slidably mounted on said stationary members, a plurality of ribbon reels carried by one of said movable members, a supplementary printing ribbon carried by said reels and by means on the other movable member whereby the ribbon is movably supported adjacent the printing line of the platen, means to actuate one of the ribbon reels to move the ribbon lengthwise across the platen and means to adjust the tension of the ribbon.

10. A duplicating attachment for adding machines and the like, comprising stationary members adapted to be mounted adjacent the ends of a platen, means slidably mounted on said members for movably supporting a supplementary printing ribbon adjacent the printing line of a platen, and means whereby the movable means may be held in removed position without being entirely removed from the machine.

11. A duplicating attachment for adding machines and the like adapted to be readily applied to standard machines without altering the construction thereof, comprising means adapted to be mounted on the machine adjacent the ends of the platen thereof, means carried by said first named means for supporting a supplementary printing ribbon adjacent the printing line of said platen, said second means being movable so that the printing ribbon may be readily removed from the printing line, and means coöperating with the mechanism of the machine for automatically moving the ribbon lengthwise of the platen as the machine is operated.

12. A duplicating attachment for adding

machines and the like adapted to be readily applied to standard machines without altering the construction thereof, comprising stationary members adapted to be readily mounted adjacent the ends of a platen and means movably mounted on said members for movably supporting a supplementary printing ribbon adjacent the printing line of the platen, said means being readily removable whereby the supplementary ribbon may be readily removed from the machine.

13. An attachment for adding machines and the like, comprising stationary members adapted to be mounted adjacent the ends of a platen, means slidably mounted on said members for movably supporting a supplementary printing ribbon on the printing line of a platen, means for guiding the movable means on the stationary members so that the movable means may be kept in alinement while being moved to move the ribbon from the printing line.

14. An attachment for adding machines and the like, comprising stationary members adapted to be mounted adjacent the ends of a plate, means slidably mounted on said members for supporting a ribbon along the printing line of a platen, means for automatically moving the ribbon along the platen, and means for guiding the movable means on the stationary members so that said means may be kept in alinement as it is moved to remove the printing ribbon from the printing line.

15. In combination, an adding machine having means slidably mounted adjacent the ends of the platen thereof for movably supporting a supplementary printing ribbon adjacent the printing line of the platen, and means for automatically moving the ribbon lengthwise of the platen as the adding machine is operated.

16. The combination with an adding machine of supporting members located adjacent the ends of the platen of the machine and means slidably mounted on said members for removably supporting a supplementary ribbon adjacent the printing line of the platen.

17. A duplicating attachment for adding machines and the like comprising stationary members adjacent the ends of the platen of the machine, means slidably mounted on said members movably supporting a supplementary printing ribbon adjacent the printing line of the platen, said members and means having coöperating pins and apertures whereby the movable means may be moved from its normal position and held in its removed position without being removed from the machine.

18. A duplicating attachment comprising a pair of movable members movably supporting a supplementary printing ribbon, means adapted to move said ribbon lengthwise and means for movably supporting said ribbon supporting members, said last named means being attachable to and detachable from a standard calculating machine or the like without altering the construction thereof whereby the ribbon is movably supported adjacent the printing line of the platen of the machine, said ribbon moving means being adapted to coöperate with the mechanism of the machine to automatically move the ribbon lengthwise as the machine is operated.

19. A duplicating attachment for calculating machines and the like comprising supporting members readily mountable on said machine adjacent the ends of the platen thereof, means on said members for supporting a supplementary printing ribbon adjacent the printing line of the platen of the machine and means carried by said last named means adapted to coöperate with the mechanism of the machine to automatically move the ribbon lengthwise as the machine is operated, said ribbon supporting means being removable from said members whereby the ribbon mechanism may be removed from the machine at will.

20. In a duplicating attachment, a supplementary printing ribbon, means supporting said ribbon so that it may be moved lengthwise, supporting members mountable on a calculating machine or the like without altering the construction thereof for receiving said ribbon supporting means whereby the supplementary ribbon is supported adjacent the printing line of the platen and actuating means carried by said ribbon supporting means coöperating with the mechanism of the machine to automatically move the ribbon lengthwise as the machine is operated, said ribbon supporting means being movable on said members so that the mechanism may be moved to an inoperative position with the ribbon removed from the printing line and so that the ribbon mechanism may be entirely removed from the machine at will.

21. A calculating machine attachment comprising a supplementary ribbon mechanism having a pair of members movably supporting a supplementary printing ribbon, supporting means for said members by which the mechanism as a unit may be attached to and detached from a standard machine without altering the structure of the mechanism or the machine, said members being movable on said supporting means so that the ribbon may be removed from the printing line of the platen of the machine without removing the mechanism from the machine and means on the attachment coöperating with the mechanism of the calculating machine for automatically moving the ribbon lengthwise as the machine is operated.

22. A ribbon mechanism for standard cal-

culating machines, having a supplementary printing ribbon, means for movably supporting said ribbon adjacent the printing line of the platen of the machine, means by which the mechanism as a unit may be attached to and detached from a standard machine without altering the structure of either the mechanism or the machine and means associated with the ribbon mechanism coöperating with the mechanism of the machine for automatically moving the ribbon lengthwise independently of the rotary movement of the platen.

23. In a duplicating attachment for standard calculating machines, a supplementary printing ribbon, a pair of ribbon reels, means for supporting said reels and for movably supporting said ribbon adjacent the printing line of the platen, means by which the attachment as a unit may be attached to and detached from a standard machine without altering the construction of either the machine or the attachment and means coöperating with the reels and with the mechanism of the machine for automatically moving the ribbon lengthwise independently of the rotary movement of the platen as the machine is operated.

In witness whereof, I have hereunto subscribed my name in the presence of two witnesses.

EDWARD F. MUMM.

Witnesses:
HENRY F. VOGT,
OSCAR A. KELLER.

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

Correction in Letters Patent No. 1,157,635.

It is hereby certified that in Letters Patent No. 1,157,635, granted October 19, 1915, upon the application of Edward F. Mumm, of Milwaukee, Wisconsin, for an improvement in "Duplicating Attachments for Calculating-Machines," an error appears in the printed specification requiring correction as follows: Page 4, line 26, claim 14, for the word "plate" read *platen;* and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 23rd day of November, A. D., 1915.

[SEAL.]

J. T. NEWTON,

Acting Commissioner of Patents.

Cl. 197—153.