Feb. 20, 1923. 1,446,041

J. GRAVES

CARBON INSERTER FOR BATTERY CORE MAKING MACHINES

Original Filed July 5, 1918 2 sheets-sheet 1

Fig. 1

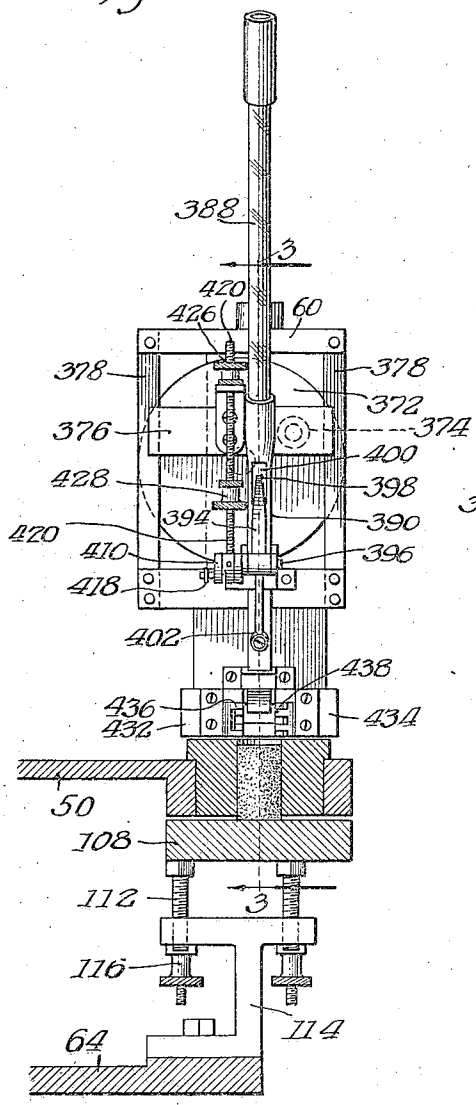
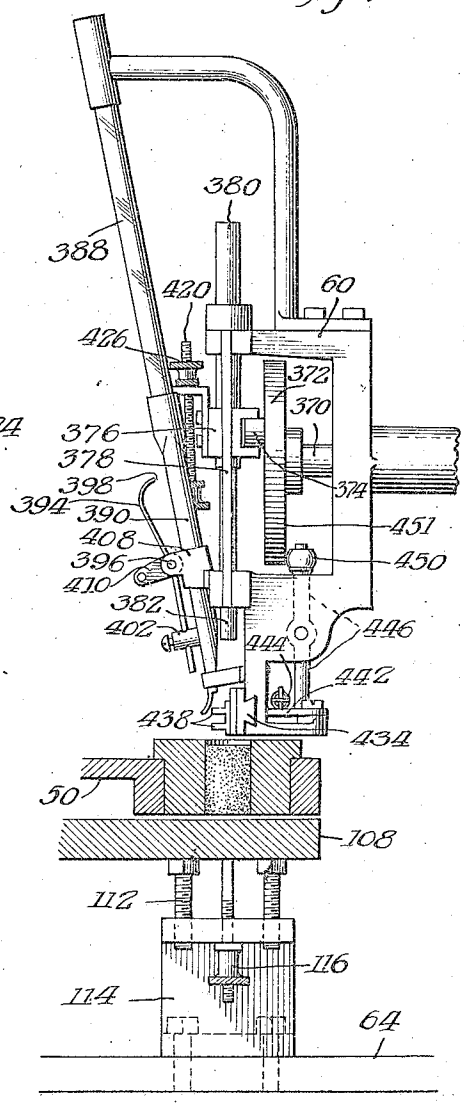


Fig. 2



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Fig. 3

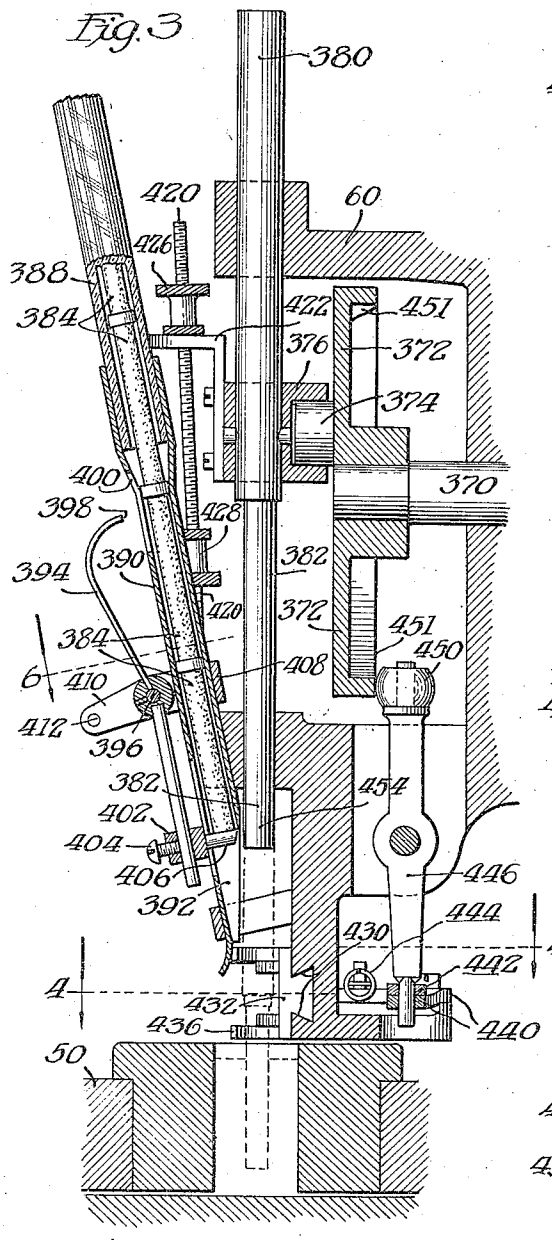
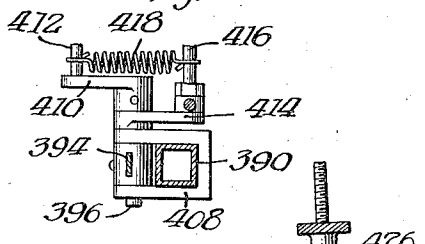


Fig. 6



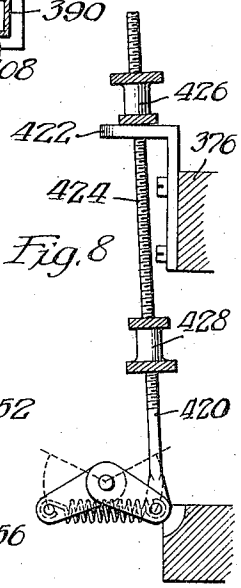


Fig. 8

Fig. 5

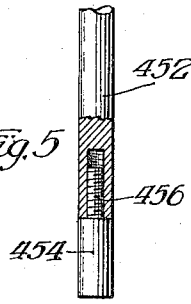


Fig. 4

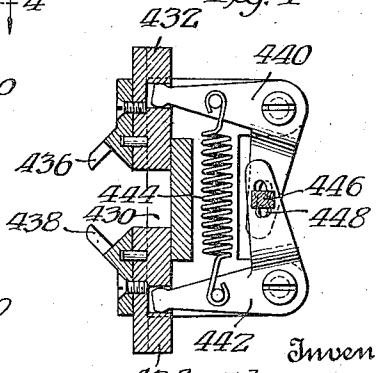
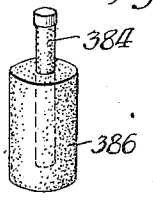


Fig. 7



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Patented Feb. 20, 1923. 1,446,041

UNITED STATES PATENT OFFICE.

JOHN GRAVES, OF MADISON, WISCONSIN, ASSIGNOR TO FRENCH BATTERY & CARBON COMPANY, OF MADISON, WISCONSIN, A CORPORATION OF WISCONSIN.

CARBON INSERTER FOR BATTERY-CORE-MAKING MACHINES.

Original application filed July 5, 1918, Serial No. 243,503. Divided and this application filed March 14, 1921, Serial No. 452,071. Renewed January 15, 1923.

To all whom it may concern:

Be it known that I, JOHN GRAVES, a citizen of the United States, residing at Madison, in the county of Dane and State of Wisconsin, have invented a certain new and useful Improvement in Carbon Inserters for Battery-Core-Making Machines, of which the following is a specification.

In the manufacture of what are commonly known in the trade as dry batteries, for use in hand flash lamps and the like, it is common to surround a fixed carbon pencil with a more or less tightly pressed cylinder of depolarizing chemicals, commonly called mix. In practice heretofore it has frequently been common to insert the carbon pencil in the mold and then tamp the depolarizing material or mix about it, but more satisfactory results are obtained both in operative manipulation of manufacture and in actual use in a battery, if the cylinder of depolarizing material is first formed in a mold and then the carbon pencil is pressed into it.

United States patent application, Serial Number 243,503, filed July 5, 1918, of which this application is a division, shows and claims a machine which prepares a cylinder of mix material preparatory to having the carbon pencil inserted therein and shows, but does not claim, the mechanism of this invention operative to insert the carbon pencil.

The object of this invention is to provide a comparatively cheap, easily constructable and efficiently operating mechanism for inserting the carbon pencil in the body of the mix. The invention consists in mechanism for attaining the foregoing objects and in many features and details of construction which will be hereafter more fully set forth in the specification and claims.

Referring to the drawings in which like numerals designate the same parts thruout the several views:

Figure 1 is a side view and Figure 2 a front view of mechanism illustrating this invention.

Figure 3 is an enlargement of Figure 1, taken in section at approximately the center so as to show details.

Figure 4 is a detail plan view on the irregular line 4—4 of Figure 3.

Figure 5 is a sectional detail view of the carbon inserting plunger showing a method by which a different tool can be inserted.

Figure 6 is a plan view on the line 6 of Figure 3.

Figure 7 is a perspective view of a particular form of core which sometimes has to be made and is used as illustrating one form of the device which a machine of this invention is capable of producing.

Figure 8 shows parts of a carbon releasing and feeding machine.

For the convenience of ready comparison with the original application, from which this application was divided, the same reference numerals used in said original application are retained in this one to designate the various parts.

This device referred to in said prior application under the general numeral 60, is supported by a portion of the frame bearing that numeral in Figure 3.

The carbon inserting and ejecting mechanism is driven by shaft 370, suitably supplied with power not entering into this invention. On shaft 370, and in a suitable recess in frame 60, is a driving wheel 372 carrying on its face a roller 374 adapted to travel lengthwise of a slot in a crosshead 376, whose ends are adapted for sliding engagement in vertical track members 378 (Figure 1). Rigidly secured to this crosshead and slidably mounted in frame 60 is a vertical plunger 380, whose lower end carries the carbon inserting tool 382. Rotation of wheel 372 operates through the mechanism just described to properly reciprocate this tool 382 to force a previously prepared carbon pencil 384, fed to it, into the cylindrical tamped core of "mix" 386 to about the depth shown in Figure 7.

In order to feed the carbon pencils to a position where they can be driven into the previously compressed bodies of depolarizing material, a suitably designed retaining chamber and escapement device is provided. In the particular form of the device illustrated in the drawings, the retaining chamber consists in a tubular member, made partly of glass 388, and partly of metal 390, suitably supported, as shown in Figures 1, 2 and 3, so that its lower end 392 discharges carbon pencils 384 into the path of travel of

the lower end of carbon inserting tool 382. An escapement mechanism for retaining these carbons in the tube and feeding them one at a time is provided, the same, in the particular case here shown, comprising an escapement lever 394, pivoted at 396, having its upper tooth 398 adapted to enter a suitable slot 400 in tube 390 so as to there engage and press upon one carbon member 384 therein when desired, and having in its lower end an adjustable block 402, detachably securable in place by a screw 404, and carrying a projecting pin 406 entering the path of travel of the bottom carbon pencil 384 within the tube 390. This escapement lever 394 is so adjusted that when upper tooth 398 engages one carbon pencil in the feeding device, pin 406 will be out of the path of travel of the bottom carbon pencil therein, and allow such bottom pencil to drop from tube 390 into the path of travel of tool 382.

The pivot pin or shaft 396, heretofore referred to, is mounted in a bracket 408, surrounding and attached to metal tube 390, as clearly appears in Figures 2 and 6. Rigidly attached to one end of this shaft 396 is a crank arm 410, having a crank pin 412. Loosely journaled on shaft 396, between crank arm and bracket 408, is another crank arm 414, having a long crank pin 416, which extends outward so that it can be connected with crank pin 412 by a spring 418. This crank pin 416 is also mounted upon the lower end of a vertical driving rod 420, slidable through a bracket 422 on the crosshead 376. Rod 420 is provided with screw threads 424 along its length on which travel two adjusting nuts 426 and 428, one located above the other below bracket 422. The arrangement of the parts recently described is such that the two crank pins 412 and 416 are always on opposite sides of the shaft 396, either above or below the center thereof, and when rod 420 is elevated so as to move crank pin 416 from one extreme position, say, below shaft 396, to the other extreme position, say above this said shaft, the tension of spring 418 automatically correspondingly moves the other crank pin, thus rocking shaft 396 and consequently, tilting escapement lever 394 rigidly attached to shaft 396 by any suitable means.

In the normal operation of the machine the adjusting nuts 426 and 428 are so placed that when crosshead 376, and consequently bracket 422, reach the upper limit of their vertical movement under the control of shaft 370, they move the parts to the position where escapement 394 releases the bottom carbon pencil 384 from tube 390 and holds the next succeeding carbon above in place, and that when the parts named reach their lower limit of movement, bracket 422 strikes adjusting nut 428 and reverses the position of the escapement, or, in other words, moves it to the position shown in Figure 3, wherein the lower carbon pencil is supported in its supply tube by pin 406.

If a carbon pencil 384 were allowed to drop from tube 390 directly on to a compressed cylinder of "mix" material 386 in the mold which is below the carbon inserting mechanism, it would not, in the absence of a holding mechanism necessarily assume such a position that the carbon inserting tool 382 could drive it into the cylinder of depolarizing material. It is, therefore, necessary to provide means by which the carbon pencil as it falls from tube 390 can be retained and held in driving position under the tool 382 until the carbon pencil has entered the cylinder of depolarizing material a sufficient distance to be self-supporting therein. This result is accomplished by providing the special gripping mechanism shown in Figures 1 and 4.

Slidable crosswise of the machine, in a suitable track provided for the purpose, adjacent to the path of travel of the lower end of the carbon inserting tool 382, which track in the case here illustrated takes the form of a triangular notch 430, cut in the frame of the machine, are two blocks or crossheads 432 and 434. Secured to the front faces of these crossheads are gripping jaws 436 and 438, adapted when the crossheads are moved toward each other to embrace and hold the carbon pencil 384 in position under tool 382 and over the cylinder of compressed depolarizing material, into which the carbon is to be inserted. These jaws just described are reciprocated toward each other by a pair of bell cranks 440 and 442, drawn toward each other by a spring 444 and moved in the opposite direction through the agency of a lever 446, one of whose ends engages the bell cranks in slots 448, while its other end carries a roller 450, which travels upon a suitably formed cam surface 451, formed on wheel 372. This cam surface is so positioned and shaped with reference to the adjustment of nuts 426 and 428 and the position of plunger 380 in crosshead 376, that when a carbon pencil 384 has been dropped from tube 390 it is grasped by jaws 436 and 438 and held in vertical position over the mold containing the cylinder of depolarizing material into which the carbon is to be inserted long enough so that as inserting tool 382 begins to descend it can bear upon the upper end of the carbon pencil and start it into the compressed cylinder and that jaws 436 and 438 then withdraw out of the path of travel of tool 382 before that tool reaches a position in its downward stroke where it would otherwise strike and injure the jaws.

In Figure 5 is shown a carbon inserting

tool 452 for the same purpose as tool 382, having a detachable lower end portion 454, in screw-threaded engagement 456 with tool 452. The object of this construction is twofold. It allows in a given tool adjustment for length by turning member 454 on threads 456, and it permits the total removal of member 454 and the substitution, therefore, of a corresponding member of different length, which substitute member might be required when a product of a different height was desired to be produced by the machine, and it was necessary to change the machine therefor. This capability of substitution also allows for change in the diameter of the tool 454, which most frequently occurs in practice.

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

1. In a machine of the character described, a plunger, means for reciprocating the plunger, and means for delivering articles to the plunger in position to be driven thereby, said article delivery means including an oscillatory member movable into and out of holding relation with the article, a rod connected to said member and carrying a pair of stops alternately engageable by an element of said plunger reciprocating means during operation of the latter whereby oscillatory movement is imparted to the member, said stops being independently adjustable along said rod whereby articles of various lengths may be delivered to the plunger at proper intervals.

2. In a machine of the character described, a plunger, means for reciprocating the plunger, and means for delivering articles to the plunger in position to be driven thereby, said article delivery means including an oscillatory shaft carrying a member movable into and out of holding relation with the articles, a crank arm rigid on said shaft, a second crank arm loose on said shaft, a contractile coil spring connecting said crank arms, and a rod connected to said loose crank arm and to the plunger reciprocating means whereby oscillatory movements are imparted to said loose crank arm and through said spring to the shaft to at predetermined times cause the member carried thereby to hold and release the articles.

3. In a device of the class described, in combination with a fixed support, a pair of jaws slidable in the support toward and from each other, a pair of bell cranks pivoted at one side of the jaws having one arm each engaging one of said jaws and the other arm adjacent to each other, spring mechanism on the first mentioned bell crank arm moving the bell cranks and consequently the jaws in one direction, a cam member, and an operating member between said cam and the operating jaws of the bell crank adapted, as the cam moves, to operate the bell cranks against the action of said springs.

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

JOHN GRAVES.

Witnesses:
W. C. Bostad,
Ben W. Park.