

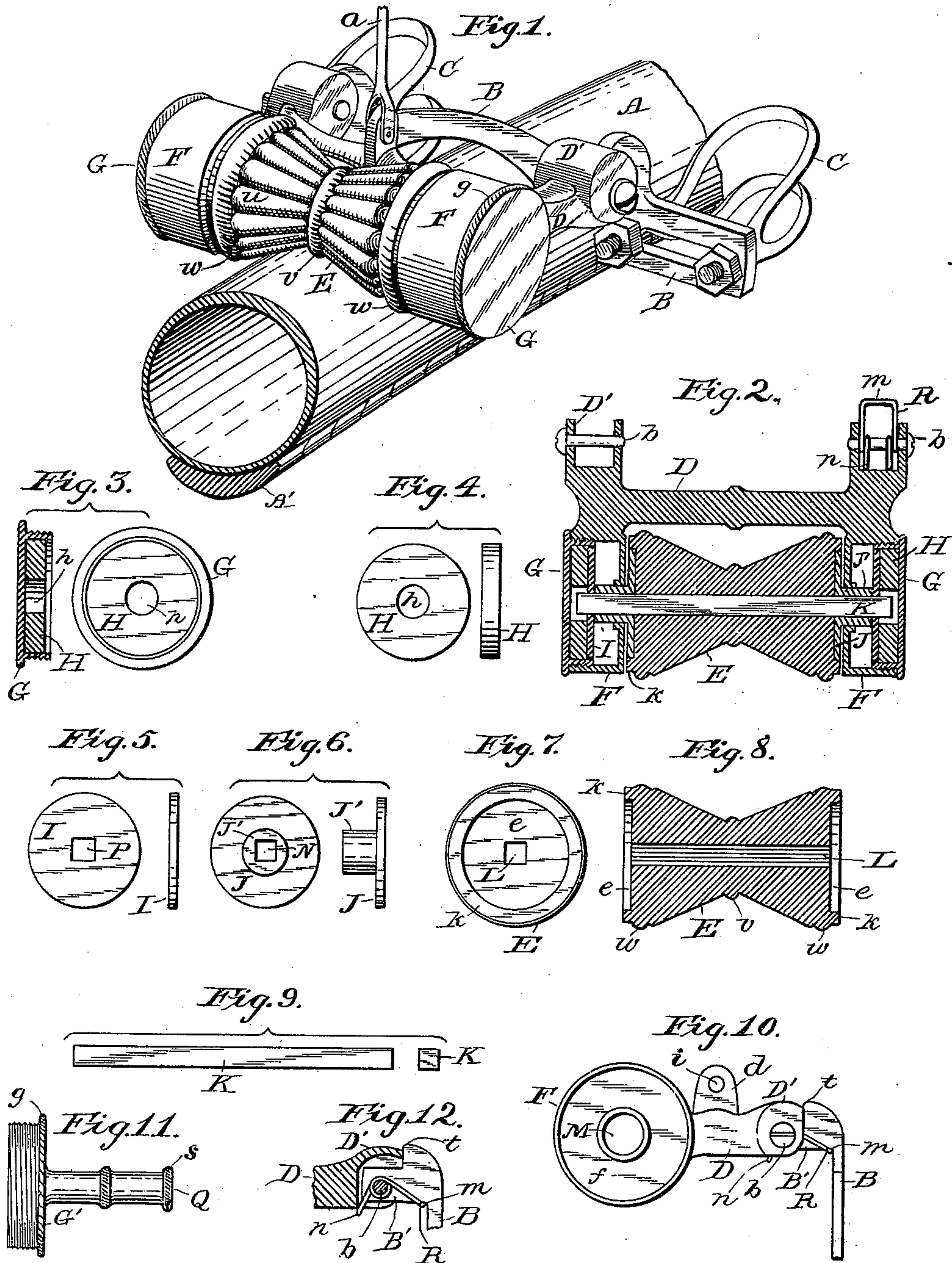
No. 621,635.

Patented Mar. 21, 1899.

E. DAVIS.
BICYCLE BRAKE.

(Application filed Feb. 21, 1898.)

(No Model.)



Witnesses:

Wm H Payne
O. E. Doll.

Inventor:

Emerson Davis
By E. J. Silvius,

Attorney.

UNITED STATES PATENT OFFICE.

EMERSON DAVIS, OF INDIANAPOLIS, INDIANA.

BICYCLE-BRAKE.

SPECIFICATION forming part of Letters Patent No. 621,635, dated March 21, 1899.

Application filed February 21, 1898. Serial No. 671,213. (No model.)

To all whom it may concern:

Be it known that I, EMERSON DAVIS, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Bicycle-Brakes; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it ap-
10 pertain to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to that class of brakes
15 in which an elastic roller is forced into contact with the tire of the wheel and commonly known as "roller friction-brakes," in which the frictional resistance occurs between the roller and its frame or housing; and it consists in an elastic roller of new and novel design, of a novel frame and housing therefor, of novel frictional surfaces, in the peculiar and novel manner in which the frictional resistance is provided, and in the parts and
20 combination of parts embodied therein, as will be fully described hereinafter and claimed.

The object of this invention is to provide a brake of this class for vehicles having rubber tires of such improved construction as to prevent damage to the tire as well as to the roller and frictional surfaces in practical use, which shall be capable of continued use without requiring renewals and readjustments and which shall be effective and reliable at all
30 times, and I accomplish these in my invention, which is, furthermore, simple and cheaply made and is durable and economical in use.

Referring to the drawings, Figure 1 represents a perspective view of my brake, showing its relation to a tire; Fig. 2, a central horizontal sectional view taken through the frame and roller; Figs. 3, 4, 5, 6, 7, 8, and 9, detail views of parts of the brake; Fig. 10, an end view of the frame; Fig. 11, an elevation of
40 foot attachment, and Fig. 12 details of the knuckle and release-spring.

In the drawings, A designates a tire; A', a wheel-rim; B, the brake-bracket; C, the bracket-clip; D, the brake-frame; E, the
50 brake-roller; F F, the roller-housings; G G, the housing-caps; H, the friction-packing; I,

the friction-plate; J, the journal; K, the axle; M, the journal-bearing; Q, the foot-pressure bar, and R the release-spring.

The frame-bracket B comprises two side
55 plates adapted to bear against either the front or rear of either the fork or rear braces of a bicycle-frame, to which it is secured by means of suitable clips C, and an integral arched cross-bar connecting the side plates. It is
60 provided with two blades B', projecting forwardly, to which the brake-frame is connected. The side plates may have a curved surface to bear against the frame of the wheel or the forks, if desired. The clips are each
65 preferably made of two bands and joined and provided with threaded bolt ends having a nut, as shown, so that the brake may be very rigidly secured.

The brake-frame D comprises a pair of side
70 bars and an integral cross-bar, the latter having an ear *d*, provided with a pin-hole *i*, to which may be connected a suitable pressure-bar *a*, adapting the brake for operation by means of a suitable hand-lever. The forward
75 ends of the side bars have each a housing F, in which the roller is journaled. Each housing is cylindrical and open at the outer end and has a bottom *f*, in which is a hole forming a journal-bearing M, in which the barrel
80 J' of the journal J rotates. Each housing has a cap G, having a milled rib *g*, and is screwed into the open end, suitable screw-threads being provided, one end having right-hand and the opposite end having left-hand threads so
85 arranged that the rotation of the roller in operation will tend to tighten the caps, and thus prevent their working off by reason of the friction exerted against them. Each cap has a packing H in the form of a disk having a
90 central hole *h* and cemented or otherwise secured in the cap. The packing is composed, preferably, of leather, such as is used for belt-
ing, or fiber, rawhide, or other material may be employed. The rear of the frame D is
95 provided with hooded jaws D', in which are fitted screw-pins *b*, passing through registering holes in the blades B', thus forming hinge joints or knuckles. In order to prevent the roller from touching the tire when not in use,
100 I provide a spring R, formed of a loop *m* and two side bars, the latter being coiled around

the pin *b* and terminating in ends *n*, projecting downward opposite the loop *m*, so that the latter, passing under the blade *B'*, bears upward, and the ends *n* press upward against the under side of the jaw *D'*, causing a contact between the rear of the top of the hood and the stop *t*.

The roller *E* is composed of rubber or other elastic composition and is made in one piece, each end of which is conical in form, the roller being smallest in diameter at its center, so that when resting transversely upon a tire it conforms approximately to the curvature of the tire in cross-section. In order to insure rotation of the roller, its outer surface is provided with ribs *u* or is fluted. These ribs being somewhat hard press into the surface of the tire and prevent slipping. Annular ribs *v* and *w* are preferably formed at the center and ends of the ribs *u*. A central hole *L* passes through the roller, into which the axle *K* is forced, both being square or rectangular in cross-section. Each end *e* of the roller is preferably provided with a flange *k*. The friction-plate *I* is of disk shape and has a central hole *P* adapted to fit neatly but freely over the axle *K*, so that they rotate in unison. The plates are composed, preferably, of hardened steel and polished, but case-hardened iron may be substituted.

The sleeve-journal *J* comprises a disk and an integral barrel *J'* at one side and has a central hole *N* conforming to the axle *K*, over which it slides, but with which it rotates. It is preferably made of composition bronze or antifrictional metal, requiring but little lubrication where the barrel bears in the bearing *M*. The disk and barrel may also be separate parts.

The axle *K* may be suitably made of iron and square in cross-section; but other suitable shapes might be employed. It is so adapted to the roller that it must rotate in unison with it.

When it is desired to have a foot-brake, *I* provide caps *G'*, having a foot-bar *Q*, provided with annular milled ribs *s*.

In assembling the roller and frictional elements, the caps being removed from the housings, the journals are first inserted in the bearings. The roller is then sprung in until the flanges *k* encircle the disks of the journals. The axle is then forced in from either end and the friction-plates are slipped over the ends of the axle, after which the caps are screwed up tight, the various dimensions being so calculated that when this is done there shall be a slight retarding frictional resistance to the roller. The end of each barrel *J'* presses against the friction-plate *I* and that rubs against the packing *H*.

In practical use when the roller is forced against the tire the roller elongates in proportion to the pressure, it being somewhat sensitive, and the ends thus press with increased force against the disks of the journals,

and thus produce the necessary friction between the plates *I* and packings *H*. It is obvious that the elongation of the roller is effected by reason of the tire pressing against the enlarged ends of the roller with more force than at its smaller center, the latter being weak enough to permit it to stretch. Sufficient space is provided between the bottom of the housing and the disk of the journal *J* so that they do not come into contact, yet they are close enough to keep out mud or grit, and as the frictional surfaces are completely inclosed they are not liable to wear away, as it is well known that smooth frictional surfaces of this description when protected from abrading substances may last indefinitely.

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

1. A vehicle-brake comprising a frame adapted to be secured to the vehicle-frame and having a pair of counterpart separated housings having each at the outer end thereof a rigidly-secured frictional packing and at the inner end thereof a circular opening providing a bearing for a rotating axle-journal, an axle mounted in said housings and having at each end thereof a sliding sleeve providing a journal-bearing therefor and mounted in said circular openings, an elastic elongating roller adapted to contact with a wheel-tire and having enlarged ends and mounted between said sliding sleeves and upon said axle, a frictional plate at each outer end of said axle-journals within the housing aforesaid and bearing against one of said frictional packings, means whereby said roller and said frictional plates are caused to rotate in unison and means whereby the elongation of said roller shall operate to force said frictional plates against said frictional packings, said roller being adapted to become elongated when forced against a tire, in combination with means whereby said brake may be operated, substantially as set forth.

2. In a vehicle-brake, the combination of an elastic roller having an external contour adapted to a wheel-tire so that when forced into contact therewith the roller shall be elongated, a supporting-frame having housings provided with journal-bearings, an axle extending through said roller and adapted to be rotated thereby, a journal at each end of said axle and so mounted in said journal-bearings that they may move endwise, a disk at each end of said roller in contact therewith and adapted to press said journal outward, a metallic frictional disk bearing against the outer end of each of said journals, a frictional packing supported rigidly in contact with the outer surface of each of said frictional disks, and means by which said frame may be supported and carried by a vehicle-frame so that said roller shall be in operative position at the periphery of a wheel-tire thereof, substantially as shown and described.

3. The combination with a vehicle-frame and a wheel-tire thereof, of a bracket rigidly secured to said frame, a brake-frame connected to said bracket by means of knuckle-joints having springs by which said brake-frame is normally forced upward, a pair of cylindrical housings integral with said brake-frame, each of said housings having an open outer end having screw-threads and a closed inner end in which is an open journal-bearing, a hollow journal in each of said journal-bearings and having at the inner end thereof a disk situated outside the closed end of said housings, an elastic roller mounted closely between said disks, an axle extending centrally through said roller and said hollow journals, a metallic frictional plate carried by said axle at each end thereof and bearing against the outer end of said hollow journals, a cap secured by screw-threads at the outer end of each of said housings, a frictional packing rigidly secured at the inner side of each of said caps and in constant contact with said frictional plates, with means whereby said roller may be forced into contact with said tire, substantially as shown and described.

4. In a bicycle-brake, the combination with the bicycle-frame and a wheel-tire of the bicycle, of a brake-frame provided with a pair of cylindrical housings adapted to support a roller, each of said housings having a bottom in which is an opening forming a journal-bearing and having an open outer end, a removable cap closing said outer end of each of said housings, a frictional disk-packing rigidly secured against the inner side of each of said caps, a hollow journal in each of said journal-bearings and having a disk or flange outside of the bottoms of said housings, an axle extending through said journals and adapted to rotate in unison therewith, a metallic frictional plate at each end of said axle and carried thereby and interposed between a hollow journal and a frictional packing hereinbefore described, a roller of elastic material such as rubber composition mounted under compression between the disks of said journals and upon said axle centrally and adapted to rotate said axle, said roller being so designed in the contour of its outer circumferential surface that when forced against a tire said roller shall increase in length and cause graduations and increase of friction between said frictional plates and said abutting frictional packings, the jaws at the rear of said brake-frame, the bracket hinged to said jaws and adapted to be secured to the frame of said bicycle-frame, substantially as shown and described.

5. In a bicycle-brake, the combination of the supporting-bracket adapted to be secured to the frame of the bicycle, the brake-frame hinged to said bracket, the housings formed integrally with said brake-frame, said housings being cylindrical and each having a bottom at the inner end of the cylindrical form

and in which is an open journal-bearing, a detachable cap secured to each of said housings at the outer end of said cylindrical form, a frictional packing secured within each of said caps, a hollow journal having at one end a disk or flange and revoluble in each of said journal-bearings, the barrel of which journal enters said housing and the disk or flange of which journal is outside of said housing, an axle adapted to said hollow journals and insertible endwise extending from one housing to the opposite housing, the elastic roller adapted to rotate said axle and mounted thereon and between the opposing disks of said journals, said roller having an external form smallest in diameter at the longitudinal center and increasing in diameter at the ends, adapting it to be elongated when forced against a wheel-tire whereby the end pressure is increased, and a frictional disk carried by each end of said axle and interposed between the barrel of said journal and said frictional packing, substantially as shown and described.

6. In a bicycle-brake, the combination with the elastic roller and the brake-frame, of the cylindrical housings integral with said frame, the removable cap secured to each of said housings, the frictional packing secured rigidly in each of said caps, the journal-bearings at the inner side of said housings, the journals in said bearings, the disks of said journals being pressed by the ends of said roller, the axle passing through said journals and said roller and adapted to be rotated by said roller, the frictional metallic plate carried by each end of said axle and interposed between said journal and said frictional packing whereby retarding of rotation of said roller is produced, substantially as shown and described.

7. In a bicycle-brake, the combination of the brake-frame having the pair of connected side arms each provided with a journal-housing and adapted to be attached to the bicycle-frame, the flanged journal mounted in each of said housings and adapted to also move endwise, the frictional packing rigid in each of said housings, the frictional rotating plate in each of said housings and controlled by said journal to engage said packing, an axle mounted in said journals, an elastic roller mounted upon said axle and between the flanges of said journals whereby said axle and said journals are caused to rotate in unison and comprising a cylinder having enlarged ends so that when placed transversely upon the periphery of the wheel-tire and forced thereon said roller shall become elongated by reason of the force exerted against said enlarged ends to increase and graduate the frictional resistance between said frictional plates and said frictional packings, substantially as set forth.

8. In a bicycle-brake, the combination of the brake-frame having the cylindrical jour-

nal-housings, the journals in said bearings,
the axle in said journals, the elongating elas-
tic roller on said axle, the frictional plates
and packings in said housings, the remov-
5 able cap secured to each of said housings at
the outer side or end thereof and provided
each with the foot-rest comprising a project-
ing bar formed integrally with said cap at

the center thereof, substantially as shown
and described.

In testimony whereof I affix my signature
in presence of two witnesses.

EMERSON DAVIS.

Witnesses:

WM. C. THOMPSON,
E. T. SILVIUS.