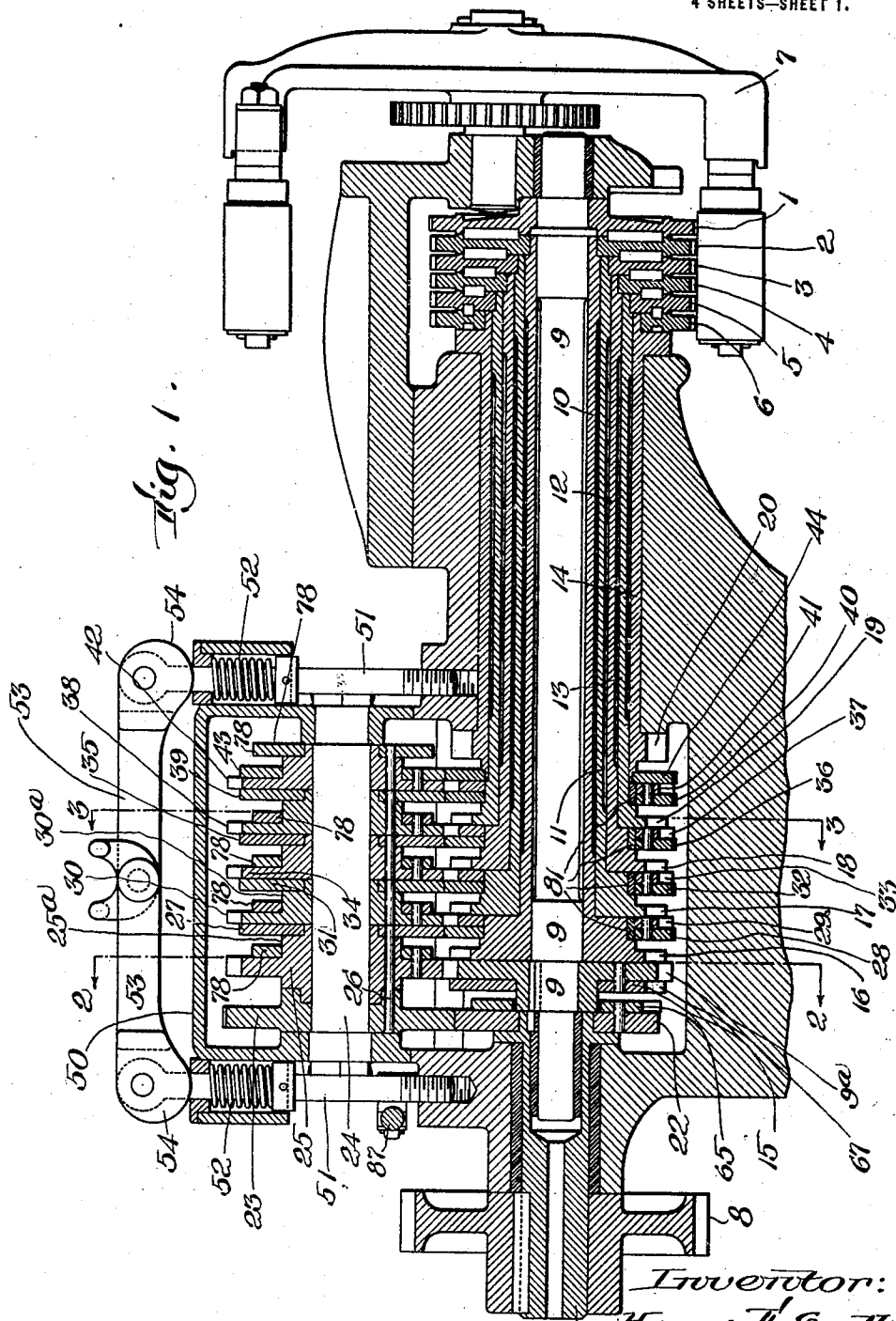


1,324,469.

H. F. SCOTT.
NUMBERING MECHANISM.
APPLICATION FILED NOV. 6, 1916.

Patented Dec. 9, 1919.

4 SHEETS—SHEET 1.



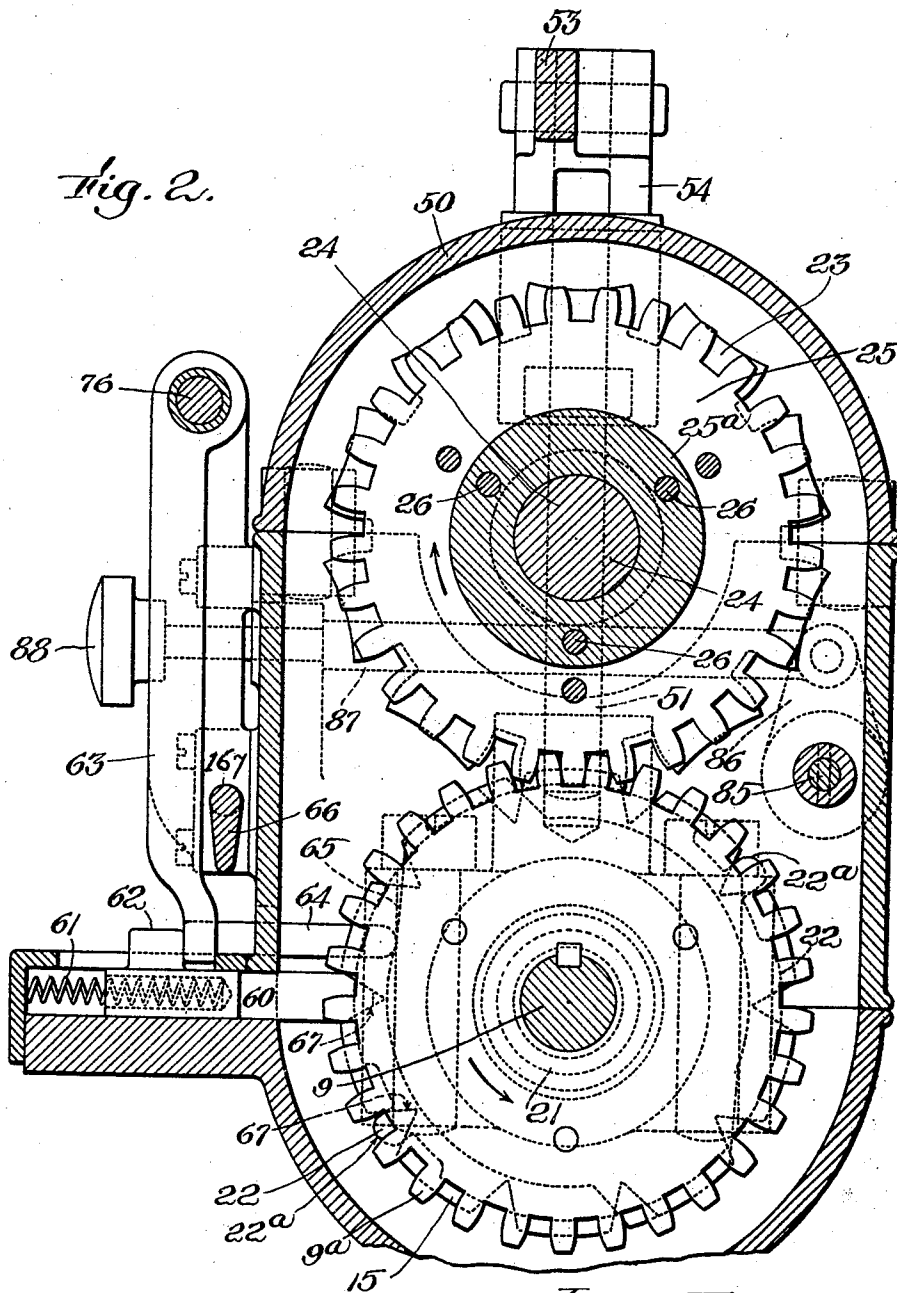
by

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4 SHEETS—SHEET 2.



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4 SHEETS—SHEET 3.

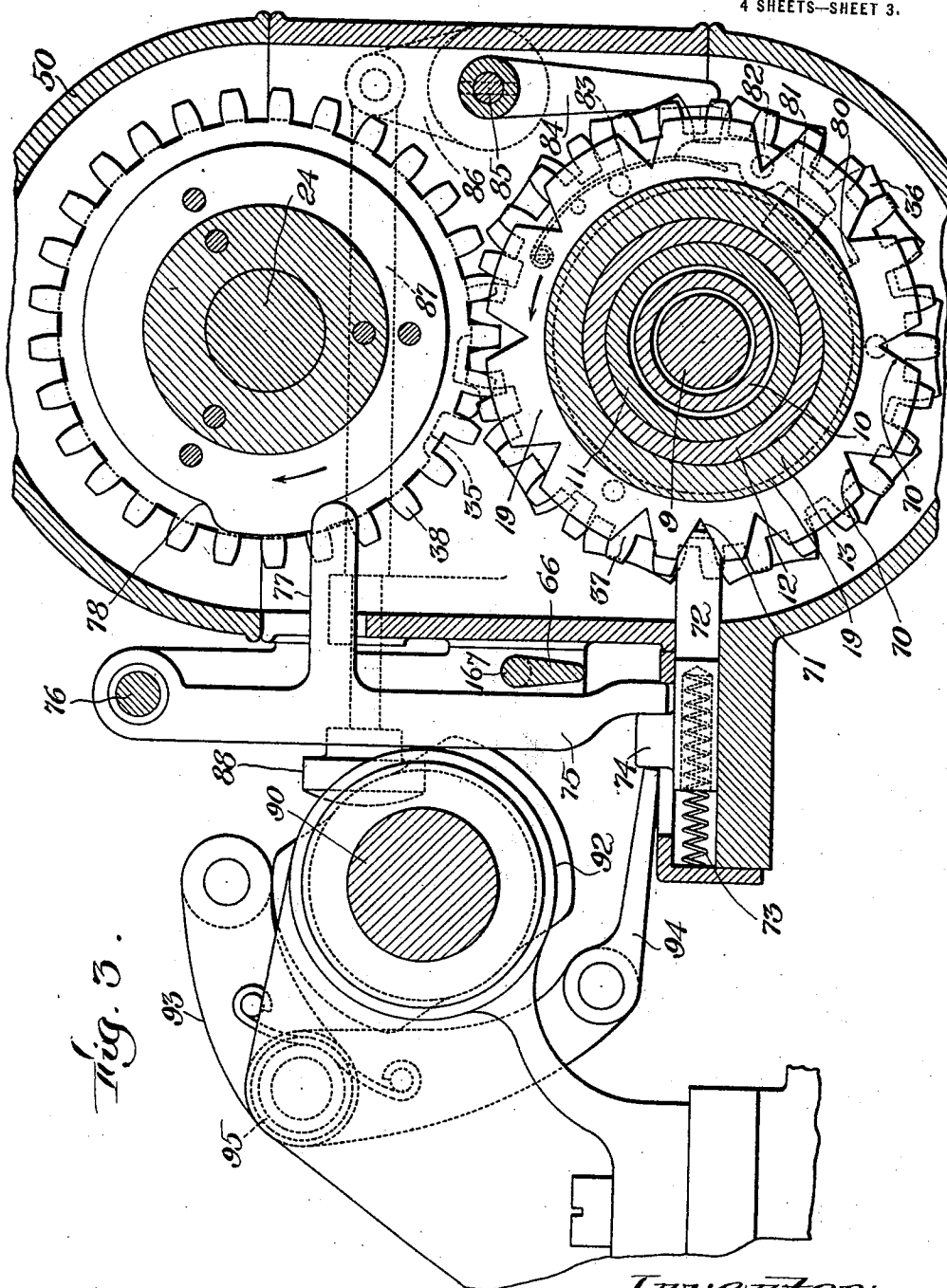


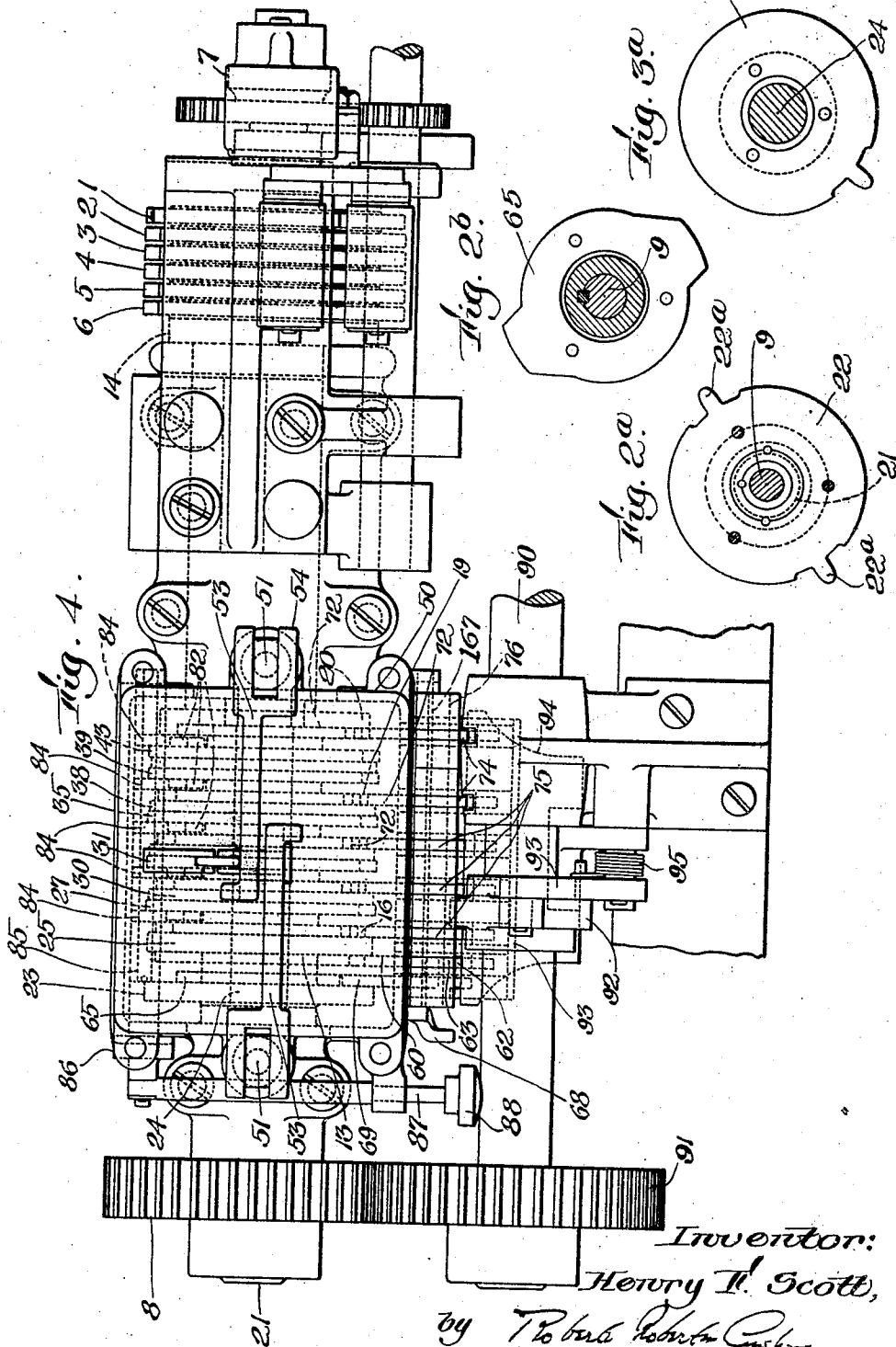
Fig. 3.

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Patented Dec. 9, 1919.
4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

HENRY F. SCOTT, OF FRAMINGHAM, MASSACHUSETTS, ASSIGNOR TO DENNISON MANUFACTURING COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

NUMBERING MECHANISM.

1,324,469.

Specification of Letters Patent.

Patented Dec. 9, 1919.

Application filed November 6, 1916. Serial No. 129,671.

To all whom it may concern:

Be it known that I, HENRY F. SCOTT, a citizen of the United States, and resident of Framingham, in the county of Middlesex and State of Massachusetts, have invented new and useful Improvements in Numbering Mechanism, of which the following is a specification.

My invention relates to mechanism for counting or numbering mechanical movements, and particularly to numbering mechanism for printing consecutive numbers upon tags, tickets and the like, and has for its objects the provision of positive means for these purposes, of improved devices for justifying or alining the numbering instruments themselves, for blanking ciphers of instruments for numbering in superior denominations, for resetting the numbering instruments, and, where ink-printing of numbers is part of the function of the numbering mechanism, for preventing ink from working into and soiling the mechanically coördinated moving parts.

This invention may be employed for numbering or lettering, and may be designed appropriately to a decimal, or any other selected system. As the decimal system is usually employed, I select a decimal numbering mechanism for purposes of illustration. In the drawings hereto annexed which illustrate such a numbering mechanism embodying my improvements,—

Figure 1 is a vertical longitudinal section through a numbering head;

Fig. 2 is a vertical cross section of the numbering head shown in Fig. 1, taken at the line 2—2 (Fig. 1) and viewed in the direction of the arrows on the said section line;

Fig. 2^a is a detail showing in elevation the two pin intermittent gears which control the advance of the primary numbering wheel or disk;

Fig. 2^b is a detail showing in elevation the control cam for the locking or alining device of the primary numbering wheel or disk;

Fig. 3 is a vertical cross-section through the numbering head shown in Fig. 1, the same being taken at the line 3—3 viewed in the direction of the arrows on said line;

Fig. 3^a is a detail showing in elevation one of the single pin intermittent gears which actuate numbering disks other than the primary disk; and

Fig. 4 is a top plan view of the numbering head.

Figs. 2 and 3 are drawn to a larger scale than the other figures.

Referring now to Fig. 1, which shows in longitudinal section the principal parts of the numbering head, the numbering wheels or disks (six in all) seen at the right hand side of the figure are numbered 1, 2, 3, 4, 5 and 6. Numbering disk 1 is the primary disk which, if the numbering head is used (as will ordinarily be the case) to present or print figures in decimal series, will be the unit disk, and will carry the ten numerical characters from 0 to 9 inclusive equally spaced about its periphery. The primary disk 1 is keyed to the central shaft 9, and this shaft serves as the bearing whereon the tubular shaft 10, to which is attached the numbering disk 2, turns when actuated by the advancing mechanism. The tubular shafts 11, 12, 13 and 14 carry respectively the numbering disks 3, 4, 5 and 6, and each of said tubular shafts constitutes the bearing on which the shaft next outside turns.

At the end farthest from the numbering disks, the aforesaid shafts are provided with enlargements or hubs, those on the tubular shafts being numbered 16, 17, 18, 19 and 20. The member on or secured to the central shaft 9 (which corresponds in function to the shaft hubs above enumerated) is the disk or plate 15, which is pinned to the spur gear 9^a, the latter being keyed to the shaft 9.

The mechanism is driven by a main driving gear 8 which is keyed fast to the shaft 21. To the inner end of the shaft 21 there is keyed the intermittent pin gear 22, which is shown in elevation and more in detail in Fig. 2^a. This pin gear is furnished with two pins or teeth 22^a (see Fig. 2^a) which mesh with the star stop wheel 23, mounted to turn on the stationary countershaft 24, this shaft being parallel to and above shafts 9 and 21. The stop gear or star wheel 23 is shown in Fig. 2 and appropriately to the decimal printing head selected for illustration contains ten spaces for engagement with the pin gear teeth 22^a and ten stop faces which engage with the smooth circumferential portion of the said pin gear 22. The provision of two such pins on the intermittent gear 22 is simply incidental to the

specific design of the numbering head used for illustration. By means of a pin 26, the star wheel 23 is secured to the spur gear 25 and also to a one pin intermittent gear 27, this pin gear being shown in elevation in Fig. 3^a. All three of these members, star wheel 23, spur gear 25 and pin gear 27, turn in unison upon the stationary countershaft 24. The spur gear 25 meshes with the spur gear 9^a, which is keyed to the central shaft 9 on which, as above stated, is fixed the primary numbering wheel 1; thus, as the star wheel 23 is intermittently advanced by the action of the pin gear 22, the spur gear 25 and spur gear 9^a cause shaft 9 and the primary numbering disk to advance one number space at a time.

Intermittent movement is imparted to the numbering disks 2, 3, 4, 5 and 6 in due succession through the positive operation of the following mechanism: The pin gear 27 which moves intermittently in unison with the star wheel 23, once in each complete rotation meshes with the star stop gear 28, the latter being mounted on the hub 16 of the first tubular shaft 10. Pinned to the said star wheel 28 there is a spur gear 29 which, meshing with the spur gear 30 mounted to turn on the stationary countershaft 24 advances the said spur gear intermittently, and with it advances the single pin intermittent gear 31 which is pinned to the hub 30^a of the spur gear 30. This pin gear 31 is exactly like the previously described pin gear 27 and need not be further described. Once in each full revolution the pin of the pin gear 31 meshes with the star stop wheel 32 which is similar in construction to the star wheel 28. Star wheel 32 being carried on the hub 17 of tubular shaft 11 causes the intermittent advance of the numbering disk 3. The spur gear 33 pinned to the star wheel 32 meshes with spur gear 34 mounted on countershaft 24, and intermittently turns the said gear and with it the single pin gear 35 which is pinned to the hub of the spur gear 34. The single pin gear 35, which is like the gear 27, intermittently meshes with the star wheel 36 and thereby intermittently advances the tubular shaft 12 and with it the numbering disk 4. Spur gear 37 mounted and turning with star wheel 36 meshes with and intermittently advances spur gear 38 turning on countershaft 24, and with the said spur gear intermittently advances the single pin gear 39 similar to the pin gear 27; and this pin gear 39 intermittently engaging with the star wheel 40 causes the shaft 13 (on which the said gear is mounted) to advance the numbering disk 5. The spur gear 41 meshing with the spur gear 42 which turns on the countershaft 24 intermittently advances the latter and also the single pin gear 43, which is secured to the said gear 42, and the last named single pin

gear intermittently advances the star wheel 44 by means of which the outer tubular shaft 14 is intermittently advanced and with it the numbering disk 6.

If the figures on the numbering disks are to be used for printing, some suitable inking device (such as is indicated by Fig. 4) may be employed. The above described arrangement by which movement of numbering disks is transmitted from the intermittently advancing mechanism to the disks themselves through a concentric nest of shafts provides means for suitably protecting the numbering mechanism from dirt, and especially ink, which in practice is bound to work off from the faces of the numbering disks on to other parts of the mechanism.

In order accurately and securely to justify or aline the numbering devices, the mechanism shown in Figs. 2 and 3 is provided, that shown in Fig. 2 being the justifying and alining mechanism associated particularly with the primary disk 1, while the devices illustrated in Fig. 3 are associated with the other numbering disks. In Fig. 2 the contour of the plate 15 which is secured to the spur gear 9^a and thus to the shaft 9, is shown to be characterized by a row of evenly spaced notches 67. A wedge pointed pin 60 mounted to slide in a suitable way formed in the casing of the numbering head is urged by a light spring 61 toward the notched hub 15, the end of this wedge pin 60 being adapted to enter into any one of the notches 67 and thus to hold the hub 15, shaft 9 and its numbering disk 1 in correct alinement. Each time that the numbering disk 1 is to be advanced by the intermittent action of the pin gear 22, the latch pin 60 is temporarily withdrawn from engagement with the notch by means of the following mechanism: The latch pin 60 is provided with a lug 62, and this lug engages with a pivoted arm 63, the same being pivoted on the shaft 76. The arm 63 has a stud pin 64 which projects into the path of the cam 65, this latter being secured to and carried by the pin gear 22, (see also Fig. 1). Fig. 2^b shows the cam 65 in elevation. It has, as will be observed, two throw surfaces which engage the stud pin 64 and push the arm 63 out, carrying the lug 62 and latch pin 60 against the stress of the spring 61. This disengages the wedge point of the pin from the notch 67 and retains it thus disengaged until the gear 9^a has been advanced one step through the agency of the pin gear 22, star wheel 23 and spur gear 25; thereupon the throwing projection of the cam 65 passes the stud 64 and allows the latch pin 60 to be again projected inwardly, this time to engage the notch 67 next succeeding the one from which it has recently been withdrawn.

The disk alining or justifying devices for the numbering disks 2, 3, 4, 5 and 6 is of

character generally similar to that last described and is shown in Fig. 3.

The hub 19 has formed in its flanged periphery a series of notches 70 equally spaced around the circumference, and between two of said notches 70 and additional notch 71, the function of which will presently be described. All of the hubs 16, 17, 18, 19 and 20 are notched in this manner, the notches being adapted to axial alinement. Over against the notched periphery of each of these hubs there is a latch or locking pin 72 mounted to slide in a suitable slideway in the casing of the numbering head, stressed toward the position of engagement of the notched hub by a light spring 73, and provided with a lug 74 which, acted upon by the swinging arm 75, causes the pin 72 to be withdrawn from a notch in the hub. The arm 75 pivoted on the shaft 76 has a cam engaging stud 77 which, on being struck by a throw portion of cam 78, is forced outwardly to retract pin 72. The cams 78 are secured to the spur gears 25, 30, 34, 38 and 42, respectively. As the latch pin cams, and operating arms associated with each of the hubs of the tubular shafts are alike in construction, the description of one suffices. The actuation of the swinging arm 75 by the cam 78 takes place at such a time that the latch pin 72 is withdrawn from a notch in the hub 19 just before the said hub and shaft 13 is advanced through the operation of star wheel 36 and pin gear 35. The latch pin 72 is held out of engagement with the notched hub until the advance movement of the hub and its shaft has been completed when, the throw part of the cam 78 leaving engagement with the stud 77, the spring 73 is free to thrust the latch pin 72 forward to engage that notch in the hub 19 which is then presented to it.

In order to secure a more affirmative locking and alinement of the several shafts than would be obtained by a series of light springs such as the springs 61 and 73, while conserving the advantage of easy operation which is incident to the light stress exerted by these springs, auxiliary alining mechanism is provided. The shaft 90 (see Figs. 3 and 4) on which is mounted the gear 91 which meshes with the main drive gear 8 has keyed to it the double throw cam 92, and this acts upon the follower end of the bell crank lever 93 which is pivoted on the numbering head frame. On the other arm of the bell crank lever there is pivotally mounted the plate 94 which extends along the entire row of latch pin lugs, such as 74 (Fig. 3). The instant before the time for retraction of any one of the latch pins 60 or 72 arrives, one of the throws of cam 92 leaves the arm 93 and allows it to ride down upon the lower part of the cam, the spring 95 urging the arm 93 to follow the contour

of the cam 92. This movement retracts the plate 94 from its contact with the lugs 74 and 62 and opens a way for retraction of any one of these latch pins through the agency of the swinging arm which acts upon the inside of the latch pin lug. This operation being performed against the stress only of the light spring, as 73 or 61, puts little strain upon the mechanism and results in a minimum of wear. When the latch pin has again been projected forward by the light spring, the cam 92 lifts bell crank lever arm 93, throwing the plate 94 forward into contact with the lugs 74 and 62, thus positively holding the latch pins with their wedge points closely pressed into the hub notches, and firmly and correctly alining the numbering disks mounted upon the same shafts as those to which the said hubs are either attached or of which they form an integral portion.

Occasionally it will be necessary to reset the numbering disks of the numbering head and for this purpose the following disengaging mechanism is provided. In Figs. 2 and 3 there will be seen in cross section a swing plate 66 which is mounted upon a shaft 167. This shaft extends parallel to the main shafts of the numbering head immediately behind the latch pin operating levers 63 and 75. At one end of the shaft 167, there is an operating handle 68 (Fig. 4) by means of which the shaft 167 and disengaging plate 66 can be turned outwardly against the arms 63 and 75, to throw them all with the latching pins 72 and 60 out of engagement with the shafting hubs. This movement of course is possible only when the cam 92 is so turned that the plate 94 is withdrawn from the lugs 74 and 62. Then, in order fully to release the numbering disks so that they may be turned by hand and reset, it is necessary to lift the intermittent pin gears out of range or mesh with the star wheels which coöperate with them respectively. This is done by raising that portion of the numbering head frame which carries the shaft 24 (Fig. 1). This part of the frame (seen in Fig. 1) is mounted upon the posts 51 (Fig. 4). Springs 52 tend constantly by their stress to lift the countershaft 24 and mechanism carried thereby away from the main part of the numbering head which carries the driving gear 8 and the shafting 9, 10, 11, 12, 13, 14. The toggle arms 53 which are provided with cam devices 54 normally hold the movable frame or casing 50 in its lower position against the stress of the springs 52. On raising these toggle arms, the frame 50 is allowed to rise, but only so far as is necessary to throw the pin gears and their coöperating star wheels out of mesh, not far enough to throw the spur gears and countershaft completely out of mesh with the spur gears lying below them

respectively. Thus, while the numbering disks and respective shafts, and the spur gears on the hub ends of their respective shafts may be turned freely by hand, they cannot be deranged in respect to the numerical system which governs the proportions of the operation of the numbering head itself. When the disks have been reset to the desired point, the frame 50 is lowered, the disengaging plate 60 restored to its idle position and the parts are in readiness to recommence operation.

For consecutively printing tags or tickets it is practically necessary and always desirable to hold the ciphers of disks, whose denominations have not been reached in the operation of the mechanism, out of coactive relationship with the printing devices, so that ciphers to the left of the effective number printed will not be impressed upon the tag or ticket. The cipher blanking devices of the numbering head shown in the annexed drawings are embodied in the following mechanism, which is shown in Fig. 3: Cipher blanking devices are not required for the primary numbering disk such as will be used for printing the digits in the unit column, and therefore only the mechanism immediately concerned with the numbering disks of higher denomination are provided with blanking devices.

The shaft hubs 16, 17, 18, 19 and 20 have, as above stated, a series of equally spaced notches such as the notches 70 shown on the flange of the shaft hub 19 in Fig. 3, these being spaced to correspond with the spacing of the numerals or other characters carried by the periphery of the numbering disks. Between the two notches which correspond to 0 and the first adjacent character on the numbering disk there is an intermediate notch 71, and when the hub 19 and the shaft and numbering disk associated with it are locked by the entrance of the latching pin 72 into this notch 71, the blank space on the periphery of the numbering wheel is then presented to the printing line so that no impression is made by the disks thus affected.

Assuming that all of the numbering disks except the primary disk 1 have been set (in a manner presently to be described) with the respective latching pin (as 72) engaging the intermediate notches (as the notch 71), the securement of the star wheels 28, 32, 36, 40 and 44 with their respective spur gears 29, 33, 37 and 41, is not a rigid keyed engagement, but is such as to provide for a limited amount of lost motion between each star wheel and the shaft hub associated with it. The devices for effecting this are substantially the same for all the shaft hubs, and the illustration shown in Fig. 3 applies to all these. A key 81 is fixed to the shaft hub 19, and projects into a notch formed

on the inner peripheries of the star wheel 36 and spur gear 37, of which the effective or driving side is shown at 80. A pawl 82 is pivotally mounted on the star wheel 36 adjacent to the key 81 and is stressed toward the key by means of a spring 83. When the pin gear 35 approaches engagement with the star wheel 36, the latch pin 72 is withdrawn from engagement with the intermediate notch 71 in the manner hereinbefore described, and when, the latch pin having been thus withdrawn, the star wheel 36 is advanced in the direction shown by the arrow in Fig. 3, its initial movement which causes the notch wall 80 to approach the key 81, is productive of no movement of the hub 19 and its associated shaft and numbering disk. Presently, however, the notch wall 80 engages the key 81 at or about the instant when the initial movement of the star wheel 36 has drawn the spring pressed pawl 82 over the edge of the key 81, so that at about the same instant the pawl 82 moves in behind the key 81 and the key is engaged by the notch wall 80, thus eliminating the lost motion. Then the remainder of the rotative movement of the star wheel 36 imparts sufficient rotation to the hub 19 to bring the first one of the notches 71 into opposition with the latch pin 72, in which position the first character of the numbering disk (in this case disk numbered 4) is brought into the printing line. Thereafter each successive intermittent partial rotation of the star wheel 36 advances the numbering disk 4 one numbering space in regular order.

The locking pin 72 is withdrawn from the notch 71 when the shaft is in out-of-print position in the same way that it is withdrawn from the notch 70 when the shaft is in printing position. Just before the star-wheel is advanced to take up the lost motion between pin 81 and slot 80 and to bring the first numeral into printing position, the cam 78 withdraws pin 72 through the medium of arms 75 and 77. This pin 72 is withdrawn just prior to the advancement of the star-wheel, whether the star-wheel is in printing or blanking position.

When it becomes necessary to reset the disks of the numbering head in order to restore the star wheels and shaft hubs (which are appropriate to all of the numbering disks except the primary disks) to the relative positions illustrated in Fig. 3, the following mechanism is brought into requisition. A series of dependent fingers 84, each positioned opposite one of the pawls 82, is mounted upon a shaft 85; at one end of the shaft 85 there is secured a crank 86, a push rod 87 is pivotally jointed to this crank and also slidingly mounted in the casing of the numbering head and this push rod is provided with a suitable handle 88. When for

purposes of resetting the numbering disks, the latch pins 72 and 60 have been withdrawn from engagement with the shaft hubs and the shaft 24 has been lifted to move the
 5 several pin gears out of mesh range with their respective star wheels in the manner hereinbefore described, the rod 87 is pushed inward by means of the handle 88 rotating the shaft 85 by means of the crank 86 and turning
 10 the pawls 82 by means of pressure exerted by the fingers 84, overcoming the stress of the springs 83, and thus lifting the key engaging ends of the pawls out of engagement with the several keys 81. This is done
 15 when the several shaft hubs have been brought close to the cipher blanking position. The release of the pawls 82 from the keys 81 enables the final movement of the numbering disks into cipher blanking position to be made by hand; then the fingers 84
 20 are released by drawing out the rod 87, the countershaft 24 is lowered, and the push rod 62 allowed to engage with the intermediate notches 71.

25 The number mechanism herein disclosed is not only adapted to be employed for the purpose of consecutively numbering tickets, baggage tags, book pages, account cards, etc., in printing apparatus of the character herein shown and described, but the mechanism is also applicable to registering or recording apparatus, such as a cash register of the type which supplies a ticket or check showing the amount recorded, it being desirable for certain purposes consecutively to
 30 number the series of tickets or checks. Indeed, my invention is applicable to indicating mechanism wherein the numerals are viewed directly instead of being employed to record the respective numbers, as for example, in an odometer, cyclometer, or the like, or for counting the reciprocations or oscillations of reciprocating or oscillating bodies. In connecting the number mechanism to any
 35 particular printing, recording, registering, indicating or counting apparatus it is only necessary to connect the mechanism with a suitable moving part of the apparatus, as for example, by means of the spur gear 8 meshing with another spur gear or by means of
 40 a belt or friction connection of the proper speed ratio.

I claim:

1. In a numbering machine, character
 55 wheels, actuating mechanism therefor, means for setting certain of the wheels in intermediate positions of rest with no characters at the operative positions, said means including a plurality of parts having a lost motion
 60 connection therebetween to permit the wheels to be moved into intermediate positions of rest, and means for automatically taking up said lost motion and locking said parts together when the wheels are moved from
 65 intermediate position to regular position.

2. In a numbering machine, character wheels, actuating means therefor, the actuating means having lost motion whereby certain of the wheels may be set in intermediate positions of rest with no characters at the
 70 operative position, and means for eliminating the lost motion when the said certain wheels are brought into the first regular positions of rest.

3. In a numbering machine, character
 75 wheels, actuating means therefor, the actuating means having lost motion whereby certain of the wheels may be set in intermediate positions of rest with no characters at the operative position, and spring catches for
 80 eliminating the lost motion when the character wheels are moved from intermediate positions into regular positions.

4. In a numbering machine, character
 85 wheels, actuating means therefor, gear wheels associated with the respective character wheels, transmission gears engaging the gear wheels for positively stepping the respective character wheels into various
 90 regular positions of rest, lost motion pin and slot connections between certain of the gear wheels and character wheels such that certain of the character wheels may be set in intermediate positions of rest with no
 95 characters at the operative position and that each such wheel may be first advanced a partial step into a regular position of rest, and means for eliminating the lost motion when the wheels are brought into the first
 100 regular position of rest.

5. In a numbering machine, character wheels, actuating means therefor, gear wheels associated with the respective character wheels, transmission gears for positively stepping the respective character
 105 wheels into various regular positions of rest, lost motion connections between the gear wheels and character wheels such that certain of the character wheels may be set in intermediate positions of rest with no characters
 110 at the operative position and that each such character wheel may be first advanced a partial step into a regular position of rest, means for eliminating the lost motion when the character wheels are brought
 115 into the first regular positions of rest, and means for actuating the last aforesaid means so that the lost motion between the respective gear wheels and character wheels may be restored and so that the character
 120 wheels may be set in the said intermediate positions of rest.

6. In a numbering machine, character wheels, actuating means therefor, gear
 125 wheels associated with the respective character wheels, transmission gears engaging the respective gear wheels for positively stepping the respective character wheels into various regular positions of rest, lost motion pin and slot connections between the
 130

gear wheels and character wheels such that certain of the character wheels may be set in intermediate positions of rest with no characters at the operative position and that each such character wheel may be first advanced a partial step into a regular position of rest, stops for engaging the pins when the said certain character wheels are brought into the first regular positions of rest to eliminate the lost motion, and means for disengaging the stops and pins so that the lost motion between the respective gear wheels and character wheels may be restored and so that the character wheels may be set in the said intermediate positions of rest.

7. In a numbering machine, character wheels, actuating means therefor, gear wheels associated with the respective character wheels, transmission gears engaging the gear wheels for positively stepping the respective character wheels into various regular positions of rest, lost motion pin and slot connections between the gear wheels and character wheels such that certain of the character wheels may be set in intermediate positions of rest with no characters at the operative position and that each such character wheel may be first advanced a partial step into a regular position of rest, stops for engaging the pins when the said certain character wheels are brought into the first regular positions of rest to eliminate the lost motion, and means for simultaneously withdrawing the stops from engagement with the pins so that the lost motion between the respective gear wheels and shafts may be restored and so that the character wheels may be set in the said intermediate positions of rest.

8. In a numbering machine, character wheels, actuating means therefor, gear wheels associated with the respective character wheels, transmission gears engaging the gear wheels for positively stepping the respective character wheels into various regular positions of rest, lost motion connections between certain of the gear wheels and character wheels such that the character wheels may be moved partial steps into positions wherein no characters are at the operative position without advancing the gear wheels and such that when the gear wheels are next advanced full steps the character wheels are only advanced partial steps into regular positions of rest, and means for eliminating the lost motion when the character wheels are advanced into the first regular positions of rest.

9. In a numbering machine character wheels, actuating means therefor, a notched wheel connecting with each character wheel, stops cooperating with the respective notched wheels for justifying the character wheels, means for intermittently rotating the character wheels, gear wheels connecting with

the respective character wheels, driving gears engaging the respective gear wheels for rotating the character wheels into various positions of rest, and means individual to the respective driving gears for automatically withdrawing the stops from the notches of the notched wheels while the character wheels are being advanced.

10. In a numbering machine, character wheels, actuating means therefor, a notched wheel rigidly connected to each character wheel, plungers cooperating with the respective notched wheels for justifying the character wheels, means for positively maintaining the plungers in the notches of the notched wheels, means for intermittently rotating the shafts to advance the character wheels, and means for automatically withdrawing the stops from the notches of the notched wheels while the character wheels are being advanced.

11. Character positioning apparatus comprising a plurality of parallel character wheel shafts, character wheels mounted on the shafts, a countershaft parallel with the character wheel shafts, transmission means for driving the character wheel shafts, cooperating parts of the transmission means being mounted on the countershaft and the character wheel shafts respectively, and means for moving the countershaft away from the character wheel shafts so as to disengage some of the said cooperating parts of the transmission means and so as to leave other of the parts in cooperative relationship.

12. Character positioning apparatus comprising a series of concentric shafts, character wheels connected to the respective concentric shafts, a countershaft parallel with the concentric shafts, transmission gears for driving the concentric shafts, two pairs of cooperating gear wheels being mounted on the countershaft and concentric shafts respectively in direct operative relationship with each of said concentric shafts so that each of the concentric shafts is rotated by the next preceding shaft, one of said pairs comprising intermittent gears and the other pair comprising continuous gears, and means for moving the countershaft away from the concentric shaft so as to disengage the intermittent gears without disengaging the continuous gears.

13. In a numbering machine, character wheels, gear wheels for driving the respective character wheels, transmission gears for driving said gear wheels, a support for said transmission gears, yielding means acting upon said support to urge said transmission gears out of engagement with said gear wheels, and means acting in opposition to said yielding means normally to maintain the transmission gears in engagement with the gear wheels and to permit limited movement.

ment of the transmission gears away from the gear wheels so that some of the gear wheels may be disengaged without disengaging other of the gear wheels.

5 14. In a numbering mechanism of the character designated, a driving shaft, numbering disks, a series of intermittently engaging pin and star wheels, lost motion connection means joined each to a numbering disk and a star wheel, and locking devices associated with said lost motion connections to eliminate said lost motion.

15 15. In a numbering mechanism of the character designated, a driving shaft, numbering disks, a series of intermittently engaging pin and star wheels, means joined each to a numbering disk and a star wheel, the junction between some of said means and star wheels comprising a lost motion connection, and manually controllable locking devices associated with said lost motion connections to engage said means and star wheels positively to eliminate the lost motion.

25 16. In a numbering mechanism of the character designated, the combination of positive engagement intermittent gears in series arrangement, numbering disks each associated with an intermittently actuated gear, means connecting the numbering disks respectively with their associated actuating gears, a series of alinement latches and means carried by said means to engage therewith, and mechanism associated with
30 the several intermittent gears of said series to disengage the alinement latches during the respective periods of motion engagement of said gears.

35 17. In a numbering mechanism of the

character designated, the combination of 40 positive engagement intermittent gears in series arrangement, numbering disks each associated with an intermittently actuated gear, means connecting the numbering disks 45 respectively with their associated actuating gears, a series of alinement latches and means carried by said means to engage therewith, mechanism associated with the several intermittent gears of said series to disengage the alinement latches during the 50 respective periods of motion engagement of said gears, and manually controlled means to throw said alinement devices out of action.

18. In a numbering mechanism of the 55 character designated, the combination of positive engagement intermittent gears in series arrangement, numbering disks each associated with an intermittently actuated gear, mechanism connecting the numbering 60 disks respectively with their associated actuating gears, a series of alinement latches and means carried by the mechanism to engage therewith, mechanism associated with the several intermittent gears of said series 65 to disengage the alinement latches during the respective periods of motion engagement of said gears, manually controlled means to throw said alinement devices out of action, and manually controlled means to 70 move said intermittent gears out of engagement position.

Signed by me at Framingham, Mass.,
this 28th day of October, 1916.

HENRY F. SCOTT.

Witnesses:

LUCIUS CUMMINGS,
M. A. BELGER.