E. E. MEEKER & C. W. CARR, Jr.

CUTTING-OFF APPARATUS.

APPLICATION FILED JUNE 5, 1908.

922,795.

Patented May 25, 1909.

3 SHEETS—SHEET 1.

Fig. 1.

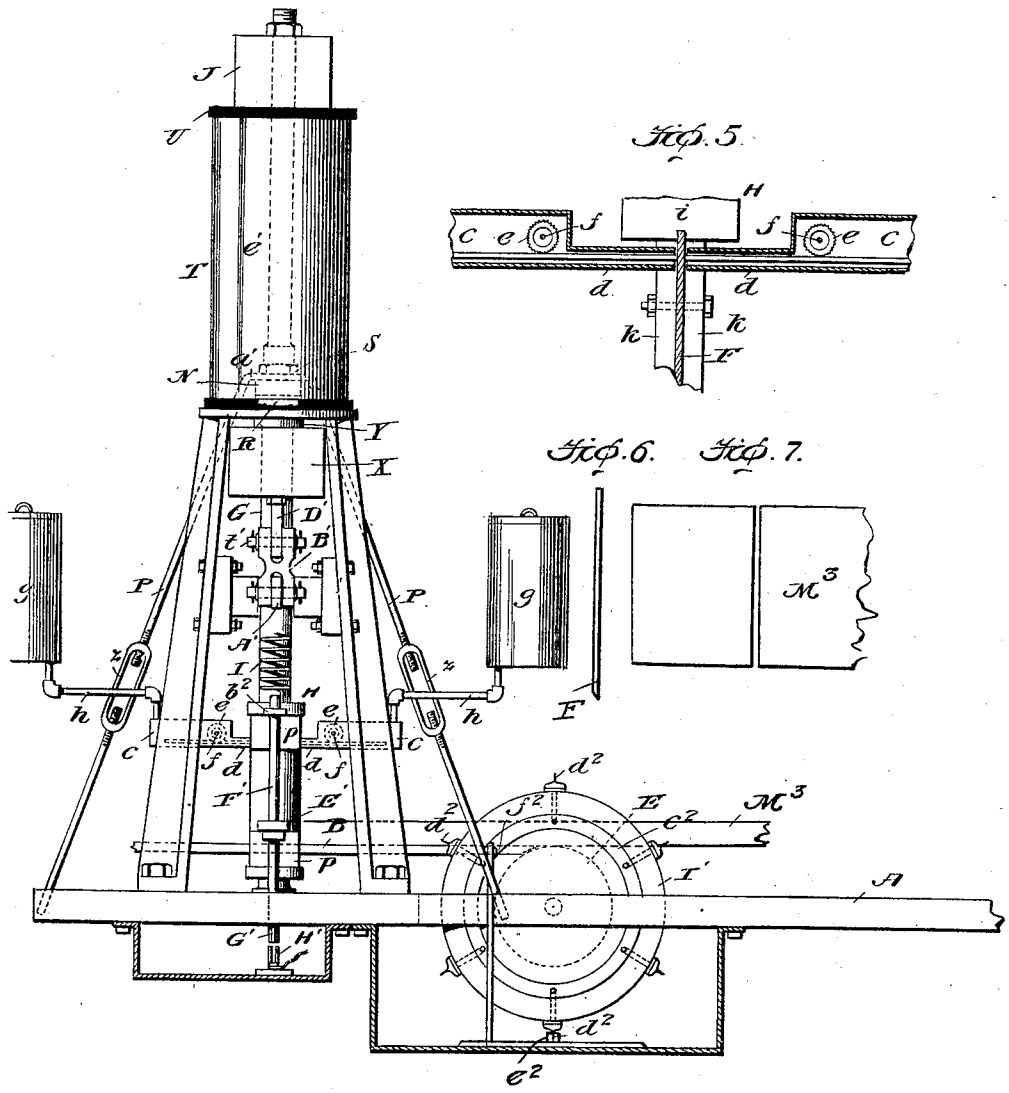


Fig. 5.

Fig. 6.

Fig. 7.

Witnesses

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3 SHEETS—SHEET 2.

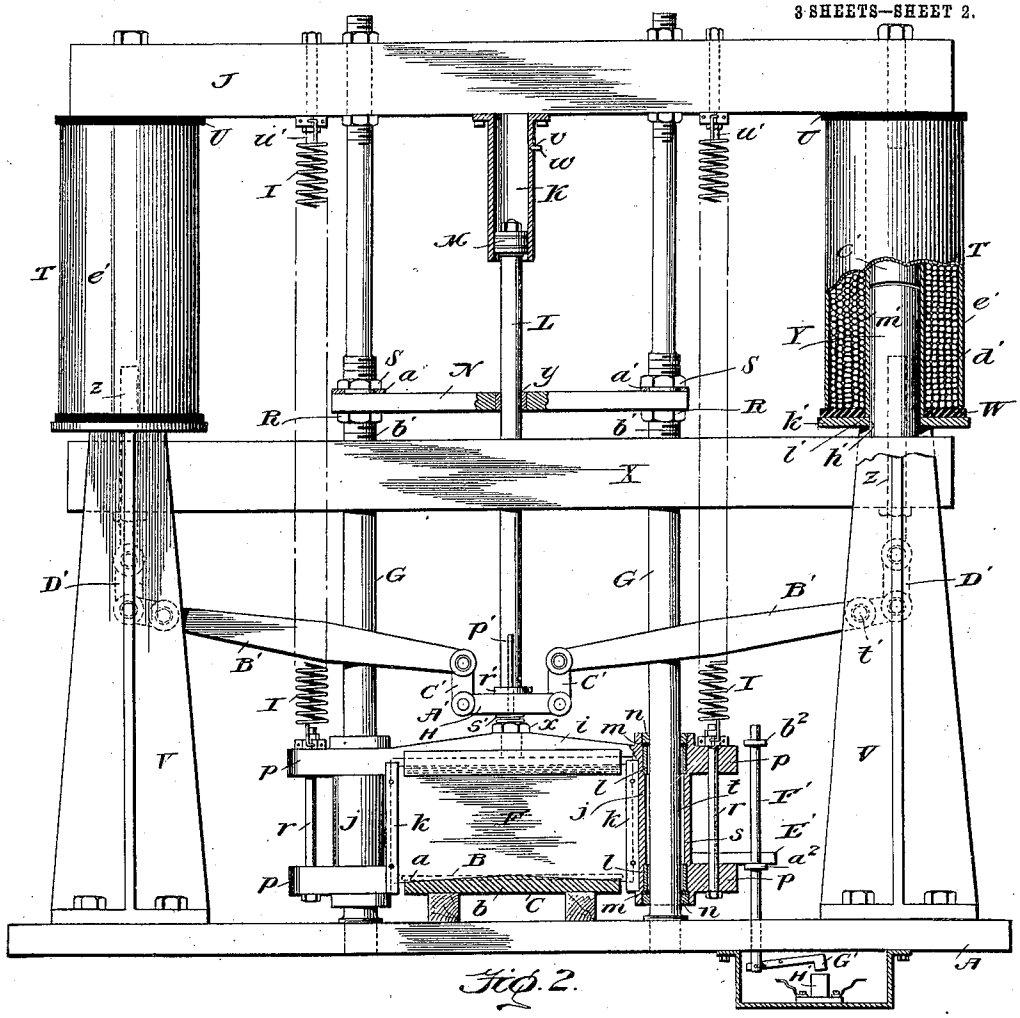
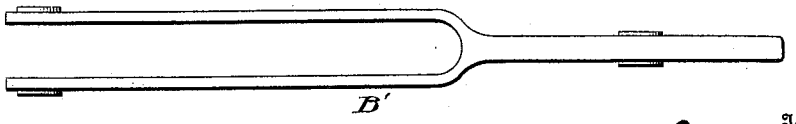


Fig. 2.

Fig. 4.



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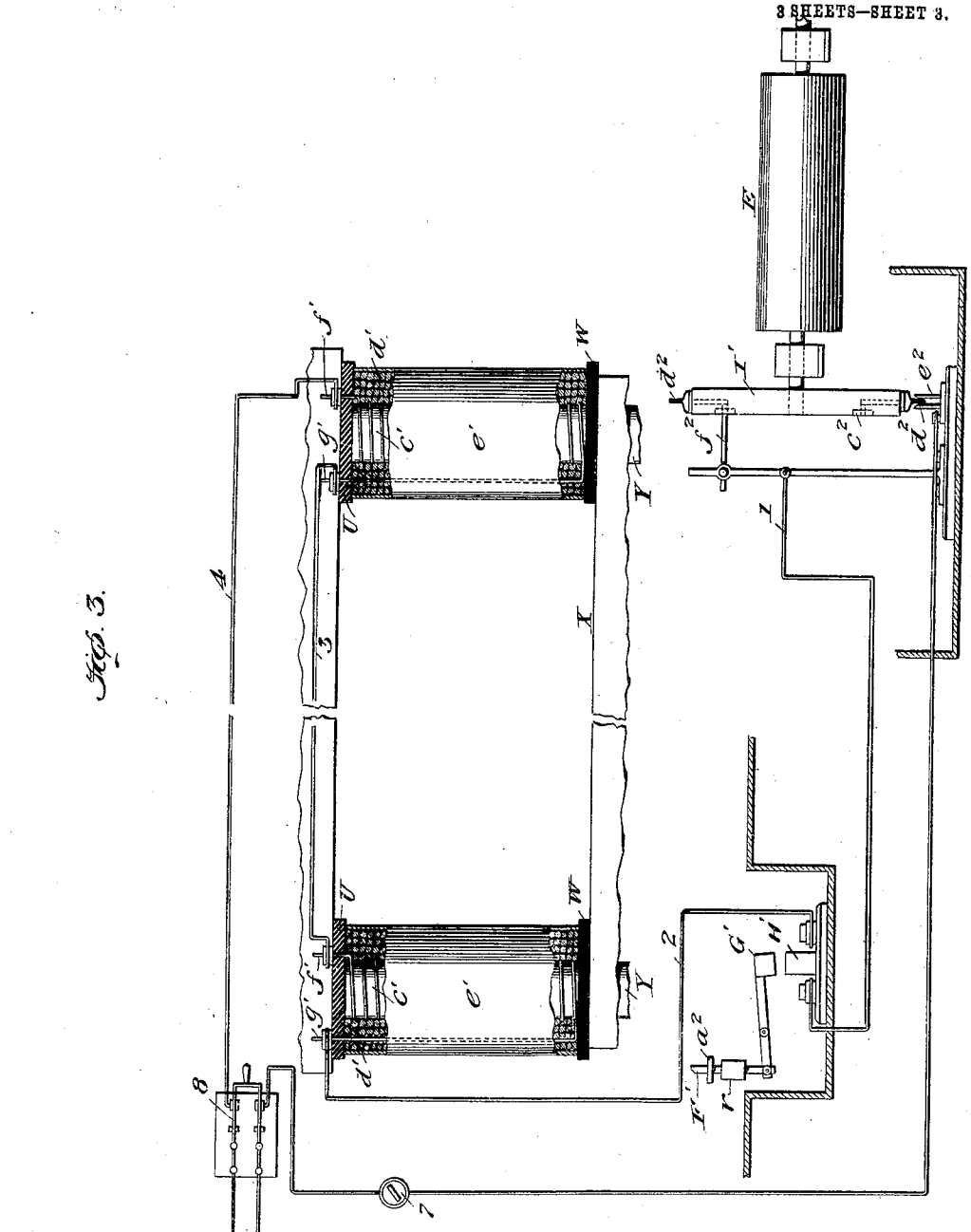
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3 SHEETS—SHEET 3.

Fig. 3.



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UNITED STATES PATENT OFFICE.

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CUTTING-OFF APPARATUS.

No. 922,795. Specification of Letters Patent. Patented May 25, 1909.

Application filed June 5, 1908. Serial No. 437,036.

To all whom it may concern:

Be it known that we, EDWARD E. MEEKER and CHARLES W. CARR, Jr., citizens of the United States, residing at Sayreville, in the county of Middlesex and State of New Jersey, have invented new and useful Improvements in Cutting-Off Apparatus, of which the following is a specification.

Our invention pertains to apparatus for cutting off brick material and other analogous material; and it has for its object to provide a simple, compact and efficient apparatus for the purpose stated, and one which may be operated at a low cost and maintained in a high state of efficiency with but a minimum expense.

The nature of the invention and its novelty, utility and practical advantages will be fully understood from the following description and claims when the same are read in connection with the drawings, accompanying and forming part of this specification, in which:

Figure 1 is a side elevation of the apparatus constituting the best practical embodiment of our invention of which we are cognizant. Fig. 2 is a view, partly in elevation and partly in section, taken at a right angle to Fig. 1 and in a plane between the time wheel and roller and the knife of the apparatus, and showing the knife in its lowermost position. Fig. 3 is a view diagrammatical in character and clearly illustrating the electric system of the apparatus. Fig. 4 is a plan view of one of the knife-depressing levers of the apparatus. Fig. 5 is a detail view illustrative of the arrangement of the lubricant-supplying wicks relative to the cutting off knife. Fig. 6 is a detail view of the knife showing the shape of the edge thereof in cross-section. Fig. 7 is a detail view showing the appearance of the severed sections or bricks and of the unsevered rod of brick material after the knife has passed through it.

Similar characters designate corresponding parts in all of the views of the drawings, referring to which:

A is the base of the apparatus, which may be of any construction consonant with the general purpose of our invention.

B is a plate disposed above and fixed with respect to the base A and having a transverse slot *a*.

C is an iron plate upon which the brass plate B is, by preference, directly superposed, as shown in Fig. 2. The brass plate B or any other table flush with the upper side of the said plate is extended to a point adjacent to a time roller E, as shown in Fig. 1, the purpose of the same being to support the brick material or other material to be cut incidental to the passage of the same between said roller E and the before mentioned transverse slot *a*. The said transverse slot *a* in the brass plate B and a similar slot *b* in the iron plate C are designed to receive a vertically reciprocating, cutting off knife F. The said knife F is designed to be depressed and raised by means hereinafter set forth in detail, and in order to assure the said knife being at all times thoroughly lubricated, I provide the lubricant receptacles *c* disposed horizontally at opposite sides of the vertical plane of the knife and having tubes *d* extending in close proximity to the said sides, wicks arranged in the receptacles *c* and tubes *d* and designed to be manually moved by toothed wheels *e* on shafts *f*, and lubricant tanks *g* connected through conduits *h* with the receptacles *c* so as to keep the latter at all times supplied with lubricant. When during the operation of our apparatus it becomes necessary to increase the supply of lubricant to either side of the knife F, the same may be readily accomplished by the attendant of the apparatus turning one of the shafts *f* in the proper direction. Any suitable means such as a wrench may be employed to turn the shafts *f*.

Fixed to and rising from the base A are guide rods G, and movable vertically on the said guide rods is a knife-carrying frame H. This frame H comprises a cross-head *i*, sleeves *j* depending from the ends of the cross-head *i*, and knife clamps *k* connected to the said sleeves and disposed at opposite sides of the knife at the ends thereof so as to securely fix the knife with respect to the frame H. Each of the sleeves *j* is provided with lower and upper bushings *l*, washers *m* of felt or other suitable material arranged at the outer ends of the said bushings, and nuts *n* disposed at the opposite sides of the washers, with reference to the bushings, and each sleeve *j* is also provided with lower and upper apertured lugs *p* to receive a rod *r*, and with a bore *s* the wall of which is separated by an intervening space from the adjacent guide rod G, whereby an oil reservoir *t* is formed in the sleeve. The said oil or lubricant reservoir may be supplied with lubricant in any

manner compatible with the purpose of our invention, and by virtue of the provision of the said reservoir and the confinement therein of lubricant by the felt washers *m*, it will be manifest that incidental to the vertical movements of the knife-carrying frame, the rods G will be thoroughly lubricated and frictional wear of the same and the sleeves *j* will be reduced to a minimum, and this without waste of lubricant, which is a material desideratum.

The knife-carrying frame H is designed to be raised by springs I extending between and connected to the rods *r* and rods *u* secured in a frame bar J supported at a suitable distance above the base A, and in order to cushion the upward movement of the knife-carrying frame and rob such movement of shock and jar, we provide an air cylinder K which is connected to the bar J and is provided with a vent *v* and a regulating screw *w* therefor, and we also provide a rod L having a piston M movable in the cylinder K, which rod L is screwed at its lower end in the cross-head *i* of the knife-carrying frame H, and is provided immediately above said cross-head *i* with a jam nut *x*. From this construction it follows that when the springs I operate to raise the knife-carrying frame H, the air in the cylinder K will serve to cushion the upward movement of the piston M, and by so doing will render the upward movement of the frame H even and will preclude such movement of the frame H being attended by shock and jar.

N is a cross-bar carried by the guide-rods G and having an aperture *y* receiving and guiding the piston rod L.

P P are braces having turn-buckles *z* and also having collars *a'* at their upper ends receiving the guide rods G and disposed above the bar N.

R R are nuts mounted on the threaded portions *b'* of rods G and serving to support the bar N, and S S are nuts mounted on said threaded portions *b'* and disposed above the collar *a'* so as to hold said collars down against the bar N, and the said bar N against the supporting nuts R. At their lower ends the braces P are fixed to the base A, and consequently it will be observed that said braces will effectually prevent lateral deflection of the guide rods G and assist materially in rendering the structure as a whole stiff and strong. It will also be noted at this point that the rods G are fixedly connected to the frame bar J and extend between said frame bar and the base A.

Connected to and depending from the frame bar J are electro-magnets T. These electro-magnets are preferably separated from the bar J by interposed disks U, of suitable insulating material, and each electro-magnet is made up of a core *c'* fixed with respect to the bar J, a continuous winding *d'* surrounding and depending below the said core *c'*, and a shell *e'* surrounding the said winding and fixed with respect to the bar J. The continuous winding of each electro-magnet terminates, as shown in Fig. 3, in binding posts *f'* and *g'*.

V V are supports fixed to and rising from the base A, and having openings *h'* in their tops *k'*, and W W are plates, of insulating material, resting on the said tops *k'* and having openings *l'*, registered with the said openings *h'*. When desired the electro-magnets T may be provided with metallic cylinders *m'* interposed between the cores *c'* and the windings *d'*, in which event the said cylinders *m'* are extended down through the insulating plates W and bear on the tops *k'* of the supports V. The windings *d'* and the shells *e'* bear on the plates W of insulating material, and consequently it will be seen that the electro-magnets T are supported and maintained between the frame bar J and the supports V.

X is a vertically movable bar disposed on the guide rods G and in the supports V.

Y Y are armatures movable toward and from the cores *c'* of the electro-magnets and through the openings in the insulating plates W and the support tops *k'*.

In Fig. 2 the parts are in the positions they occupy when the knife F is moved downwardly to the full extent, and it will be readily understood that when the electric circuit is interrupted and the knife frame and the inner, comparatively long arms of the levers B' are raised by the contraction of the springs I, the armatures Y will be moved downwardly through the openings *h'* in the tops *k'* of the supports V; the said armatures Y being connected to and movable with the said bar X.

Z Z are bolts secured in the armatures Y and the bar X and depending below the latter.

A' is a link held against turning on the piston rod L by a key *p'*, and interposed between a collar *r'* adjustably fixed on rod L, and a coiled spring *s'* provided for cushioning purposes on the nut *x*.

B' B' are vertically swinging levers fulcrumed at *t'* in the supports V and bifurcated, as shown in Fig. 4, whereby they are enabled to straddle the guide rods G.

C', C' are links connecting the inner ends of the levers B' and the link A', and D', D' are links connecting the outer ends of the levers B' and the lower ends of the before mentioned bolts Z.

By virtue of this construction it will be manifest that when the electro-magnets T are energized and the armatures Y are drawn upwardly, the inner, comparatively long arms of the levers B' will be swung downwardly, and in that way the knife-carrying frame H and the knife F will be depressed.

In order to assure the brick or other material being cut in pieces of uniform length, we provide the knife-carrying frame H at one side with a lateral arm E′ which is designed to coöperate with an enlargement a^2 on a rod F′ to depress said rod at the completion of the downward movement of the said frame H, and with an enlargement b^2 on the rod F′ to raise said rod at the completion of the upward movement of the frame H, and we also provide a circuit-closing lever G′ connected to the rod F′ and adapted to coöperate with terminals H′ and effect electrical connection between the same. We further provide for said purpose a time wheel I′ fixed with respect to and adapted to turn with the time roller E, and having a circular brass plate c^2 at one side and peripheral contact pieces d^2 electrically connected with said plate c^2, a stationary contact piece e^2 adapted to cooperate with the contact pieces d^2, and a brush f^2 arranged in permanent contact with the plate c^2 of the wheel I′. Now it will be observed by reference to Fig. 3 that the brush f^2 is electrically connected through a wire 1 with one of the terminals H′, and that the outer terminal H′, which is electrically isolated from the first named terminal H′, is electrically connected through a wire 2 with one end of the winding of one electro-magnet T. It will also be observed that the other end of said winding is electrically connected through a wire 3 with one end of the winding of the other electro-magnet T, that the opposite end of the latter winding is electrically connected through a wire 4 with one pole of a source of electric energy 5, and that the opposite pole of said source of energy 5 is electrically connected through a wire 6 with the contact piece e^2. We would also have it understood that when deemed expedient the connection 6 may include a conventional emergency switch 7, and that the connections 4 and 6 may include a conventional knife switch 8.

It will be understood from the foregoing that when the roller E turns incidental to passage of the bar M³ of brick or other material over it, the time wheel I′ will turn with said roller E, and at intervals the contact pieces d^2 on the wheel I′ will engage and make electrical connection with the contact piece e^2, and in that way close the electric circuit which is normally open. When the electric circuit is thus closed, the current will pass from the positive pole of the source of energy 5 through the wire 6, the contact piece e^2, the contact piece d^2 that is in engagement with the contact piece e^2, the plate c^2, the brush f^2, the wire 1, one of the terminals H′, the circuit-closing lever G′, the other terminal H′, the wire 2, the winding d' of one electro-magnet T, the wire 3, the winding of the other electro-magnet T, and the wire 4, back to the negative pole of the source of electric energy. In this way the electro-magnets are energized, the armatures Y and the short arms of the levers B′ are drawn upward and the long arms of said levers B′ are, together with the knife-carrying frame H and the knife F, depressed to force the knife through the brick material. Then when the knife reaches the lower extremity of its stroke, the arm E′ coöperates with the enlargement a^2 of rod F′ to depress the said rod and rock the lever G′, which is fulcrumed at x^3 out of engagement with the terminals H′, whereupon the electro-magnets T will be de-energized, and the springs I will raise the knife frame H. Then when the knife frame H reaches the upper extremity of its stroke, the arm E′ will coöperate with the enlargement b^2 on the rod F′ to raise the said rod and rock the lever G′ back into engagement with the terminals H′, and afterward when the following contact piece d^2 of the wheel I′ makes connection with the contact piece e^2, the electric circuit will be completed and the operation described will be repeated.

The severed sections or bricks and the unsevered bar or strip of brick material have the appearance of repressed bricks; the cut being a very smooth one, due to the rapid travel of the knife. Incidental to the downward and upward movements of the knife the bar or strip of clay is checked for about one-fiftieth part of a second. For instance in cutting one hundred and eight thousand bricks in ten hours, four hundred and fifty inches of clay must pass under the knife per minute and the bar of clay will be upset about fifteen one hundredths of an inch per cut. In such a case we contemplate arranging our apparatus about ten feet from the brick machine and consequently the said upsetting will be overcome by the elastic nature of the clay.

It will be gathered from the foregoing that our novel apparatus is adapted to cut the pieces of brick material a uniform length under variable speeds, and that the apparatus may be operated at a low cost and may be maintained in a high state of efficiency with but little expense; and it will further be gathered that the apparatus is simple and compact, that it occupies but little floor space, and that it requires but a minimum amount of attention.

As before stated the construction herein illustrated and described constitutes the best practical embodiment of our invention of which we are aware, but it is obvious that in the future practice of the invention such changes in the form, construction and relative arrangement of the parts may be made as fairly fall within the scope of our invention as defined in the claims appended.

Having described our invention, what we claim and desire to secure by Letters-Patent, is:

1. In an apparatus for cutting off brick and

like material, the combination of a movable knife, means for moving said knife in one direction, electric means for moving the knife in the opposite direction, a source of electric energy arranged in circuit with the electric means, means movable by the knife for closing and opening the electric circuit, and rotary means carrying contact pieces, and a contact piece complementary to the contact pieces of the rotary means, both arranged in the electric circuit.

2. In an apparatus for cutting off brick and like material, the combination of a movable knife, means for moving said knife in one direction, electric means for moving the knife in the opposite direction, a source of electric energy arranged in circuit with the electric means, means adapted to derive motion from the knife, for closing and opening the electric circuit, and means movable by the material to be cut for closing the electric circuit at intervals.

3. In an apparatus for cutting off brick and like material, the combination of a movable knife, a knife-carrying frame, means for moving said knife and frame in one direction, electric means for moving the knife and frame in the opposite direction, a source of electric energy arranged in circuit with the electric means, electrically separated terminals arranged in the electric circuit, a lever for electrically connecting the said terminals when the lever is in one position, and a rod connected with said lever and adapted to be moved in one direction when the knife-carrying frame is moved by the first named means, and to be moved in the opposite direction when the knife-carrying frame is moved by the electric means.

4. In an apparatus for cutting off brick and like material, the combination of a movable knife, a knife-carrying frame having a lateral arm, means for moving said knife and frame in one direction, electric means for moving the knife and frame in the opposite direction, a source of electric energy arranged in circuit with the electric means, electrically separated terminals arranged in the electric circuit, a lever adapted to assume a position intermediate and make direct electric connection between the terminals, and a rod connected to the lever and having enlargements disposed at opposite sides of and adapted to be engaged by the lateral arm on the knife-carrying frame, whereby said arm is enabled to move the rod in opposite directions.

5. In an apparatus for cutting-off brick and like material, the combination of a movable knife, a knife-carrying frame having a lateral arm, means for moving said knife and frame in one direction, electric means for moving the knife and frame in the opposite direction, a source of electric energy arranged in circuit with the electric means, electrically separated terminals arranged in the electric circuit, a lever adapted to assume a position intermediate and make direct electric connection between the terminals, a rod connected to the lever and having enlargements disposed at opposite sides of and adapted to be engaged by the lateral arm on the knife-carrying frame, whereby said arm is enabled to move the rod in opposite directions, and rotary means carrying contact pieces, and a contact piece complementary to the contact pieces of the rotary means, both arranged in the electric circuit.

6. In an apparatus for cutting off brick and like material, the combination of a movable knife, means for moving said knife in one direction, electric means for moving the knife in the opposite direction, a source of electric energy arranged in circuit with the electric means movable by the knife for closing and opening the electric circuit, a time roller, a rotary device fixed with respect to and adapted to turn with the time roller and having contact pieces arranged in the electric circuit, and a stationary contact piece arranged in the electric circuit and adapted to be engaged by the said contact pieces of the rotary device in succession.

7. In an apparatus for cutting off brick and like material, the combination of a movable knife, means for moving said knife in one direction, electric means for moving the knife in the opposite direction, a source of electric energy arranged in circuit with the electric means, means movable by the knife for closing and opening the electric circuit, a time roller, a time wheel fixed with respect to and adapted to turn with the time roller and having a conductive plate at its side and also having contact pieces on its periphery, electrically connected with the said plate, a brush arranged in the electric circuit and bearing against said plate, and a stationary contact piece also arranged in the electric circuit and adapted to be engaged by the said contact pieces of the rotary device in succession.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

EDWARD E. MEEKER.
CHARLES W. CARR, JR.

Witnesses:
JONATHAN BRIGHT,
H. F. C. ATKINSON, Jr.