# United States Patent [19]

**Mercer**

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[54] **MOBILE MUFFLER SHOP**


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[52] **U.S. Cl.** ..... **72/455,** 72/389, 296/24 R, 296/37 R

[51] **Int. Cl.** ..... **B21d 9/00**

[58] **Field of Search** ..... 72/389, 455, 705, 7; 296/24 R, 37 R



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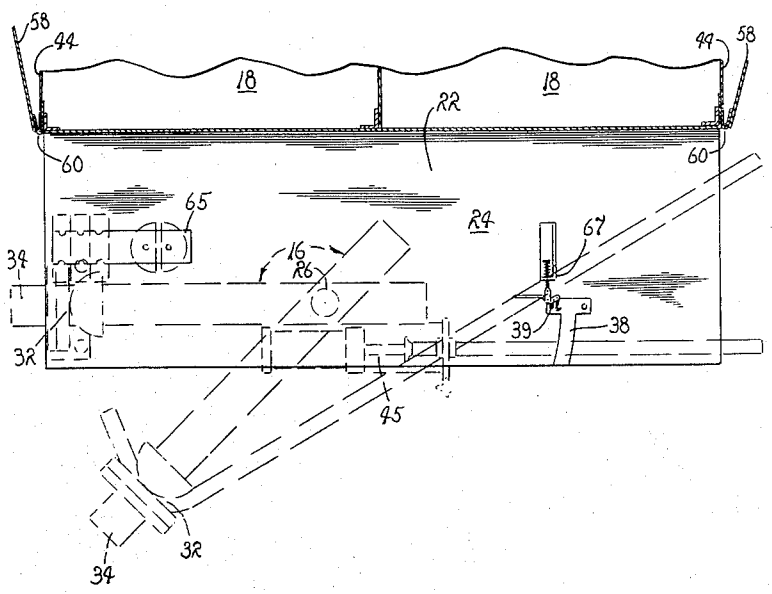
*Primary Examiner*—C. W. Lanham
*Assistant Examiner*—Gene P. Crosby



[57] **ABSTRACT**

Disclosed is a truck with a tube bender mounted on the rear and enclosed in a body which also provides storage for mufflers and tail pipes. The tube bender is pivotally mounted so it can be swung from a storage position normal to the body longitudinal axis outward to position near alignment with the body longitudinal axis for use. The body portion which surrounds the bender opens on three sides to cooperate with the pivotal movement of the bender in permitting the forming of tail pipe configurations without interference from the body.


**10 Claims, 5 Drawing Figures**



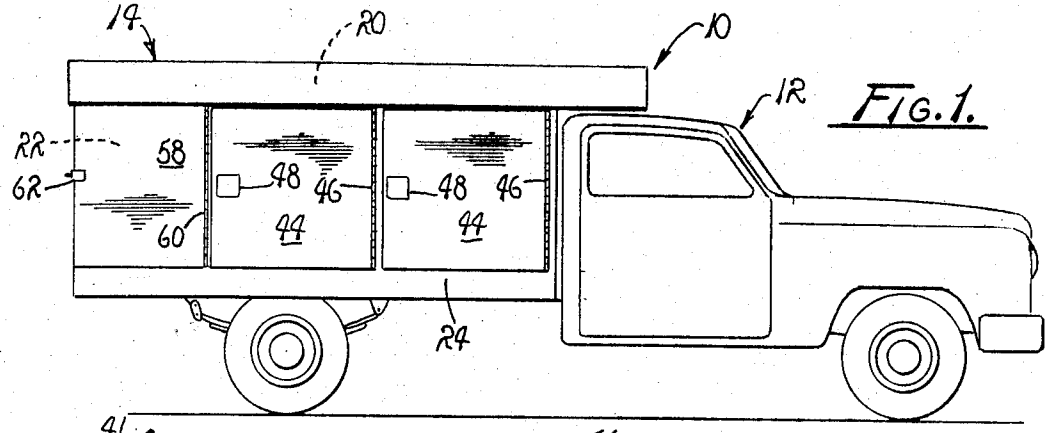



FIG. 1.

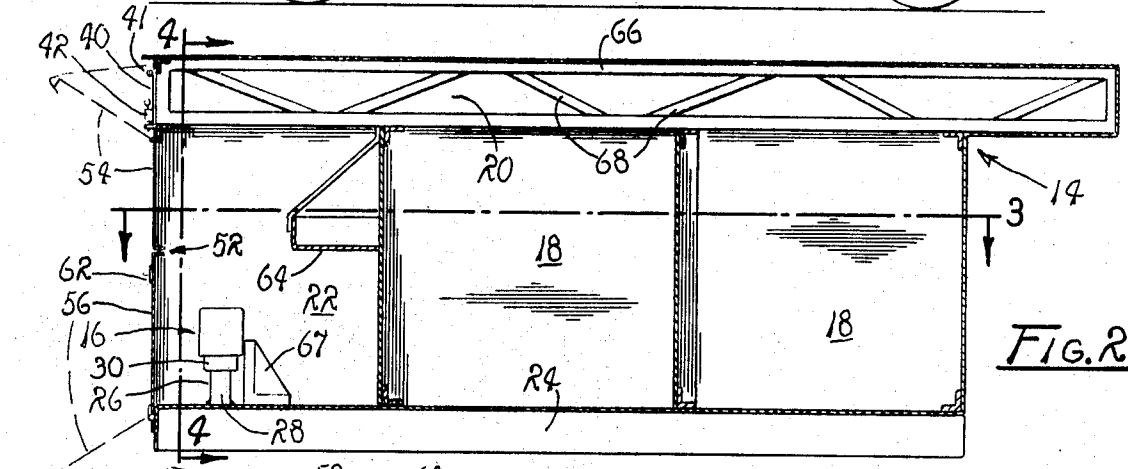



FIG. 2.

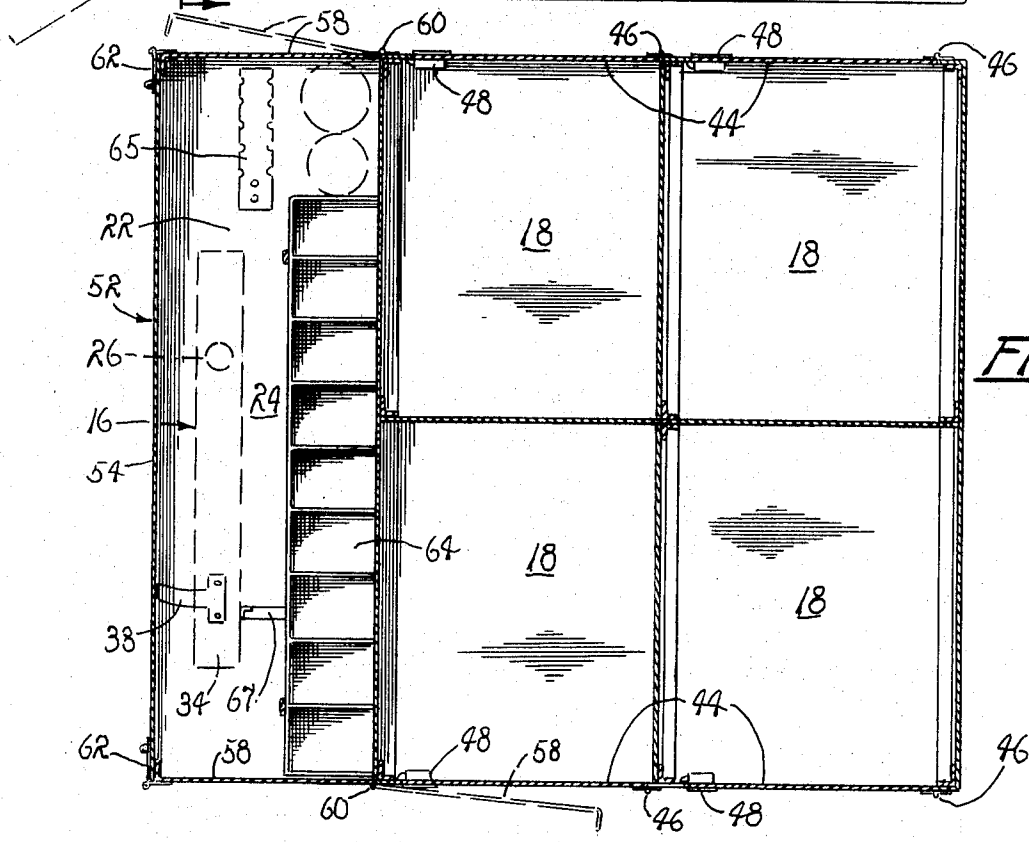



FIG. 3.

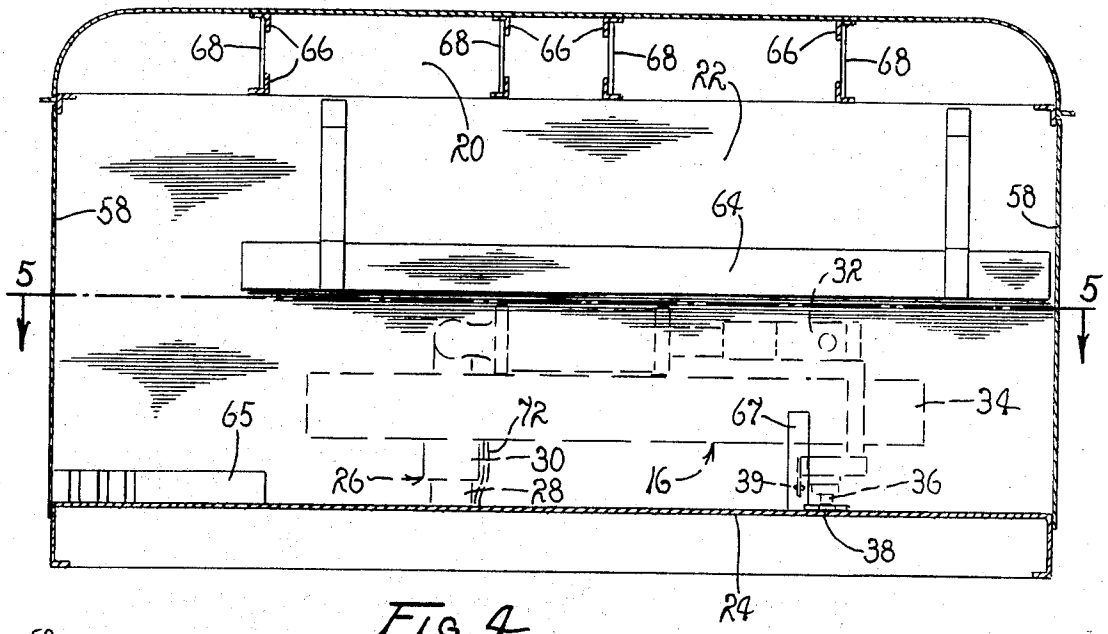

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FIG. 4.

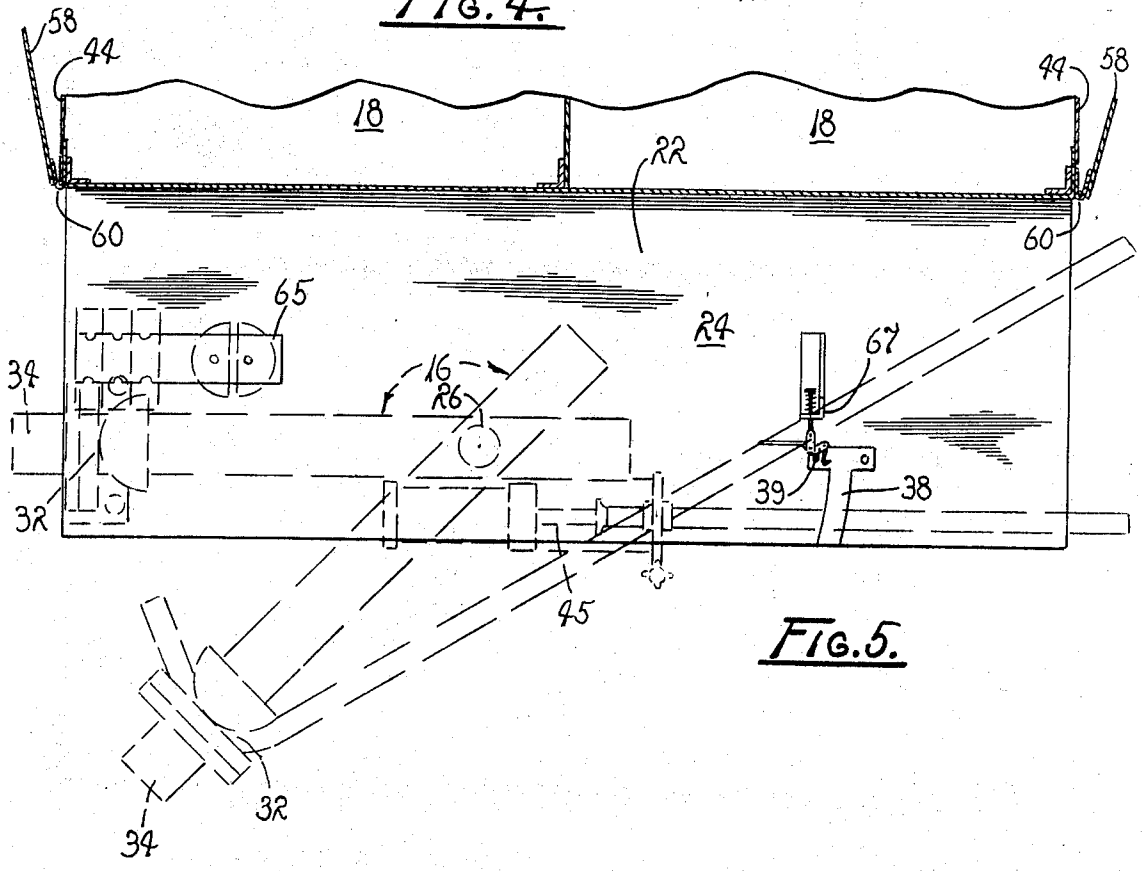

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FIG. 5.

# MOBILE MUFFLER SHOP

## BACKGROUND OF INVENTION

This invention relates to automotive facilities, and particularly to mobile specialty repair units.

In recent years auto repair has become increasingly complex and specialized. The cost of skilled labor has increased to the extent that some degree of the specialization permitted by mass production techniques has been required in order to keep repair costs reasonable. Also, customer convenience has encouraged the development of small neighborhood shops, many of which are limited in the type of equipment and the extent of inventory available to them. These changes have prompted the advent of mobile specialty shops which provide a wholesale repair service to the small garages and service stations. An example of this development is the relined brakeshoe exchange service. Mobile trucks were developed to travel from garage to garage and provide this service and not it is a well accepted practice for a brake relining job taken in by a small garage or service station to actually be done by a mobile brake shop called in by the garage man.

As automobile exhaust systems have become more diversified and sophisticated, special muffler shops have come into being. They do work either wholesale for small garages and services stations which bring in cars of their customers, or retail customers who contact the specialty shop directly. Because of the increasing numbers of different size pipes and mufflers required in inventory to supply the needs of the automobile users, and the frequent need for special tools, it has become the practice of most small garages and service stations to use specialty muffler shops for exhaust system work. The difficulty involved in this approach, however, is that the small garage man must leave his shop to take the customer's car to the specialty shop. Therefore, most small garage men prefer to have specialty work done on their own premises whenever possible. These considerations are responsible for the present popularity of the mobile relined brakeshoe service.

The need has, therefore, existed for a mobile muffler shop which can bring to the premises of the garageman a specialty shop in exhaust systems. The need has not been filled because the principal piece of machinery needed in exhaust system specialty work is the hydraulic tube bender, and prior to my invention no one had devised a practical way to mount such a machine on a truck.

It is, therefore, a major object of my invention to provide a mobile muffler shop.

It is also an important object of my invention to provide a truck installed specialty shop for repair and replacement of automobile exhaust systems which has substantially the same facilities as a fixed shop including a hydraulic tube bender but is nevertheless sufficiently compact and inexpensive to be practical.

Another object of my invention is to provide a mobile muffler shop of the type described wherein the hydraulic tube bender is carried in a bender compartment at the rear of the truck bed and is pivotally mounted so the die jaws can be swung outward from the rear of the truck to permit manipulation of substantial lengths of tail pipe.

A further object of my invention is to provide a mobile muffler shop of the type described in which the truck body is constructed with storage compartments for mufflers and tail pipes formed together with a compartment for a tube bender in such a manner that the tube bender may be utilized without interference from the storage compartments.



Still another object of my invention is to provide a mobile muffler shop of the type described which utilizes a standard one ton, single axle, dual wheel truck chassis as the supporting mobile unit. thereby providing economy, compactness and maneuverability.

These and other objects and advantages of my invention will become more readily apparent from the following detailed description of the preferred embodiment thereof and the accompanying drawings in which:

FIG. **1** is a side elevational view of a preferred embodiment of my invention;

FIG. **2** is a longitudinal section view of the body portion of my preferred embodiment;

FIG. **3** is a sectional view taken on **3—3** in FIG. **2**;

FIG. **4** is a sectional view taken on **4—4** in FIG. **2**; and

FIG. **5** is a partial sectional view taken on **5—5** in FIG. **4.**

Referring now to the drawings, the numeral **10** designates my mobile muffler shop. The mobile muffler shop **10** is a truck **12** with a special body **14** and a pipe bender **16.** The body **14** has muffler compartments **18,** two on each side of the forward portion, and a pipe compartment **20** above the muffler compartments that extends over the cab to provide the necessary length for tail pipes.

At the rearmost portion of the body **14** a bender compartment **22** is provided. The bender compartment **22** extends laterally across the chassis of the truck and houses the bender **16.** A bed **24** forms the bottom of the body **14.**

The truck **12** is a standard one ton vehicle with dual wheeled single rear axle and a four speed transmission. The four speed transmission option is used because a hydraulic pump for driving the hydraulic tube bender is coupled to the transmission as later expalined. By properly arranging the body compartments and the bender mounting I am able to achieve the necessary working and storage space using a truck of this size and, therefore, provide compactness, economy and maneuverability not available in a larger unit.

The bender **16** is a hydraulic tube bender of a type commonly used in specialty muffler shops. The model 100 tube bender manufactured by American Machine, of Thousand Oaks, Calif. has been found to work quite satisfactorily, however, there are other similar machines which would also be satisfactory. These tube benders are normally mounted on four legs with casters, however, in my invention a special pivotal mounting **26** has been devised.

As best seen in FIG. **4,** the pivotal mounting **26** consists of a mounting post **28** which is welded to the rear portion of the truck chassis and extends upward through the bed **24** a short distance to one side of the centerline of the truck. The bender **16** is equipped with a cap **30** which fits over the upper portion of the post **28** to mount the bender on the post. A pair of roller bearings (not shown) are mounted between the cap **30** and the post **28** to permit pivotal movement of the bender about the post. The cap **30** is attached to the bender frame about three-quarters of the way back

from the die jaws **32.** Since the post **28** is offset to one side of the centerline of the truck, the bender is nearly centered laterally on the truck chassis when it is in its stowed position in the bender compartment **22** (see FIG. **4**).

To support distal end **34** of the bender when it is stowed in the bender compartment **22,** a support leg **36** is provided which extends downward from the bender a short distance and engages a skid plate **38** on the truck bed **24.** When the bender distal end **34** is supported on the truck bed by the support leg **36** and skid plate **38** the bending force normally applied to the post **28** by the off-center weight of the bender is relieved. This prevents excessive stress on the pivotal mounting **26** during travel of the truck. A releasable leg latch **39** is provided adjacent the skid plate **38** to hold the bender in its stowed position.

When the bender is in use, it is swung pivotally outward from the truck bed and the rear of the chassis to permit adequate space for sections of tail pipe to be manipulated into the die jaws **32** and formed into desired shapes. When the distal end **34** of the bender is swung outward into its working position all the bending moment from the off-center mounting is reflected on the post **28** and it must be sufficiently well anchored to the chassis to withstand this stress. However, if the bender were centered on the mounting post, the distal end **34** would not swing outward far enough from the rear of the truck chassis in the working position to permit the desired degree of manipulation, in a truck of the preferred size.

The mounting of the bender must meet several criteria. First, it must be disposed laterally of and generally centered with respect to the truck chassis in its stowed position. This disposition keeps a load balance on the truck chassis. second, the bender must be so located and mounted that it can be readily exposed and positioned for work without interference with the storage compartments of the body, and still leave adequate space for storage compartments in a one ton truck.

Obviously, if a big enough truck is used, space for the bender is no problem. But where it is necessary, as it is in a mobile unit of this type, to make the unit as compact as possible then conservation of space is important.

Since benders of the type used in my invention weigh from one-half to three-quarters of a ton, a one ton truck is adequate for the bender and other tools and accessories, provided the body is designed to provide sufficient storage and working space. By my body construction and bender mounting arrangement I have provided sufficient storage space and still avoided interference with the body by the pipe being manipulated in the bender jaws. My resultant mobile muffler shop is only 8 feet wide so it meets highway width restrictions and has a wheel base of about 11 feet and an overall length of about 18 feet, so it is readily maneuverable in city traffic.

As best shown in FIG. **5,** it is possible with the pivotal mounting of the bender to bend a tail pipe section to an angle of less than 90° with each end of the pipe extending from the jaws a distance sufficient to reach the storage compartments of the body when the bender is at an angle of approximately 45° from the truck's longitudinal axis and to achieve a 180° bend in such a tail pipe by pivoting the bender toward a 90° angle to the truck's longitudinal axis. Therefore, by properly maneuvering the pivotal position of the bender nearly any desired tail pipe configuration can be achieved and yet a minimum amount of body space is required and the bender is quickly changed from stowed to work condition.

The tail pipe compartment **20** has a door panel **40** at its rearward end which has a hinge **41** along its top edge, and a door lock **42** to hold it closed.

The muffler storage compartments **18** each have access doors **44** mounted on hinges **46** to swing outward to the sides of the truck. The access doors **44** also have door latches **48** which prevent unauthorized access to the muffler storage compartments.

The bender compartment **22** has rear doors **52** consisting of an upper door **54** and a lower door **56.** The doors are hinged at their upper and lower edges respectively and the upper door interlocks with the door panel **40** of the tail pipe compartment to lock each door in its open position (see FIG. **2**). The lower door **56** hangs down from the rear of the load bed when open and is latched to the upper door **54** by hasp **57** when both doors are closed. To keep the distal end **34** of the bender from moving forward from its stowed position a stop **67** is provided on the skid plate **38.**

The bender compartment **22** also has a pair of side doors **58** hinged on their forward edges **60** to swing forwardly against the access doors **44** of the adjacent muffler compartments **18** (see FIG. **5**). When the rear doors **52** and the side doors **58** of the bender compartment **22** are fully open and the bender is pivoted outward into its working position, the bed **24** of the compartment forms an open workbench and space is provided at each side to manipulate a tail pipe in the die jaws **32** of the bender. Lock hasps **62** are provided at the corners of the bender compartment when the side doors and rear doors join to provide locking means when the compartment is closed. Parts bins **64** are provided along the front wall of the bender compartment to store mounting brackets and other accessories and a die holder **65** is provided to store dies for the bender jaws.

To give strength to the top of the body **14,** the tail pipe compartment **20** is longitudinally divided by stringer walls **66** supported by diagonal braces **68** (see FIGS. **2** and **4**).

Since the bender is hydraulically operated, a hydraulic system is incorporated into my shop **10.** The system consists of a hydraulic pump (not shown) which operates off the truck transmission and hydraulic lines **72** which pass up through the bed **24** into the bender compartment **22** and connect with the bender **16.**

## OPERATION

The operation of my mobile muffler shop **10** is as follows. The shop is transported to the use site on the truck **12** and parked in a convenient location. Since a principal advantage provided by the mobile muffler shop is its facility to form a tail pipe to match the one being replaced right at the job site and thereby eliminate the need for small garages keeping a large inventory of tail pipes and mufflers, the operator first measures up the old exhaust system. Next, he opens the rear doors **52** and side doors **58** of the bender compartment **22,** releases bender leg latch **39** which latches the support leg **36** on the skid plate **38,** and pivotally swings the distal end **34** of the bender outward beyond the rear of the truck. He then acquires a straight tail pipe piece

of the desired length and diameter from the tail pipe compartment **20.** Working from one end of the tail pipe section, he commences putting in the bends required by placing the appropriate dies in the bender jaws **32** and hydraulically actuating the bender **16.** He avoids interference between forward portions of the body **14** and the tail pipe by swinging the bender distal end **34** pivotally about the post **28** to maneuver the tail pipe.

The bender **16** also has a hydraulic press **45** for flaring tail pipe ends and otherwise tailoring the pipe to the system.

When the tail pipe is formed, he selects a proper muffler from his inventory in the muffler compartments **18,** and completes his new exhaust system. He then cuts out the old exhaust system with a cutting torch and installs the new one.

After completion of a job at one location, the operator swings the bender **16** back into its stowed position in the bender compartment **22,** and closes and latches the doors. He then drives to the next location and commences his work again.

From this description it will be understood that I have provided a compact, economical and very maneuverable mobile muffler shop which can fill the need for a specialty muffler shop on wheels. It should also be apparent that my invention is fully capable of attaining the other objects and achieving the advantages heretofore attributed to it.

I claim:

**1.** A mobile muffler shop comprising:

a mobile chassis;

a body mounted on said chassis and having a pair of oppositely disposed body sides and a pair of oppositely disposed body ends;

a tube bender having a proximal end mounted in said body adjacent a first of said body ends, and a distal end with bending jaws, said tube bender being pivotally mounted on said chassis for swinging movement from a stowed position with said bender extending between said body sides to a variety of work positions with said distal end extended outwardly beyond said first body end; and

storage compartments formed in said body adjacent said tube bender and disposed to store muffler supplies, said storage compartments being positioned to avoid interference with a tail pipe disposed in said tube bender bending jaws, when said bender is in said work positions.

**2.** A mobile muffler shop as described in claim **1,** in which:

said pivotal mounting is so disposed with respect to said bender and said body that said bender is pivotally movable from a stowed position laterally disposed with respect to said body and substantially centered between said body sides, to a variety of work positions including a position longitudinally aligned with said body with more than half the length of said bender projecting rearward of said first end of said body.

**3.** A mobile muffler shop as described in claim **2,** in which:

said work positions of said bender further include a position wherein an acute angle is formed between straight lines from the bending jaws of said bender to the most laterally extended portions on each side of said storage compartments.

**4.** A mobile muffler shop as described in claim **1,** in which:

said mobile chassis includes a truck having a load capacity of one ton or less; and

which further includes a hydraulic drive system for driving said tube bender including a hydraulic pump driven from the transmission of said truck.

**5.** A mobile muffler shop as described in claim **2,** in which said mobile muffler shop further includes:

a bender compartment formed adjacent said first end of said body and including enclosure means operable to enclose said bender and to open to expose said bender from said first end and said sides of said body.

**6.** A mobile muffler shop comprising:

a truck having a load capacity of less than 1½ tons, a cab adjacent the forward end and a load bed extending rearwardly from said cab and having a rear end and oppositely disposed sides;

a tube bender mounted on said load bed adjacent said rear end;

a body mounted on said load bed and having a muffler storage compartment, a tail pipe storage compartment and a bender storage compartment; and

mounting means interconnected between said tube bender and said truck and disposed to movably mount said bender on said truck for movement from a stowed position within said bender storage compartment to a variety of work positions in which portions of said bender extend outside said bender storage compartment.

**7.** A mobile muffler shop as described in claim **6,** in which:

said bender storage compartment of said body is disposed at said rear end of said load bed and has closure means operable to enclose said bender and retractable to expose said bender from the rear and each side of said load bed.

**8.** A mobile muffler shop as described in claim **6,** in which;

said bender storage compartment of said body is disposed at said rear end of said load bed, said muffler storage compartment is disposed between said bender storage compartment and said cab, and said tail pipe compartment extends longitudinally of said truck and above said bender storage compartment, said muffler compartment and said cab.

**9.** A mobile muffler shop as described in claim **8,** in which:

said bender storage compartment has closure means operable to enclose said bender and retractable to expose said bender to permit movement thereof to said work positions, said muffler storage compartment has an access door operable to permit access from a side of said load bed, and said tail pipe storage compartment has an access door operable to permit access thereto.

**10.** A mobile muffler shop as described in claim **7,** in which:

said mounting means includes a pivotal connection between said bender and said track so disposed that said bender extends laterally between the sides of said load bed and is substantially centered therebetween when said bender is in its stowed position, and said bender has a distal end with jaws which extend out of said bender storage compartment and

rearward of said rear end of said truck when said bender is in said working position, and said distal end extends rearward of said truck rear end a distance sufficient to permit an acute angle to be formed in a tail pipe section disposed in said bender jaws without interference between said bender storage compartment and the ends of said tail pipe section.

* * * * *