

ENGEL'S COACH SHOP

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Greetings from Joliet, Montana!

We are a small town, family owned business very similar to the multitude of carriage shops that used to dot our country years ago. Joliet is nestled in the foothills of the Beartooth Mountains and only 90 miles from Yellowstone National Park where our coaches are used at Roosevelt Lodge.

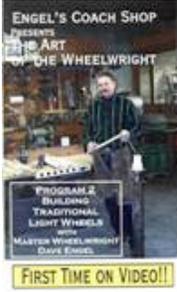
We are only 30 minutes southwest from Billings, Montana's largest city, and only 15 minutes off Interstate 90. And since Joliet's 'business district' is only 2 blocks long we're real easy to find.

Over the years, I've had the opportunity to build, repair, and restore a number of Yellowstone style coaches and have grown to appreciate the craftsmanship of the *Abbot, Downing Company*. Since Yellowstone Park is in our 'back yard', that style touring coach is extra special to us. I'll try to include some pictures of restoration projects of Yellowstone coaches, buggies, Broughams, Breaks, Band wagons, and what ever else I can squeeze in. The coach pictured here is one of 3 seventeen passenger coaches we built for Yellowstone Park during 1980 and 1982. (The gentleman standing on the wheel is Rick Bischoff, whom many of you know and now operates The Luminary Shoppe here in Joliet.)



This is our 35th year in the horse drawn vehicle and wheelwright trade. Where has the time gone! This is still a ma and pa operation in a one-horse town, so don't be fooled. We still like to know what your latest 'project' is, how big your horses or mules are, what you do for *real* work, and where your kids live.

Our shop of over 5000 sq. feet allows us to do most things right here, including custom wood bending and machining. We build, *and rebuild* all sizes of wooden wheels and do custom work on horse drawn vehicles. The highlight here is *custom*. We don't mass-produce. If you have a vehicle or a set of wheels you would like reproduced, or restored, so they look like the originals, that's what we like to do.

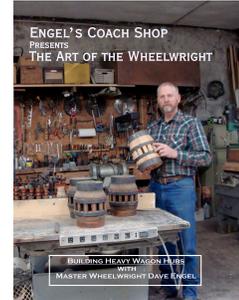


We have produced a video series called *The Art of the Wheelwright* for those of you interested in understanding the trade better. It's just like being here in the shop while I work!

We also have a few parts and supplies around that include most of your buggy hardware, shafts, poles, tongues, singletrees, doubletrees, neck yokes, wagon bows of all sizes, etc., etc., etc.. This is all in a little catalog we have available. Just let us know if you want one! It's FREE!

To those of you who've been here before, we're still at the same place on Main Street in Joliet. Those of you who haven't, stop by when you're close by (200 miles is considered close here in Montana). Of course you can always call, mail, or email us anytime.

Even though we live in a one horse town, technology allows us to accept VISA and Master Card. We ship mostly via USPS (the post office) and it's amazing what we get through! If UPS is better for you, we'll do that too. Maybe we'll see you someday.

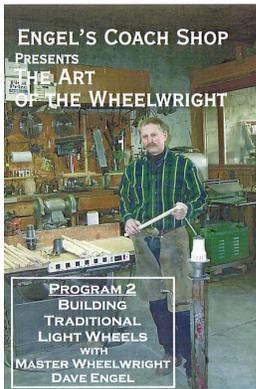


This is a photo in the late 1800s in front of Yellowstone's Hot Springs Hotel showing 6 white horses hitched to a touring coach.

This is the pattern coach sent to us from Yellowstone from which we replicated three similar coaches still in use today at Roosevelt Lodge; built back in 1980-1982.



Wheels

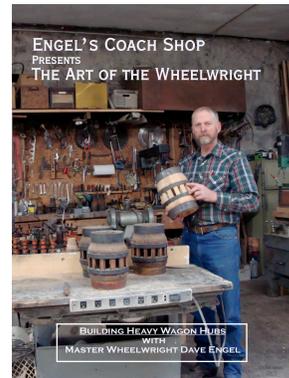


FIRST TIME ON VIDEO!!

I've been at the wheelwright trade since 1979 and needless to say, I've seen a few. Whether they're large or small, light or heavy, rubber tired or steel tired, horse drawn or automotive, civilian or military, old style or new roller bearing, foreign or domestic, I've had 'em come through. And I still enjoy working on them!

If you're interested in learning a bit of the trade yourself, I have begun putting together a video series on *The Art of the Wheelwright*. The first program deals with common repair concerns you'll find in old wheels and how to identify different styles of wheels. Program two walks you through the whole process of building a light buggy wheel – start to finish. Program three

deals with building heavy wagon wheel hubs.



Building light wheels & Evaluating wheels – 1 DVD - \$89.00 + 5.50 S&H Building Heavy Hubs - \$44.00 + \$5.50 S&H Building Heavy Wheels – \$79.00 + 5.50 S&H Complete Set of 4 Programs – \$199.00 + 6.00 S&H
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BUGGY WHEELS

In this section, I'll put together some charts on how I figure repair expenses as well as new wheel pricings. If you're interested in some numbers you can write, call or email me and we'll get it figured out.

If you have noticed in the 'Hub' section, light roller bearing hubs and light buggy wheel Sarven hubs are about the same price range so there isn't a price difference between the two wheel styles. The same style spokes, felloes, and tires are used on both. If you are considering a new vehicle, now is the time to consider roller bearing wheels. Going this way you will need roller bearing axles to match also. (See 'Axles') If you are rebuilding an older vehicle and want to preserve the original Sarven style wheel, we would need the boxing (or box) out of the old hub. In this case, the best approach is to package up the remnants of the old wheels and send them to us. This way we can sort through what's salvageable and replace whatever is needed.



As you begin to become more aware of original wheels in general, you'll notice they have a distinct styling to them. They needed to be functional, but they also had to be stylish and that is what we duplicate. I call it 'function and fashion'. Many wheels being produced on the market today definitely have the function, but lack in the fashion area. It involves more time and attention to details, but results in a more original style wheel. That's what we do here.

NEW LIGHT BUGGY WHEELS

SIZE	STEEL TIRES / wheel	RUBBER TIRES / wheel
Up to 1 1/8" hub	\$225.00	\$255.00
Up to 1 1/4" hub	\$265.00	\$295.00
Up to 1 1/2" hub	\$275.00	\$305.00

Rubber Tires



Rubber tires are truly an added benefit to your wheels. Steel tires not only grate on the pavement, but also on your nerves. In the mean time they are being hammered on the pavement, accelerating your wheels loosening process. Rubber tiring protects against this hammering and even allows you to visit with those good friends you are taking for a ride.

Adding channel & rubber

Tire Size	\$/ Wheel
1"	\$105.00
1 1/4"	\$115.00
1 1/2"	\$150.00
2"	\$210.00
2 1/2"	\$255.00

The King Family in Sheridan displays this gentleman's Brougham in their King Rope Museum.





REPLACING SARVEN SPOKES

Many original wheels are merely in need of a spoke or two replaced, a felloe repaired and a tire reset. This is often the case where wheels have set in one place for a long period of time; the grass has grown over and the wheels have settled into the dirt. If that's the case, I've included some break down pricing for repairs. These include light and heavy wheels.

SIZE	5 OR LESS	6 OR MORE
Up to 1 ¼"	\$8.00	\$6.50
Up to 1 ½"	\$9.50	\$7.50
Up to 1 ¾"	\$12.00	\$9.80
Up to 2"	\$16.00	\$13.90
Up to 2 ¼"	\$19.00	\$17.00
Up to 2 ½"	\$24.00	\$21.00

REPLACING WAGON SPOKES

SIZE	5 OR LESS	6 OR MORE
2"	\$16.00	\$14.00
2 ¼"	\$18.00	\$16.00
2 ½"	\$20.00	\$18.00
3"	\$24.00	\$22.00



A new hitchwagon built on the remnants of axles, springs and hubs.

An Express Wagon rebuilt from axles and springs using a natural finish maple.





REPLACING BENT FELLOES

Often times the felloes are the first to rot away from being left in one place and overgrown by foliage. The steel tires also retain moisture causing rust and decay to form necessitating felloe replacement.

SIZE	\$ / WHEEL
1" up to 44"	\$65.00
1" up to 50"	\$66.00
1 1/8" up to 44"	\$65.00
1 1/8" up to 50"	\$66.00
1 1/4" up to 44"	\$65.00
1 1/4" up to 50"	\$66.00
1 1/2" up to 44"	\$75.00
1 1/2" up to 50"	\$78.00
2" up to 44"	\$105.00
2" up to 50"	\$108.00
2 1/2" up to 44"	\$115.00
2 1/2" up to 50"	\$120.00
3" up to 44"	\$140.00
3" up to 50"	\$145.00
4" up to 44"	\$160.00
4" up to 50"	\$165.00

REPLACING SAWN SECTION FELLOES

SIZE	\$ / SECTION
2"	\$26.00
2 1/2"	\$32.00
3"	\$37.00



Sawn section felloes can be seen on this Red River cart, commonly used by fur trappers. This style cart is assembled with only mortise and tendon joint work and pegs. The only steel on this cart was the tires.

We build these carts for around \$3500.00

SETTING TIRES



For the process of setting tires, we use a roller which slowly rotates the tire to insure a uniform heat throughout the tire.

Propane torches are set up on either side to apply as much heat as needed. We generally bring the temperatures to about 900 degrees.



With the use of old original tire tongs we are able to set the tire just like they were originally

SIZE	\$ / WHEEL
Up to 1 ½"	\$65.00
Up to 3"	\$75.00
Over 3"	\$85.00

When we reset old tires, they are removed from the wheel and both the face of the tire and the face of the felloes are sanded or buffed to ensure a solid contact surface in the resetting process. To check your own wheels for tightness, we recommend holding the wheel vertical and "bouncing" it on a solid concrete slab. The sound should be a distinct solid tone, whereas the loose wheel will sound dead, or even rattle.



HEAVY WHEELS REBUILT

(On good old hubs)

We do a large number of heavy wheel repairs where the hubs are useable and the tires are good. Some common sizes are presented here. This includes all new spokes, bent felloes, and the old steel tire reset on an old useable hub. (For wheels with sawn section felloes add 12%)

SPOKE SIZE	FELLOE SIZE	\$ / FRONT	\$ / REAR
2"	2"	\$309.00	\$336.00
2 1/4"	2"	\$357.00	\$392.00
2 1/2"	2 1/2"	\$386.00	\$426.00
2 1/2"	3"	\$395.00	\$436.00
3"	3"	\$443.00	\$492.00
3"	4"	\$464.00	\$513.00



If the hubs are bad and need replacing, add \$245.00 / wheel.
If new iron tires are needed, call for current steel prices.



3/16 & 1/4" tires bolts \$.10 & \$.25 ea
With square nuts
We have a variety of soft iron rivets available.
Call for piece or lb. prices



STAGECOACH WHEELS

We also build stagecoach wheels on the Archibald roller bearing hub that can incorporate a 12" hydraulic brake system and axles up to 2 1/2". Common sizes are 45" fronts and 60" rears and can be with either a 5/8 x 2 1/2" steel tires or 2 1/2" rubber tires.

45" x 60" x 2 1/2" – 5/8" steel tire	45" x 60" x 2 1/2" - rubber tire
\$2950.00 / set of 4	\$3250.00 / set of 4

(Wooden hub coach wheels also available)



. This is a 6 passenger coach we custom built for the Nortman's here in Montana. This coach was used extensively for terminally ill children's camps and is now owned by the Hopes in Leavenworth, WA.

SETTING BOXINGS



This machine is where we bore our hubs. This was made by converting an old turret lathe into this adjustable post hub borer. This allows us to bore any taper into any hub for all the various size boxings.

1 - 1 1/4" Wheels	\$25.00
1 1/2" Wheels	\$35.00
2" Wheels	\$55.00

Hubs

There are a number of different manufacturers of roller bearing hubs today, but I feel these hubs represent the old styling while incorporating modern conveniences. These hubs are built after the Sarven style, yet without the wooden core. The mortising for the spokes is an integral part of the casting and uses a spoke very similar to the Sarven spoke (just a shorter tendon). The heavy rear flange is often machined to accommodate a drum for hydraulic brakes. These hubs come fit for four axle sizes; 1", 1 1/8", 1 1/4", and 1 1/2", and use spoke sizes correspondingly.

A 1 3/4" hub is also available for medium sized vehicles and light coaches that fit a 1 3/4" axle and spoke.



Roller Bearing Hubs

1" and 1 1/8" hubs are \$49.00 each
 1 1/4" and 1 1/2" hubs are \$64.00 each
 1 3/4" hubs are \$173.00 each



Roller Bearing Archibald

This large hub is fashioned after the military hub, referred to as the Archibald hub. It will fit the 2" and larger axles and requires a 2" to 2 1/2" spoke. Unlike the lighter roller bearing hubs, these do not have mortises for the spokes to fit in to. This is an extremely strong hub and often used on larger coaches and hitch wagons. It is machined to take the large 12" hydraulic drum brake and has a very nicely machined brass hub cap.

2" roller bearing Archibald hub \$225.00 each.

For those of you interested in competition driving, this roller bearing flush hub is the way to go.

The shortened outer flange is ribbed to deflect obstacles when you're cutting those corners tight. This hub requires its own specific axle because of its shortened length. It is also machined to take the 8" and 10" brake systems.



Roller Bearing Flush Hub

1" and 1 1/8" flush hubs are \$48.50 each
 1 1/4" and 1 1/2" flush hubs are \$75.00 each

The Sarven hub was probably one of the more widely used hub styles in its day and is still a reliable hub today. When interested in keeping that Doctor's buggy or spring wagon original, this is the hub to use. After the wheel is assembled, the boxing from the old style axle is fitted into the core to provide a reliable, true running wheel. These Sarven style hubs are still available from a 1" spoke up to a 2" spoke. Prices include cores and flanges.



Sarven Hubs

1" spoke hub is \$35.00
 1 1/8 & 1 1/4" hubs are \$40.00
 1 3/8" and 1 1/2" hubs are \$45.00
 2" hub is \$120.00



We also turn our own wooden wagon hubs, complete with mortising, bands set and a 1 1/4" center bore. We build these for \$245.00 each. The hub on the right has been turned and mortises bored while the hub on the left has been center bored and hub bands set (ready to build a wheel on). If I have accurate measurements, or better yet, the old boxing, we'll taper bore the center to fit the boxing for you.

These are the common style new hubs we deal mostly with. There are a multitude of hub styles out there today, but of all the wheels we repair through the shop, these are what I would consider to

be the reliable, both in style and function. We do a lot of wheels, so if we can help you figure something out, let us know.



Hydraulic brake systems are available in 8", 10" and 12" drum sizes. The 8" brake system fits the 1" and 1 1/8" axles; the 10" brakes fit the 1 1/4" and 1 1/2" axles; and the 12" brakes fit the 2" to 2 1/2" axles. It is necessary to specify which hub and axle you are fitting to ensure the correct brake system. Each complete set comes with drum, backing plate (with shoes mounted), master cylinder, hydraulic lines and brake fluid.

8" brake system is \$295.00
10" brake system is \$345.00
12" brake system is \$545.00



1993, driving "Black & Grey" to a poor sod-buster's sled in Far and Away and the Oklahoma Land Rush
(The "wheel-man" with no wheels)

Mowing dry-land hay with "Chips & Chum"



Axles



Most new vehicles are equipped with roller bearing axles as shown here. An advantage in roller bearing axles is less frequent maintenance and adaptability to hydraulic brakes.

These come in sizes from 1" to 2 1/2" as measured at the square portion of the axle and are often referred to as 'standard track' and 'wide track'. The standard track will measure about 48" between spindles and the wide track will measure close to 54". Overall lengths are available up to 75" by special order.

1" and 1 1/8" are common to most light vehicles such as doctor's buggies and phaetons. The surreys, spring wagons and Vis-à-vis will have the 1 1/4" sizes. Vehicles which accommodate more passengers, such as wagonettes, ought to be up to 1 1/2" size. When you go into the light coaches the 1 3/4" axle is appropriate, while the larger coaches, drays and freighters will require the larger 2" to 2 1/2" axles.

1" roller bearing axles	\$155.00/pr	1" roller bearing stubs	\$35.70/ea
1 1/8" roller bearing axles	\$167.50/pr	1 1/8" roller bearing stubs	\$37.70/ea
1 1/4" roller bearing axles	\$204.00/pr	1 1/4" roller bearing stubs	\$39.00/ea
1 1/2" roller bearing axles	\$246.00/pr	1 1/2" roller bearing stubs	\$42.00/ea
1 3/4" roller bearing axles	\$371.00/pr	1 3/4" roller bearing stubs	\$55.00/ea
2" roller bearing axles	\$560.00/pr	2" roller bearing stubs	\$78.00/ea

(Axles and stubs come with bearings, seals, nuts and washers)



Pictured here is the boxing style axle commonly found on older original vehicles produced here in the United States. Measurements and functionality is the same as the roller bearing axles, but the draw back is the routine maintenance required. Since both ends of the boxing are open and exposed, the grease tends to work its way out and needs to be regularly replenished. Because of the inner collar between the spindle and the square body of the axle, this style axle is not easily fitted to hydraulic brakes. The collar will not allow a backing plate to be installed which is necessary with drum style brakes.

1" old style axles	\$178.00/pr	1" old style stubs	\$39.00/ea
1 1/8" old style axles	\$195.00/pr	1 1/8" old style stubs	\$40.00/ea
1 1/4" old style axles	\$212.00/pr	1 1/4" old style stubs	\$42.00/ea

Axle Questions

Question; *"When is it beneficial to change from old style to roller bearing style axles?"*

When originality is not the issue and maintenance is a concern, roller bearing axles are something to consider. When a roller bearing axle conversion is considered, one must also realize that different wheels with hubs that accommodate these axles will be required. (Since the Timken bearing did originate in the buggy era, there are a few originals out there, but not real common. Some of the heavy tanker wagons also came equipped with ball bearings.)

Question; *"Does a buggy or wagon pull easier with roller bearing axles?"*

You will not notice a difference in how a vehicle pulls until you get into the larger class vehicles. An old style axle, when greased properly, will pull quite easily. The draw back here is the routine maintenance to keep these axles greased properly.

Question; *"Can I just cut off my old spindles and weld on new roller bearing spindles?"*

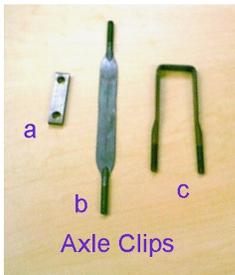
Spindles are less expensive than full length axles; however there are additional welding expenses and time involved in gauging the axles again for gather and swing (caster and camber). If you are doing this conversion yourself and time is not the issue, then you will have less expense. But if you have to hire a welder to help you, the full length axles will be less expensive in the end.



Roller Bearing Boxings

Another option for larger worn out axles is to replace the axle with roller bearing and also place a roller bearing boxing into the old hubs. There are limitations to this approach, especially in light vehicles. Because the roller bearing boxing is machined to accommodate bearings, it is significantly larger than many small boxings and hub size limitations will not allow its insertion. As a general rule, a wheel has to have 1/4" spoke or larger to have a hub large enough for this approach.

#1 roller bearing boxing	\$31.00/ea	(fits 1" & 1 1/8" axles)
#2 roller bearing	\$56.00/ea	(fits 1 1/4" & 1 1/2" axles)
#3 roller bearing boxing	\$92.00/ea	(fits 2" axles)



Axle Clips

Axle clips fasten wood axle caps to the steel axles and come in every 1/2" in lengths starting at 2 1/2" up to 7". This measurement is the portion of the clip that is flat and does not include the threaded ends. Picture "a" is the clip bars that goes under the axle which the axle clips and spring clips "c" are fastened to. These clips are threaded with 5/16" threads and include square nuts. The spring clips "c" are half-round between the threads. I have some pre-bent for 1/2" or 1/4" springs and also straight, which can be shaped to any size.

Clip bars – 1", 1 1/8", 1 1/4", 1 1/2"	\$.90 each
All axle clips	\$2.50 each
All spring clips	\$2.50 each

What about these wagon running gears that are worn out or even missing wheels? Many times you will find gears that have had wheels changed and don't fit the axles worth a hoot. With axles and skeins varying so widely, it is difficult at best to find replacement wheels without thousands of dollars invested into new wheels. So, now what do I do?

Salvage old Running Gears?



Here in the west we see a large number of farm wagons, chuck wagons, sheep wagons, etc. that have worn out axles, or gears with no wheels because someone has put them in a flower garden. Shown here is an approach of inseting a 2" roller bearing axle up into the old wooden axle thereby making a useless gear usable again, keeping an authentic look.



Whatever your axle problems are, there is usually an answer to it. If we can help you out, we'd be happy to.

Shafts

Buggy Shafts

Shafts are sometimes referred to as 'fills' or 'staves' and are designed for single horse driving, either on a two wheeled cart or a four wheeled vehicle. Different styles of vehicles require different styles of shafts and these styles are determined primarily by the shape of the bend at the back, or heel, end. Typically shafts are made out of hickory, but on occasion one will see lesser qualities made from ash. We stock only hickory shafts because of their authenticity and superior strength. All shaft styles are available either as blank sets, kits, or complete assembled. Blank sets include two sides and the cross bar; kits include all hardware and a sword end or hook end single tree; complete are assembled, but unfinished, ready to use. (Premium spring-clip singletrees and Bradley Coupler irons are available also, but additional.) Four sizes are available and are measured in length from the front of the cross bar to the tip of the shafts.

Miniature sizes are 48"
 Pony sizes are 65"
 Horse sizes are 75"
 Draft sizes are 87"

Shafts often used on runabouts, piano box and similar vehicles are of the drop heel, or single bend, style. Mortises are precut for the cross bar.



Size	Blanks	Kits	Complete
Miniature	\$52.00	\$129.00	\$249.00
Pony	\$52.00	\$129.00	\$249.00
Horse	\$52.00	\$129.00	\$249.00
Draft	\$76.00	\$165.00	\$299.00

(Premium spring-clip singletrees add \$24.50)
(Bradley Coupler ends add \$28.50)



The double bend buggy shaft is designed to position the cross bar and single tree further ahead of the point of attachment of the shafts to the axle. This is necessary on vehicles that have the body positioned ahead of the front axle, as is common on spring wagons, so when the shafts are turned extreme right or left, the cross bar will not hit the corner of the box or driver's foot board.

Size	Blanks	Kits	Complete
Pony	\$64.00	\$155.00	\$295.00
Horse	\$64.00	\$155.00	\$295.00
Draft	\$84.00	\$170.00	\$315.00

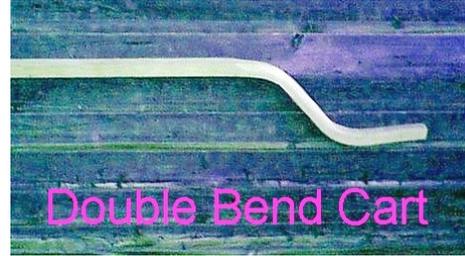
(Premium spring-clip singletrees add \$24.50)
(Bradley Coupler ends add \$28.50)

Cart Shafts

The two main differences between buggy shafts and cart shafts are their length and method of cross bar attachment. Cart shafts are longer, to facilitate the footboard for the driver, in front of the axle and the cross bars are mounted either above or below the shafts themselves, instead of being mortised like the buggy style shafts. These are provided as blanks only and include both sides and the cross bar.



Size	Blanks
Pony	\$68.00
Horse	\$76.00
Draft	\$81.00



Size	Blanks
Horse	\$99.00
Draft	\$105.00



Unlike buggy shafts, cart shafts are also available in a straight heel style. These are commonly used on Meadowbrook carts and Village carts.

These are available in two styles; the heels are rectangular in shape and are available where the rectangle is in a vertical position or in the horizontal position. Because of their straight heel design, horse and draft sizes are the same and are adjusted for length simply by shortening the length of the heel. We have straight heel styles also in a pony size.

Size	Blanks
Pony	\$66.00
Horse / Draft	\$69.00



Due to the nature of attachment of the cross bar to the shafts on carts, it is imperative that a circle brace be added ahead of the cross bar. This triangulates the point of attachment of the cross bar to the shafts giving the necessary strength side to side. The mortise on buggy shafts, along with the iron placed underneath, strengthens this joint, but cart shafts need this extra bracing. These are extra long and can be trimmed to match the width of the shafts.

Cart shaft circle brace	\$12.50
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Buggy shafts can also be strengthened by a brace that fits inside the shafts, just ahead of the cross bar, but it is not a mandatory issue as it is with carts.

Buggy shaft circle brace	\$12.00
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We carry an assortment of shaft tips to fit most shaft sizes. We have tips in brass, steel, and chrome from 3/4" to 1 1/4".



Size / style	Price / pair
3/4 brass	\$7.50
7/8 brass	\$9.00
1" brass	\$11.25
1 1/8" brass	\$12.00
1 1/4" brass	\$12.95
7/8" steel	\$5.00
1" steel	\$5.25
1 1/8" steel	\$5.50
1 1/4" steel	\$5.75
7/8" chrome	\$5.50
1" chrome	\$5.95



Tee Plates

These tee plates are used with carriage bolts, placed under the head of the carriage bolt when used near the end of a piece of wood, such as the end of a cart circle brace. These help prevent the bolt from splitting the wood by bending around the contour of the wood.

Tee plates in 1/4", 5/16", and 3/8" all sizes are \$.70 each

Sometimes the tip of a shaft will be broken and one way to repair the tip is with a repair horn. This is a tapered metal sleeve filled with a wood plug near the tip and hollow near the large end to fit over the broken shaft. By sawing off the broken shaft tip to appropriate length you can slip the repair horn on to replace the broken section. These measure about 30" in length.



Shaft Repair Horn

Shaft repair horn \$16.00



Shaft Shackle

Shaft shackles are fastened to the front axle of the vehicle and are where the shafts or pole attaches. These have either a 3/8" or 7/16" bolt to attach the shafts to. Standard placement width on the axle is 43" center to center; this way both shafts and poles are interchangeable. (Specify bolt size)

Shaft shackles \$16.50 each

When you get tired of looking for a wrench to take your shafts on and off, these quick pins are a real nice replacement for the bolt on the shaft shackles above. These are only available in a 3/8" pin size and are hardened steel.



Quick Pins

Quick pins \$3.90 / pair



Antirattler

Another option to bolts, and is similar to the quick pin, is this antirattler. Though it works like a quick pin, it also puts pressure on the pin to prevent rattling in the shackle. This is nice if the holes are becoming worn in the shackles and you notice the bolts rattling.

Antirattler \$10.00 / pair

If you like premium shaft and pole attachments, this Bradley Coupler is the Cadillac way to go. This is a ball & socket style of attachment where the shaft or pole ends fasten to the ball end (left) and the spring loaded socket attaches to the axle (right). The spring clip catches or releases the top of the socket as the shafts or pole needs to be attached or taken off of the vehicle. This ball is also surrounded by a piece of leather to prevent any rattle. This Bradley Coupler is the best of all attachment styles. (These require 1 axle clip each to attach to the axle.)



Bradley Coupler

Bradley Coupler sockets - 3/4 or 7/8 - \$53.25 each
 Bradley Coupler - 3/4 or 7/8 " balls - \$14.25 each
 Leather packing - \$ 1.50 each

Poles

Buggy poles come in several sizes and bends, similar to shafts. These poles are made from straight grained hickory for best strength and flexibility. We carry most styles in pony, regular horse, and draft horse sizes.



Single bend poles are used most commonly on run-a-bouts and similar light vehicles. These come with extra long ends to allow plenty of room to fit the pole circle and irons.

SIZE	PRICE
Pony	\$44.00
Regular	\$47.00
Draft	\$54.00

Double bend poles are used more on spring wagons and similar vehicles where the box sets on top of the front axle spring, or slightly ahead. The pole circle is most often attached in the lower bend which allows for a little flexibility to adjust the angle of the circle. The heels are extra long to allow for trimming.



SIZE	PRICE
Pony	\$48.00
Regular	\$51.00
Draft	\$57.00

Wagon and mower tongues are not pictured here, because there's not much to put in a picture. Both sizes are made out of ash for strength and flexibility. Many times I am asked why tongues are not made out of oak, and much of it is availability in these larger sizes. When you look at testing done by the U.S. Forest Products Laboratory on different species of woods available in the U.S. today, there is very little difference between oak and ash. Ash shows a higher rating in bending and compressive strength, while oak shows a higher specific gravity and stiffness rating. As a general rule, it is thought that ash will have a greater resistance to a sudden impact than oak. Have you ever seen a baseball bat made out of oak? All I have ever seen are made out of ash. Maybe the baseball industry has something figured out?

Wagon tongues are roughly 4 x 4 x 13'	\$84.00
Mower tongues are roughly 4 ½ x 4 x 14'	\$89.00

We also have straight carriage poles for wagonettes, hearses, Vis-à-vis, and similar vehicles.

2 x 3 x 138" straight poles are \$69.00



Pole circles fit to the back of buggy poles and allow the irons of the pole to attach to the front axle of the vehicle. These are already mortised and are extra long to allow for trimming and fitting. These are also made out of hickory.

SIZE	PRICE
Pony	\$11.50
Regular	\$12.50
Draft	\$14.50

We carry pole tips in three sizes. The (a) tip is a zinc alloy and the largest tip we have. It measures 1 5/8 ID. The (b) tip is also zinc alloy and measures 1 3/8 ID. The (c) tip is an original style cast iron pole tip and measures 1 1/4 ID.



SIZE	PRICE
a	\$15.00
b	\$13.00
c	\$10.75

Our wagon tongue ends are adaptable to tongues with 2 ends. They are predrilled for two rivets or bolts.



Wagon tongue ends \$13.50

Singletrees / Doubletrees

Singletrees

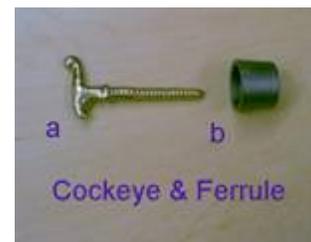
Singletrees come in various sizes, styles and applications. There are some general 'rules of thumb' that are adhered to, but as always, there are exceptions to the norm. We will present the usual standards and address some of the more common questions asked.



Two of the most common styles of buggy singletrees used in light driving are what are referred to as the "hook end or cockeye end" (a) and the 'sword end' (b). Both are designed for use with leather trace driving harness, whether on a cart or light buggy.

The hook or 'cockeye', shown here on the right, is threaded into the end of the wood singletree while the cast iron ferrule is placed over the wood end to prevent the singletree from splitting when it is pulled on.

Cock eye single tree	\$16.50	Brass cockeye	\$3.75
Wood blank only	\$9.00	Cast iron ferrule	\$1.95
(Sizes available from 22" to 38")			
Sword end single tree	\$11.50		



Pictured on the left is a replica of an old style singletree end made for when heel chain harness is used. The end is spring loaded to allow the chain to be inserted, but prevents it from accidentally coming unhooked; these are available in two sizes; 1 1/4" (a) for the draft breeds and 1" (b) for the lighter breeds.

1 1/4" Premium end	\$16.90/ea
1" Premium end	\$13.50/ea
Complete assembled singletree 1"	\$49.00
Complete assembled singletree 1 1/4"	\$56.00



The sword end singletree is designed for leather traces where the trace is slipped over the end of the singletree. In order to prevent the trace from slipping back off, trace holders are fastened to the sword end singletree. The steel trace holder is spring steel while the brass is spring loaded, both serving the same function. The brass trace holders come in two sizes.

Spring steel trace holder	\$3.60/pr
Heavy brass trace holder –a	\$11.50/pr
Light brass trace holder –b	\$9.50/pr
Leather tang (not shown)	\$2.30/pr



Attaching the buggy singletrees to a cart, buggy shafts or buggy doubletrees often uses a singletree clevis & plate assembly. This reinforces the bolt and helps keep the singletree from rolling forward when being pulled on. This has a 5/16" bolt.

Singletree clevis & plate	\$8.75
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For draft animals, a heavier yoke and caster assembly is used. This uses a 3/8" bolt, with a separate caster set

Heavy singletree yoke	\$4.25
Cast iron caster set	\$4.25
Zinc alloy caster set	\$8.00



Question: What size singletree do I need?

When used on a set of shafts, either cart or buggy, you would like the ends of the singletree to be just inside the shafts themselves. This allows the traces to be placed through the shaft loops, if present. Most standard cross bars, where the singletrees are fastened, are about 40". Here is where the 38" size is applicable. (Sword end singletrees are 42" in length, but when the traces are slipped on they will fasten at 38") If you were on a cutter with a cross bar of 36" width, you would use a 34" singletree.

In the cases where singletrees are mounted in a doubletree set up, you then want to match singletree lengths with horse size. As a general rule, an 800# animal, driven as a pair, will use a 28" singletree and a 1000# animal will use a 30" singletree.



When you get into the heavier working style singletrees, they are fashioned a bit different. These are designed for work harness with heel chains yet can be used individually or in a doubletree set up. These are well ironed on the back side for heavier pulling. (Measurements are wood lengths)

- 18" is for miniatures
- 22" and 24" are your pony ranges
- 26" and 28" are the mule ranges
- 30" is the saddle horse size
- 32" is the light draft – draft/cross range
- 34" is the 1800# to 2000# area
- 36" is ton and over

18"	\$20.75	30"	\$27.50
22"	\$23.50	32"	\$28.50
24"	\$24.50	34"	\$29.50
26"	\$25.50	36"	\$31.50
28"	\$26.50		

General Rule

What ever size singletree you would use on a wagon, single or in a hitch, you should go up one size when you skid the log or stone boat.



Sometimes when you are skidding, you might not want to abuse your wood singletree and an iron one might suit you better. These are fabricated singletrees and eveners that are meant to be left outside and drug over the rocks.

Steel single trees 28" – 36"	\$27.50
Steel eveners 36" to 48"	\$35.00

New straight-sill Auto seat Surreys are a stylish way to go. These can be fitted with hydraulic brakes and either shafts or a pole. Since we custom build all our vehicles, you can pick your own colors and upholsteries.



Doubletrees

Doubletrees are, as the name implies, a set of two singletrees fastened to an evener bar to which a pair, or as we refer to them in the west, a team is hitched. The evener allows the equalization of pull to be distributed between the two animals, unlike the European style hitch which hooks each animal to a solid bar. Sometimes the evener is referred to as a doubletree, but for purposes here I will refer to it as the complete set.



A buggy doubletree is two singletrees fastened to a hickory evener. This would include two hook end singletrees, two sets of clevis and plates, and the evener. These are pre-fit and shipped unassembled. This style is used on team harness with all leather traces.

We can also place two premium end singletrees on this evener for teams with heel chain tugs. We also go to the heavier singletrees yokes and casters for heavier pulling.

Buggy Doubletree with hook end singletrees	\$84.00
Buggy Doubletree with premium end singletrees	\$128.00
Buggy Eveners only – horse or draft, 44, 46, 48"	\$14.00



Wagon doubletrees include two wagon singletrees of your choice, two clevises, and an evener. These eveners are oak, ash, or elm. We also make three horse tripletrees for plowing and four abreast eveners.

Wagon Doubletrees	\$98.00
Evener only (ironed)	\$34.00
Three horse plow hitch	\$169.00
Four horse evener	\$52.00



Doubletree clevises are available individually in 4", 5", and 6" lengths.

4" clevis	\$6.50
5" clevis	\$7.50
6" clevis	\$8.50

If you have questions or special needs, we'd be happy to help.

Here's a very nice gentleman's Phaeton we restored, complete with storm curtains and lamps. Black body, leather upholstery and Brewster green gear.



Wagon Neck Yokes



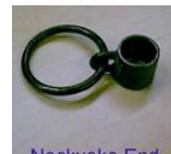
We carry hickory neck yokes in sizes from 32" to 48" which will handle most applications, from ponies to draft. The top neck yoke pictured, (a), is an eye bolt style attachment designed for mowing machines, drills, fore carts and implement applications.. The second style, (b), is for wagons, sleds and general driving applications. Sizes 32" to 38" ring center neck yokes have 3" rings while 40" to 48" have 4"

center rings. The neck yoke ends are riveted on, instead of nailed or screwed, to prevent their being pulled off.

SIZE	PRICE / BOLT CENTER	PRICE / RING CENTER
28"	(miniatures)	\$32.00
32"		\$37.00
34"		\$39.00
36"		\$42.00
38"		\$44.00
40"	\$46.00	\$46.00
42"	\$48.00	\$48.00
44"	\$50.00	\$50.00
48"	\$54.00	\$54.00



We also have just the wagon neck yoke hardware available.



Neck yoke center \$11.75	Neck yoke end \$9.50
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Wagon neck yoke blanks \$17.50



A restored original straight-sill Surrey we did back in the mid 80's

Buggy Neck Yokes

Buggy neck yokes are also made of hickory, with acorn style ends. These have a leather center to accommodate buggy poles and footman loops on each end where the pole straps fasten. Horse size neck yokes are 48" over all length and 40" where the pole straps fasten. Pony size is 36" overall length and 28" where the pole straps fasten.



Complete horse size buggy neck yoke	\$49.50
Complete pony size buggy neck yoke	\$47.00



Just the leather center or footman loops are available individually.

Leather center	\$16.00
Footman loops	\$2.00 / pr.



Buggy neck yoke blanks	\$17.00
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This is the Democrat my father drove when I was a youngster, to a team of quarter horses. I restored it in 1981 or 82.

Accessories

These pages are a bit of a catch all for items that don't deserve a category of their own, but are little necessary items to buggies.



Tailgate Latch

These cast iron tail gate latches are a nice added touch the spring wagon end gates. The hook end fastens to the rear of the side boards and the eye attaches to the tail gate. These are also sometimes used on chuck wagon boxes.

Tail gate latch \$19.50/pr (2 hooks and eyes)

These Quick pins are sure handy when it comes to taking your shafts or poles on and off. Forget the bolts and nuts and having to have a wrench handy. Simply slip the spring clip off the end of the pin and slide them on or off the shafts or pole. These are hardened pins and are 3/8" in diameter.



Quick Pins

Quick pins \$3.90 / pr



Antirattler

Anti-rattlers are some what similar to the quick pins in that you don't need a wrench for bolts. The spring tensioner keeps the pin fastened to the shaft shackles while keeping tension on the pin to keep it from rattling in the shaft shackle.

Anti-rattlers \$10.00 / pr

Inside the axle nuts on lighter vehicles is a machined ring which accommodates a leather washer. These leather coils are for making various size washers to fit this ring. The coil can be expanded or contracted in diameter to fit various sizes. One coil will do 8 to 10 nuts or four wheels when inside and outside washers are needed.



Leather Coil Washer

Leather coil washer \$4.50 / coil



Whip Sockets

Every buggy needs a place to carry a whip and there is a variety of styles available. The whip socket lettered (a) is solid brass and designed to mount on a horizontal surface. The lip to the left can be drilled for either a screw or a bolt and is commonly used on carts where it is mounted on the shaft. Whip sockets (b) and (c) are mounted on vertical surfaces such as wooden dashes or box sides. (b) is brass and (c) is cast iron and paintable.

(a)	whip socket	\$12.50 ea
(b)	whip socket	\$10.50 ea
(c)	whip socket	\$9.00 ea

We also carry wooden whip sockets that are fashioned to mount on leather covered dashes. The tabs on the bands fit around the metal framing in a dash and fastened with a small bolt. These come in both black and natural finishes. (Natural not shown, but same style)

Black	\$12.50
Natural	\$12.50



Wood Whip Socket

These are two original style cast iron steps we have available. The round is more for the light buggy vehicles while the square is a bit heavier for the spring wagon size vehicles.



Buggy Step

Round buggy step \$12.50 ea
Square spring wagon step \$17.50 ea

Often times wagon seats will have corner braces to strengthen the corner joints. These cast corner braces can be drilled and fastened to your new seat or added to an old seat for added support.



Spring Wagon Step

Seat corner brace \$1.95 ea



Tee Plates

Tee plates, as shown here, are meant to be placed under the head of a carriage bolt when the bolt is placed near the end of a piece of wood. The tee plates are then molded to fit the contour of the wood and helps prevent the wood from splitting. Applications are often on shaft ends, near the eyes, and circle braces for both carts and buggies. These come in 1/4", 5/16" and 3/8" bolt sizes.



Seat Corner Brace

All sizes of tee plates \$.70 ea

Meadowbrook carts have seat backs that fold down to allow rear entry into the cart. These seat back brackets allow this function. The base is bolted to the seat and the upper portion is bolted to the seat back. These come in pairs and one pair is required for each seat. Meadowbrook carts take two pairs of brackets.

Seat back brackets \$31.00 / pr



Roller Rub Irons

Roller rub irons are a must for vehicles with rubber tires. When wheels are converted to rubber tires, the steel rub iron must be replaced with a roller rub iron. Otherwise, when the rubber comes up against the steel rub iron in a tight turn, it will grab and crawl under the body, often times overturning the vehicle.

Buggy roller rub irons \$13.50 / pr
Large wagon rollers \$15.50 / pr
Angled wagon rollers \$17.80 / pr



Fold Down Seat Back Bracket

Steam-bent wagon bows

We have our own steamer and bend our own chuck wagon and sheep wagon bows. Common sizes are 38", 42", and 78", but we have a wide range of forms for custom sizes also. We bend our bows out of quarter sawn air dried ash for exceptionally strong bows. Each bow measures 5/8 x 2" x 14 feet in length and have the outer corner rounded to reduce wear on the canvas. We also will bend wagon bows up to 3" wide on order. (Bows wider than 2" are not quarter sawn)



We used to be able to ship via the Post Office, but they have recently restructured their measuring guidelines and have made it not possible any more. Therefore, all bows have to be shipped truck freight. I must add a \$10.00 packaging fee for plastic wrapping each bundle. Freight charges are calculated for each shipment.

All 5/8 x 2 x 14' bows are \$35.00 each – specify width of wagon
 All 5/8 x 2½ x 14' bows are \$41.00 each – specify width of wagon
 All 3/4 x 3 x 14' bows are \$45.00 each – specify width of wagon
 Bow clips available to fit our bows. \$1.25 each (requires 4 / bow)

Wagon Seat Springs

These springs are 3/16" thick leaves, are available in 1 ¼" and 1 ½" widths and are about 24" long.

1 ¼ seat springs – 38.00 each
 1 ½ seat springs – 42.00 each

We have restored numbers of Yellowstone style touring coaches and built others from the ground up. We stay with original Abbot-Downing styling, so prominent around here. This coach is currently in Carbon County's Historical Museum in Red Lodge, MT

We reproduce this style coach for around \$45,000.00



Steam bent Bob-Sled Runners

We now have available one piece steam-bent bob-sled runners. We start with 9/4 ash x 5" deep and 7 foot long. The tips are tapered to 4 1/2" and bent on a 40" diameter curve. When these are finish-planed they are a full 8/4 in thickness. These runners are in the "blank" form which allows you to fit them to your old runner patterns. (This means neither the tips nor the heels are shaped) We also bend lighter runners for passenger bob-sleds, as well as cutter runners and replacement runners for buggy wheels.

Heavy Bobsled Blanks – \$60.00 ea.

Cannon Wheels



Built to 1857 Ordnance specs, these 3' x 57" wheels are for 12 Pdr. Guns. We are currently building these wheels for \$900.00 each. Spindles to fit these wheels are also available. Plans are available for a wide variety of authentic cannons, so let us know what your project needs for wheels.

ENGEL'S COACH SHOP

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