E. J. PRINDLE.

ELECTRIC SIGN.

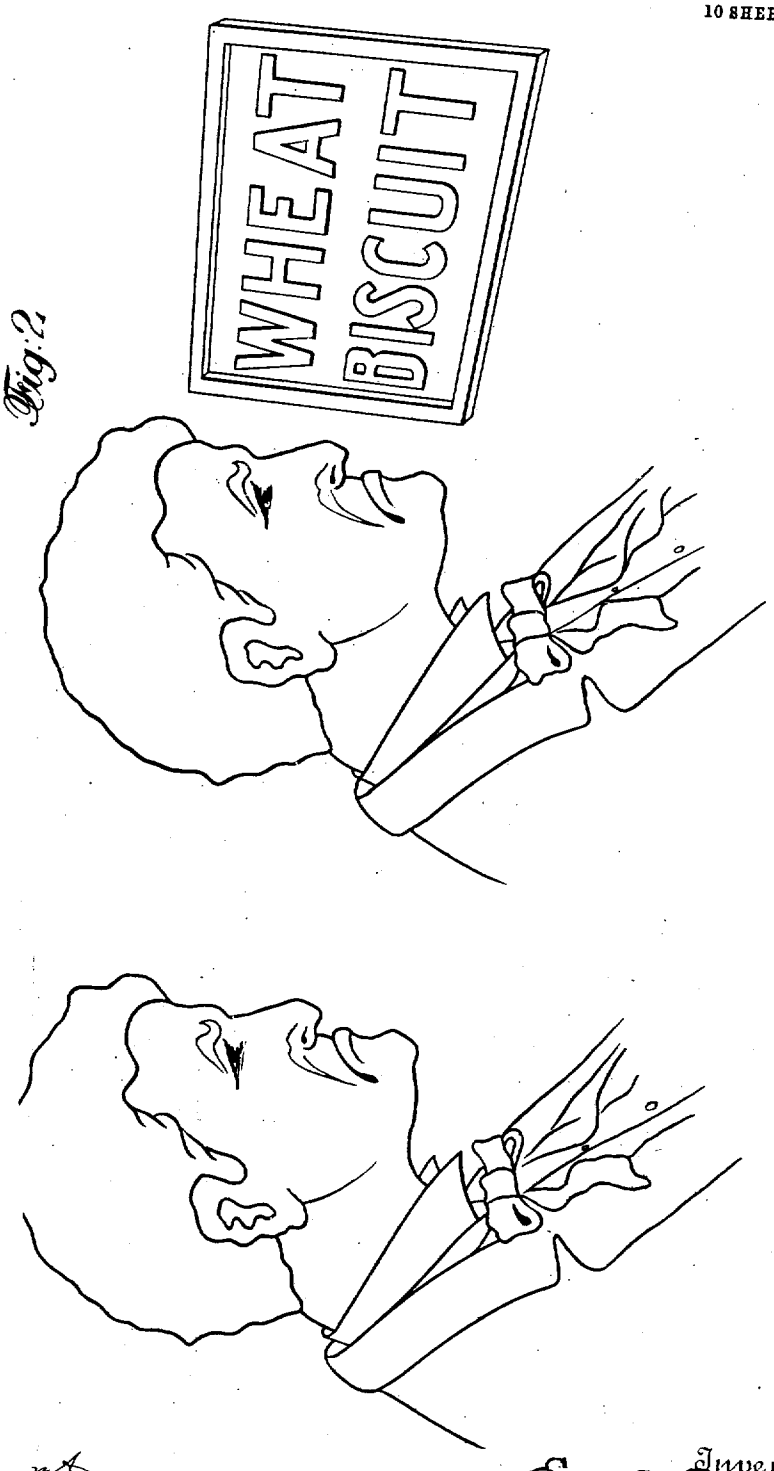
APPLICATION FILED NOV. 24, 1909.

957,710.

Patented May 10, 1910.

10 SHEETS—SHEET 1.

Fig. 2.



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10 SHEETS—SHEET 2.

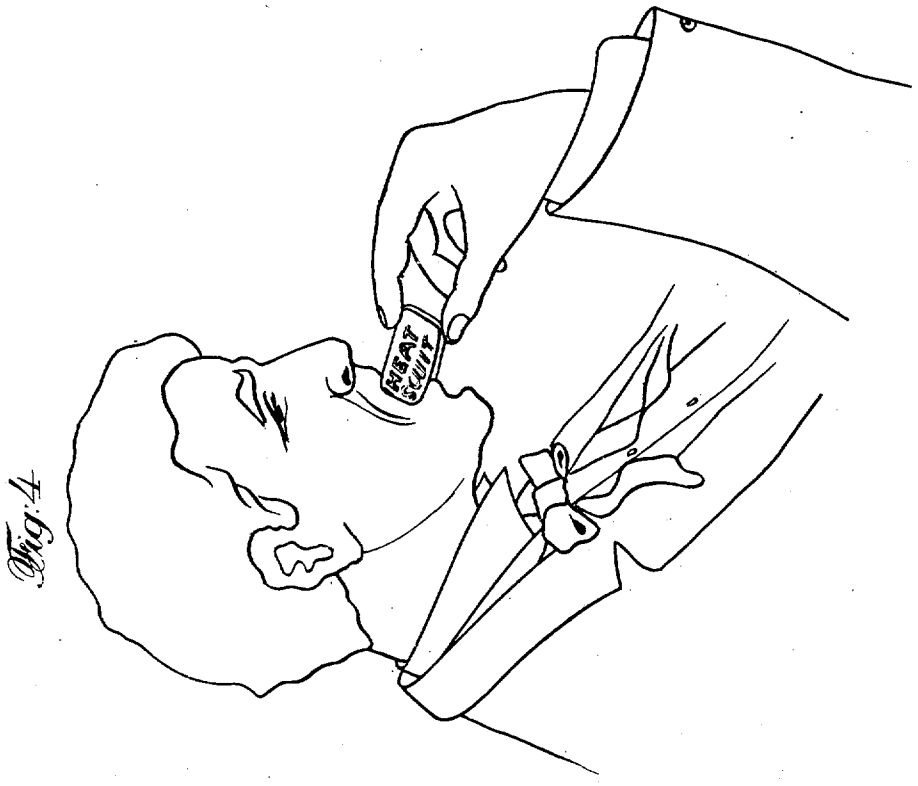
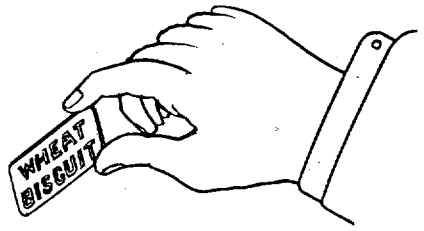


Fig. 4



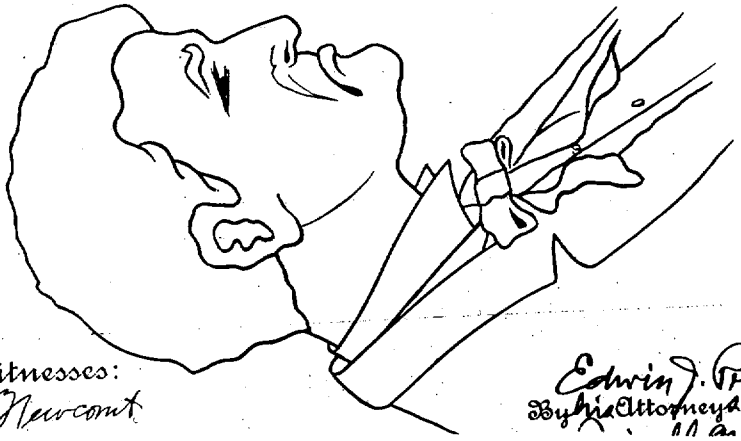


Fig. 3

Witnesses:

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10 SHEETS—SHEET 3.

Fig. 5

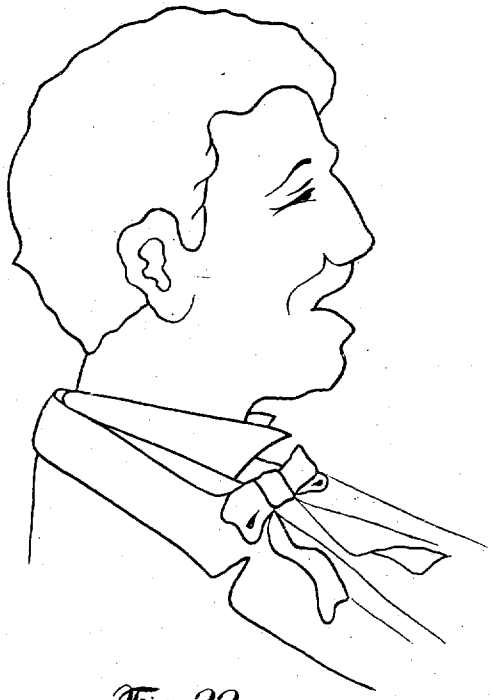
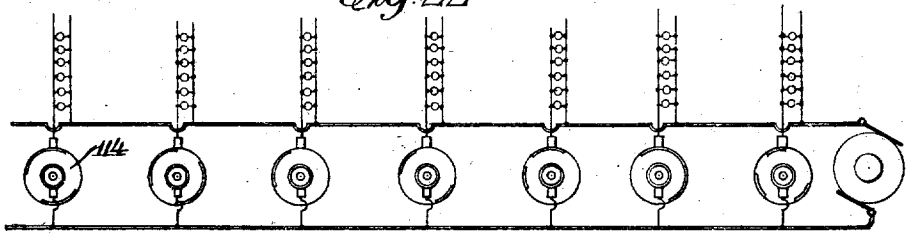


Fig. 22



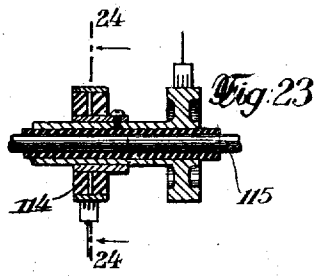


Fig. 23

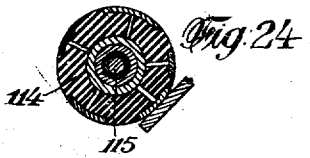


Fig. 24

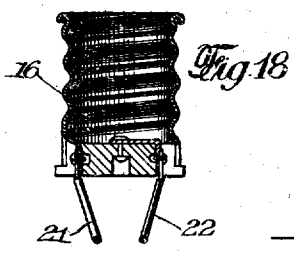


Fig. 18

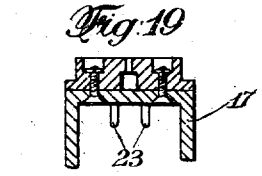


Fig. 19

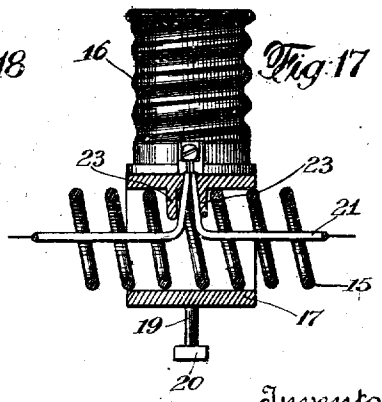


Fig. 17

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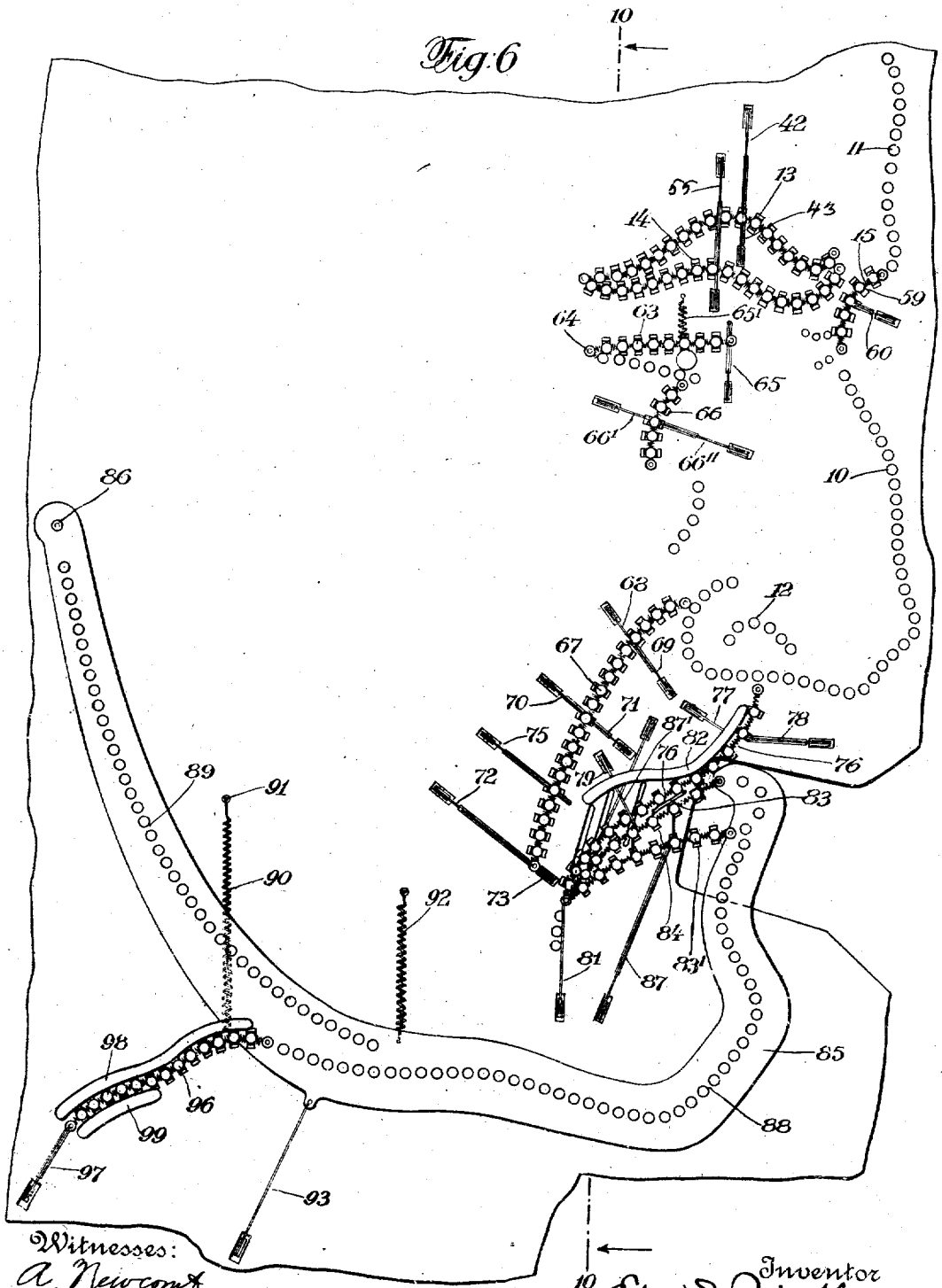
10 SHEETS—SHEET 4.

Fig. 6



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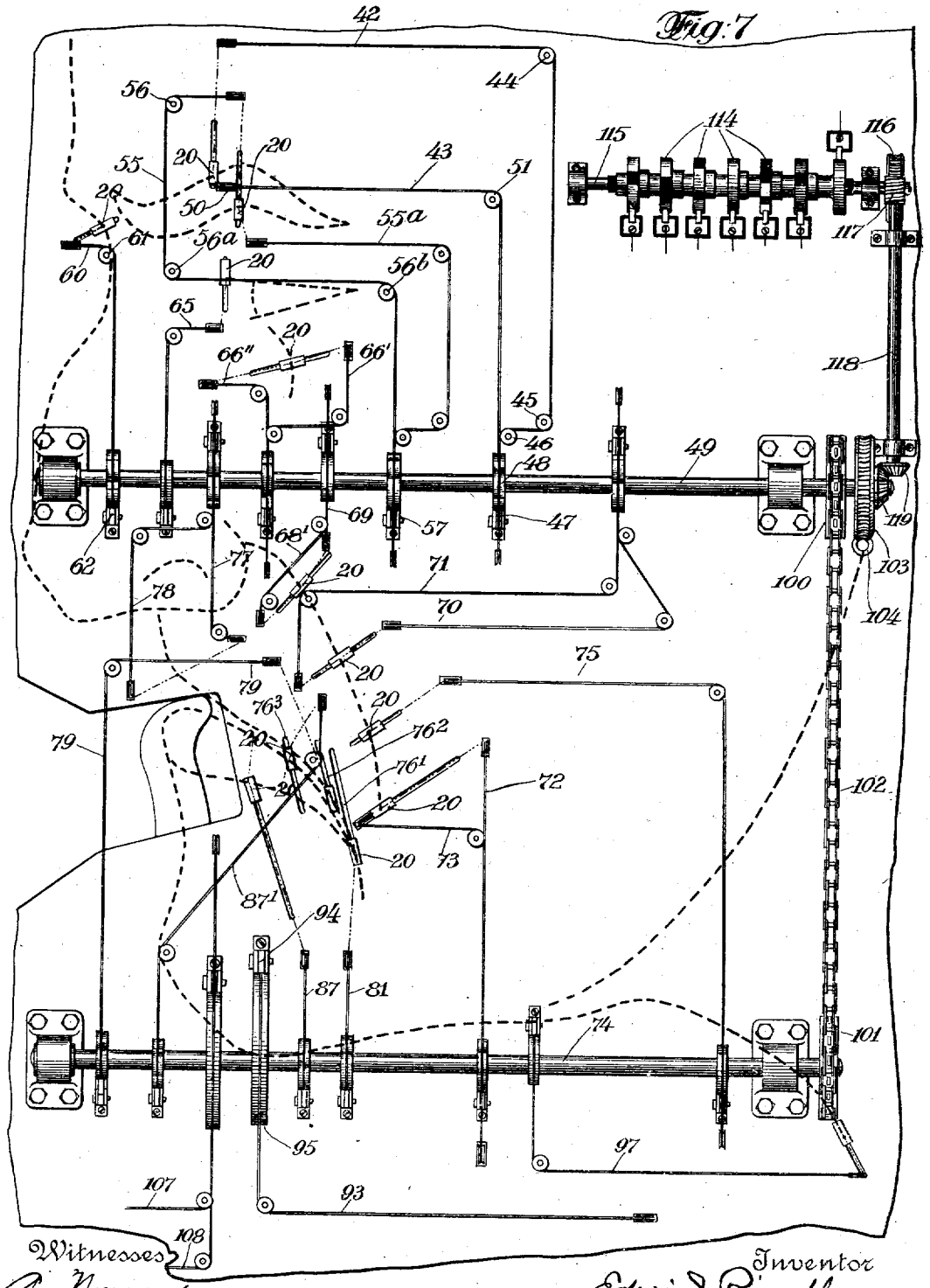
10 SHEETS—SHEET 5.

Fig. 7



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10 SHEETS—SHEET 6.

Fig. 8

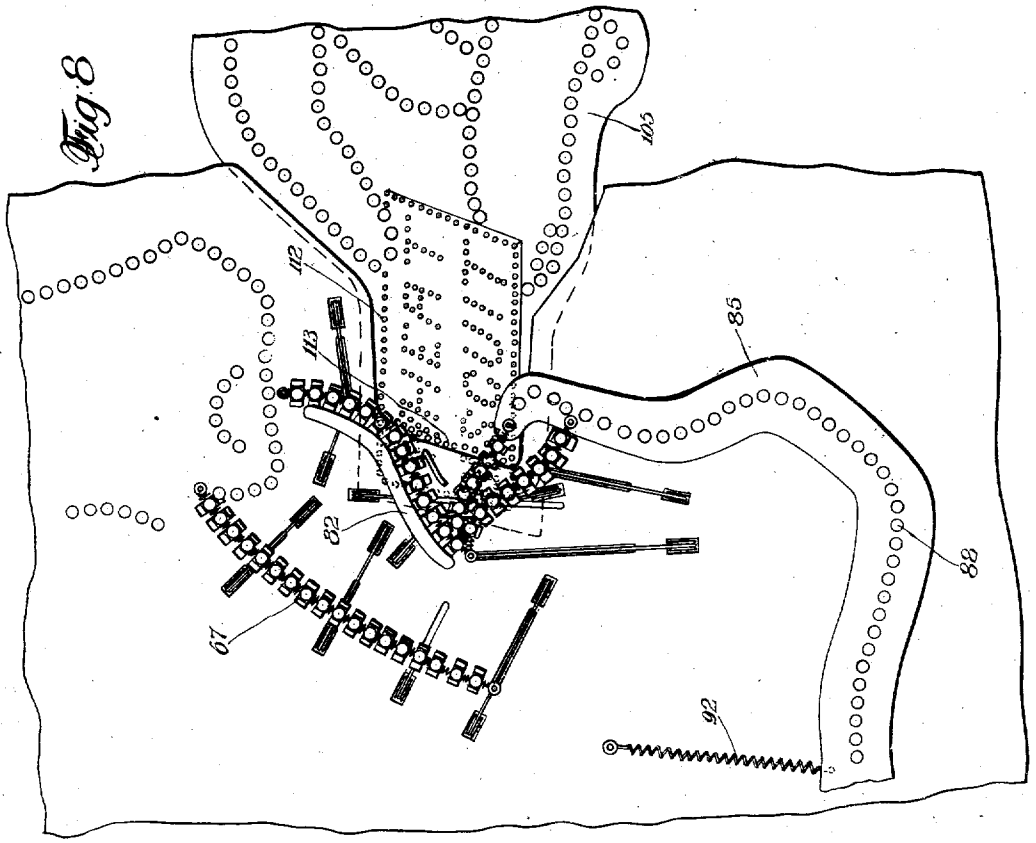
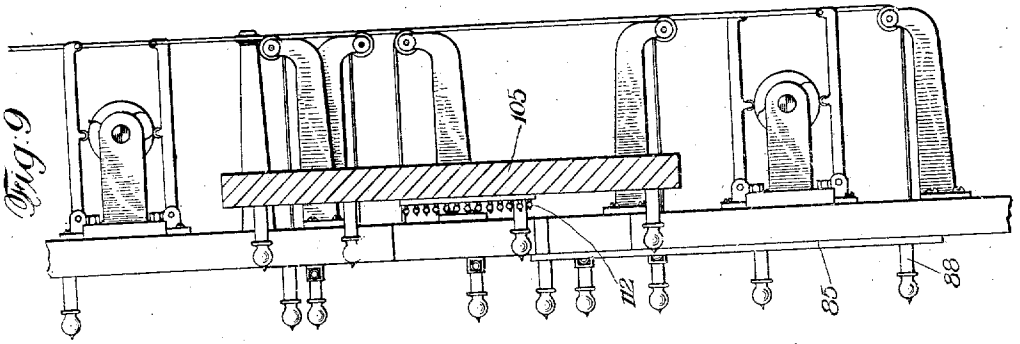


Fig. 9



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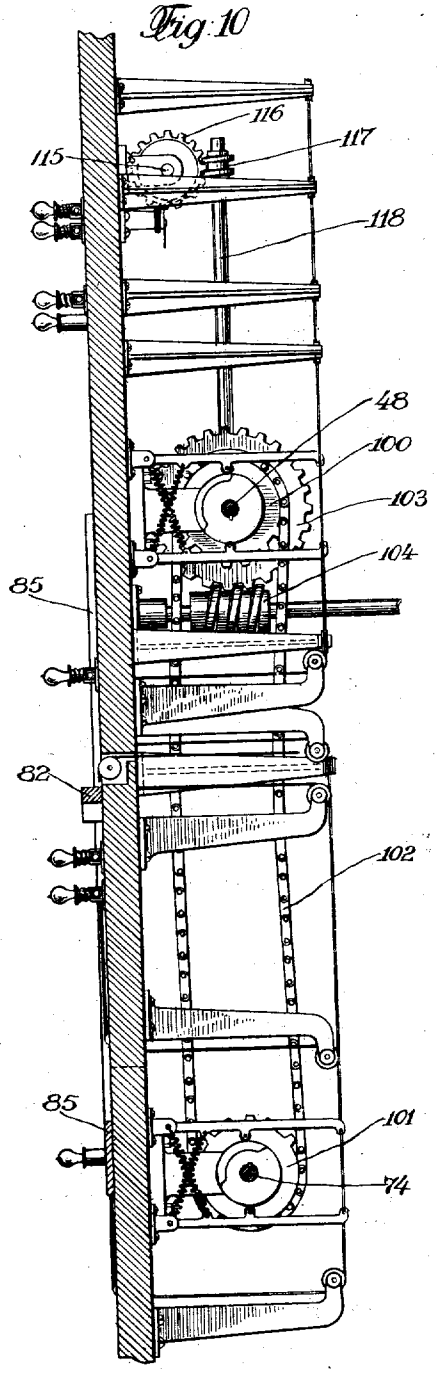
10 SHEETS—SHEET 7.

Fig. 10



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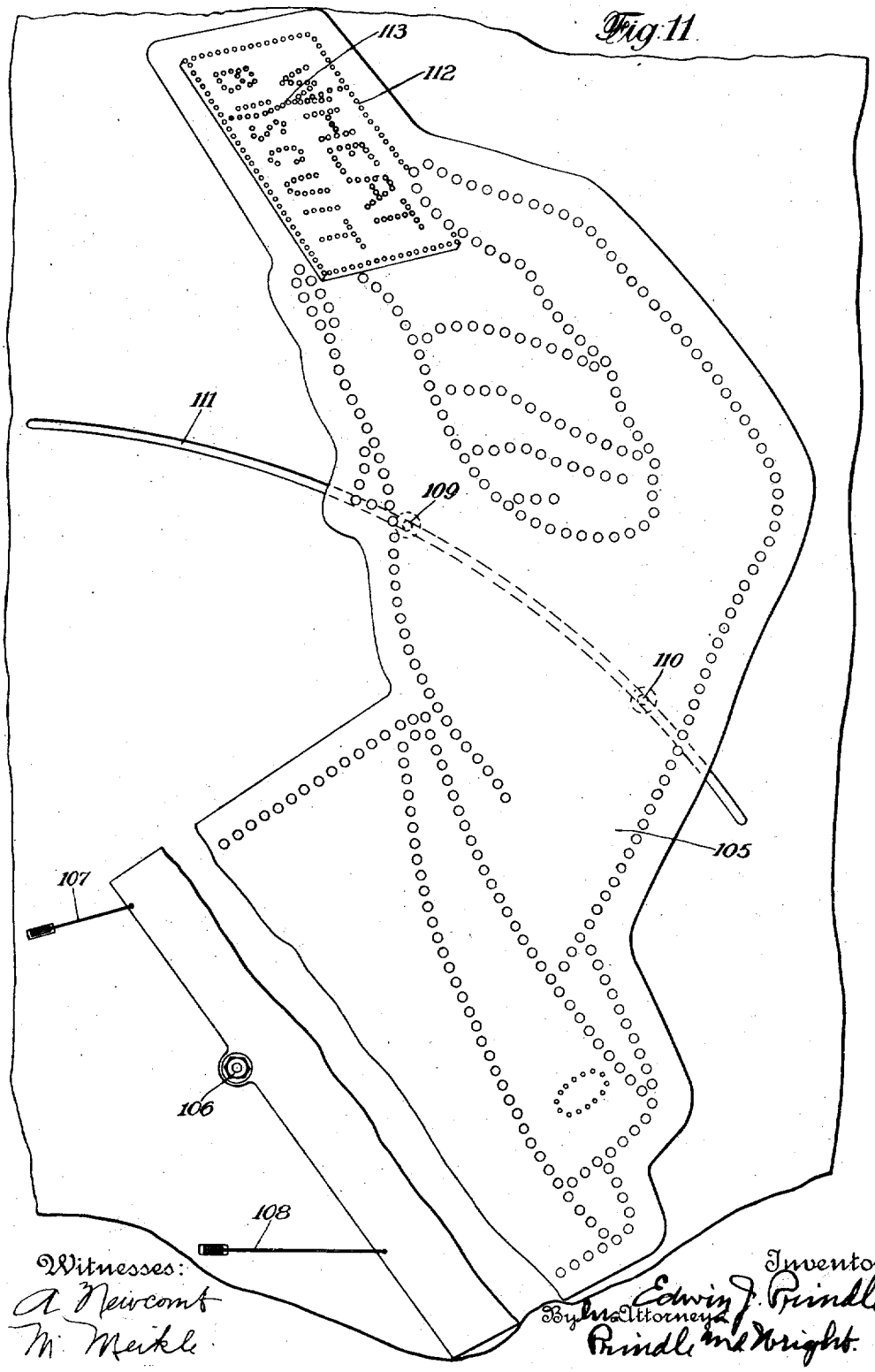
10 SHEETS—SHEET 8.

Fig. 11.



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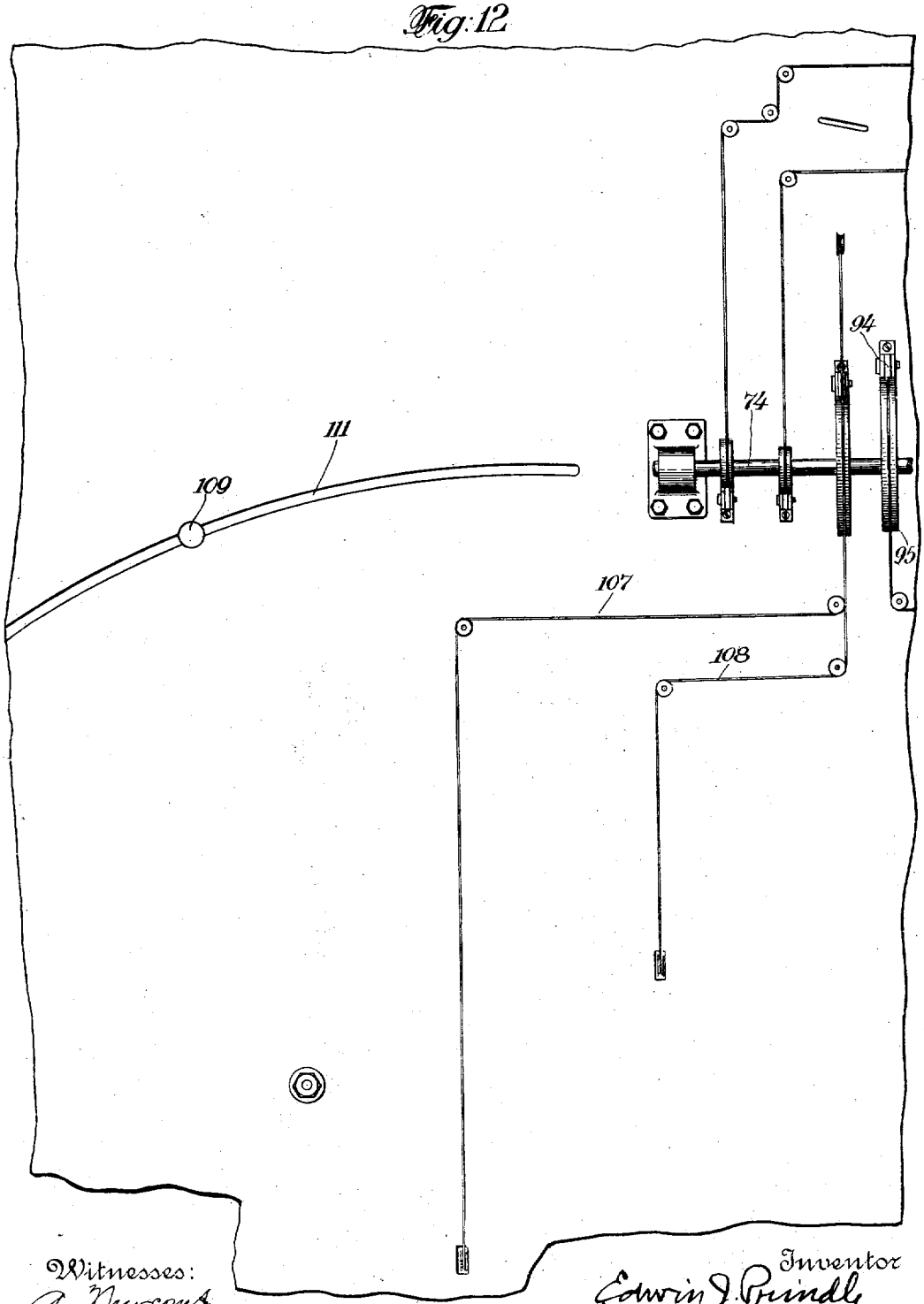
10 SHEETS—SHEET 9.

Fig. 12



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Patented May 10, 1910.

10 SHEETS—SHEET 10.

Fig. 13

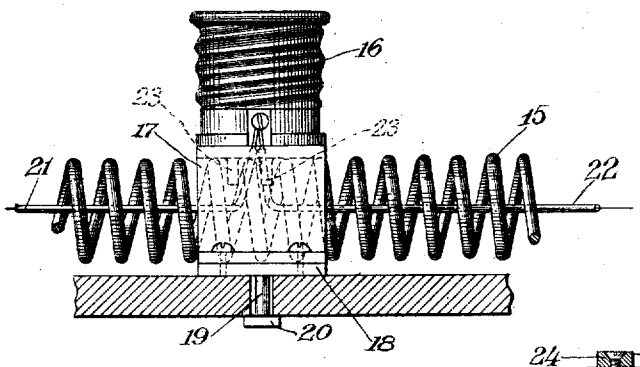


Fig. 14

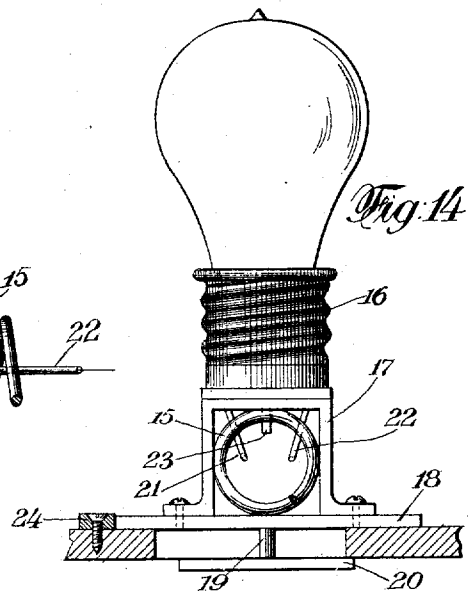


Fig. 15

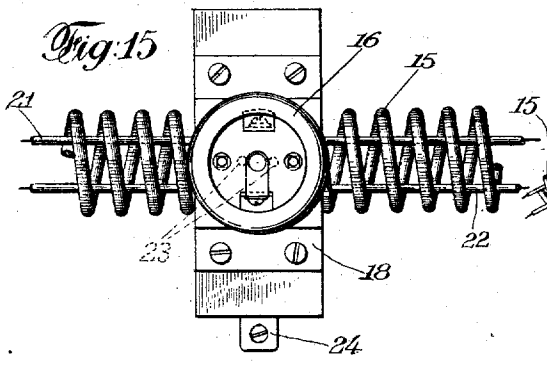


Fig. 16

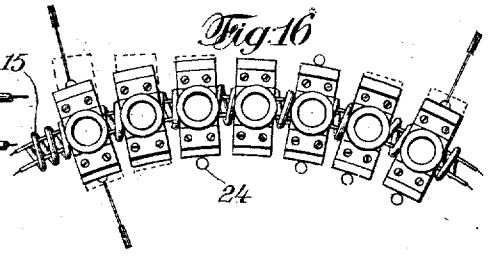


Fig. 20

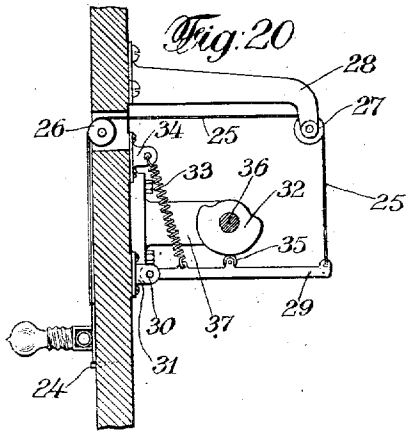
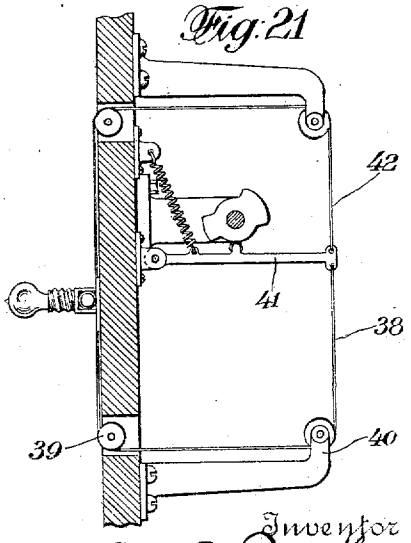


Fig. 21



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UNITED STATES PATENT OFFICE.

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ELECTRIC SIGN.

957,710. Specification of Letters Patent. Patented May 10, 1910.

Application filed November 24, 1909. Serial No. 529,675.

To all whom it may concern:

Be it known that I, EDWIN J. PRINDLE, of East Orange, in the county of Essex and in the State of New Jersey, have invented a certain new and useful Improvement in Electric Signs, and do hereby declare that the following is a full, clear, and exact description thereof.

The object of my invention has been to provide an electric sign, by which apparent movement of the objects depicted by the sign may be effected, and more specifically to provide a sign by which a moving picture can be formed; and to such ends my invention consists in the electric sign hereinafter specified.

In the accompanying drawings Figures 1, 2, 3, 4 and 5 represent five stages of a moving picture which can be reproduced by the sign which is illustrated; Fig. 6 is a front view of a portion of the sign representing the features of the face, the mouth being closed; Fig. 7 is a back view of the sign showing the mechanism for moving the parts; Fig. 8 is a view of the parts of Fig. 6, showing the mouth, the parts being in an open position, portions of a hand and a biscuit being also shown; Fig. 9 is an edge elevation of Fig. 8; Fig. 10 is a sectional view taken on the line 10—10 of Fig. 6 and looking in the direction of the arrows; Fig. 11 is a front elevation showing parts which represent the hand and biscuit; Fig. 12 is a rear elevation of Fig. 11; Figs. 13 and 14 are respectively a side and an end elevation of a lamp socket, and a coiled spring upon which it is mounted; Fig. 15 is a plan view of Fig. 13; Fig. 16 is a plan view showing a series of the said lamp sockets on a coiled spring; Fig. 17 is a view similar to Fig. 13, partly in section, to show the electrical connections; Fig. 18 is a sectional view of the socket of Fig. 17 in a plane at right angles to Fig. 17; Fig. 19 is a sectional view showing the base of the lamp socket, and the bridge piece upon which it is mounted; Figs. 20 and 21 are sectional views showing the lever mechanisms for moving the lines of lights; Fig. 22 is a diagrammatic view of one of the electric circuits of the lamp; Fig. 23 is a sectional view of a shaft having a make and break thereon; and Fig. 24 is a section on the line 24—24 of Fig. 23.

I have shown my invention as embodied in an electric sign. Its principle, however, is applicable to signs which are not electric, and to electric signs of endless variety. The illustrated embodiment is therefore to be regarded merely as typical of many possible embodiments.

In the sign chosen for illustration, I have sought to delineate a human head, and to simulate life by movement of the lines forming said head, the lines in most instances moving as would the corresponding lines in life, instead of putting out one line of lights in one position and lighting another line in a different position, the former procedure giving a very smooth and lifelike appearance, while the latter procedure would give a jerky intermittent effect.

In the illustrated sign, a man is represented, as in Fig. 1, as having an unhappy, dissatisfied appearance. In front of him a sign appears in perspective, having thereon the words "Wheat biscuit", suggestive of something pleasant to eat. The man then raises a hand holding a biscuit, as in Fig. 3, and opening his mouth, as in Fig. 4, takes a bite from the biscuit. The hand is then lowered and a pleasant effect produced by the eating of the biscuit is illustrated by the lines of the face changing to an expression of laughter.

Throughout the illustrated sign, the lines of the picture are formed by incandescent electric lights. The lines which are not moved, such as the line 10 of the bridge of the nose, 11 of the forehead and 12 of the nostril, in Fig. 6, are formed by mounting such lights in a fixed position on the signboard, in any desired manner, as by sinking them into holes on the signboard. The lines which must be movable, such as the lines 13 and 14 of the eye-brow, are preferably, although not necessarily, formed in the following manner. Each line of lights is mounted on a coiled spring 15 (see Figs. 13 to 16), the lights preferably being mounted in a socket 16, which is mounted on a bridge piece 17, the latter being mounted on a base 18, the bridge piece and base inclosing the spring between them. The base 18 is connected by the pin 19, or other convenient means, with a plate 20 on the rear side of the signboard, the pin extending through a slot. In this manner the parts holding the

lamp can be shifted laterally over the signboard as may be needed in changing the picture. Wires 21 and 22, forming the circuit to the lamp, may conveniently be passed through the center of the spring, and reach the lamp socket by passing between its coils. The bridge piece 17 may conveniently be provided with pins 23, Figs. 17 and 19 which will engage between the coils of the spring, so as to prevent the lamp from working along the spring and thus losing its position. The line of lights mounted on their spring may be shifted conveniently in either of the two following manners: Stops 24 may be fastened to the signboard in either of the two extreme positions of the line of lights, and the spring may rest against the said stops. The spring may then be moved in the other direction, as in Fig. 20, by a cord 25 attached to the spring or the lamp sockets at the proper point, and passing over a pulley 26 mounted in the signboard, and a pulley 27 supported by a bracket 28, the end of the cord being attached to a lever 29. The lever 29 may be fulcrumed on a pin 30 supported on a bracket 31 on the back of the signboard and may be pulled against a cam 32 by a spring 33, which is secured to a fixed point, as to a bracket 34 on the signboard, the opposite end of the spring being attached to a lever. The lever may be provided with a roller 35, or other projection to engage said cam. The cam may be mounted on a shaft 49 having bearing in brackets on the rear of the signboard. The other arrangement which I have illustrated for moving the flexible line of lights is shown in Fig. 21, and consists of the elements illustrated in Fig. 20, except that no stops 24 are used, but, instead, a cord 38 is attached to the spring on the opposite side from the cord 42 corresponding to the cord 25, to pull the line of lights in the opposite direction, said cord 38 running over pulleys 39 and 40 corresponding to the pulleys 26 and 27, and being attached to a lever 41 on the opposite side from the cord 42, which corresponds with the cord 25.

Referring again to Fig. 6, the upper line of the eye-brow is pulled upward by cord 42 which passes over pulleys set in the signboard. and appears on the back of the signboard, said cord passing around pulleys 44, 45 and 46, and being attached to a lever 47 that is operated by a cam 48 on a cam shaft 49. A cord 43 draws the upper line of the eye-brow down, and it passes around the pulleys 50 and 51, and is attached to the lever 47. The lower line of the eye-brow is drawn up by a cord 55, which passes through to the back of the signboard, around pulleys 56, 56^a and 56^b, and is attached to a lever 57, operated by a cam on the shaft 49. The said lower eye-brow line is drawn down by a cord 55^a running around suitable pulleys and attached to the lever 57. A line 59 at the bridge of the nose is drawn outward by a cord 60 passing over a pulley set in the signboard, and around a pulley 61 on the back of the signboard, and down to a lever 62 operated by a cam on the shaft 49. The said line 59 returns to initial position by the elasticity of the spring 15 upon which the lights are mounted. The upper line of eye-lashes 63 is pivoted at 64 and is moved down by a cord 65 passing around a pulley set into the signboard, and attached to a lever operated by a cam on a cam shaft, similar to that before described. The said line of eye-lashes is moved upward by a coiled spring 65′, which is attached thereto, and to the front side of the signboard. The lower line of eye-lashes is stationary. The little line 66 running from the lower line of lashes down into the cheek is operated by cords 66′ and 66″, which pass over pulleys set in the signboard, and to the back of the signboard where said cords are attached to a lever operated by a cam as before described. A line 67 extending from the base of the nose to the corner of the mouth is operated by three pairs of cords 68 and 69, 70 and 71, and 72 and 73, which pass to the rear of the signboard as before and over pulleys to the cam-operated levers mounted either on the shaft 49 or the shaft 74 parallel thereto. A single cord 75, operated as before, pulls the line 67 in one direction, the spring of the line being depended upon to pull it in the opposite direction.

The line 76 of the upper lip is fastened at its upper end to the signboard and is pulled by an upper pair of cords 77 and 78, and a single cord 79 near to but farther down the line. The lower end of the line 76, which forms the corner of the mouth, is drawn downward by a cord 81. A curved stop 82 is mounted above the upper lip line, and as the line is drawn against this stop, it helps to shape it. Guide slots 76′, 76^2 and 76^3 are formed in the signboard to receive pins 19 on the lamp mountings of the line 76 to help form the proper shaped curve as the line moves from position to position. The upper line 84 of the lower lip is attached at its lower or inner end to the lower or inner end of the upper lip line 76, thus forming the corner of the mouth, and at its upper end is attached to the free end of a lever 85 which is shaped according to the jaw, and which is pivoted at 86 to the signboard at a point below the ear. The lower line 83′ of the lower lip line has a cord 87 attached thereto near its center, which tends to draw it downward, and a cord 87′ attached lower down which tends to draw it upward. Lines of lights 88 and 89 are mounted on the jaw lever. The jaw is drawn upward by a spring 92 and downward by a cord 93, the latter running to the back of the signboard.

and being operated by a lever 94 in conjunction with a cam 95 on the shaft 74. The under line of the jaw 88 connects with a flexible line of lights 96, which represents the throat line, the said line 96 having its opposite end controlled by a cord 97, which is operated by a cam and lever as before, and stops 98 and 99 are provided to help position the said line.

The shafts 49 and 74 are provided with sprocket wheels 100 and 101 respectively, which are connected by a sprocket chain 102. The shaft 49 is also provided with a worm gear 103 operated by a worm 104, the latter being operated in any desired manner. The hand, as shown in Figs. 8 and 11, is delineated in electric lights on a lever 105, which is pivoted at 106 to the signboard. The said lever is oscillated by cords 107 and 108 which are operated by levers moved by cams attached to the cam shaft 74. Headed pins 109 and 110 mounted on the hand engage a slot 111 in the signboard in order to guide the hand in its movement. The hand is represented as holding a biscuit, and the biscuit has its full outline 112, and also a broken line 113 running across in order that the biscuit may be given the appearance of having been bitten off, as later described. The various lines of lights which are to be illuminated and put out are connected in separate circuits, as illustrated diagrammatically in Fig. 22, and each of the said lines is provided with a commutator 114. The said commutators are mounted on a shaft 115, which is driven by a worm wheel 116 that is geared with a worm 117, the latter being on a shaft 118, which is driven from the shaft 49 by bevel gears 119.

The illustrated embodiment of my invention is operated as follows: The cycle of operations starts with the lines in the position of Fig. 1. The shafts being in rotation, the proper commutator lights up the sign in perspective reading "Wheat Biscuit," the face remaining unchanged during this operation, the parts appearing then as in Fig. 2. The hand then appears as in Fig. 3, with a motion toward the mouth, and as the biscuit approaches the mouth, the mouth opens as in Fig. 4, and the biscuit, passing behind the plane of the main switchboard, as shown in Figs. 8 and 9, the biscuit appears to enter the mouth, the mouth closing and apparently taking a bite out of the biscuit. During these movements the normal lights of the biscuit have been illuminated, but not the broken line 113. At this time the broken line 113 is illuminated, and the portion of the biscuit to the left of the said line is cut out, thus giving the biscuit the appearance of having been bitten, and the hand and biscuit move away from the mouth. By means of the various cords, levers and cams attached to the movable lines of the face, the eye-brow is given the position shown in Fig. 5, the lip lines assume the positions shown in said figure, and the line extending from the nose to the corner of the mouth assumes the new position of the said figure. At the moment of swallowing, the line 96 may be given the motion which the throat would make when swallowing. In this manner the face is given a pleased expression, as though the eating of the biscuit made the change from discontent to happiness. The cycle is then repeated.

It is obvious that many changes can be made in the illustrated embodiment of my invention which will be within its scope, and I desire that my claims be not limited beyond the requirements of the prior art and their necessary intendment.

I claim:

1. An electric sign, having a line of lights, said lights being capable of movement independently of each other and means for moving said lights independently of each other.

2. An electric sign, a line of lights having an immediate support, and means for moving said line of lights independently of said support.

3. A sign comprising lines of electric lights representing the face of an animate being, and means for shifting said lines to cause a change of expression of said face.

4. A sign comprising lines representing a human face, and means for shifting said lines to cause a change of expression of said face.

5. An electric sign comprising lines of lights delineating a picture, and means for causing a change in said picture by shifting said lines of lights.

6. A sign comprising fixed lines of electric lights and a line of electric lights, said latter line of lights being movable independently of its support and means for causing such movement of the individual lights of said latter line of lights to cause a change in the representation of said sign.

7. A sign comprising a picture delineated by fixed lines of lights and a line of lights, the individual lights of said last mentioned line being movable relatively to each other and means for so moving the individual lights of said latter lines of lights to change said picture.

8. A sign comprising a human being represented by fixed lines of electric lights and a line of electric lights, the individual lights of said last mentioned line being movable relatively to each other and means for shifting the individual lights of said latter lines of lights relatively to each other to cause apparent movement of said human being.

9. A sign comprising fixed lines of lights and a line of lights, and means for shifting the individual lights of said latter lines of lights relative to each other and for ex-

tinguishing and illuminating the lights of said sign for causing the representation of said sign to change.

10. A sign, comprising movable lines of electric lights, said lines comprising lamps mounted upon springs, having the general shape of the line to be represented.

11. A sign comprising movable lines of electric lights, said lines comprising coiled springs extending longitudinally of said lines, and lamps mounted upon said springs.

12. In a sign, the combination of a sign support, a series of lamp supports movably mounted upon said sign support, and a spring connecting said series of lamp supports, said spring extending substantially in the direction of the line to be represented.

13. In a sign, the combination of a sign support, a series of lamp supports movably mounted thereon, and a coiled spring connected to said lamp supports.

14. In a sign, the combination of a sign support, a series of lamp supports movably mounted on said sign support, said lamp supports having openings therethrough, and a coiled spring passing through said openings.

15. In a sign, the combination of lamps delineating a human head, lamps delineating a hand and an object to be eaten, means for moving the lines of said head to cause its mouth to open and close, means for moving said object toward said mouth and behind the same, and means for extinguishing a portion of the lights delineating said object so as to cause it to have the appearance of having been bitten.

16. An electric sign, comprising lines of light representing an object, means for mounting the lights so as to permit unequal movement thereof, and means for changing the relative positions of lines representing a unitary portion of said object.

17. An electric sign, comprising lines of lights representing an animate being, and means for changing the relative positions of lines on a single member of the body of such being by moving one of said lines of lights relative to another.

18. An electric sign, comprising lines of lights representing a human head, the lines representing movable portions of the face being flexible.

19. An electric sign, comprising lines of lights representing a human head, a pivoted jaw, flexible lines of lights representing the mouth, and means for moving said parts.

20. An electric sign, comprising lines of light representing a human head, a pivoted jaw, flexible lines of lights representing the mouth and the throat, and means for moving said flexible lines of lights.

21. An electric sign, comprising an animate figure, consisting of bodily movable lines of lights, and means for moving said lines of lights, an object delineated by electric lights, and means for changing the appearance of said object, and causing a representation of a corresponding emotion to be delineated by movements of lines of said figure.

22. An electric sign, comprising a line of lights mounted upon a spring whereby said line may be increased or decreased in length.

23. An electric sign, comprising a line of lights mounted upon a spring, and cams and levers for moving said line of lights.

24. An electric sign, comprising a movable line of lights mounted upon a coil spring, and cams and levers for moving said line of lights.

25. An electric sign, comprising two objects delineated by electric lights, and means for apparently causing one of said objects to pass within the other of said objects by causing said first mentioned object to pass behind said last mentioned object, and extinguishing the lights as they pass behind said last mentioned object.

26. An electric sign, comprising a human head having flexible lip lines, a movable hand having an object therein, and means for causing said hand to approach said lip lines and to pass said object behind said lip lines.

27. An electric sign, comprising a human head having flexible lip lines, a movable hand having an object therein, means for causing said hand to approach said lip lines and to pass said object behind said lip lines, and means for extinguishing the lights of said object as they pass behind said lip lines.

28. An electric sign, comprising lines of light representing an object or body capable of motion, including a flexible line of lights representing a movable portion thereof, and means for moving said line of light to simulate motion in said body.

In testimony that I claim the foregoing I have hereunto set my hand.

EDWIN J. PRINDLE.

Witnesses:

M. MEIKLE,

A. NEWCOMB.