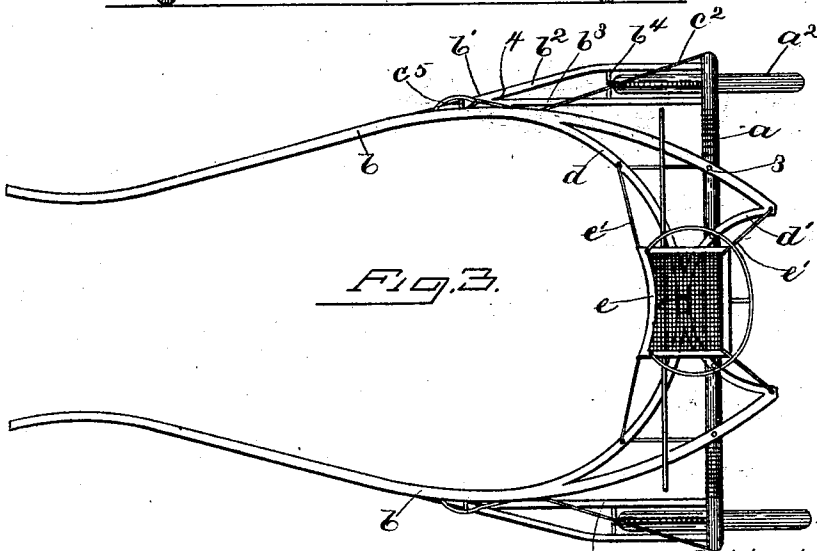
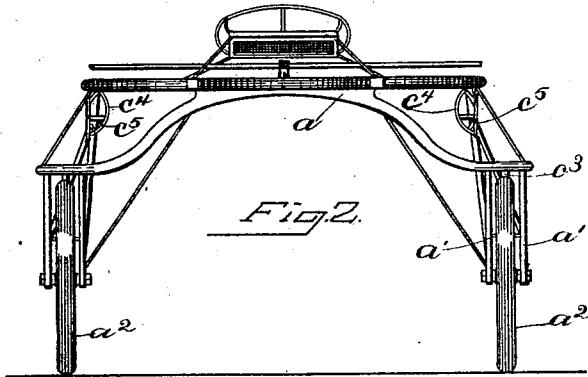
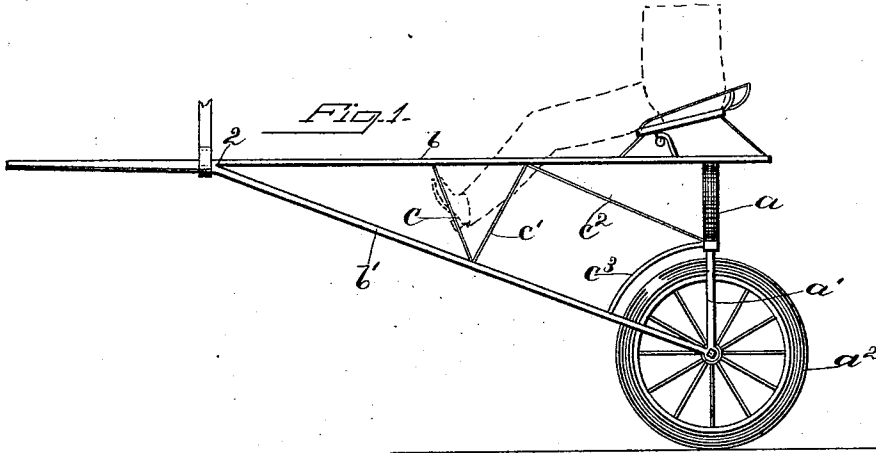


(No Model.)

S. ELLIOTT.  
SULKY.

No. 521,460.

Patented June 19, 1894.



WITNESSES.  
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att'y.

# UNITED STATES PATENT OFFICE.

STERLING ELLIOTT, OF NEWTON, ASSIGNOR TO THE HICKORY WHEEL COMPANY, OF SOUTH FRAMINGHAM, MASSACHUSETTS.

## SULKY.

SPECIFICATION forming part of Letters Patent No. 521,460, dated June 19, 1894.

Application filed December 16, 1892. Serial No. 455,329. (No model.)

### *To all whom it may concern:*

Be it known that I, STERLING ELLIOTT, of Newton, county of Middlesex, State of Massachusetts, have invented an Improvement in Sulkies, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

In sulkies as now commonly made the shafts have been composed each of a single long slender bar, and as the front ends thereof are repeatedly and quickly raised by the horse in trotting, the said shafts spring or vibrate, thereby unduly vibrating the load, and having a tendency to disturb the even gait of the horse, and also to disturb the driver. It has also been the aim to place the seat directly above the axle so that the weight of the rider will be balanced as nearly as possible, and as the sulky is vibrated the rider is moved from one to the other side of a point in a vertical plane with the axle. The seat, so arranged, therefore enhances the tendency of the shafts to spring and increases the vibration of the sulky, because when the preponderance of the weight of the rider is thrown to the rear of the axle, gravity cannot restore it to its normal position. The stirrups or foot rests have been arranged on the inside of the horizontal shafts, while the seat has been supported in a plane but little above the shafts so that the legs of the driver have been brought into nearly horizontal position, and when driving he usually bends forward, thereby assuming a most unnatural position, which it has been found in practice is conducive to many permanent physical injuries.

This invention has for its object to so improve the construction of sulkies that these serious objections may be overcome, and at the same time reduce its weight.

In carrying out this invention the shafts have been made as divided shafts, that is divided from a point at or near where the back strap is attached, and extending rearwardly as two essential parts, and suitable struts or supports are interposed between said divided portions, to give additional stiffness, and form a truss like frame. The upper part or bar of the divided portion of the shaft occupies substantially a horizontal plane, and is connected

at the rear to the top of the wheel supporting cross-bar or frame, while the lower part or bar is connected to said frame at a point near the ground. To give as wide a divergence as possible to said divided portions of the shafts, and furnish a suitable support to which the rear ends of the lower parts may be connected as well as for many other reasons, the wheels are made quite small in diameter, and turn on short axles supported at the lower ends on arms or forks which depend from the axle or frame.

The seat is located at such a point as to bring the preponderance of the weight of the rider continuously in front of the axle, so that as the sulky vibrates on the axles as pivots, his weight is moved from a point in advance of a vertical plane with said axles to a point substantially in said vertical plane, thereby depending upon gravity to restore the weight.

The stirrups or foot rests are arranged below the horizontal portions of the shafts, so that the legs of the rider may assume a more natural position.

Many details of construction in the form of braces are provided which will be hereinafter described.

Figure 1, shows in side elevation a sulky embodying this invention; Fig. 2, a rear side view of the sulky shown in Fig. 1, and Fig. 3, a plan view of the sulky shown in Fig. 1.

The cross-bar or frame *a*, which is or may be curved in any usual way, is provided at each end with depending arms *a'*, or in lieu of such arms, suitable forks may be employed, and the short axles or journals of the small wheels *a<sup>2</sup>* are supported at the lower extremities of said arms.

As distinguished from that class of sulkies in which is employed a duplicate or double set of shafts, one arranged within the other, approximately in the same horizontal plane or position, as well as that class of sulkies which the usual form of shafts is employed, together with braces extending from beneath the shafts at a suitable point forwardly of the wheels, and thence backwardly to the wheel supports, the shafts of the present invention differ in the respect of their being divided at points at or near to the forward

ends thereof, say for instance, at the point 2, about where the back strap is attached. The shafts are made alike and are constructed or formed preferably from a single piece of wood or other suitable material, possessing practically the same uniform thickness throughout, but the divisions of the shafts are made so that after the shafts are divided into the upper and lower portions *b*, and *b'*, a forwardly projecting end will remain undivided, substantially as appears in the drawings.

The two divided portions of the shafts occupy substantially the same vertical planes, the lower divided portion *b'* being practically directly beneath the upper divided portion *b*, the said upper portions *b*, extending rearwardly and being curved as desired, and attached to the cross-bar or frame *a* at 3, and the lower portions *b'* also extending rearwardly and having their rearward extremities attached to the lower ends of the depending wheel supporting arms *a'*. The lower divided portion *b'* of each arm is split at a suitable distance from its rearward end to form two side arms *b<sup>2</sup>*, *b<sup>3</sup>*, which constitute practically a fork receiving the wheel, thereby securing a simple and effective form of attachment as well as a guard for each of the wheels. Instead of dividing the rearward extremities of the lower portions *b'*, the said portions *b'* may be made continuous, and attached at their lower extremities to the lower end of either the inside or outside depending arms, but I prefer to provide such arms *b<sup>2</sup>*, as I thereby obtain an extra stiffness to the frame, as well as a strong and permanent guard for the wheels. In the event of dispensing with the said arms *b<sup>2</sup>*, and forming the lower divided portion *b'* of a continuous piece, a divided shaft within the spirit and scope of this invention is provided.

The shafts are preferably constructed from a single piece, but it is apparent that the same could also be made of separate pieces bolted or otherwise secured together.

Struts or supports *c*, *c'* are interposed between the upper and lower portions of the divided shafts, connecting them together, and braces *c<sup>2</sup>* are provided, one end of which is connected to the upper divided portion of the shafts, and their opposite ends being connected to the extremities of the cross-bar or frame, thereby giving to the shafts additional stiffness and rigidity, like a truss.

The arms *b<sup>2</sup>*, *b<sup>3</sup>*, which constitute the forked guard, as hereinbefore explained, are preferably connected together by short cross-pieces or bars *b<sup>4</sup>*, which are brought in front of the wheels, and suitable curved bars *c<sup>3</sup>* are connected at their upper ends to the ends of the cross-bar or frame, while the lower ends thereof are connected to said short connecting bars *b<sup>4</sup>*.

From the construction thus far explained, it will be seen that the rearward extremities

of the upper portions of the shafts extend backwardly and are suitably secured to the cross-bar or frame, while the rearward extremities of the lower divided portions extend back and are attached or secured to the lower ends of one or the other of the depending wheel-supporting arms, thereby obtaining a construction differing essentially from this class of sulkies as heretofore constructed.

Instead of attaching the rearward extremities of the lower divided portions of the shafts to the lower ends of the depending arms, I may in some instances, construct such rearwardly extending extremities so as to receive the short axes or spindles upon which the wheels are directly supported, but preferably I resort to the arrangement herein shown.

The stirrups or foot rests are formed on the struts *c*, being herein represented as formed by curving said struts outwardly, and providing additional struts *c<sup>4</sup>*, curved in the opposite direction, and connected at the ends to the upper and lower divided portions, and interposing cross-bar *c<sup>5</sup>* between and connecting said struts *c*, *c<sup>4</sup>*. This construction enables the stirrups or foot rests to be arranged below the horizontal portions of the shafts so that the legs of the rider may assume a more natural position.

A curved connecting rod or bar *d* is interposed between and connects the horizontal portions *b* of the shafts as usual, while the rear ends of said portions *b* are connected by the connecting bar *d'*, curved in the opposite direction, crossing and resting upon the axle or frame and connected thereto by bolts or otherwise, and also connected to the connecting bar *d*. By making this connecting bar *d* in the form shown additional supports are provided, and therefore additional stiffness given to the connected parts.

The seat *e* is supported by suitable props *e'* in the usual way, but as best shown in Fig. 1, is located so that the preponderance of the weight of the rider is always in front of the point in a vertical plane passing through the axes of the wheels.

The whiffle-tree is pivoted in a suitable support rising from the connected bars *d*, *d'*.

I do not desire to limit myself to the particular shape or construction of parts, as it is obvious that the shafts may be divided in different ways and provided with intermediate struts, and also that the stirrups or foot rests may be arranged below the shafts in different ways.

By providing the small wheels as shown good and sufficient connecting points are provided for the arms *b<sup>2</sup>*, *b<sup>3</sup>*, of the lower divided portion of the shafts, to thereby permit the introduction of struts or supports of suitable length to give great stiffness to the shafts, and furthermore the pivotal points on which the sulky vibrates are brought nearer the ground.

The shafts constructed in this way or in

any equivalent way cannot spring, yet in practice I find that the sulky can be made even lighter than when constructed in the usual way.

5 I claim—

1. A sulky, each shaft of which is in a plane above the top of the wheels, and is a single bar at the forward end, and is split or divided back of said end, one portion extending horizontally to the seat and support, and the other extending at an angle to the first and downward to the axle, substantially as set forth.

2. A sulky provided with shafts each of which is a single bar at the forward end and divided toward the back end, the upper portion extending to the seat frame, the lower portion to the axle, and the two portions being braced to form one rigid structure, substantially as set forth.

3. A sulky provided with a pair of divided shafts, each shaft constructed of a single piece split or divided at a suitable point from the forward end thereof, and arms projecting from the lower divided portions of said shafts so as to embrace the wheels, substantially as described.

4. A sulky provided with a pair of divided shafts consisting of upper and lower portions the former of which extend back to the frame of the sulky, occupying a plane above the tops of the wheels, and the latter extending back to the wheel supports, and braces connecting said upper and lower portions to form a rigid structure, substantially as described.

5. A sulky provided with a pair of divided shafts, each constructed of a single piece split or divided at a suitable point from the forward end thereof, the lower divided portions of which being provided with projecting arms, and struts or supports connecting the upper and lower divided portions of said shafts, and connections between said projecting arms and the lower divided portions, substantially as described.

6. In a sulky, the combination of a cross-bar or frame, having at its ends depending wheel-supporting arms or forks, and a pair of divided shafts each constructed of a single piece, and consisting of an upper and lower portion, the rear ends of the said upper portions being connected with the body of the cross-bar or frame, and the rear ends of the lower divided portions being connected to the lower ends of said wheel-supporting arms, substantially as described.

7. In a sulky, the combination of the frame, seat, wheel-supporting frame having at each end a wheel support, and wheel, and shafts, each shaft having an upper portion on a plane above the wheels and below the seat, and a lower portion which is split to form a fork receiving the wheel, the ends of said split portion being attached adjacent to the lower ends of the wheel supports, substantially as set forth.

8. In a sulky, the combination of a cross-

bar or frame having at its ends depending wheel-supporting arms or forks, and a pair of divided shafts, the lower divided portions of which are provided with projecting arms, and the rear ends of the upper divided portions being connected to the body of the cross-bar or frame, and the rear ends of the lower divided portions, together with said projecting arms, constituting forked braces which are connected to the lower ends of the wheel supporting arms, substantially as described.

9. In a sulky, the combination of a cross-bar or frame having at its ends depending wheel-supporting arms or forks, and a pair of divided shafts, the rear ends of the upper portions of which being connected to the cross-bar or frame, and the rear ends of the lower divided portions of which being connected to the lower ends of said wheel-supporting arms, and braces connecting the said lower divided portions with the cross-bar or frame, substantially as described.

10. In a sulky, the combination of a cross-bar or frame having at its ends depending wheel-supporting arms or forks, and a pair of divided shafts the rear ends of the upper divided portions of which are connected with the cross-bar or frame, and the rear ends of the lower divided portions of which are connected to the lower ends of said wheel-supporting arms, and braces connecting the said lower divided portions with the cross-bar or frame, and braces connecting the said upper divided portions with said cross-bar or frame, substantially as described.

11. In a sulky, the combination of a cross-bar or frame having at its ends wheel-supporting arms, a pair of divided shafts, the lower divided portions of which are provided with projecting arms, and with said arms connected to the lower ends of the wheel-supporting arms, short connecting bars connecting the said projecting arms and lower divided portions, and braces connecting the said short connecting bars, with the cross-bar or frame, substantially as described.

12. In a sulky, the combination of a wheel-supporting frame, wheels thereon, a seat located above the tops of the wheels, a pair of divided shafts, the upper portions of which extend rearwardly in substantially a horizontal plane to the wheel supporting frame, and the lower portions of which extend at an angle with relation to the upper portions and are connected with the wheel-supports at their lower ends, braces interposed between and connecting said upper and lower portions of the shafts, and cross pieces connected between said braces to form foot rests, substantially as described.

13. In a sulky, a rigid frame constructed and arranged to support a seat and a pair of wheels, with the seat in elevation above the tops of said wheels, and a pair of shafts, each comprising a substantially horizontal upper portion, and a lower portion arranged at an

angle with relation thereto, the rear extremities of said portions being connected to said frame at suitable points whereby the frame serves as a rigid connection between said upper and lower portions, substantially as described.

In testimony whereof I have signed my

name to this specification in the presence of two subscribing witnesses.

STERLING ELLIOTT.

Witnesses:

BERNICE J. NOYES,  
LUCY F. GRAVES.