(No Model.) 3 Sheets—Sheet 1.

F. S. STODDARD.

SULKY.

No. 525,033. Patented Aug. 28, 1894.

Fig. 1.

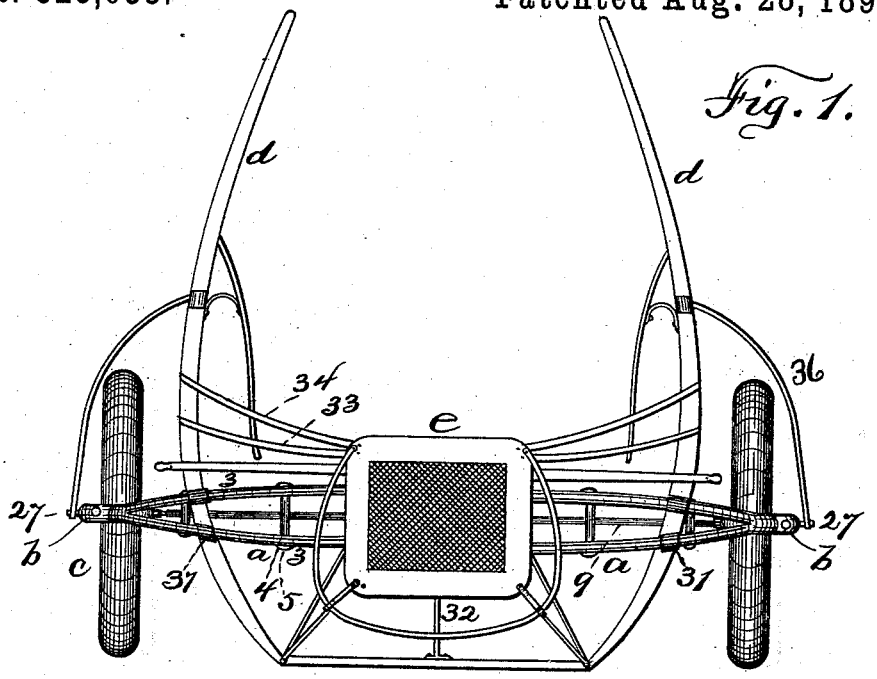


Fig. 4.

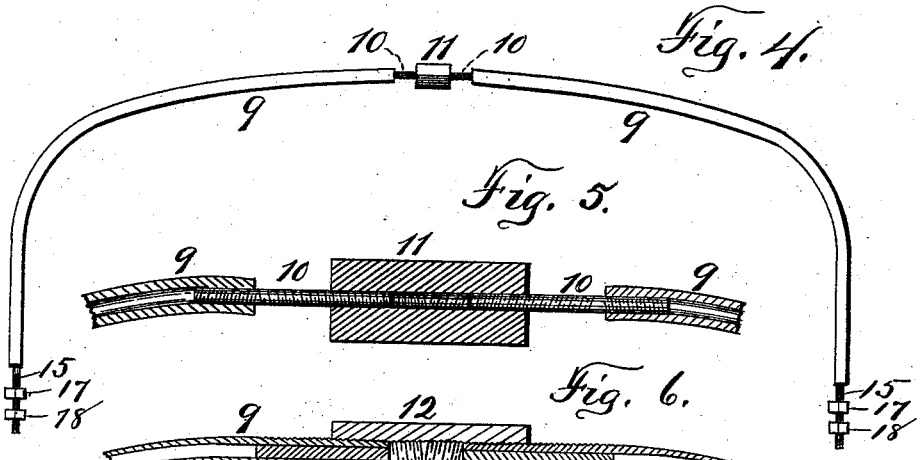
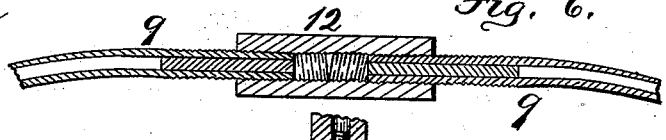


Fig. 5.

Fig. 6.



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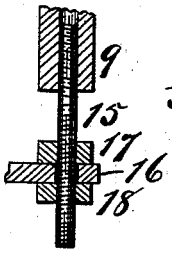

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(No Model.) 3 Sheets—Sheet 2.

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SULKY.

No. 525,033. Patented Aug. 28, 1894.

Fig. 2.

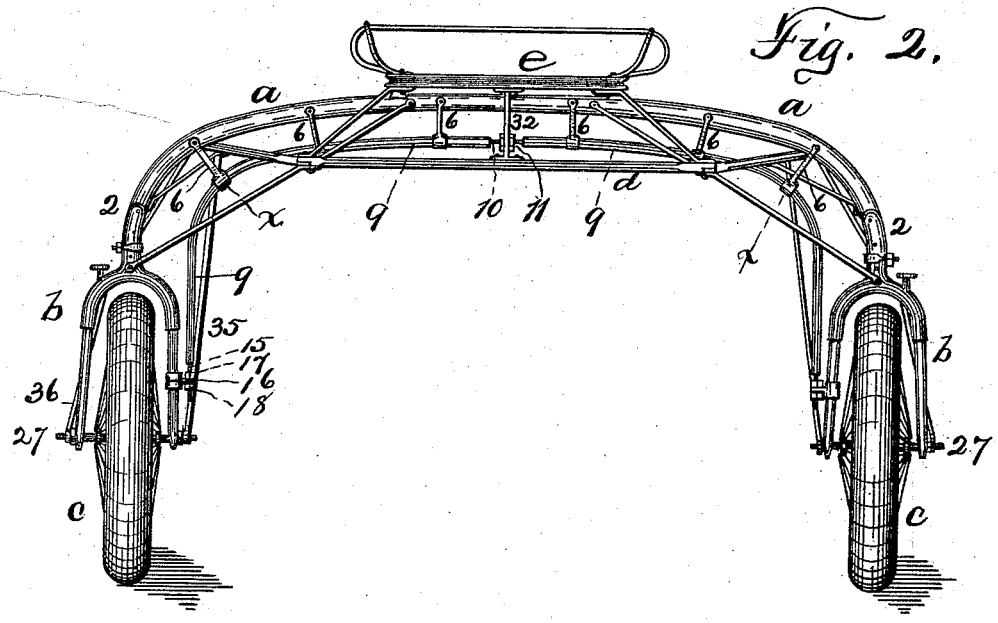
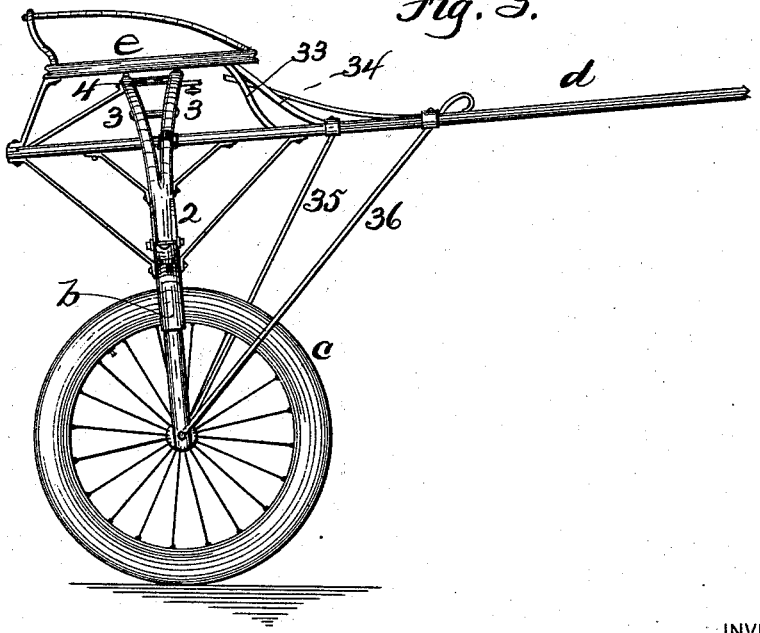


Fig. 3.



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(No Model.) 3 Sheets—Sheet 3.

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Fig. 9.

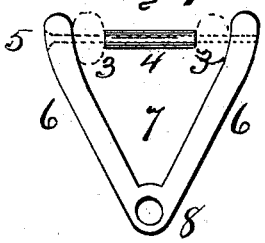
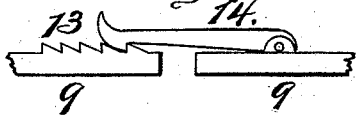


Fig. 10.

Fig. 7.



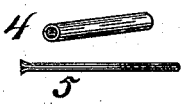


Fig. 11

Fig. 12.

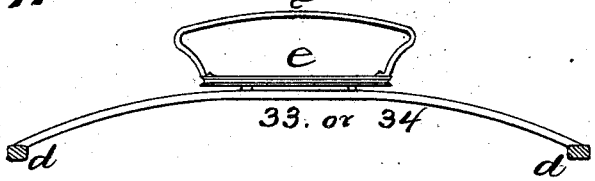


Fig. 13.

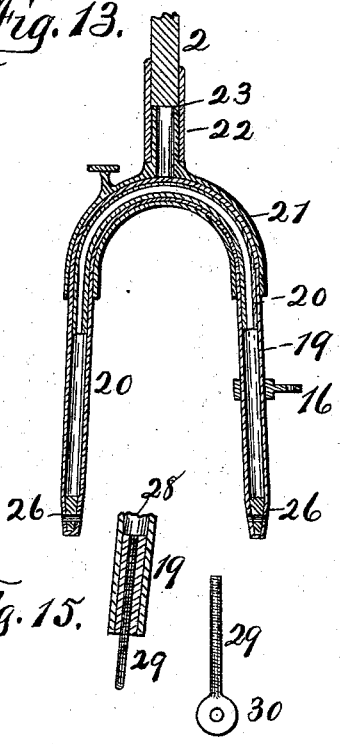
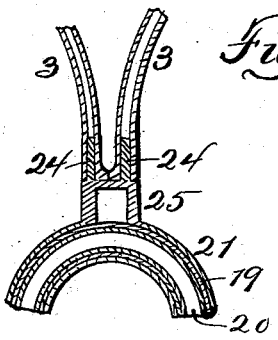


Fig. 15.

Fig. 14.



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UNITED STATES PATENT OFFICE.

FREDERICK S. STODDARD, OF SYRACUSE, NEW YORK, ASSIGNOR OF ONE-HALF TO JOHN NOTTINGHAM, OF SAME PLACE.

SULKY.

SPECIFICATION forming part of Letters Patent No. 525,033, dated August 28, 1894.

Application filed March 26, 1894. Serial No. 505,053. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK S. STODDARD, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Sulkies, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to bicycle sulkies; and my object is primarily to remedy the difficulties heretofore existing in sulkies of this class, owing to the fact that they have not been adapted to persons of different weights, nor provided with means for adjusting them to different weights of drivers, so that heretofore when a sulky has been made for a light rider, and a heavier person occupies it, the extra spring downward of the arch connecting the separate wheel axles, will throw said axles out of a horizontal, and the wheels out of a vertical, thereby causing said axles to bind and cut, even with ball bearings, because said axles are not at a right angle to the line of draft, and also causing the sulky to draw much harder and run heavier, all producing and causing damage to the sulky, and reducing the speed of the horse.

The object of my invention is to produce a sulky of this class, which is provided with simple, efficient means for remedying the aforesaid difficulties, objections and faults of construction and operation; in which the arch which is connected to and carried by the wheel-forks, is provided with a truss-rod adjustably connected to the inner branches of said forks, and having intermediate connections to said arch, in which said truss-rod is also, when desired, made in sections, said sections being provided with means whereby they can be adjusted with reference to each other; or in which both the center and the ends of said truss-rod are provided with means of adjustment, whereby, whether one or both are used, said truss-rod can be adjusted to spring said arch against the strain of the load to be carried, so that when loaded the axles will always stand horizontal and the wheels vertical; in which the arch is split longitudinally and spread or widened out, not only to produce a double arch with a single truss-rod, but to also permit the seat to be mounted upon and secured directly to the arch; also in which the forward connection between the thills is arched upwardly and forms the front support for the seat, and at the same time permits the closer hitching of the horse to the sulky; also in which the stiffness of the fork, or of the arch below the split and spread thereof permits me, when desirable, to dispense entirely with the draft-rods, or draw-bars commonly used to connect the thills to the wheel axles, and thereby entirely overcome the horse-motion.

My invention consists in the several novel features of construction and operation hereinafter described and which are specifically set forth in the claims hereunto annexed. It is constructed as follows, reference being had to the accompanying drawings, in which—

Figure 1, is a top plan of my sulky. Fig. 2, is a rear elevation thereof. Fig. 3, is a side elevation thereof. Fig. 4, is an elevation of the sectional truss-rod, detached. Fig. 5, is an enlarged sectional elevation of a nut, and rod connection between said sections for adjustment. Fig. 6, is a like view of an internally threaded sleeve connection between them. Fig. 7, is an elevation of a ratchet connection between said sections. Fig. 8, is a sectional detail of a connection between the end of said truss-rod and the wheel-fork for adjustment. Fig. 9, is a side elevation of a connection between the truss rod and the arch, and an arch-section spreader. Fig. 10, is a front (or rear) elevation thereof. Fig. 11, is a detail of the spreader and securing bolt. Fig. 12, is a front elevation of the seat, and the front truss cross bar connected to the thills, which are shown in section. Fig. 13, is an enlarged vertical section of the wheel-fork and the single, solid, end of the arch connected thereto. Fig. 14, a vertical sectional detail of a connection of the arch to the fork, when the division of the arch extends for its entire length and the ends of both arch sections are connected to the fork. Fig. 15, is a sectional detail of an adjustable axle-mounting upon a fork arm, and a detail of an adjustable axle-bearing, by which the height of the sulky can be varied for horses of different sizes.

The sulky consists broadly of the arch

—*a*—, forks —*b*—, wheels —*c*—, thills —*d*—, seat —*e*—, and the other parts hereinafter especially mentioned. The arch —*a*— is shown as constructed with solid ends —2— between which it is split to produce the arch-bars —3— which are spread apart, by means of a spreader —4—, shown as tubular and through which the bolt —5— is inserted to secure it in position, said bolt also serving to connect the arms —6— of the link —7— to said arch. Each link is provided with an eye —8— to receive the truss-rod —9— shown as consisting of sections, and having its adjacent ends connected adjustably, as in Figs. 4 and 5, by the right and left hand threaded rods —10— screwed into the truss sections, and an interiorly right and left hand threaded nut —11— upon said rods; or as in Fig. 6, by threading the ends of said sections, right and left, and mounting a sleeve —12— thereon, threaded interiorly in like manner; or as in Fig. 7, by a ratchet —13— on one section, and a hooked locking bar —14— pivoted upon the other one; these several means for adjusting said sections with reference to each other being given as some of the numerous other devices adapted to be used for such adjustment by varying the space between these ends of said sections; such devices being shown at the center of the truss in order to better equalize the changes incident to the operation of the adjusting device, and to exert equal force upon each end of the arch, or upon each fork.

The extremities of the truss rod are shown as threaded interiorly to receive an adjusting rod —15— which passes freely through a bracket —16— secured upon the inner arm of the fork, and —17—, —18—, are jam nuts threaded to fit on to said rod, one above and the other below said bracket. By this construction a single truss-rod, through the branching link connections, stays both arch-bars where spread apart, as also the solid portions of the arch, and all together create a truss-support for the load upon the seat —*e*— which is mounted directly upon and secured to the bars —3—.

The forks —*b*— are shown in Fig. 13, as consisting of the tubular arms —19— connected by an arch, a curved tube —20— within said arch, and extending down into said arms, to reinforce a curved tube —21— inclosing said arch and further stiffening and reinforcing, and a socket —22— integral with, or secured to said tube —21— and shouldered interiorly to support the end of the arch when inserted and secured therein; and in Fig. 14, the arch bars are shown as extending separately to the fork, and mounted upon the stems —24— integral with or secured to the block —25— secured to or integral with the tube —22—; and as the body and arms of the fork are tubular, great strength is obtained for comparatively light weight. In the lower ends of said arms a plug —26— is (in Fig. 13) secured and the axle —27— is mounted therein, and the wheels —*c*— are journaled thereon by ball-bearings or any other style of bearing.

In Fig. 15, a nut —28— is secured in the arm, and —29— is a threaded bar inserted into it, and provided with an eye —30—, in which eyes the axle is mounted, and by removing the wheel, said bars can be adjusted vertically to vary the height of the fork from the ground, and consequently vary the height of the sulky for horses of different size.

The thills are of any ordinary construction and are secured to the arch by clips —31—, of any desired construction.

The seat —*e*— is of the usual construction and is mounted upon the arch, its rear being stayed by a brace or braces —32— between it and the rear extension of the thills. The front cross-bars —33—, —34— between the thills, are curved rearwardly and arched upwardly so that they support the front of the seat. This construction also permits the horse to be hitched closer, and thereby reduces the draft of the sulky.

Draw-bars —35— and —36— may be used, if desired, connecting the axles to the thills; but if these are omitted, all, or substantially all, of the horse motion is avoided, particularly when driving at a comparatively slow speed.

The adjustment of the truss screw between the sections of the truss-rod, by screwing it up and thereby drawing the ends of the sections toward each other, operates to throw the wheels out, by the drawing of the sections through the links marked —*x*—, and the consequent leverage of the lower ends of said sections upon the forks, thereby causing the wheels to become inclined inwardly toward each other, from a vertical, and then when the load is applied to the seat, the downward spring of the arch will restore said wheels to a vertical. This is the adjustment for a heavy person. When the ends of the sections are forced apart, the wheels are thrown in, so that they incline outwardly from each other, and then the application of the load brings them up to a vertical. This mechanism can be used alone, or in conjunction with the take-up mechanism, or the take-up mechanism can be used alone; said take-up operating as follows: The nut —17— is first loosened, then by screwing up the nut —18— the wheel is drawn in, by the reduction in the length of the truss-rod, and then screwing the nut —17— down again to the bracket the wheel is secured in that position. Each wheel is separately adjusted. By loosening or unscrewing the nut —18— and screwing the nut —17— down the wheels are thrown out; through and by reason of the increase of the length of the truss-rod above said bracket, and the fact that the links maintain it at the same distance from the arch at all times and under all circumstances. It will be seen that in either case the adjust-

ment is effected by varying the length of the truss-rod and consequently varying the rigidity of the truss, as also that of the arch, all according to the variation of the weight of the load to be carried; and that when the arch is solid for its entire length, as it can be, then the adjustment of the truss-rod to vary its length, will perform the same function and accomplish the same results.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a bicycle-sulky, an arching truss, wheel forks secured thereto, and means to vary the length of the truss-rod, in combination.

2. In a bicycle sulky, an arching truss, wheel forks secured thereto, connections between the truss-rod and truss-arch intermediate to its length, and means to vary the length of the truss-rod in combination.

3. In a bicycle-sulky, an arching truss, comprising a body split between its solid ends, creating a double arch, wheel-forks secured to its ends, connections between the truss-rod and the arches intermediate to its length, and means to vary the length of the truss-rod, in combination.

4. In a bicycle-sulky, an arching truss comprising a double arch and a truss-rod connected to the wheel forks, and intermediately to said arches, wheel forks secured to the ends of said arches, and means to vary the length of the truss-rod.

5. In a bicycle-sulky, an arching truss split between its solid ends, creating a double arch, wheel forks secured to said ends, connections between the truss-rod and arches, means to vary the length of the truss-rod, a seat mounted upon said truss-arch, and thills connected to said arch.

6. In a bicycle-sulky, a truss-arch, wheel-forks secured thereto, and a truss-rod connected to said arch and to said wheel forks and means to vary its length, in combination.

In witness whereof I have hereunto set my hand this 22d day of March, 1894.

FREDERICK S. STODDARD.

In presence of—

HOWARD P. DENISON,

M. M. BORST.