Sept. 15, 1931. W. E. MOLINS 1,823,281

CIGARETTE MAKING MACHINERY

Filed Sept. 25, 1926 6 Sheets-Sheet 1

Fig. 1.

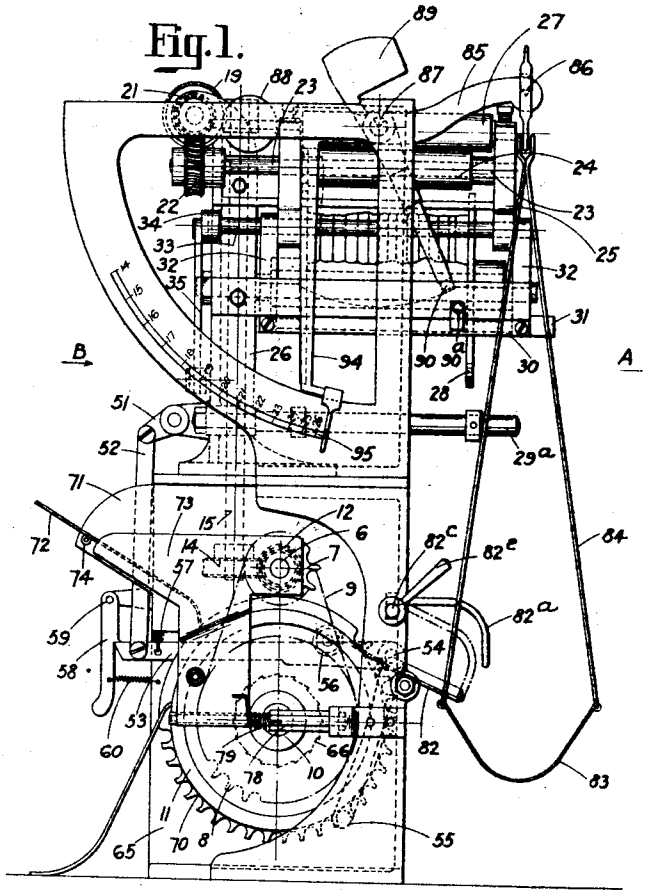
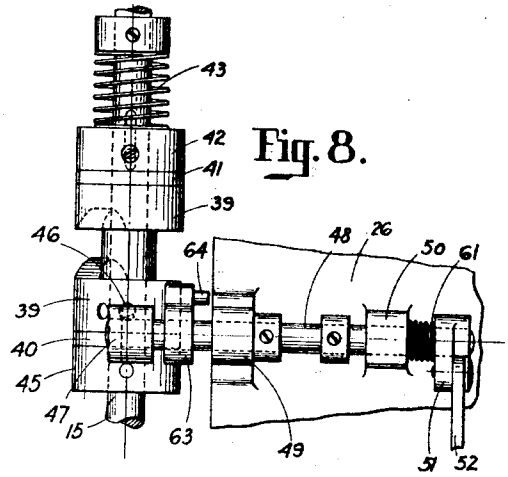


Fig. 8.



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CIGARETTE MAKING MACHINERY

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Fig. 2.

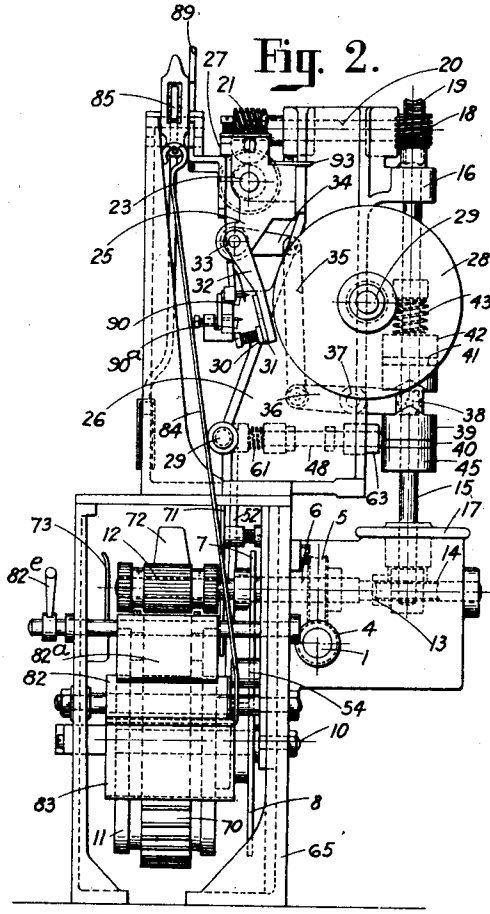


Fig. 3.

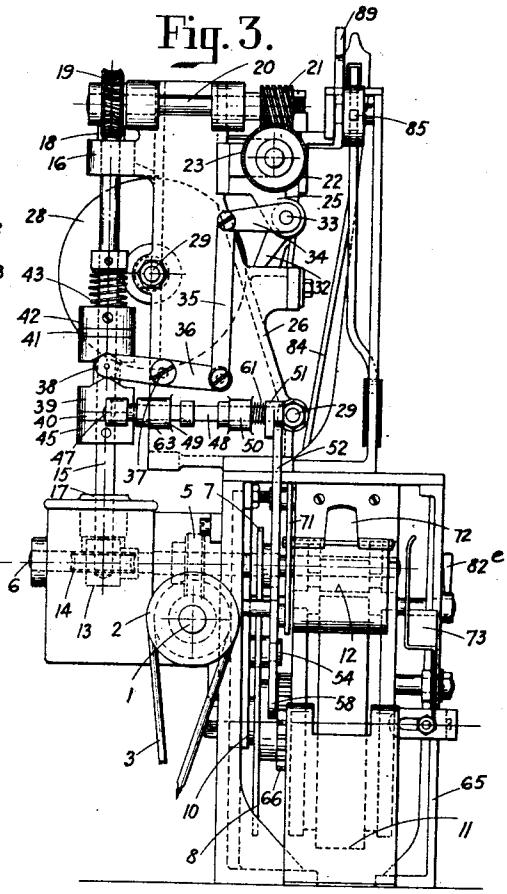


Fig. 10.

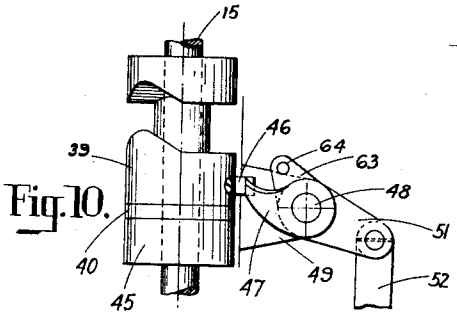
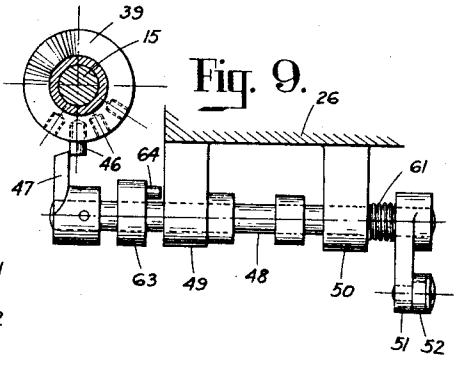


Fig. 9.



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CIGARETTE MAKING MACHINERY

Filed Sept. 25, 1926 6 Sheets-Sheet 3

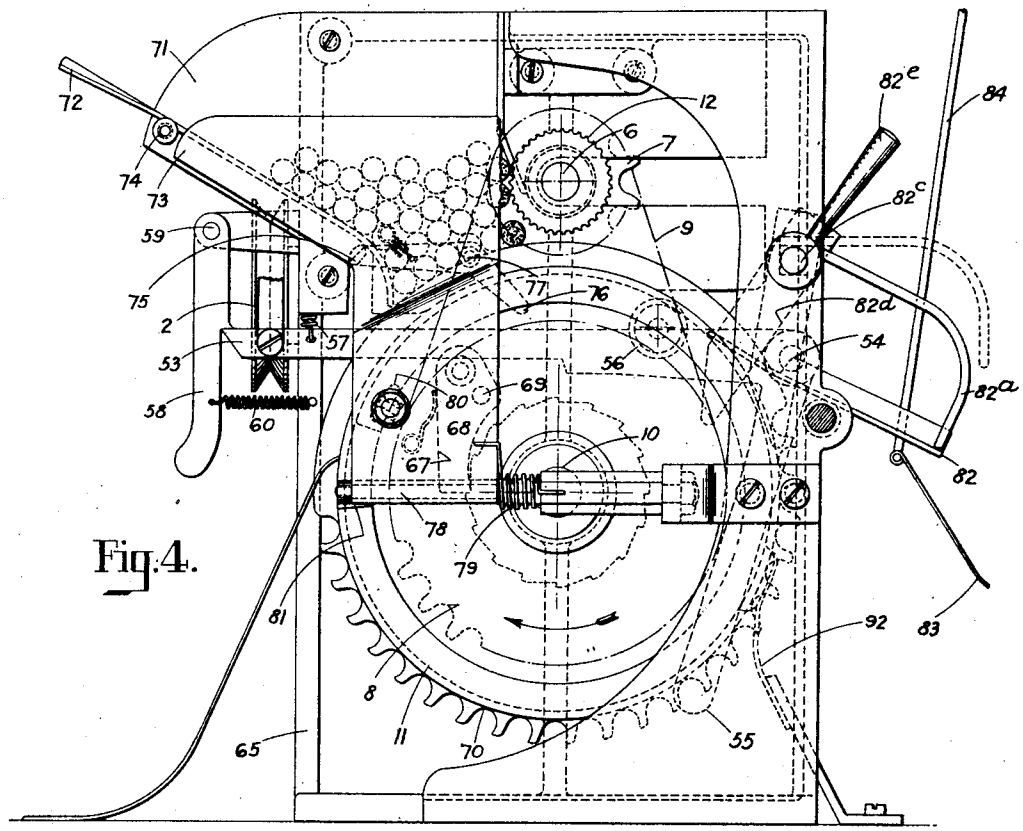


Fig. 4.

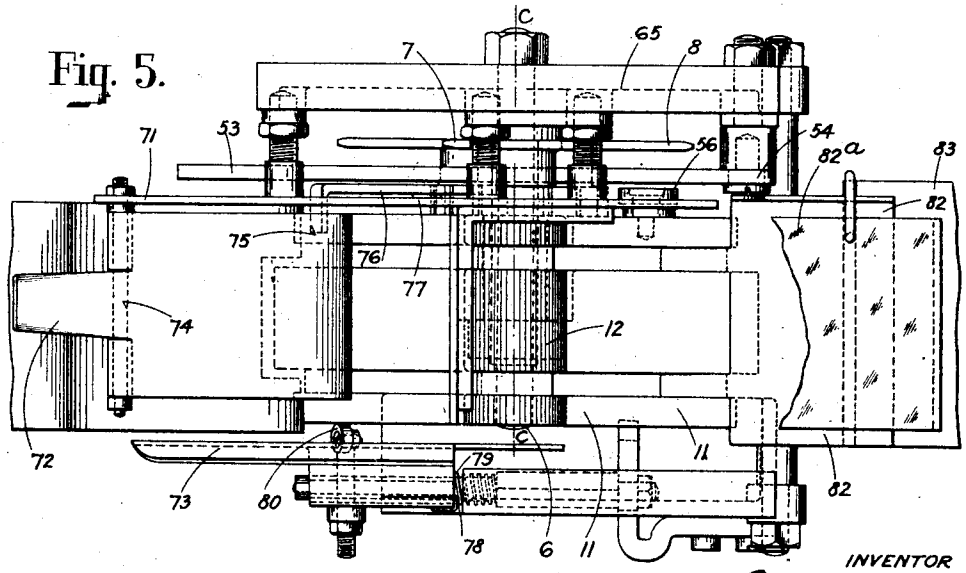


Fig. 5.

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CIGARETTE MAKING MACHINERY

Filed Sept. 25, 1926 6 Sheets-Sheet 4

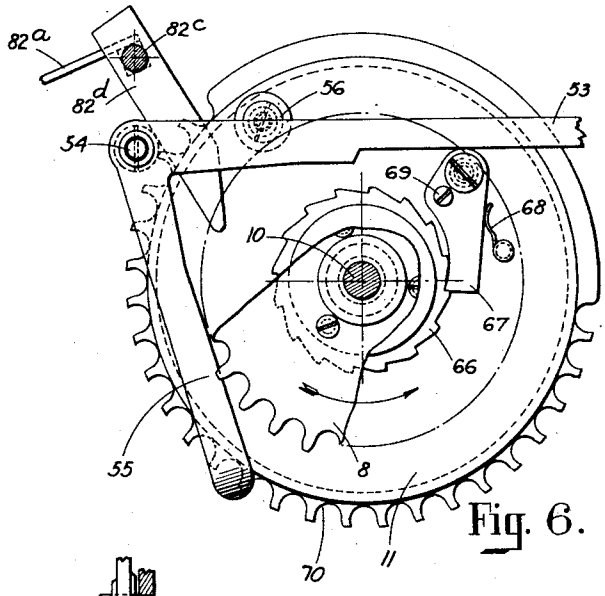


Fig. 6.

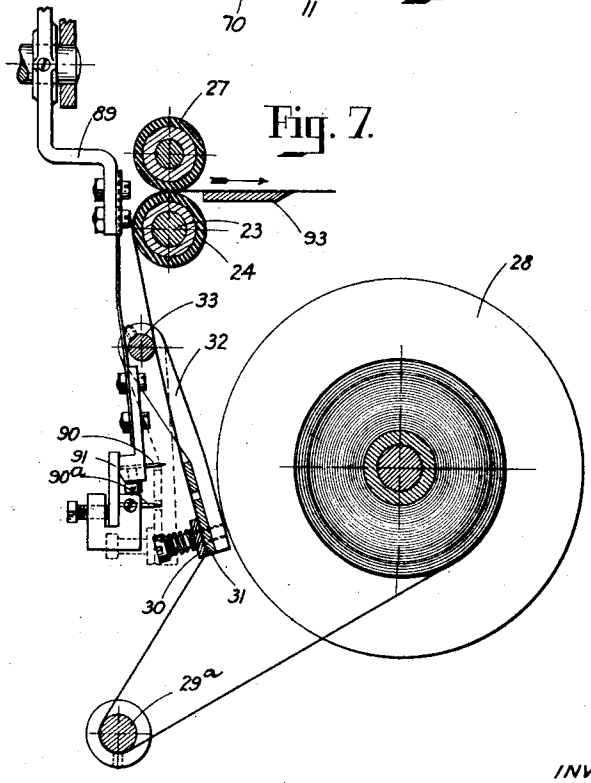


Fig. 7.

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IGARETTE MAKING MACHINERY

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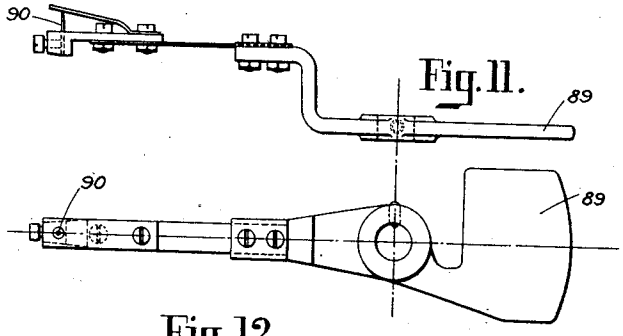


Fig. 11.

Fig. 12.

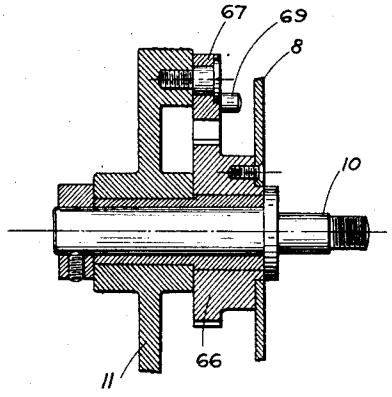


Fig. 13.

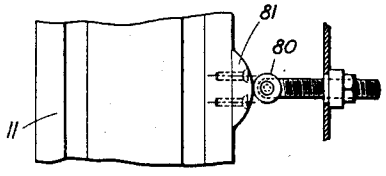


Fig. 14.

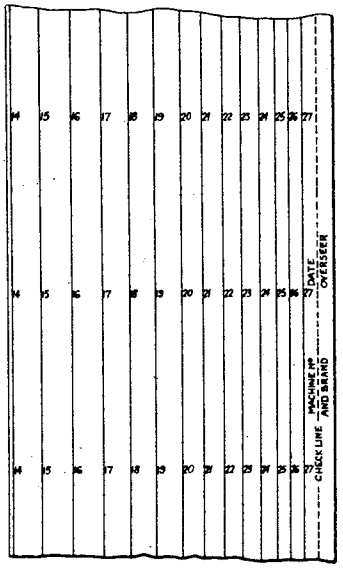


Fig. 15.

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CIGARETTE MAKING MACHINERY

Filed Sept. 25, 1926 6 Sheets-Sheet 6

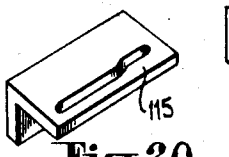


Fig. 20.

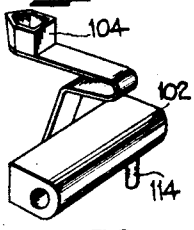


Fig. 19.

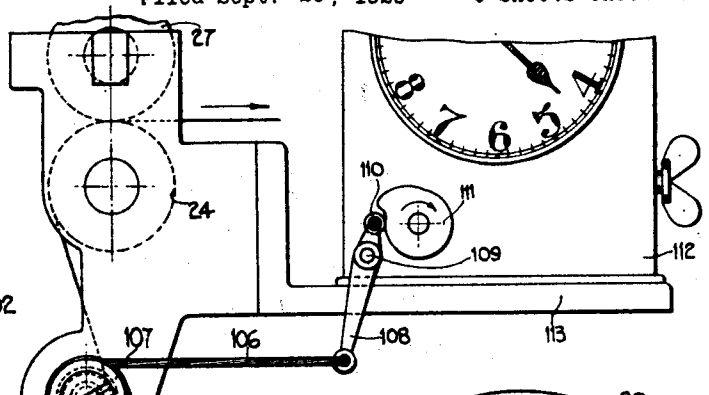


Fig. 16.

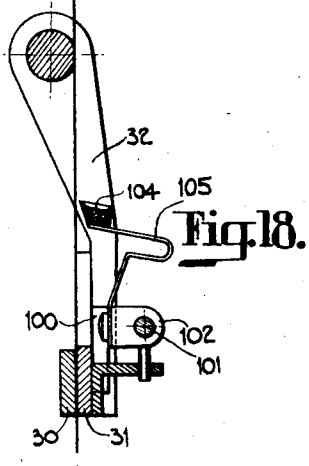
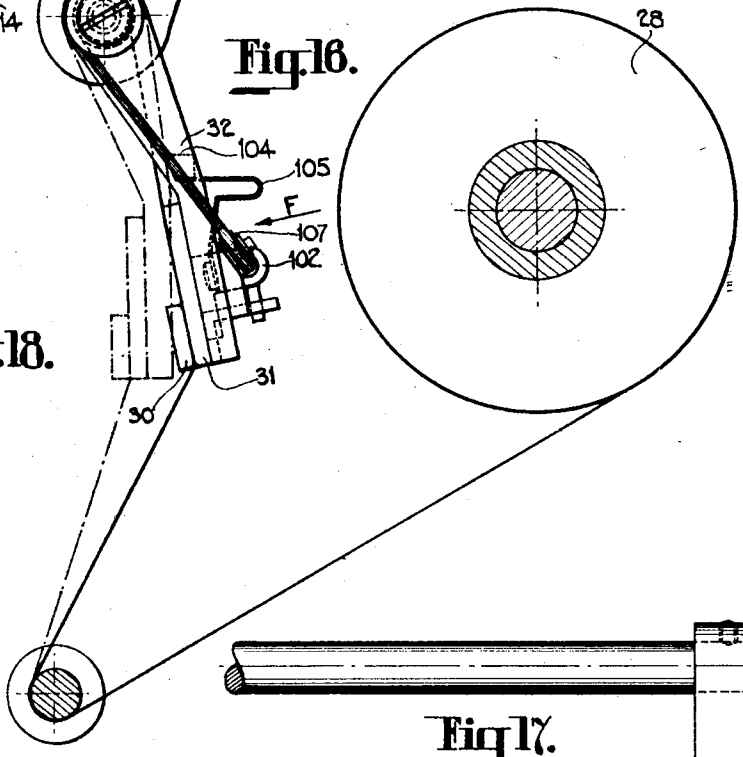


Fig. 18.



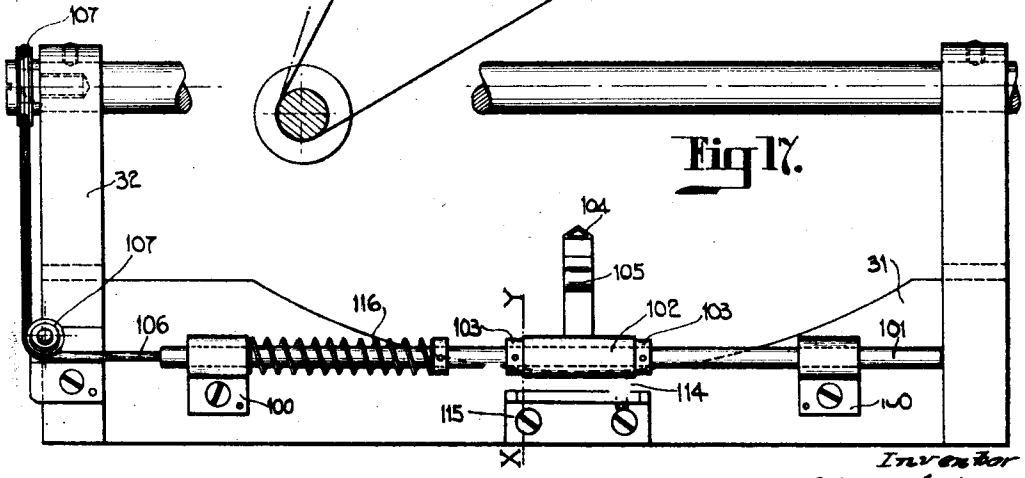


Fig. 17.

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UNITED STATES PATENT OFFICE

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CIGARETTE MAKING MACHINERY

Application filed September 25, 1926, Serial No. 137,715, and in Great Britain October 8, 1925.

This invention is for improvements in or relating to a device for checking the consistency of cigarettes and has for its object the provision of a device adapted for use in connection with a cigarette making machine which will enable the operator to readily ascertain from time to time whether the machine under his supervision is producing cigarettes of the desired consistency, and may also register upon a chart a permanent record of the consistency of the cigarettes weighed from time to time.

It is essential in the manufacture of cigarettes to maintain a consistency in the density of the tobacco which will avoid the serious defects which accrue when the tobacco is either too tightly or too loosely packed. It is well known that when cigarettes are packed too tightly the same do not "draw" freely, whereas cigarettes too loosely packed are equally objectionable.

It has hitherto been customary for the attendant upon a cigarette making machine to weigh periodically one or two ounces of cigarettes and then count the number of cigarettes to the ounce, in order to ascertain whether the machine is functioning correctly. Such a method of testing the accuracy of the machine depends entirely upon the human element for its accuracy and employs a considerable amount of time and labour on the part of the attendant.

It is an object of the present invention to provide means whereby the consistency of the cigarettes manufactured may be more readily and easily determined than is possible with the method at present employed.

The present invention consists of a device for use in periodically checking the consistency of cigarettes produced by a cigarette making machine which comprises a weighing mechanism adapted to receive a predetermined number of cigarettes and means operatively connected to said mechanism for producing a permanent record of each weighing operation.

Further the present invention consists of a device for checking the consistency of cigarettes produced by a cigarette making machine which comprises a hopper adapted to accommodate cigarettes, a weighing mechanism adapted to receive the cigarettes from said hopper and means interposed in the path of the cigarettes from the hopper to the weighing mechanism for automatically delivering a predetermined number of cigarettes to the weighing mechanism for each weighing operation.

The invention is more particularly described with reference to the accompanying drawings, in which:—

Fig. 1 is a front elevation of an apparatus constructed according to the present invention.

Fig. 2 is a side elevation of Fig. 1 looking in the direction of the arrow "A".

Fig. 3 is a side elevation of Fig. 1 looking in the direction of the arrow "B".

Fig. 4 is a detailed front elevation of the counting mechanism.

Fig. 5 is a plan view of Fig. 4.

Fig. 6 is a fragmental view of the counting mechanism.

Fig. 7 is a diagrammatical illustration of the chart feeding and recording mechanism.

Figs. 8, 9 and 10, are detailed views of the mechanism which actuates the recording device.

Figs. 11 and 12, are detailed views of the recording arm of the weighing mechanism.

Fig. 13 is a fragmentary cross section on the line C—C of Fig. 5.

Fig. 14 is a fragmentary view of the cam mechanism which operates the movable side of the hopper and,

Fig. 15 illustrates a portion of the chart upon which weights or equivalent designations are automatically recorded.

Fig. 16 is a diagram showing the application of a time recording mechanism to the apparatus.

Fig. 17 is a detailed view in direction F, Fig. 16.

Fig. 18 is a section on XY, Fig. 17.

Fig. 19 is a perspective view of the pin carrier.

Fig. 20 is a perspective view of the cam bar.

Referring to the drawings, the apparatus

which comprises the subject matter of the present application consists of a counting mechanism which is illustrated in detail in Fig. 4, and a combined weighing and recording mechanism operatively connected to the counting mechanism in such a manner that a predetermined number of cigarettes may be automatically counted, and removed from a batch, weighed, and their weight or equivalent designation automatically recorded upon a chart.

The mechanism is driven from a main spindle 1 upon which is fixed a pulley 2 driven by means of a belt 3 from the main drive of the cigarette making machine.

The spindle 1 is provided with a worm 4 which is adapted to mesh with the worm-wheel 5 mounted upon a spindle 6 arranged at right angles to the spindle 1. The spindle 6 carries at one end a sprocket wheel 7 which drives a sprocket wheel 8 through the medium of a chain 9. The sprocket wheel 8 is mounted upon a spindle 10 (Fig. 13) which carries the counting drum 11 (Fig. 1).

Mounted on an extension of the spindle 6 is a knurled roller 12, the periphery of which is located in close proximity to the periphery of the counting drum 11.

Mounted at that end of the spindle 6 which is remote from the knurled roller 12, is a worm 13 adapted to mesh with a worm-wheel 14 secured to a vertical spindle 15 rotatable in bearings 16 and 17.

The spindle 15 carries at its upper end a worm 18 which meshes with the worm-wheel 19 secured to a spindle 20 arranged at right angles to the spindle 15.

Mounted on the free end of the spindle 20 is a worm 21 which meshes with a worm-wheel 22 secured to the spindle 23 of a feeding roller 24. The spindle 23 is carried in a bracket 25 secured to an upright bracket 26 which is mounted upon the frame which carries the counting mechanism.

Mounted in the bracket 25 is a second roller 27, which is adapted to be pressed into frictional engagement with the roller 24.

The rollers 24 and 27 are continuously rotated through the medium of the spindle 15 from the main drive of the cigarette machine. The rollers 24 and 27 are adapted to feed a web of paper from a reel 28 carried upon a spindle 29 over the platform 93 (Fig. 7) the leading edge of which may be serrated to facilitate the tearing of the web. The web of paper in its passage towards the feeding rollers 24 and 27, passes around a guide member 29^a (Fig. 7) between the elements 30 and 31 secured to a rocking lever 32, mounted upon spindle 33. The spindle 33 is connected to a lever 34 (Figs. 2 and 3) which is connected through a link 35 to a rocking arm 36 adapted to pivot at its centre point about the pivot pin 37.

The rocking arm 36 carries at its free end a roller 38 which is adapted to extend between the faces of a cylindrical cam 39. The cam 39 is freely mounted upon the spindle 15 and is held by means of a spring 43 in contact with a fibre washer 40 fitted between the cam 39 and a collar 45 fixed to the spindle 15.

The upper portion of the cam 39 is pressed into engagement with a fibre washer 41 located between the upper section of the cam 39 and a collar 42 slidable without rotation on the spindle 15. The lower half of the cam 39 is provided with a radial lug 46, which is adapted to extend into the path of a finger 47 secured to a spindle 48 rotatably mounted in bearings 49 and 50 formed in the triangular frame-work 26. The spindle 48 is arranged to slide axially in the bearings 49 and 50.

The spindle 48 carries at the end remote from the finger 47 a lever 51 (Fig. 1) the free end of which is connected to a link 52 which is connected to a lever 53 pivoted on a pin 54 and provided with a downwardly extending arm 55 (Fig. 6) the free end of which is arranged in the path of a roller 56 carried on one end face of the drum 11.

The end of the lever 53 is connected to a spring 57 which tends to draw the lever upwardly and move the finger 47 out of the path of the lug 46 on the cam 39. The free end of the lever 53 is further arranged to engage with a catch 58 pivoted at 59 and drawn towards the lever 53 by the spring 60 so that normally the catch 58 holds the lever 53 in the position shown in Fig. 1.

The spindle 48 is normally drawn towards the right by a compression spring 61 located between the lever 51 and the bearing 50. When the finger 47 is not in engagement with the lug 46 and the lever 53 is in the position illustrated in Fig. 1 the spring 61 draws the spindle 48 to the right until the abutment 63 bears against the bearing 49 and the pin 64 on the abutment C3 is located above the surface of the bearing 49. In this position the spindle 48 is prevented from rotating about its axis until it has been moved axially by the lug 46 acting on the finger 47.

The spindle 10 (Fig. 13) which carries the drum 11 is bolted to the side frame 65 (Fig. 3). The spindle 10 carries a ratchet wheel 66 (Fig. 13) which is secured to the sprocket wheel 8 hereinbefore referred to.

Pivotally secured to the drum 11 is a pawl 67 adapted to engage with the ratchet wheel 66.

The drum 11 is mounted freely on the spindle 10 and is adapted to be driven by the ratchet wheel 66 through the medium of the pawl 67 which is pressed into engage-

ment with the teeth thereof by means of a spring 68.

Mounted on the pawl 67 (Fig. 6) is a stud 69 which is adapted to engage with the lever 53 hereinbefore referred to so as to disengage the pawl 67 from the wheel 66 after the drum 11 has moved a predetermined distance.

The drum 11 is provided with a series of flutes 70 arranged to pass beneath the delivery opening of a hopper arranged to accommodate cigarettes.

The hopper is preferably constructed with a fixed side plate 71, a pivoted base-plate 72 and a movable side plate 73. The pivoted base-plate 72 is adapted to hinge about the pin 74 and is adapted to engage at its free end with a retaining pin 75, (Fig. 4) secured to a bell-crank lever 76 pivoted upon a pin 77, the free end of which is arranged in the path of the roller 56 hereinbefore referred to.

The movable side plate 73 of the hopper is carried upon a spindle 78 and is pressed inwardly by means of a spring 79. The movable side plate 73 has secured to one face thereof a roller 80 (Fig. 14) which is adapted to ride over one end face of the fluted drum and periodically engage with a raised portion 81 formed on the face of the drum so as to move the side face of the hopper outwardly against the influence of the spring 79 and thereafter permit the spring to return the side face 73 to its normal position.

The fluted drum 11 is adapted to receive cigarettes from the hopper hereinbefore referred to and deliver them one at a time into a chute 82.

The chute 82 is provided with a retainer 82^a pivoted upon a spindle 82^c and is adapted to retain each cigarette upon the chute until all the cigarettes have been delivered by the drum. The retainer 82^a is adapted to release the cigarettes automatically by means of an arm 82^d secured to the spindle 82^c which is rocked by the roller 56 (Fig. 4), after all the cigarettes have been delivered to the chute, so as to move the retainer upwardly. The retainer if necessary may be operated manually by means of the handle 82^e connected to the spindle 82^c.

The pan 83 is connected by means of arms 84 to a beam 85. The arms are adapted to pivot about a knife edge 86. The beam 85 is adapted to pivot about a knife edge 87 and is held in a balanced position by means of a balance weight 88. Mounted at the centre of the beam 83 is a balance arm 89 adapted to carry needle point 90 flexibly mounted situated in close proximity to the rocking lever 32 and is arranged to bear against a supporting surface 91 in such a manner that as the rocking lever 32 moves the paper against the needle point 90, the knife edge of the balance arm is not subjected to any side thrust which may be imparted by the paper. Further the pointer 94 is connected to the beam 85 and is adapted to move over the scale 95 to indicate to the operator the consistency of the cigarettes tested. The drum 11 is preferably provided with a brake 92 which bears upon the cylindrical surface of the same to bring the drum to rest at the end of each complete revolution.

Referring to Fig. 15 the chart is provided with a datum line which is shown in dotted lines and is intended to show the zero position of the needle 90. In order to obviate the necessity for the correct alignment of the web so as to ensure that the needle is always located opposite the datum line when in the zero position, there is preferably provided a stationary needle 90^a which in the correct functioning of the apparatus will perforate the web constantly along the datum line, and which will indicate any variation in the path of the web should the same move laterally and yet continue to show whether the cigarettes manufactured are consistent in weight. Figs. 16 to 20 inclusive, illustrate an arrangement for marking the movable chart periodically to indicate definite time intervals thereon.

On the plate 31 are mounted two brackets 100 through which a rod 101 can slide.

A pen carrier 102 is carried on the rod 101 and can rotate thereon, but is restrained from endwise movement by collars 103. The pen 104 comprises a small metal cup with a pointed end which forms the pen point and is carried on a spring 105. The pen cup is filled with a thick ink which feeds up to the point, the pen being a standard fitting on recording barometers etc. A flexible wire 106 is connected to rod 101 and guided around pulleys 107 and fastened to one end of a lever 108 pivoted at 109. The other end of the lever carries a roller 110 engaging with a cam 111 driven by a clock mechanism 112. This latter is mounted on a bracket 113, fixed to the carrier in which the paper feed rollers 27 and 24 are mounted. The cam rotates at a predetermined rate and at each chosen interval of time the pen carrier is moved across the chart. A pin 114 on the carrier runs in a cam groove formed in a cam bar 115 which causes the carrier to rock over until the pen touches the paper as soon as the movement starts. A spring 116 returns the parts.

The operation of the apparatus is as follows:—When a cigarette making machine, to which the apparatus is operatively connected is started, the pulley 2 drives the spindle 15 which in its turn rotates the spindle 20 and causes the web of paper which comprises the chart, to be continu-

ously drawn from the reel 28 by the rollers 24 and 27.

The rotation of the rollers 24 and 27 depend upon the speed of the cigarette making machine and consequently the length of the web fed by the rollers in any one day gives a rought indication of the number of cigarettes which have been manufactured by the machine. Thus a superintendent may, by inspecting the chart, ascertain whether the machine is operating correctly, and further, gauge the output of the machines under his care without obtaining any data from the operators.

The attendant upon the cigarette making machine in order to test the consistency of the cigarettes produced, periodically takes a handful of cigarettes from the delivery bolts and inserts them into the hopper of the apparatus. The operator thereupon moves the catch 58 outwardly so as to disconnect the same from the end of the lever 53.

When the lever 53 is released the spring 57 moves the same upwardly and through the medium of the links 52 and 51 rotates the spindle 48 about its axis.

Further the upward movement of the lever 53 removes the same out of engagement with the pin 69 on the pawl 67 and permits the pawl to be moved into engagement with the continuously rotating ratchet wheel 66. When the pawl 67 engages with the ratchet wheel 66, the drum 11 commences to rotate about its axis and causes the cam surface 81 on one end face thereof to displace the movable side of the hopper momentarily which upon its return presses the ends of the cigarettes against the fixed side of the hopper.

The continued rotation of the drum 11 brings the flutes formed therein beneath the delivery opening of the hopper and due to the action of the fluted roller 12 one cigarette is fed to each flute in the drum.

As the drum rotates, the roller 56 mounted thereon engages with the free end of the arm 55 so as to move the lever 53 downwardly about its pivot so as to reset the catch 58 and through the medium of the links 52 and 51 again rotate the spindle 48 about its axis and bring it back to its initial position. As the cigarettes are conveyed forwardly by the fluted drum a bifurcated end on the chute 82 removes the cigarettes from the drum and the retainer 82^a maintains the cigarettes upon the chute. When the predetermined number of cigarettes have been fed by the drum on to the chute 82, the roller 56 on the drum engages with the arm 82^a and releases the retainer 82^a so as to permit the cigarettes to fall into the pan 83 and the stud 69 on the pawl 67 engages with the lever 53 so as to move the pawl 67 out of engagement with the ratchet wheel 66 and so disconnect the drum from the main drive, the brake 92 thereafter bringing the drum to rest.

When the cigarettes have been deposited in the pan 83, the beam is moved about the knife edge 87 and the balance arm 89 is given an angular displacement.

Immediately the lever 53 is released by the catch 58, the spindle 48 is rotated about its axis so as to move the finger 47 out of the path of the lug 46, on the cam 39.

The cam 39 is thereafter rotated by the spindle 15 and after the predetermined number of cigarettes have been weighed and the balance arm displaced, the cam 39 rocks the arm 36 so as to move momentarily the web carried by the rocking arm 32 into engagement with the needle points 90 and 90^a and a permanent record is made upon the chart of the weight of the cigarettes tested.

Immediately after the desired number of cigarettes have been removed from the hopper by the drum 11 the roller 56 is adapted to engage with the bell-crank lever 76 so as to release the movable base-plate 72 of the hopper and allow the excess of cigarettes in the hopper to fall therefrom, whereupon the attendant replaces the movable base-plate in its initial position so as to reset the same for a second weighing operation.

Due to the fact that the web is fed very slowly between the feeding rollers 24 and 27, it is necessary to ensure that two weighing operations may not be recorded in rapid succession. For example if an attendant should attempt to weigh a second quantity of cigarettes immediately after having recorded the weight of a previous quantity, the web would not have travelled sufficiently far to give two distinct readings. In order to ensure therefore, that a minimum time interval elapses between successive weighing operations the spindle 48 is mounted so as to be slidable axially and the spring 61 normally tends to move the spindle to the right. Therefore when lever 53 is moved downwardly after the drum has been set in motion the spindle is rotated so as to bring the finger 47 again into the path of the lug 46. Immediately the pin 64 disengages with the side of the bearing 49, the spring 61 moves the spindle 48 to the right and the pin 64 rests on the top of the bearing 49. Thus it will be seen that until the lug 46 on the cam 39, displaces the spindle 48 to the left, it is impossible for the lever 53 to move upwardly and release the pawl 67 so as to set the drum in motion. It will be observed therefore, that the cam 39 must make one complete revolution before a second weighing operation can be effected. When the cam 39 has made one complete revolution, the lug 46 will move the spindle 48 to the left and immediately the pin 64 disengages with the bearings 49, the lever 53 will be moved upwardly to permit the pawl 67 to be moved

into engagement with the ratchet wheel 66.

It will be appreciated that with machines which travel at a speed which is incapable of variation by the operator the chart will not only indicate the number of cigarettes produced and their consistency, but will also inform the superintendent as to the total productive period of a working day.

With a machine however, the speed of which is variable by the operator it would be impossible with the arrangement hereinbefore described to ascertain whether a machine has been running continuously or not, as an operator could increase the speed of the machine in order to make up for a lost period. In order to check a machine of this character, it would be necessary to provide means which would mark time intervals of, say quarter of an hour along the web as the same was fed forward. The position of these time markings along the web compared with markings indicating the number of cigarettes manufactured would indicate the speed at which the machine had been run from time to time. The time mechanism hereinbefore referred to, could be connected to the rocking arm 32. The timing mechanism could be arranged to stamp upon the chart, the time at which the machine was started, the time when the machine was closed down and also periodically mark the chart at definite time intervals during the working period. The charts could be collected at the end of each day and would constitute a guide to the managerial staff both as to the efficiency of the individual operators and also the total output of the factory.

What I claim as my invention and desire to secure by Letters Patent is:—

1. An apparatus for periodically checking the consistency of cigarettes produced by a cigarette making machine which comprises in combination a weighing mechanism, means adapted periodically to deliver a constant number of cigarettes to said mechanism, and means operatively connected to said mechanism for effecting a permanent record of each weighing operation.

2. An apparatus for periodically checking the consistency of cigarettes produced by a cigarette making machine, which comprises in combination means adapted to accommodate cigarettes, a weighing device, counting mechanism operable to receive a predetermined number of cigarettes from said means and to deliver the same to the weighing device whereby a definite number of cigarettes may be weighed on each operation of said counting mechanism.

3. An apparatus for periodically checking the consistency of cigarettes produced by a cigarette making machine, which comprises in combination means adapted to accommodate cigarettes, counting mechanism adapted to receive a predetermined number of cigarettes from said means, a weighing device arranged to receive the counted cigarettes from the counting mechanism and means operatively connected to said weighing device adapted to effect a permanent record of the weight of each predetermined number of cigarettes selected.

4. An apparatus for periodically checking the consistency of cigarettes produced by a cigarette making machine, which comprises in combination a hopper adapted to accommodate cigarettes, a rotatable fluted drum located beneath the delivery opening of said hopper and adapted to receive a predetermined number of cigarettes from said hopper, a weighing mechanism, means adapted to remove the cigarettes from said drum and deliver the same to said weighing mechanism, and means operatively connected to said weighing mechanism adapted to effect a permanent record of the weight of said cigarettes.

5. An apparatus for periodically checking the consistency of cigarettes produced by a cigarette making machine, which comprises in combination a hopper adapted to accommodate cigarettes, a rotatable fluted drum located beneath the delivery opening of said hopper and adapted to receive a predetermined number of cigarettes one at a time from said hopper, a weighing mechanism, a chute adapted to transfer the cigarettes from said drum to said weighing mechanism adapted to effect a permanent record of the weight of the said cigarettes.

6. An apparatus for periodically checking the consistency of cigarettes produced by a cigarette making machine, which comprises in combination a hopper adapted to accommodate cigarettes, a rotatable fluted drum located beneath the delivery opening of said hopper and adapted to receive a predetermined number of cigarettes one at a time from said hopper, a weighing mechanism, a chute adapted to remove the cigarettes one at a time from said drum and deliver the same in bulk to said weighing mechanism and means operatively connected to said weighing mechanism adapted to effect a permanent record of the weight of the said cigarettes.

7. An apparatus for use on a cigarette making machine which comprises in combination a flexible sheet, means for driving said sheet from said machine, and means for marking said sheet at definite time intervals.

8. In a device for use with a cigarette machine in which the speed of the machine determines the number of cigarettes produced thereby in a given time, a movable chart driven from said machine, mechanism for determining the consistency of cigarettes manufactured by the machine, and a marking device operated by said mechanism and cooperating with said chart.

9. An apparatus for use on a cigarette machine comprising in combination a movable chart, means for driving said chart from said machine, mechanism for weighing a predetermined number of cigarettes, and a device operatively connected to said mechanism for recording the weight on said chart.

10. An apparatus for use with a cigarette machine, comprising a weighing mechanism, means for automatically selecting a predetermined number of cigarettes from a batch and transferring the same to said weighing mechanism, and a recording device operatively connected to said weighing mechanism.

11. An apparatus for periodically checking the consistency of cigarettes produced by a cigarette making machine, which comprises in combination a weighing mechanism adapted periodically to receive a constant number of cigarettes, a chart fed by said machine, and means operatively connected to said mechanism for permanently recording the weighing operation on said chart.

12. An apparatus for use with a cigarette machine, comprising a weighing mechanism, means for transferring a predetermined number of cigarettes to said weighing mechanism, a chart fed by said machine, and means operatively connected to said mechanism for permenently recording the weighing operation on said chart.

13. An apparatus for periodically checking the consistency of cigarettes produced by a cigarette making machine, which comprises in combination means adapted to accommodate cigarettes, counting mechanism adapted to receive a predetermined number of cigarettes from said means, a weighing device arranged to receive the counted cigarettes from the counting mechanism, a chart fed by said machine, and means operatively connected to said mechanism for permanently recording the weighing operation on said chart.

14. An apparatus for use with a cigarette machine, comprising a weighing mechanism, means for transferring a predetermined number of cigarettes to said weighing mechanism, a recording device operatively connected to said weighing mechanism, and an automatically operated means cooperating with said first named means for locking the same against movement during a predetermined period after each transferring operation.

15. An apparatus for periodically checking the consistency of cigarettes produced by a cigarette making machine, which comprises in combination means adapted to accommodate cigarettes, counting mechanism adapted to receive a predetermined number of cigarettes from said means, a weighing device arranged to receive the counted cigarettes from the counting mechanism, means operatively connected to said weighing device adapted to effect a permanent record of the weight of each predetermined number of cigarettes selected, and an automatically operated means cooperating with said first named means for locking the same against movement during a predetermined period after each transferring operation.

16. An apparatus for periodically checking the consistency of cigarettes produced by a cigarette making machine, which comprises in combination a hopper adapted to accommodate cigarettes, a rotatable fluted drum located beneath the delivery opening of said hopper and adapted to receive a predetermined number of cigarettes, one at a time, from said hopper, a weighing mechanism, a chute adapted to remove the cigarettes one at a time, from said drum, a retaining device on said chute operable by the rotation of the drum to release the cigarettes in bulk to said weighing mechanism, and means operatively connected to said weighing mechanism adapted to effect a permanent record of the weight of the said cigarettes.

17. An apparatus for periodically checking the consistency of cigarettes produced by a cigarette making machine, which comprises in combination means adapted to accommodate cigarettes, counting mechanism adapted to receive a predetermined number of cigarettes from said means, an intermittent grip device for driving and counting mechanism from said machine, and a weighing device arranged to receive the counted cigarettes from said mechanism.

18. An apparatus for periodically checking the consistency of cigarettes produced by a cigarette making machine, which comprises in combination, a hopper adapted to accommodate cigarettes, a rotatable fluted drum located beneath the delivery opening of said hopper and adapted to receive a predetermined number of cigarettes, one at a time, from said hopper, an intermittent grip device for driving said drum from said machine, a weighing mechanism, a chute adapted to transfer the cigarettes from said drum to said weighing mechanism, and means for permanently recording the weight of said cigarettes.

19. In apparatus for weighing cigarettes, the combination with a container adapted to receive cigarettes, of a rotatable drum for receiving cigarettes from the container, an intermittent grip mechanism for driving said drum, means controlled by the rotation of said drum for disconnecting said intermittent grip mechanism from said drum, and a weighing device for receiving cigarettes from said drum.

20. In apparatus for weighing cigarettes,

the combination with a container for the cigarettes, a rotatable drum for receiving the cigarettes from said container, an intermittent grip mechanism for driving said drum, means controlled by the rotation of said drum for disconnecting said intermittent grip mechanism from said drum, a latch cooperating with said means for retaining said intermittent grip mechanism disconnected, and a weighing mechanism for receiving cigarettes from said drum.

21. In a weighing mechanism for cigarettes, the combination with a container for the cigarettes, a rotatable drum for receiving the cigarettes from the container, an intermittent grip mechanism for driving said drum, a lever for engaging said intermittent grip device to move the latter to inoperative position, means on said drum for operating said lever, a latch for said lever, and a weighing mechanism arranged to receive cigarettes from said drum.

22. An apparatus for use with a cigarette making machine of the type in which the number of cigarettes produced is in direct proportion to the speed and duration of operation of the machine, comprising in combination, a movable record receiving device driven from said machine so that the extent of movement of said device indicates roughly the number of cigarettes produced, and means fixed with relation to the direction of movement of said device for marking said device at definite intervals, whereby the number of cigarettes produced during any period indicated by successive markings will be proportional to the spacing between such markings.

23. In a cigarette machine of the type wherein the number of cigarettes produced is in direct proportion to the speed and duration of operation of the machine, apparatus for determining the number of cigarettes produced during a given period of time, said apparatus comprising in combination a record receiving device, and a recording device cooperating with said record receiving device to indicate periods of time thereon, said devices being relatively movable, and one of said devices being driven from the machine whereby the spacing of successive indications on said record device will be proportional to the number of cigarettes produced during the interval of time indicated.

24. An apparatus for use with a cigarette making machine comprising in combination a record receiving device, means for driving said device in timed relation to the speed of operation of the machine, mechanism for determining the consistency of cigarettes produced by the machine, and a recording device cooperating with said record receiving device and operated by said mechanism.

25. An apparatus for use with a cigarette making machine in which the speed of the machine determines the number of cigarettes produced thereby in a given time comprising in combination a mechanism for determining the consistency of cigarettes produced by said machine, a pair of relatively movable cooperating indicating devices, one of said indicating devices being driven in definite speed relation to said machine and the other of said indicating devices being driven by said mechanism.

26. An apparatus for use with a cigarette making machine comprising in combination a mechanism for determining the consistency of cigarettes produced by said machine, a pair of relatively movable cooperating indicating devices, one of said indicating devices being driven in definite speed relation to said machine, the other of said indicating devices being driven by said mechanism, and means for engaging and disengaging said indicating devices.

27. An apparatus for use with a cigarette making machine comprising in combination a mechanism for determining the consistency of cigarettes produced by said machine, a pair of relatively movable cooperating indicating devices, one of said indicating devices being driven in definite speed relation to said machine, the other of said indicating devices being driven by said mechanism, and means for engaging and disengaging said indicating devices, said means being driven from said machine.

28. An apparatus for periodically checking the consistency of cigarettes produced by a cigarette making machine, which comprises in combination means adapted to accommodate cigarettes, counting mechanism adapted to receive a predetermined number of cigarettes from said means, a weighing device arranged to receive the counted cigarettes from the counting mechanism, and means operatively connected to said weighing device adapted to effect a permanent record of the weight of each predetermined number of cigarettes selected, said last named means comprising a pair of normally disengaged recording elements, and means for operatively engaging said recording elements on completion of the weighing operation.

29. An apparatus for periodically checking the consistency of cigarettes produced by a cigarette making machine, which comprises in combination means adapted to accommodate cigarettes, counting mechanism adapted to receive a predetermined number of cigarettes from said means, a weighing device arranged to receive the counted cigarettes from the counting mechanism, and means operatively connected to said weighing device adapted to effect a permanent record of the weight of each predetermined number of cigarettes selected, said last named means comprising a pair of normal-

ly disengaged recording elements, a cam driven from said machine, and a link mechanism operable by said cam for engaging said recording elements on completion of the weighing operation.

30. In apparatus of the class described, a driving means, a record receiving means driven thereby, a weighing mechanism, a recording device operable by said mechanism, said recording device and record receiving means being normally disengaged, and means driven by said driving means and operatively connected to the record receiving means and recording device for periodically engaging the same.

31. In apparatus of the class described, a driving means, a record receiving means driven thereby, a weighing mechanism, a recording device operable by said mechanism, said recording device and record receiving means being normally disengaged, and a cam frictionally driven by said driving means and operatively connected to the record receiving means and recording device for periodically engaging the same.

32. In apparatus for use on a cigarette making machine, in combination a container for cigarettes, a weighing mechanism and a rotatable drum arranged to convey cigarettes from said container to said weighing mechanism, an intermittent grip device for driving said drum, a lever for disengaging said intermittent grip device to interrupt the drive, a recording device operatively connected to said weighing mechanism, means to move said recording device to operative and inoperative positions, and means controlled by said lever to hold said last named means against movement.

33. In apparatus for use on a cigarette machine, in combination a container for cigarettes, a weighing mechanism, and a rotatable drum arranged to convey cigarettes from said container to said weighing mechanism, an intermittent grip device for driving said drum, a lever for disengaging said intermittent grip device and drum to interrupt the drive, a recording device operatively connected to said weighing mechanism, a frictionally driven cam connected to said recording device to move the same to operative and inoperative positions, a finger cooperating with said cam to lock the latter against movement, and connections between said lever and finger to move the finger into and out of locking position.

34. In apparatus for use on a cigarette machine, in combination a container for cigarettes, a weighing mechanism, and a rotatable drum arranged to convey cigarettes from said container to said weighing mechanism, an intermittent grip device for driving said drum, a lever operable by the rotation of said drum for disengaging said intermittent grip device and drum to interrupt the drive, a recording device operatively connected to said weighing mechanism, a frictionally driven cam connected to said recording device to move the same to operative and inoperative positions, a finger cooperating with said cam to lock the latter against movement, and connections between said lever and finger to move the finger into and out of locking position, means for locking said lever and finger against movement, and means actuated by said cam for releasing said last named locking means.

35. In a recording apparatus for a weighing machine, the combination of a pair of cooperating recording elements, and means for periodically engaging and disengaging said elements comprising a frictionally driven rotatable cam and mechanism connecting said cam with one of said recording elements, a rock shaft, an abutment on said shaft, and an abutment on said cam, said abutments cooperating to lock said cam against movement.

36. In a recording apparatus for a weighing machine, the combination of a pair of cooperating recording elements, and means for periodically engaging and disengaging said elements comprising a frictionally driven rotatable cam and mechanism connecting said cam with one of said recording elements, a rock shaft, an abutment on said shaft, and an abutment on said cam, said abutments cooperating to lock said cam against movement, means for rotating said rock shaft into position for locking or releasing said cam, a stationary abutment, and a second abutment on said rock shaft for engagement with said stationary abutment to lock said rock shaft in cam locking position.

37. In a recording apparatus for a weighing machine, the combination of a pair of cooperating recording elements, and means for periodically engaging and disengaging said elements comprising a frictionally driven rotatable cam and mechanism connecting said cam with one of said recording elements, a rock shaft, an abutment on said shaft, and an abutment on said cam, said abutments cooperating to lock said cam against movement, means for rotating said rock shaft into position for locking or releasing said cam, a stationary abutment, and a second abutment on said rock shaft for engagement with said stationary abutment to lock said rock shaft in cam locking position, said second abutment and said stationary abutment being disengaged by longitudinal movement of said rock shaft.

38. In a recording apparatus for a weighing machine, the combination of a pair of cooperating recording elements, and means for periodically engaging and disengaging said elements comprising a frictionally driven rotatable cam and mechanism connecting

said cam with one of said recording elements, a rock shaft, an abutment on said shaft, and an abutment on said cam, said abutments cooperating to lock said cam against movement, means for rotating said rock shaft into position for locking or releasing said cam, a stationary abutment, and a second abutment on said rock shaft for engagement with said stationary abutment to lock said rock shaft in cam locking position, said second abutment and said stationary abutment being disengaged by longitudinal movement of said rock shaft, the abutment on said cam serving to move said rock shaft longitudinally on each rotation of said cam to permit rotation of said rock shaft to cam releasing position.

39. In a recording apparatus for a weighing machine, the combination of a pair of cooperating recording elements, and means for periodically engaging and disengaging said elements comprising a frictionally driven rotatable cam and mechanism connecting said cam with one of said recording elements, a rock shaft, an abutment on said shaft, and an abutment on said cam, said abutments cooperating to lock said cam against movement, means for rotating said rock shaft into position for locking or releasing said cam, a stationary abutment, and a second abutment on said rock shaft for engagement with said stationary abutment to lock said rock shaft in cam locking position, said second abutment and said stationary abutment being disengaged by longitudinal movement of said rock shaft, the abutment on said cam serving to move said rock shaft longitudinally on each rotation of said cam to permit rotation of said rock shaft to cam releasing position, means for automatically restoring said rock shaft to the position in which it is locked against rotation on release of said cam.

In testimony whereof I hereunto affix my signature.

WALTER EVERETT MOLINS.