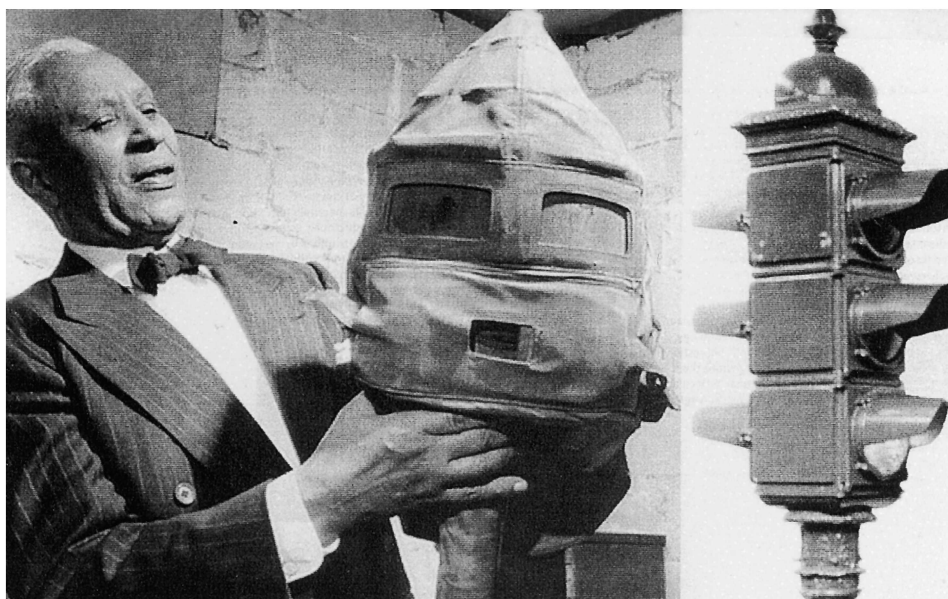


Garrett A. Morgan, pioneer in safety



Garrett A. Morgan, 1877-1963. Il est photographié ici avec deux de ses inventions : le *Masque à gaz* et le *Feu rouge*. L'utilisation des sciences et de la technologie pour la protection des corps et des biens : tel semble avoir été le *credo* de Garrett Morgan, comme cela apparaît constamment dans ses inventions.

□ Garrett Morgan, un grand inventeur du XX^{ème} siècle

Jean Paul MBELEK

Présent dans toutes les grandes villes du monde pour régler la circulation routière voire ferroviaire, le feu rouge est un de ces grands symboles de modernité du vingtième siècle. Précisément, ce que nous appelons communément "feu rouge", c'est-à-dire une signalisation routière automatique à trois positions (trois couleurs), a été mis au point en 1923 (brevet US n° 1,475,024). Son inventeur, **Garrett Augustus Morgan**, est un autodidacte Africain-Américain né en 1875 à Paris dans le *Tennessee* aux États-Unis d'Amérique. Le feu rouge a souvent été signalé parmi les grandes inventions du vingtième siècle. **Garrett Morgan** vécut de ses inventions, en particulier il céda pour \$ 40 000 de l'époque à la *General Electric Company* les droits de son brevet sur le feu rouge.

Garrett Morgan est un inventeur-né, un des plus grands inventeurs du début du vingtième siècle. L'humanité entière lui doit beaucoup. Dès 1912, mettant sa grande compétence en chimie au service de ses préoccupations humanitaires, il invente le masque à gaz dont le brevet US est déposé en 1914 (premier grand prix de la seconde exposition internationale d'hygiène et de sûreté qui a eu lieu en 1914 aux U.S.A.) et a contribué à sauver tant de vies pendant la Première Guerre mondiale où le gaz a été utilisé pour la première fois comme une arme de destruction massive. Par la même occasion, il crée sa propre société pour l'exploitation commerciale de ses brevets d'invention.

L'efficacité du masque à gaz fut constaté en 1916 lors d'une explosion dans un tunnel de la station hydraulique de Cleveland. Grâce au masque à gaz, **Garrett Morgan** put sauver une vingtaine de travailleurs piégés à 75 mètres de profondeur sous le lac Érié, ce qui lui valut la médaille d'or pour héroïsme par la ville de Cleveland dans l'Ohio (ville où il s'est installé en 1895 et a effectué sa première invention en 1901). L'utilisation des sciences et de la technologie pour la protection des corps et des biens : tel semble avoir été le *credo* de **Garrett Morgan**, comme cela apparaît constamment dans ses inventions. Par sa conception technique d'emblée complète, le feu rouge de **Garrett Morgan** fait apparaître un triple souci humanitaire, économique et d'anticipation. En effet, le système est tout à la fois mécanique (utilisation de jour), électrique (utilisation de nuit) et sonore (pour les non-entendants) ; il est visible à distance et de tout point de l'intersection qu'il régule. Le feu rouge est devenu aujourd'hui l'un des éléments majeurs contribuant à la régulation des circulations automobile, ferroviaire et fluviale.

Garrett Morgan n'a pas été le seul inventeur Africain-Américain de son époque. Des inventeurs Africains-Américains dont l'histoire officielle a retenu les noms, il y en a eu beaucoup et de très grands même en pleine période d'esclavage¹, comme par exemple

¹ Malgré la barbarie esclavagiste de la société américaine d'avant et après l'abolition officielle de la traite négrière en 1864, l'invention et la volonté d'entreprendre étant des facultés naturelles des êtres humains, il y eut toujours des Africains-Américains pour tenter l'aventure de l'invention et de l'industrie malgré les difficultés et l'adversité qu'ils pouvaient rencontrer à l'époque. Ceci est tant et si vrai qu'en 1858, un avocat général des États-Unis, un certain **Jeremiah S. Black**, fait passer une loi contre le dépôt de brevets par les esclaves vu qu'un brevet US était un contrat entre le gouvernement des États-Unis et l'inventeur et qu'un esclave n'étant pas considéré comme un citoyen américain, ce dernier ne pouvait ni signer un contrat avec le gouvernement US ni céder

Elijah McCoy, Grandville T. Woods, Jan E. Matzeliger qui est l'inventeur de la première machine pour la fabrication en série des chaussures, **Norbert Rillieux**, né à la Nouvelle-Orléans en 1806, dont l'invention a révolutionné l'industrie de la fabrication industrielle du sucre, a été directeur de l'École Centrale, a enseigné à Paris en France et publié plusieurs articles sur les machines à vapeur, **Lewis H. Latimer**, inventeur qui a su apporter les améliorations qu'il fallait à la lampe à incandescence, inventée en 1879 par **Edison**, pour permettre sa fabrication industrielle et la rendre utilisable à grande échelle dans la vie domestique et urbaine. Compte tenu du peu de promotion fait autour des inventeurs et savants noirs en général tant d'aujourd'hui que d'hier, on pourrait s'étonner d'apprendre que telle ou telle invention emblématique du monde moderne est redevable à un inventeur africain-américain (on pourra se reporter utilement à l'ouvrage collectif *Blacks in Science ancient and modern*, édité par **Ivan van Sertima**). Cependant, c'est un fait historique certain que, depuis les premiers déportés négro-africains aux Amériques dans les conditions indignes de l'homme civilisé que l'on sait, les inventeurs noirs ont contribué par leurs réalisations à l'élévation du niveau de vie des citoyens américains tout autant que la traite négrière (ce crime contre l'humanité perpétré en continu tous les jours pendant au moins quatre siècles) a contribué en profondeur et durablement à l'éclatement, la déstructuration et l'appauvrissement généralisés des sociétés négro-africaines. C'est ainsi qu'après avoir participé pour une part non négligeable à la révolution industrielle du XIX^{ème} siècle, les inventeurs africains-américains ont contribué largement à l'invention du XX^{ème} siècle.

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- 4 - *Science illustrée*, n°9, septembre 1996 (8^{ème} année), p. 61 : encadré sur Grandville T. Woods.
- 5 - *Lewis Howard Latimer : A Black Inventor*, publié par la fondation Thomas Alva Edison, Detroit, Michigan, 1973.
- 6 - **Yves Antoine**, *Les inventeurs et savants noirs*, Paris, Montréal, L'Harmattan, 1998.
- 7 - **John H. Clarke**, Bibliographical guide, in *Blacks in Science ancient and modern*, Van Sertima I. (editor), Transaction Books, New Brunswick (U.S.A.) and London (U.K.), pp. 295-297.
- 8 - "How Black Inventors changed America", Kevin Cappell, *Ebony*, February 1997, pp. 40-50; "Black Inventor Garrett Augustus Morgan, le père du masque à gaz (1877-1963)", in *BlackMatch*, Magazine francophone de la Culture noire, BMI n°14, 2000, p. 32 et p. 33.
- 9 - "Benjamin Banneker, un scientifique noir américain au 18^{ème} siècle", *Expression Nouvelle*, n°18, mars 1993, p. 2.
- 10 - **Claude Lewis**, *Benjamin Banneker : The Man Who Saved Washington*, McGraw-Hill Co., New York, NY, 1970.

son invention à son maître (cf. Robert C. Hayden, *Black Americans in the Field of Science and Invention*, in *Blacks in Science ancient and modern*, Van Sertima I. (editor), Transaction Books, New Brunswick (U.S.A.) and London (U.K.), p. 216) ; cela donne à penser qu'un certain nombre d'inventions faites par des Africains-Américains étaient souvent reconnues à leur maîtres esclavagistes : cela mériterait sans doute une étude historique approfondie. En fait cela tombe sous le sens que tout Africain adulte déporté aux Amériques emportait nécessairement avec lui non seulement sa force de travail, sa culture (musique, religion, etc.) mais aussi la somme de ses expériences et connaissances, ses compétences, en un mot l'investissement africain de départ : à ce sujet le cas du père de Benjamin Banneker est très instructif (cf. *Expression Nouvelle*).

Patents Nos. 1,113,178 to 1,113,937.

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THE OFFICIAL GAZETTE

OF THE

United States Patent Office.

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Labels.....	41—No. 18,005 to No. 18,045, inclusive.
Prints.....	12—No. 3,745 to No. 3,756, inclusive.
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Total..... 891

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States.	Patents and Designs.	Trade-Marks, Labels, and Prints.	States.	Patents and Designs.	Trade-Marks, Labels, and Prints.
Alabama.....	5	1	North Carolina.....	2	1
Arizona.....	2	1	North Dakota.....	58	2
Arkansas.....	35	5	Oklahoma.....	5	1
California.....	5	1	Oregon.....	4	1
Colorado.....	21	1	Pennsylvania.....	71	3
Connecticut.....	2	2	Rhode Island.....	11	1
Delaware.....	2	1	South Carolina.....	4	1
Florida.....	3	1	South Dakota.....	5	1
Georgia.....	1	1	Tennessee.....	13	2
Idaho.....	63	13	Texas.....	3	1
Illinois.....	22	1	Utah.....	1	1
Indiana.....	18	1	Vermont.....	6	1
Iowa.....	11	1	Virginia.....	6	1
Kansas.....	6	1	Washington.....	6	1
Kentucky.....	1	1	West Virginia.....	24	11
Louisiana.....	10	2	Wisconsin.....	1	3
Maine.....	60	3	Wyoming.....	1	3
Maryland.....	23	3	Alaska, District of.....		
Massachusetts.....	16	4	Canal Zone.....		
Michigan.....	1	1	District of Columbia.....		
Minnesota.....	19	2	Hawaii Territory.....		
Mississippi.....	3	1	Philippine Islands.....		
Missouri.....	8	1	Porto Rico.....		
Montana.....	3	1	U. S. Army.....		
Nebraska.....	5	1	U. S. Navy.....		
Nevada.....	24	3	Total to residents of the United States.....	720	92
New Hampshire.....	1	1			
New Jersey.....	116	22			
New Mexico.....					
New York.....					

TO RESIDENTS OF FOREIGN COUNTRIES.

Countries.	Patents and Designs.	Trade-Marks.	Countries.	Patents and Designs.	Trade-Marks.
Argentina.....	1	1	Netherlands.....	1	1
Austria-Hungary.....	5	1	Newfoundland.....	1	1
Bermuda.....	1	1	New South Wales.....	1	1
British India.....	1	1	New Zealand.....	1	1
Bulgaria.....	18	1	Norway.....	1	1
British West Indies.....	1	1	Portugal.....	1	1
Canada.....	1	1	Queensland.....	1	1
Canary Islands.....	1	1	Russia.....	1	1
Cuba.....	1	1	Roumania.....	1	1
Denmark.....	1	1	Scotland.....	1	1
Dominican Republic.....	1	1	South Australia.....	1	1
Dutch East India.....	14	1	Spain.....	1	1
England.....	7	1	Sweden.....	1	1
France.....	16	1	Switzerland.....	2	1
Germany.....	1	1	Transvaal, South Africa.....	1	1
Greece.....	1	1	Victoria.....	1	1
Guatemala.....	1	1	Western Australia.....	1	1
Ireland.....	1	1	Total to residents of foreign countries.....	73	2
Italy.....	1	1			
Japan.....	1	1			
Mexico.....	1	1			

Attorneys.

DEPARTMENT OF THE INTERIOR, UNITED STATES PATENT OFFICE,

Washington, D. C., October 8, 1914.

By direction of the Assistant Secretary of the Interior, Order No. 2,002, of September 3, 1912, disbarring Silas C. Sweet, of Des Moines, Iowa, from practicing before the United States Patent Office, has been canceled and revoked, and he is from September 2, 1914, restored to practice before the Patent Office under his former number, 296.

Respectfully,

W. F. WOOLARD,
Chief Clerk.

Notice.

A limited number of copies of the Definitions of the Revised Classes, bound in buckram, may be secured from the Office for \$1 each.

Classification Bulletin No. 32 is ready for distribution, and copies may be purchased at 10 cents each.

Publishers' Catalogues.

This Office would be pleased to receive from manufacturers and publishers such catalogues, circulars, price-lists, or other advertisements relating to the sciences and mechanical arts as are published by them for gratuitous distribution. It is requested that at least three copies of such publications be forwarded in order that the subjects may be properly indexed, classified, and subclassified in the Scientific Library for convenient and ready reference.

Reproduction d'une première page de *The OFFICIAL GAZETTE* des États-Unis, qui expose de manière condensée les brevets déposés par les inventeurs aux États-Unis. L'exemple, ci-dessus, se rapporte au numéro paru le 13 octobre 1914 contenant le descriptif du *Masque à gaz - Breathing device* - inventé par Garrett A. Morgan. Ce descriptif est également reproduit ci-après.

OCTOBER 13, 1914.

U. S. PATENT OFFICE.

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1,113,675. BREATHING DEVICE. GARRETT A. MORGAN, Cleveland, Ohio, assignor to The National Safety Device Company, Oberlin, Ohio, a Corporation of Ohio. Filed Aug. 19, 1912. Serial No. 715,897. (Cl. 128—42.)



1. The combination with a fireman's hood, of a device for supplying air thereto, said hood provided with an outlet opening in its upper end, a gravity valve in said opening, a tube having an inlet opening within said hood into which the wearer can exhale his breath, said exhaling tube having its outlet opening opposite the outlet opening for the hood and spaced therefrom, substantially as described.

2. The combination with a fireman's hood, of a tube for supplying air thereto, a separate tube into which the air exhaled by the wearer is discharged, and having an inlet opening arranged opposite the mouth of the wearer, and having an outlet opening at the upper end of the hood but spaced therefrom, the wall of said hood having an outlet opening opposite the outlet opening in said exhaling tube but spaced therefrom, and a gravity valve in the outlet opening in said hood.

3. The combination with a fireman's hood, of an air inlet therefor, an exhaling tube arranged within the hood, and having an outlet opening located within the hood, said hood having an outlet opening located opposite the outlet opening in said exhaling tube.

4. The combination with a fireman's hood provided with inlet and outlet openings, of an appliance located within the hood and controlled by the breath of the operator, for creating a circulation of fresh air in the hood.

5. In combination with a hood having an opening in its upper end, of a pair of flexible breathing tubes connected with the lower front face thereof, said tubes joined together intermediate of their ends, forming a loop of sufficient size to embrace the body of a fireman and rest upon his hips, and a single tube communicating with said pair of tubes at their point of juncture, and adapted to depend behind the wearer.

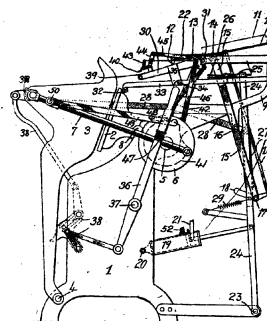
[Claims 6 to 9 not printed in the Gazette.]

1,113,676. TRIPPING MECHANISM FOR PLATEN-PRESSES. LEWIS E. MORRISON, Newark, N. J., assignor to himself and Matthias Plum, Newark, N. J. Filed Feb. 14, 1913. Serial No. 748,327. (Cl. 101—36.)

1. In a printing press the combination of suction means for separating the sheets, a pump for supplying the suction to said means, a platen, mechanism for removing the printed matter from said platen, an electrical circuit having its two normally open terminals supported on said mechanism and devices operable upon the closing of said terminals for rendering said pump inactive.

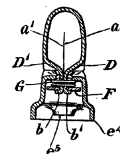
2. In a printing press the combination of printing means, a sheet separating device including a pump, grippers for delivering the printed sheet from said printing means, a normally open electric circuit having two terminals carried by said grippers and devices operable upon the closing of said terminals for rendering the said pump inactive to trip the said separating means.

3. In a printing press the combination of a sheet separating mechanism including a pump, a magnet on said pump, a normally open electrical circuit, including said magnet, means for closing said circuit to energize the said magnet and means operable by the latter for opening communication between the interior of said pump and the atmosphere to render said sheet separating mechanism inactive.



4. In a printing press the combination of a sheet separating mechanism including a pump, a magnet on said pump, a tripping mechanism including a second magnet, a normally open electric circuit including both of said magnets, means for closing said circuit to energize both of said magnets and devices rendered operative when the said magnets are energized for rendering said pump inactive to trip the said sheet separating mechanism and for actuating the said tripping mechanism to trip the said press.

1,113,677. VEHICLE CURTAIN-FASTENER. FRED A. NEIDER, Augusta, Ky., assignor to The F. A. Neider Company, Augusta, Ky., a Corporation of Kentucky. Filed Sept. 28, 1910. Serial No. 584,218. (Cl. 24—221.)



1. A vehicle curtain fastener comprising a base having an elongated boss formed thereon and provided with a longitudinally extending shoulder-receiving depression in the face thereof, a marginal rib along each end of the face, and a shoulder-receiving depression extending transversely across the face thereof and between the ribs at a point intermediate the ends of the boss, an elongated head pivotally secured to the boss and located axially, with relation thereto, and having shoulders formed thereon intermediate the ends thereof, for engaging the transversely extending depressions when the head is turned to an operative position, with relation to the boss, and for projecting into the longitudinally extending depression when the head is turned to an inoperative position, with relation to the boss, said shoulders being of such altitude, with relation to the depth of the longitudinally extending depression, that the head rests upon the marginal ribs when the boss is in the inoperative position, and means for holding the head against the face of the boss.

2. A vehicle curtain fastener comprising a base, an elongated boss formed on the base and having longitudinal and transverse depressions formed therein, marginal ribs

Descriptif du Masque à gaz - *Breathing device* - inventé par Garrett A. Morgan.
Ce descriptif est paru dans le numéro du 13 octobre 1914 de *The OFFICIAL GAZETTE*.

Reproduction du brevet d'invention du « Feu Rouge » – Traffic Signal - de Garrett A. Morgan.

Patented Nov. 20, 1923.

1,475,024

UNITED STATES PATENT OFFICE.

GARRETT A. MORGAN, OF CLEVELAND, OHIO.

TRAFFIC SIGNAL.

Application filed February 27, 1922. Serial No. 539,403.

To all whom it may concern:

Be it known that I, GARRETT A. MORGAN, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in a Traffic Signal, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates to traffic signals, and particularly to those which are adapted to be positioned adjacent the intersection of two or more streets and are manually operable for directing the flow of traffic.

One of the objects of my invention is the provision of a visible indicator which is useful in stopping traffic in all directions before the signal to proceed in any one direction is given. This is advantageous in that vehicles which are partly across the intersecting streets are given time to pass the vehicles which are waiting to travel in a transverse direction: thus avoiding accidents which frequently occur by reason of the over-anxiety of the waiting drivers, to start as soon as the signal to proceed is given.

Another object is the provision of a semaphore signal which is useful by night as well as by day and which is arranged to be easily and automatically operable by the traffic director. In addition, my invention contemplates the provision of a signal which may be readily and cheaply manufactured.

To this end, I provide a signal wherein the direction indicating arms are pivotally supported and adapted to be moved vertically for stopping the flow of traffic and then to be revolved and dropped to indicate a right of way to vehicles moving in another direction. The raising and revolving movements of the arms are adapted to be accomplished by the turning of a crank, and suitable mechanism actuated by the crank is provided for automatically indexing the arms to the required position, and for permitting their proper functioning in accordance with the wishes of the traffic director.

The means for accomplishing the above objects will be fully set forth in the following description which relates to the drawings, and the essential characteristics

of my invention will be summarized in the claims.

In the drawings, Fig. 1 is a front elevation of a semaphore signal constructed according to my invention; Fig. 2 is an elevation of the direction indicating means showing the arms in vertical position; Fig. 3 is a side elevation of the direction indicating portion when the arms are in horizontal position as shown in Fig. 1; Fig. 4 is a side elevation of the signal when the arms are in vertical position as illustrated in Fig. 2; Fig. 5 is a vertical section through a part of the signalling mechanism; Fig. 6 is a similar section adjacent the operating end of the signal; Fig. 7 is a transverse section taken on the line 7-7 in Fig. 6; and Fig. 8 is a fragmentary view illustrating the signal and alarm bells that may be used with my invention.

My invention is concerned with the provision of a traffic signal which enables a director to control the flow of traffic by stopping the movement thereof in all directions momentarily just prior to allowing the traffic to move in any one direction. Accordingly, in the embodiment shown I have illustrated a standard 10, having a support 11, revolvably mounted therein, which support is provided with direction indicating signals. The signal indicating means may comprise a box-like structure 12 which is rigid with the support 11, and a pair of arms 13 which are pivoted, as at 14, to the opposite sides of the support as illustrated in Fig. 1. The characters shown on the vertical indicator may be the usual "Stop" and "Go" words, as is customary for this class of work.

Each of these arms may be also a box-like structure having a rectangular cross section and having exposed faces provided with direction indicating characters. In the form illustrated the arms are each provided with "Stop" indicating characters on the side and bottom faces, and with "Go" characters on the end faces. The arms are pivoted so that when raised to the position indicated in Fig. 2, the "Go" characters on the indicator 12 are hidden from view, and the "Stop" characters on the bottom of the arms are then visible from the direction in which traffic was moving. The two positions of the arms showing this arrangement are illustrated in Figs. 3 and 4.

2

1,475,024

My invention is adapted to direct traffic by raising the semaphore arms to stop traffic which was moving in one direction and then by revolving the arms and releasing them, thus indicating the right of way for traffic in another direction. The means for raising the arms as shown in Figs. 5 and 6 may be accomplished by lowering a bracket 20 having racks 21 thereon, which actuate segments of a pinion 22, mounted as at 23, on the semaphore arms. This bracket is adapted to be lowered by moving a shaft 24, on which the bracket is mounted, downwardly. This shaft extends entirely through the support 11 and terminates within the standard 10 adjacent another rack 25, which is adapted to be actuated by a pinion 26 mounted on a crank shaft 27. This crank shaft is supported in the standard and is provided with a crank arm 28 which may be rotated by the director.

The segment 26 is shown as having teeth on only a portion of the periphery thereof so that the rack 25 is lowered only during a fractional turn of the crank shaft. Accordingly, to hold the arms in vertical position, I have illustrated a spring operated plunger 30 which is adapted to engage a notch 31 in the rack 25 just before the teeth in the pinion disengage those in the rack. In this way, the arms are held in vertical position whereby traffic is stopped in all directions as indicated in Figs. 2 and 4 respectively.

After the arms are raised and traffic is stopped, then to direct the flow of traffic in a direction different from the flow previous to the raising of the arms, I have illustrated suitable means for revolving the entire signal. This mechanism is adapted to function while the arms are held in vertical position. In Fig. 6, the means for revolving the indicators is shown as a gear 32 rigid with the shaft 27 and provided with teeth on a portion of the periphery thereof for engaging an annular gear 33, which may be integral with a sleeve 34, within the upper portion of the standard 10. This sleeve is shown as being rigidly attached by securing members 35 to the support 11, and since the vertical indicator is rigid with the upper portion of the support, it follows that whenever the gear 33 is rotated, the indicators are revolved.

The degree of turning usually desired is only 90°. Accordingly, I provide an indexing mechanism comprising a yieldable plunger 36 carried by the standard 10 and adapted to engage suitable notches 34. The number of teeth in the gear 32 are so arranged that they just disengage the gear 33 when the plunger 36 engages a succeeding notch. The turning of the indicators is preferably designed to be accomplished only after the arms are moved to vertical position, and this

is obtained by spacing the teeth on the gear 32 as illustrated in Fig. 6 so that the gear 33 is not engaged until the pinion 26 disengages the rack 25. Then, while the indicators are being turned, the arms may be released by providing a cam 40 which engages the arms 41, to which the plunger 20 is secured; and thereby releases the rack 25. The weight of the arms 13 causes them to drop to horizontal position.

When the arms are released, the inertia of the moving parts is apt to cause damage to the operating mechanism. Accordingly, I have shown a dashpot for absorbing the shock incident to the fall of the arms and I have shown this dashpot as embodying a piston 45 which is carried by the shaft 24 and is movable within a cylinder 46, forming part of the support 11. Suitable openings 47 may be provided in a closure 48 for regulating the outlet of air from the dashpot cylinder.

To adapt a signal constructed according to my invention for use at night, I have shown two electric lamps 50 and 51 which are mounted within the vertical indicator. These lamps may receive electrical energy either from a battery mounted within the standard 10 (not shown) or from any other suitable source of supply, such as through leads depending from an overhead line. The lamp 50 is positioned adjacent the openings 52 above the point of pivotal connection, while the lamp 51 is adjacent the openings 53 below the point of pivotal connection.

Thus, when the arms are in horizontal position, the lamp 50 illuminates characters on the indicator 12, while the lamp 51 gives an additional warning through openings 53. Then, when the arms are raised, two of the openings 53 hidden by the arms are uncovered, whereupon an illuminated signal is flashed out. This occurs substantially simultaneously with the covering of the "Go" signal shown on the vertical indicator. The "Stop" signal which is flashed when the arms are raised, is augmented by light from the lamp 50 which passes through openings 54 in the top of the arms, and illuminates the characters on the bottom face thereof.

When the source of electrical supply is carried by the standard, the current may be carried to the lamps by means of a collector ring 60 mounted on the sleeve 34, and a brush 61 carried by an arm 62 on the standard 10.

If desired, the signal may be provided with alarm mechanism as illustrated by bells 65 and 66 mounted at the top of the vertical indicators. One of these bells may be an alarm bell, while the other may be a signal bell. For selectively operating these bells, circuit controllers 67 and 68 may be mounted on the standard 10.

1,475,024

B

The operation of a signal constructed according to my invention is as follows:—Assuming that traffic is moving in the direction indicated by the "Go" characters in Fig. 1 and that the director desires to change the right of way, then the crank 28 is turned, whereupon the arms 13 are immediately raised by virtue of the rack and pinion connections actuated by the crank shaft 27. As soon as the arms are raised, the signal which was visible to the moving traffic now changes as shown in Fig. 4, while the signal visible to traffic which was formerly stopped remains the same. Thus, traffic is stopped in all directions. This is accomplished while the signal is moved about $\frac{1}{4}$ of a revolution. Then as the crank is turned still further, the gear 32 engages the gear 33, whereupon the indicators are revolved while the arms are still held in vertical position. Then while the arms are being revolved, the cams 40 engage the latch arms 41, thereby releasing the plunger 30 and allowing the arms to drop to horizontal position. The dash-pot controlled by the piston 45 permits the arms to descend with slow motion so that by the time the crank has been turned a complete revolution, the arms are in substantially horizontal position and are automatically held in the desired direction by the indexing plunger 36. When the arms are lowered, the right of way is changed from the traffic which was flowing in the direction indicated by Fig. 1 to the traffic which was waiting to move in another direction.

When the lights are used, the signals are illuminated to indicate the direction of travel when the arms are in either vertical or horizontal position, and if desired, this may be augmented by bells which are actuated by the circuit controllers adjacent the hand of the director.

From the foregoing description, it will be seen that my invention provides a signal which is operable for enabling a director to control traffic more conveniently than is accomplished by merely revolving semaphore arms in a horizontal plane. A further advantage of my invention is that the movement of the semaphore arms is entirely automatic whereby the operator may devote his attention to the requirements of traffic and still accomplish his purpose without manually signalling, moving traffic to stop, until the direction of travel is changed.

Having thus described my invention, I claim:—

1. In a traffic signal the combination with a vertically disposed indicator, of semaphore arms pivoted thereto and revoluble thereon, said arms being disposed on opposite sides of the indicator, means for raising and lowering the arms and crank mechanism for controlling said means, said mechanism being so arranged that the arms are raised

during the initial turning of the crank and are then revolved upon continued turning of the crank.

2. A traffic signal comprising in combination, a standard, a vertical indicator carried thereby, a semaphore arm pivoted to the indicator, a crank carried by the standard, means associated with the crank for raising the arm and subsequently revolving the indicator, and other means for permitting the arm to be lowered in a position at right angles to the former position when the crank has been turned further.

3. In a traffic signal, the combination with a standard, of a revoluble indicating member carried thereby, semaphore arms disposed on opposite sides of said member and pivoted thereto, a crank shaft projecting laterally through the standard, mechanism within the standard and member for raising the arms to vertical position subsequently revolving the member and then lowering the arms, whereby traffic is momentarily stopped in all directions and then subsequently permitted to flow in another direction, said mechanism being so arranged that the signal is actuated to automatically stop traffic in all directions on each operation of the crank shaft.

4. In combination, a standard, a revoluble member projecting upwardly therefrom, semaphore arms pivoted to the indicator and disposed on opposite sides thereof, a shaft extending vertically through the member, rack and pinion means at each end thereof for raising said arms, a crank actuated member carried by the standard for controlling the rack and pinion means, a latch carried by the standard for retaining the shaft in lowermost position, and a cam controlled by the crank shaft for releasing the latch, whereby the arms are permitted to drop to horizontal position.

5. In combination, a standard, a revoluble member carried thereby, a vertically disposed indicator secured to the upper end of the member, semaphore arms pivotally disposed on opposite sides of the indicator, mechanism extending within the indicator, a standard for raising the arms, a crank actuated mechanism carried by the standard, said last mentioned mechanism being so arranged that the arms are raised during the initial turning of the crank shaft and then revolved upon continued turning of the shaft.

6. In combination, a standard, a hollow member projecting upwardly therefrom, an indicator rigid with the upper end of said standard, semaphore arms pivoted to the indicator, mechanism controlled from the standard for actuating the arms to move them in a vertical plane and for revolving them with the indicator to a new position, means associated with the standard for in-

dexing the indicator to the proper position, means associated with said standard for retaining the arms in a vertical position during a portion of the turning operation and
5 for releasing the arms when moved to a new position, and a dash pot associated with said member for cushioning the shock incident to the fall of said arms.

7. In a traffic signal, the combination with
10 a vertical indicator having openings in opposite sides thereof, of a semaphore arm piv-

oted thereto below the openings, said arm having openings in the upper wall thereof which are adapted to register with openings in the indicator when the arm is raised to vertical position, a lamp within the indicator adjacent the openings therein, and means
1. for operating said arm.

In testimony whereof, I hereunto affix my signature.

GARRETT A. MORGAN.

Nov. 20, 1923.

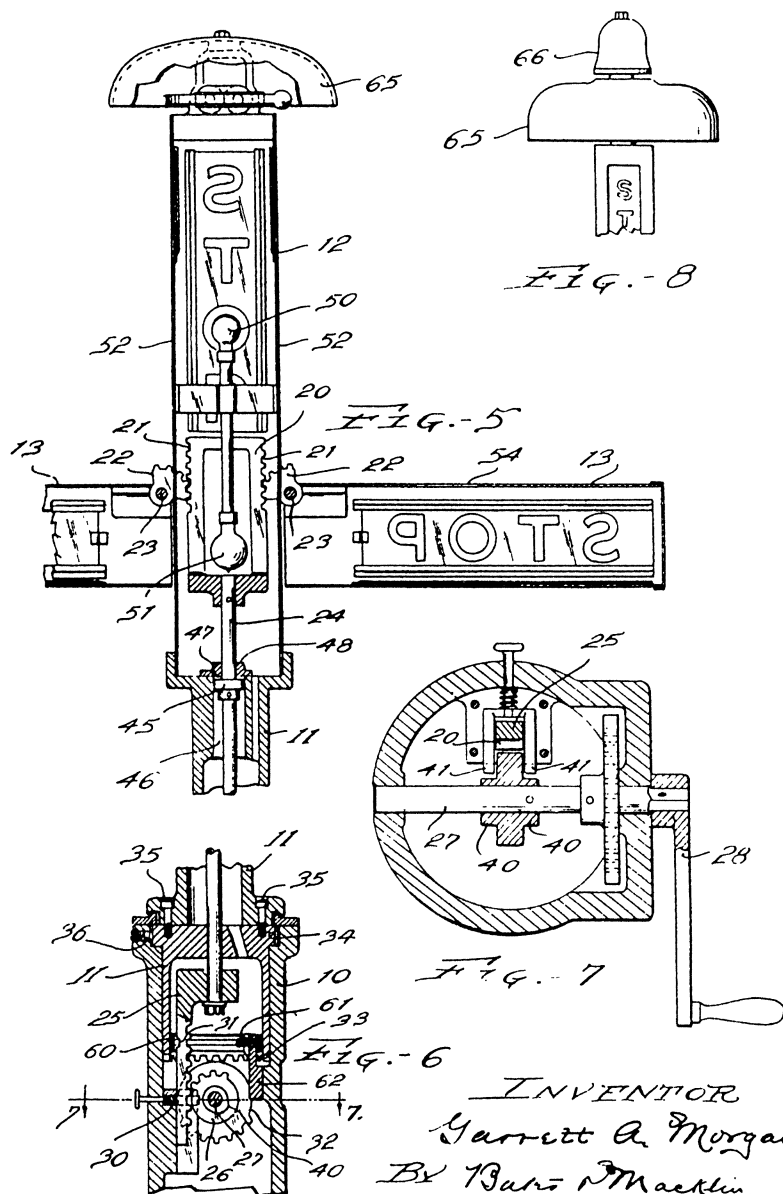
1,475,024

G. A. MORGAN

TRAFFIC SIGNAL

Filed Feb. 27. 1922

2 Sheets-Sheet 2



INVENTOR
Garrett A. Morgan.
By *Barth Macklin,*
ATTORNEY'S

Nov. 20, 1923.

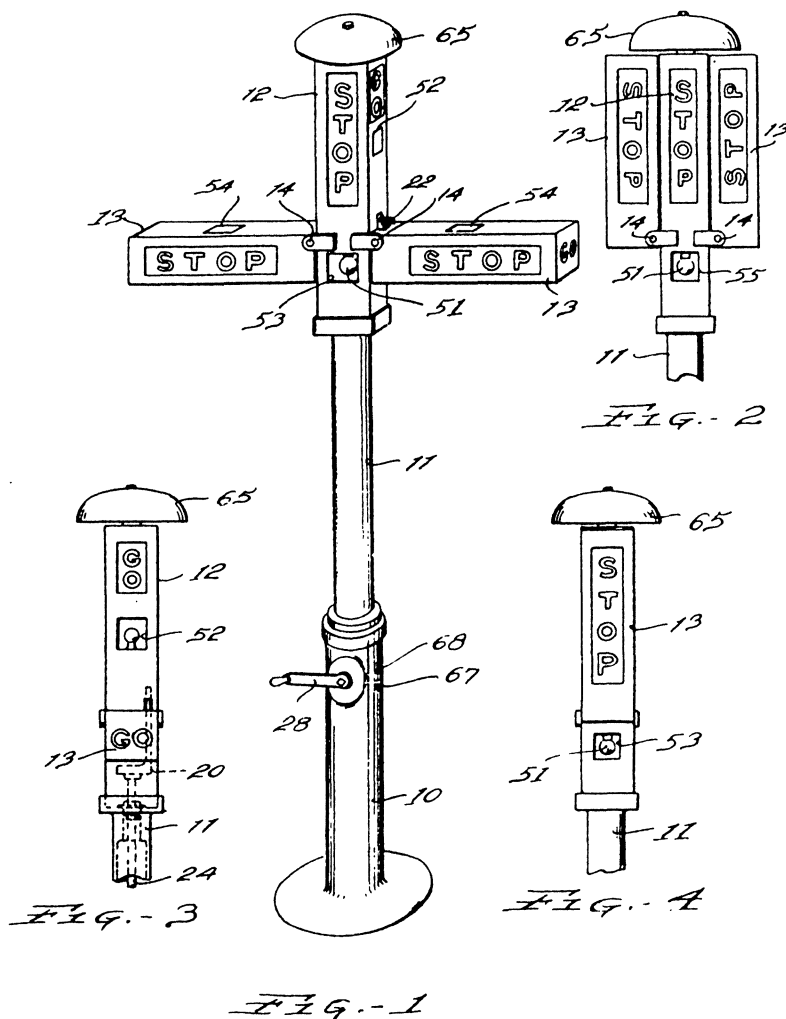
1,475,024

G. A. MORGAN

TRAFFIC SIGNAL

Filed Feb. 27, 1922

2 Sheets-Sheet 1



INVENTOR
Garrett A. Morgan,
By *Patricia Macklin,*
ATTORNEYS

Reproduction du descriptif du brevet d'invention de la **Lasting-Machine**, «Machine à monter des empeignes» pour la fabrication des chaussures, de **Jan E. Matzeliger** (1852-1889). Parution dans *The OFFICIAL GAZETTE* du 22 septembre 1891.

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OFFICIAL GAZETTE.

SEPTEMBER 22, 1891.

carriage, pawls *v*, spring *a*¹⁰, a pawl *a*¹¹, and lever *a*¹², all said parts being arranged and operating substantially as set forth.

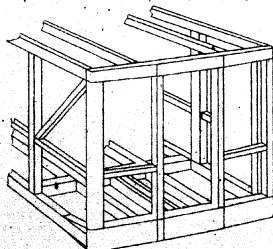
11. In a fare-register, the combination, with the number-disks *k*, ratchet-wheels *m*, pawls *p*, carriage *g*, lever *d*⁸, engaging said carriage, rack or roughened strap *i*⁵, pawl *j*³, secured to said lever, and springs controlling said pawl, and a spring *h*² for the lever *d*⁸, all arranged and combined substantially as and for the purposes set forth.

12. In combination with the number-disks *k* & *k*, having numbers on the peripheries thereof, ratchet-wheels *m* *m*, pawls *p* *p*, supported by a sliding carriage, a lever operating said sliding carriage, an independent lever, and pawls *a*¹⁰ *a*¹¹, engaging said ratchet-wheels *a*¹⁰, and stop-pawls *v* and springs *m*, all arranged substantially as and for the purposes set forth.

13. In combination with the frame or bed *I*, having a series of number-disks *m*⁴, with numbers on the peripheral faces thereof and notches therein, of a stepped pawl *p*⁵, pivoted on an arm pivoted, as at *s*⁶, to said frame or bed, and a sliding carriage provided with an arm *a*¹⁰, adapted to engage said pivoted arm *p*⁵, substantially as and for the purposes set forth.

14. In a fare-register with a bell-lever and bell, a series of registering-disks *m*⁴, a pawl *p*⁵, pivoted on a pivoted arm, a sliding carriage having an arm *a*¹⁰, and a lever for operating said carriage, bell-lever, and pawl simultaneously, substantially as set forth.

459,896. RAILWAY-CAR. EVERETT B. MACMILLAN, Chicago, Ill. Filed Nov. 28, 1890. Serial No. 372,966. (No model.)



Claim.—1. In a car, the combination of an upper and lower buffer-beam for receiving the shock on the end of a car with a frame composed of longitudinal timbers, and a roof-truss for sustaining the floor by a system of vertical rods, all substantially as and for the purpose set forth and described.

2. In a car, the combination of a truss for suspending the floor of the car, composed of longitudinal and vertical timbers, with diagonal braces, and the means for suspending the floor to the said roof-truss, all substantially as and for the purpose set forth.

3. In a car without platforms, the combination of a floor-frame composed of continuous longitudinal timbers held in sockets in the cross buffer-timbers at the ends of the car with an upper series of longitudinal timbers and sustaining-trusses, with the means for supporting the said upper timbers, so that the impact of a blow shall be transmitted uninterruptedly throughout the entire car as a unit, all substantially as and for the purpose set forth and described.

459,897. MOTH-PROOFED HAIR AND PROCESS OF PREPARING THE SAME. JOHN RUCH and JOHN RUCH, JR., Philadelphia, Pa., assignors to themselves and George Ruch, same place. Filed Sept. 30, 1889. Serial No. 335,591. (No specimens.)

Claim.—1. The method of destroying moth life in hair and the like and of rendering the same moth-proof, which consists in subjecting it to the action of pyroigneous vapors, substantially as described.

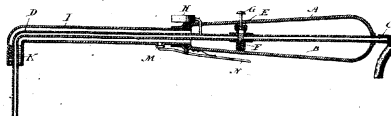
2. The method of destroying moth life in hair and the like and of rendering the same moth-proof, which consists in subjecting it to the pyroigneous and wood-tar vapors given off during the slow combustion of wood, substantially as described.

3. As a new article of manufacture, hair impregnated with the pyroigneous and tarry products given off during the slow combustion of wood, substantially as described.

459,898. INSTRUMENT FOR FORCING AIR INTO THE LUNGS. FREDERICK P. WILCOX, CHRON. Springs, N. Y. Filed Feb. 28, 1891. Serial No. 335,548. (No model.)

Claim.—1. An instrument for artificially expanding the cells of the lungs, consisting of a source of supply of compressed air, a valve for controlling the passage of the same to the lungs, a gage showing the pressure upon the lungs when so administered, and a second valve for controlling its exit substantially as described.

2. In an instrument for artificially expanding the cells of the lungs, the combination of a source of supply of compressed air, an inner tube leading from such source to the lungs, a valve in said inner tube for controlling the passage of the air therethrough, an auxiliary tube surrounding the first and also in communication with the lungs, and a valve in said exterior tube for controlling the escape of the air therefrom, substantially as described.



3. An instrument for artificially expanding the cells of the lungs, consisting of a source of supply of compressed air, an inner tube leading from such source to the lungs, a valve in said inner tube for controlling the passage of the air therethrough, an auxiliary tube surrounding the first and also in communication with the lungs, a valve in said exterior tube for controlling the escape of the air therefrom, and a gage for showing the pressure of the air upon the lungs, said instrument being provided with a bulbous terminal attachment conoidal in general form and flattened or elliptical in cross-section, substantially as described.

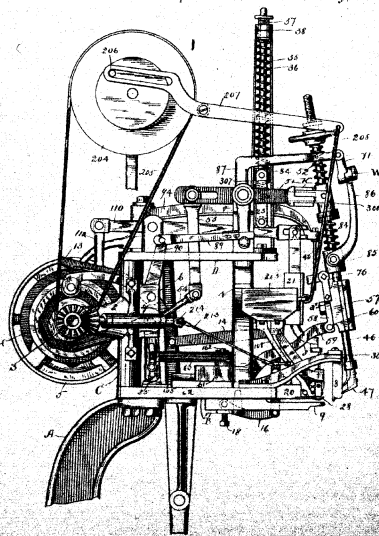
459,899. LASTING-MACHINE. JAN E. MATZELIGER, LYNN, MASS., assignor, by mesne assignments, to the Consolidated Hand Method Lasting Machine Company, Nashua, N. H.; George W. Moulton executor of Jan E. Matzeliger, deceased. Filed Aug. 14, 1885. Serial No. 174,378. (No model.)

Claim.—1. In a lasting-machine, the combination, with a fixed rest, of a single pair of pinchers suspended above said rest, and mechanism for moving said pinchers vertically and forward and back above and over the rest from a position in front to a position back of the same, substantially as described.

2. In a lasting-machine, the combination, with a fixed rest, of a single pair of pinchers suspended above said rest and adapted to be moved vertically and forward and back above and over the rest from a position in front to a position toward the back of the same, and a forwardly and backwardly moving elastic wiper, substantially as described.

3. A lasting-machine provided with a frame, a rest supported in a fixed position on the frame, a pair of pinchers and appliances supporting them above the rest in position to swing from front to back over the rest, and mechanism connected with the pinchers to open and close and move the same vertically and forward and back, substantially as described.

4. In a lasting-machine, the combination, with a fixed rest having its bearing-surface upon its under side, of a single pair of pinchers suspended above said rest and adapted to be moved vertically, laterally,

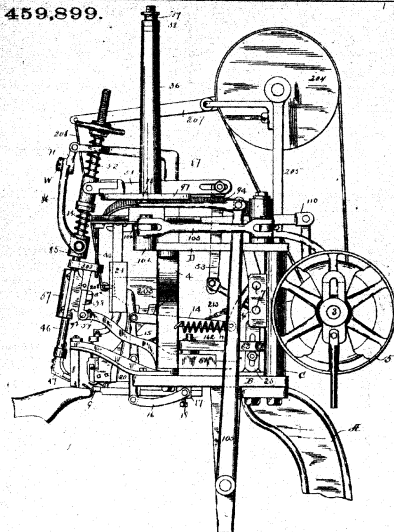


SEPTEMBER 22, 1891.

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459,899.



and forward and back above the horizontal plane of the rest, whereby the upper is drawn over the last and plaited at the same time, substantially as set forth.

5. In a lasting-machine, the combination, with the reciprocating pinchers and fixed rest, of a guide 9, adjustable to and from the rest, for the purpose set forth.

6. In a lasting-machine, the combination, with the reciprocating pinchers, of a rest having an under bearing for the last, and an edge guide 9, movable toward and from the rest, substantially as described.

7. In a lasting-machine, the combination, with the pinchers and last-rest and with the devices for reciprocating the pinchers back and forth, of the devices for reciprocating the pinchers laterally, a shaft from which motion is imparted to said devices through a movable driver, and a shifter whereby said driver may be moved by the operator to vary or arrest the lateral reciprocation, substantially as described.

8. The combination, in a lasting-machine, of pinchers and pincher-actuating mechanism, the driver M, and the shifter N and connections, substantially as described.

9. In a lasting-machine, the combination, with the pinchers of a lasting-machine supported to move freely, of a carrier J and devices for moving it laterally, said carrier connected with said pinchers to swing them sidewise, substantially as described.

10. In a lasting-machine, the combination, with the pinchers, of two carriers 40 J, one moving back and forth and the other from side to side and each connected to operate the pinchers, substantially as described.

11. In a lasting-machine, the combination, with the pinchers, of a laterally-movable carrier, driving-shaft, movable driver, and a shifter arranged in the line of connection between the pinchers and shaft in position to be moved by the operator, substantially as described.

12. In a lasting-machine, the combination, with the pinchers and carrier, of a vibrating block, a bearing movable upon said block past the axis thereof, and a shifter connected with said bearing and arranged to be operated by the attendant, substantially as described.

13. In a lasting-machine, the combination, with the pinchers and the forward and laterally movable carriers thereof, of the driving-shaft and connections between the same and the carriers, and a driver connected with the laterally-reciprocating carrier and adjustable to vary the movements of the carrier, substantially as described.

14. In a lasting-machine, the combination, with the pinchers and devices for moving the same forward and laterally, of a lifter K, provided with a swivel and a sleeve, substantially as described.

15. In a lasting-machine, the combination, with the pinchers S, forward and lateral carriers J and 40, and lifter K, of side spring-bearings interposed between the lateral carrier and the pinchers, substantially as described.

16. In a lasting-machine, the combination of the pinchers S, lateral carrier 40, and intermediate yielding bearings, substantially as described.

17. In a lasting-machine, the combination of the pinchers S, a lifter K, and forward and lateral carriers J and 40, and vertical and lateral yielding bearings between the pinchers and said lifter and carriers, substantially as described.

18. In a lasting-machine, the combination of the vertically-reciprocating lifter provided with a swinging yoke supporting a pivoted ring or collar, in combination with pinchers supported by a shaft extending through said collar, substantially as described.

19. In a lasting-machine, the combination, with the swinging pinchers, of a slide connected with the movable jaw thereof and jointed connections 71 86 between said slide and an operating-shaft, substantially as described.

20. In a lasting-machine, and in combination, pinchers provided with mechanism for causing them to grip the leather and draw it over the last, and a wiper and mechanism, substantially as described, to advance it over the last toward the position of the pinchers, said mechanism being timed so that the wiper shall commence to advance while the pinchers hold the leather tightly down over the last and continue to advance after the pinchers let go and bear upon and hold the leather tightly stretched during the latter part of the movement, substantially as described.

21. In a lasting-machine, the combination, with the reciprocating pinchers, of a nailer and means, substantially as described, for moving the latter horizontally toward and from the last independently of the movements of the pinchers, substantially as described.

22. In a lasting-machine, in combination, pinchers provided with mechanism for causing them to grip the leather and draw it over the last, a nailing mechanism, substantially as described, adapted to advance into the position of the pinchers for inserting the tack, and a wiper independent of the pinchers for smoothing and holding the strained upper while the tack is inserted, the wiper being timed to take hold in time for the pinchers to let go and give place to the nailer, all substantially as described.

23. In a lasting-machine, the pinchers suspended as described and provided with a sleeve on a lever 51, joint W, loose trunnions 72, and mechanism to impart a forward lateral movement to the pinchers, substantially as described.

24. In a lasting-machine, the combination of the shank 48 and upper jaw, the shank 46, with lower jaw, collar 85, spring 84, rod 86, link 71, bell-crank lever 87, and connections with the driving mechanisms, substantially as described.

25. In a lasting-machine, the combination of the guide-foot 9, sliding on the under side of plate B, the rod 16, lever 15, and connections with the driving mechanism, substantially as described.

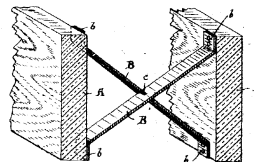
26. In a lasting-machine, the combination of the driver, the guide-block 21, lever 110, the link 23, spring 36, rod 35, post on the plate D, and the driving mechanism connected to the lever 110, substantially as described.

27. In a lasting-machine, in combination with the driver suspended as described, the bar 20, the lever 25, and driving mechanism, substantially as described.

28. The combination, with the stretching devices of a lasting-machine, of a box 203, provided with the described slot or channel and double-inclined ridgeway 209, with the channel and tack-driver, all substantially as described.

29. In a lasting-machine, the combination, in the pinchers, with the upper movable jaw, of the lower jaw and side flanges secured thereto, whereby the edge of the leather is prevented from entering the pinchers too far, substantially as described.

459,900. BRIDGING FOR FLOORING-JOISTS. FREDERIC H. MOORE, Boston, Mass. Filed Apr. 13, 1891. Serial No. 388,780. (No model.)



Claim.—Bridging for flooring-joint, consisting of two pieces of metal having their ends bent to abut against the joists and interlocking one with the other at their center, substantially as set forth.

459,901. DRY CLOSET. FRED P. SMITH, Waterford, N. Y., assignor of one-half to Oliver S. Kendall, Worcester, Mass. Filed June 26, 1890. Serial No. 356,883. (No model.)

Reproduction du descriptif du brevet d'invention (23 juillet 1872) d'un système de Lubrification d'une machine à vapeur en fonctionnement – Lubricators for steam-engines - de Elijah McCoy (1844-1929).

UNITED STATES PATENT OFFICE.

ELIJAH MCCOY, OF YPSILANTI, MICHIGAN, ASSIGNOR TO HIMSELF AND
S. C. HAMLIN, OF SAME PLACE.

IMPROVEMENT IN LUBRICATORS FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. 129,843, dated July 23, 1872.

SPECIFICATION.

To all whom it may concern:

Be it known that I, ELIJAH MCCOY, of the city of Ypsilanti, in the county of Washtenaw and State of Michigan, have invented certain new and useful Improvements in Lubricators; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing and to the letters of reference marked thereon, which form a part of this specification.

The nature of my invention consists in the construction and arrangement of a lubricator for steam-cylinders, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawing, in which is represented a longitudinal section.

A represents the oil-cup, provided with the cover B. In the center of the bottom of the cup A is a downward-projecting stem, C, to be screwed into the place where the lubricator is to be used. This stem is hollow, and from the same extends a tube, D, through the center of the cup. Within this tube is a rod, *a*, having a valve, *b*, at its upper end above the tube D to close the same, and at the lower end is a piston or disk, *d*, within the stem C. Around the lower end of the rod *a*, between the piston *d* and a shoulder in the stem, is

placed a spiral spring, *e*, which forces the rod down, so that the valve *b* will close the upper end of the tube D and prevent the passage of the oil.

When the steam presses upon the piston the valve rises and allows the oil or other lubricating material used to pass out.

In the cover B is a thumb-screw, E, directly above the valve *b*, by means of which the flow of oil may be readily regulated. At the bottom of the oil-cup is a faucet, G, for the purpose of drawing off the condensed steam when necessary.

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

1. The tube D, rod *a*, and spring *e*, in combination with the valve *b* and thumb-screw E and top B, the several parts being arranged to operate substantially as and for the purpose specified.

2. The stem C, tube D, rod *a*, and piston *d*, in combination with the spring *e*, when the spring is arranged in the stem and between the piston and end of the tube, substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my own I hereby affix my signature in presence of two witnesses.

ELIJAH MCCOY.

Witnesses:

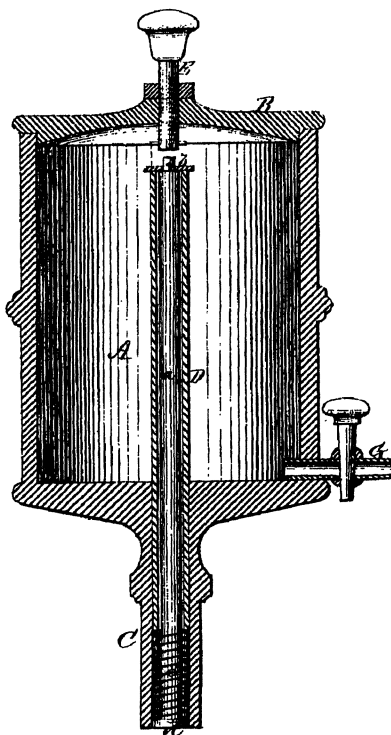
S. M. CUTCHEON,
W. R. SAMSON.

E. McCOY.

Improvement in Lubricators for Steam-Engines.

No. 129,843.

Patented July 23, 1872.



Witnesses

John A. Ellis
C. H. Watson

Inventor
Elijah McCoy
Per.

J. H. Alexander
Att'y.

Reproduction du descriptif du brevet d'invention (29 janvier 1901) d'un système de d'électrification de voies ferrées - Electric Railway - de Granville T. Woods (1856-1910).

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OFFICIAL GAZETTE.

JANUARY 29, 1901

frame-plate secured thereto by vertically-extending pieces, and a side tube which passes through the disk and is secured to a boss formed in one of the side pieces.

20. In an electric-arc lamp, the combination of a disk, a flat metal frame-plate, a pair of vertically-extending side pieces which are secured to the plate and the disk, bosses between the disk and the frame-plate formed on the side pieces, and a support for the outer globe which passes through the disk and is secured to the bosses.

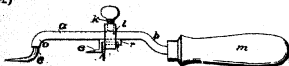
21. In an electric-arc lamp of the carbon-feed type, the combination of a carbon-tube, a clutch carried thereby, and having an opening therein to permit the carbon-holder to be seized with the fingers or by a tool while trimming the lamp, a guide for the carbon formed integral with the clutch, a holder for the upper carbon, and a contact device on the holder for making contact with the tube.

22. In an electric-arc lamp designed for use on constant-potential alternating current circuits, the combination of carbons movable with respect to each other, a magnet for separating and feeding the carbons as they are consumed, a base or frame to which the magnet is secured, a support extending upwardly from the base, a reactance comprising a laminated structure having an air-gap therein and wound with wire which is in series relation with the arc, and means for securing said reactance to the support.

23. In an electric-arc lamp, the combination of a pair of circular metal disks which are centrally connected through a hub formed integrally therewith, and side rods which extend through both disks and are secured against movement and form a globe-support.

24. In an electric-arc lamp, the combination of a carbon-tube, a follower, and a clutch secured to the tube comprising shoes, arms to which the shoes are pivotally secured, and a plate connecting the arms at the lower ends which is bored centrally to receive the carbon, the space between the arms, guide and tube being arranged to permit the carbon-follower to be grasped when recarboning.

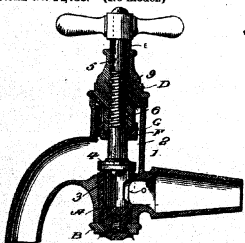
667,108. CAN-OPENER. HARRY W. THURLOW and JAMES T. EP-
LER, Seattle, Wash. Filed Apr. 30, 1900. Serial No. 14,865. (No
model.)



Claim.—1. In a can-opener, the combination with the shank, of a clamp-frame adjustable along said shank, and two removable cutting-blades, respectively adapted to cut the top and the side of a can, and having shanks fitting into said clamp-frame, and a single clamp-screw for clamping both of said shanks in said clamp-frame.

2. In a can-opener, the combination with the shank, of a clamp-frame embracing the shank and adjustable thereon, two removable cutting-blades respectively adapted to cut the top and the side of a can, and having shanks fitting into said clamp-frame and between the said frame and the shank of the can-opener, and a clamp-screw for clamping said clamp-frame to the shank of the can-opener, and at the same time clamping the blade-shanks.

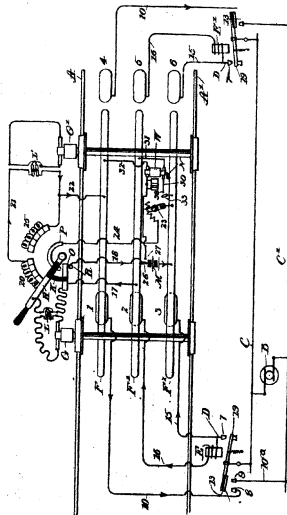
667,109. FAUCET. EDWIN L. WALTER, Scranton, Pa. Filed Apr.
28, 1900. Serial No. 14,753. (No model.)



Claim.—1. In a faucet, cock or the like, a casing having a valve-chamber, a valve-seat removably fitted within the valve-chamber, a closure for the open end of said valve-chamber and having a tubular extension, a valve having a tubular extension telescoping with the tubular extension of the closure and held from turning therein, a stem rotatably fitted within the aforesaid closure and held against outward movement by a collar, and having its lower end threaded to cooperate with a threaded opening in the valve extension, and a packing-gland applied to the extension of the said closure and forming a tight joint with the tubular extension of the valve, substantially as set forth.

2. In a faucet, cock or the like, a casing having a valve-chamber with its lower end portion made tapering, a plug-valve removably fitted within the valve-chamber through the upper end thereof and having its lower end reduced, a washer secured to the projecting part of the reduced portion of the plug-valve and overlapping the lower end of the valve-chamber and formed with an angular portion to receive the upper end of the valve-chamber and having a tubular extension, a stem mounted in the said cap, a valve controlled in its movements by the said stem, a packing-gland fitted to the lower end of the extension of the cap, and a sleeve fitted to the upper portion of the said stem and held in place by the handle fitted thereto, substantially as set forth.

667,110. ELECTRIC RAILWAY. GRANVILLE T. WOODS, New
York, N. Y., assignor to the General Electric Company, of New York
Filed Sept. 29, 1897. Renewed Oct. 15, 1898. Serial No. 693,680 (No
model.)



Claim.—1. In an electric railway, the combination of two sets of sectional conductors arranged in two distinct lines, a connection from one conductor in one line to one in the other, both sets being adapted to take current constantly from the feeding-circuit and deliver the same in multiple to the car motor or motors as the car moves along, the conductors of both sets being normally dead, a normally open pick-up circuit including a source of electrical energy carried by the car, and a car-controlling switch mechanism whereby, when the car is being brought to rest, said pick-up circuit is closed, substantially as and for the purpose set forth.

2. In an electric railway, the combination of two sets of sectional conductors arranged in two distinct lines, a connection from one conductor in one line to one in the other, both sets being adapted to take current constantly from the feeding-circuit and deliver the same in multiple to the car-motors as the car moves along, the conductors of both sets being normally dead, a switch for controlling the flow of current to a pair of conductors, one in each set, an operating-coil for such switch (normally operated by current which energizes the car-motors) in a connection between said pair of conductors, a normally open pick-up circuit including a source of electrical energy carried by the car, and a car-controlling switch mechanism whereby, when the car is being brought to rest, said pick-up circuit is closed, substantially as and for the purpose set forth.

3. In an electric railway, the combination of two sets of sectional conductors arranged in two distinct lines, both sets being adapted to take current constantly from the feeding-circuit and deliver the same in multiple to the car-motors as the car moves along, the conductors of both sets being normally dead, a switch for controlling the flow of current to a pair of conductors, one in each set, an operating-coil for such switch (normally operated by current which energizes the car-motors) in a connection between said pair of conductors, the controlling-switch, and means carried by the car for energizing said coil when the car-motors are at rest, said

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means being controlled by the car-controlling switch, substantially as set forth.

4. In an electric-railway system, the combination of two sets or series of conductors arranged in two distinct lines, a connection from one conductor in one line to one in the other, one set being adapted to take current from the feeding-circuit through a magnet-coil which is normally operated by said current, a switch operated by said magnet for controlling the flow of current to said conductors, a car carrying two driving-motors operating by current from said conductors, a switch in the circuit of the car-motors for coupling said motors in series or in multiple to vary the resistance in said circuit, and a pick-up circuit closed for operation by the latter switch as the car is being brought to rest, substantially as set forth.

5. In an electric-railway system, substantially as described, the combination with the two lines of working conductors, a connection from one conductor in one line to one in the other, and the normally open electromagnetic switches controlling the flow of current to said conductors, the magnets of said switches being normally energized by the power-current, of a transformer carried by the car in a normally open branch circuit for supplying current to said switch-magnets when the car-motors are at rest, means for bringing said transformer into action as the car is being brought to rest, and means for operating said switches when the supply of current to the motor side of the transformer is cut off.

6. In an electric-railway system, substantially as described, the combination with the two lines of working conductors, a connection from one conductor in one line to one in the other, and the normally open electromagnetic switches controlling the flow of current of said conductors, the magnets of said switches being normally energized by the said current, of a transformer carried by the car in a normally open branch circuit, and means whereby said transformer is cut into the pick-up circuit when the car is being brought to rest and disconnected therefrom when the car resumes its motion.

7. In an electric-railway system, the combination with the main circuits, of branches electrically communicating therewith, working conductors in electrical communication with said branches and located along the road-bed, means electrically connected to the car-motor system and carried beneath the car for engagement with said working conductors, two motors in said circuit on the car, a controlling-switch for coupling said motors in series and then in multiple to vary the resistance and counter electromotive force in said circuit, and a pick-up circuit (including a source of electrical energy carried by the car) closed through the operation of said controlling-switch as said motors are being cut out of circuit and vice versa, substantially as set forth.

8. In a surface-contact electric railway, the combination of multiple positive connections between a given point in the feeder and the car, with a magnet-coil in one of the branches.

9. In an electric railway, the combination with a car, of two collectors carried thereby, two sets of sectional conductors arranged in pairs of sections, each section of which is adapted to be independently engaged by only one of said collectors, and a single electromagnetic pick-up switch for connecting the supply-circuit with each pair of said conductor-sections, each section of which pair is engaged by one of said independent collectors.

10. In an electric railway, the combination with a car, of a pair of exactly-corresponding collectors carried thereby, and two sets of sectional conductors arranged in pairs of sections, each section of each pair being adapted to be engaged by one of said independent collectors simultaneously with the engagement of the other collector of the pair with the other section of the pair of sections.

11. In an electric railway, the combination with the supply-conductors, of sectional working conductors normally disconnected therefrom, pairs of said working conductors being adapted to be connected in parallel with the supply-conductors during the same and equal extent of time.

12. In an electric railway, the combination with two sectional working conductors, of a supply-conductor an electromagnetic switch adapted to connect said sectional conductors in parallel with said supply-conductor, a sectional return-conductor, and a solenoid for the switch in the circuit to the sectional working conductor located between its mate and said sectional return-conductor.

13. In an electric railway, the combination with working conductor-sections, of return-conductor sections, a magnet-coil in circuit with each of said working sections, and a switch operated by said coil for connecting said working and return sections to the main supply-circuit.

14. In an electric railway, the combination with two working conductors which are connected in parallel with the feeder, of a car carrying collectors for said conductors, and also a contact movable with respect to the car to be connected with the car-motors and to be connected through one collector to one working conductor, said car carrying also a stationary contact adapted to be connected through the other collector to the other working conductor and which is adapted to be engaged by the movable

15. An electric controller comprising two simultaneously-movable electrically-connected contacts H and O, the second of which is connected to the source of current-supply, a stationary contact 20 adapted to be engaged by the first of said movable contacts to connect the motors in series, and a second stationary contact 25 adapted to be engaged by said first movable contact at the same time that said first stationary contact is engaged by the second movable contact, to connect the motors in parallel.

16. The combination with a car, of electric motors connected to the respective axles, a movable contact connected to the source of supply and to one of said motors, a second contact movable with the first contact and connected to the other side of the same motor, a stationary contact connected through the other motor to ground and traversed by the second movable contact to connect the motors in series, and a second stationary contact connected to ground and traversed by the second movable contact to connect the first motor to ground while the first movable contact is traversing the first stationary contact to supply the second motor with current, whereby the motors are connected in parallel.

17. The combination with a car, of electric motors connected to the respective axles, a movable contact connected to the source of supply and to one of said motors, a second contact movable simultaneously with the first and connected to the other side of the same motor, a series of resistance-contacts connected through the other motor to ground and traversed by the second movable contact to connect the motors in series, a second series of resistance-contacts connected to ground and traversed by the second movable contact to connect the first motor to ground while the first movable contact is traversing the first series of resistance-contacts to connect the second motor to ground, whereby the motors are connected in parallel.

18. In an electric sectional railway, the combination with a car, of pick-up switches, an auxiliary source of electricity on the car for said switches, a movable switch adapted to complete the pick-up circuit in one position, to feed the motors in series in another position, and to feed the motors in parallel in a third position.

19. In an electric sectional railway, the combination with a car, of pick-up switches, an auxiliary source of electricity for said switches on the car, a motor-controller, and means operated by said controller for opening and closing the pick-up circuit.

20. In an electric sectional railway, the combination with a car, of pick-up switches, an auxiliary source of electricity for said switches on the car, and a motor-switch adapted to keep said circuit closed while no current is flowing through the motors.

21. The combination with a motor-car, of sectional working conductors along the way, collectors carried by the car and adapted to engage with said conductors, electromagnetic switches between the working conductors and the supply, each adapted to be normally operated by the current shunted through the collectors from a preceding sectional conductor, an auxiliary source of energy for said electromagnets, and means for automatically inserting said source in circuit with said electromagnetic switches when the current is cut off from said motors, and for opening said circuit when current is flowing through the motors.



□ L'auteur

Jean Paul MBELEK : Chercheur et enseignant en physique, il a publié un ouvrage intitulé : *Interaction entre photons et gravitons - Incomplétude des équations de l'électrodynamique et de la gravitation*. Il est l'auteur principal de quatre articles d'astrophysique parus dans les numéros 1, 2, 3 et 4/5 de ANKH. Du même auteur est récemment paru : "*Motion of a test body in the presence of an external scalar field which respects the weak equivalence principle*", in ACTA COSMOLOGICA, Fasciculus XXIV-1, Conceptions of Space in Physics, Proceedings of the International Conference, Les Houches (France), 29 September – 3 October 1997, ed. by Z. A. Golda, M. Heller and M. Lachièze-Rey, Univeytet Jagiellonski, Kraków, 1998. J.P. MBELEK est également l'inventeur de dispositifs brevetés.

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