

ENGINEERING

Amputees Can Drive

Special devices will make it easy for disabled veterans to operate any make of car. Hand service brake control permits a man without legs to stop quickly.

By MARTHA G. MORROW

➤ MANY veterans who have lost an arm or leg are asking "Will I be able to drive a car?" They and their friends may be assured that if they really want to drive, they undoubtedly will be able to do so.

Men today who have lost both legs, an arm and a leg, or both arms, are passing the most exacting driving tests, having been taught to drive safely despite their handicaps. Some who had never driven before have painfully mastered the intricacies of driving and now hold driving licenses from their home states. Sure, they can drive, either their own car or a friend's!

The more seriously injured men, and those who want ease as well as safety in driving long distances, may look forward to owning a special set of controls which can be installed in any standard car. Already demonstrated at several Army hospitals, these devices which enable an amputee to drive with one foot, one hand or mechanical hooks, will probably be on the market within a few months.

12,500 Already Drive

Many of the 12,500 men who lost either arms and legs fighting in Italy, France, Germany and the Pacific areas have already demonstrated that they can drive standard automobiles without special aids, and do so as expertly as a good driver with both arms and both legs.

Early this year an instructor training course was given at Walter Reed General Hospital, Washington, D. C., by the American Automobile Association. Looking for those slight but all-important variations between the way an average person drives and the manner in which an amputee can drive best, the AAA's general plan of driver training was adapted to meet the special needs of the wounded men. Representing the seven amputation centers, 26 Army instructors, some themselves lacking an arm or a leg, were trained to teach driving with dual control cars.

"Behind the wheel again!" brag hun-

dreds of servicemen who are regaining confidence in their ability to drive, while others, handling a car for the first time, look forward to the time when they will earn their drivers' licenses.

A recent demonstration at one of the Army hospitals, which exhibition can probably be equalled at other amputee centers throughout the country, showed the men driving around obstacles, stopping short and parking in a manner that few old-time drivers could equal.

Gauge Space Well

A private whose left or clutch leg had been amputated above the knee drove both forward and backward on a straight line 100 feet long. Despite his limitations, he certainly "toed" the line.

Another soldier, who lost his leg below the knee, demonstrated his ability to gauge space when steering in close limits, readily avoiding the obstacles both when driving forward and when backing. A lieutenant whose right leg had been amputated stopped smoothly in 40 feet when driving 20 miles an hour. Another, who had lost his right or brake leg below the knee, stopped the car with his front wheels, and then the bumper, right over the yellow line, then repeated the performance for his back wheels and bumper.

Another test required in order to qualify for the driving certificate of the AAA was demonstrated by a soldier, both of whose legs were missing above the knee. Quickly moving his artificial legs with his hands when necessary, this private parked parallel in the only kind of parking space you are likely to find in a crowded city block. He now holds two driving licenses—and are his fellow-patients proud of him!

Next to learning to walk, driving is highest on the list of favorite courses at these hospitals.

One of the chief difficulties has been in convincing state authorities that the men can drive as safely as those with all limbs. For years some states have required that people with hands, feet, arms or legs missing have specified mechanical aids. Other states permitted the license

applicant to select whatever equipment he felt he needed, merely demanding that he demonstrate that he can drive safely.

Progress is being made in this connection. Amputees at Percy Jones General Hospital, at Battle Creek, Mich., for instance, who complete the driver training course, after passing a driving test given by the Michigan State Police, are issued drivers' permits that are valid in four other states as well.

Officials of the American Association of Motor Vehicle Administrators are now working to simplify the granting of driver's licenses to disabled servicemen. This will enable those who are given drivers' examinations by state licensing officials in the various hospitals to acquire licenses for operating an automobile in their home states.

Devices which may soon be available to help disabled GI's drive more easily and safely resulted from research and actual tests carried on during recent months as a cooperative effort of the office of the Army's Surgeon General, the Society of Automotive Engineers, the Automobile Manufacturers Association



DRIVING AIDS—A few easy-to-manipulate devices are shown. Notice the steering wheel rod attached to the steering wheel, bar joining the foot pedals and extension on the accelerator. No veteran will need all of the special devices.



LITTLE TRAINING NEEDED—Specially designed devices will make it possible for the legless soldier, shown inspecting the car during a recent demonstration at Walter Reed General Hospital, to drive safely with little training.

and the American Association of Motor Vehicle Administrators.

After cataloging all the known devices—in the past many a local mechanic was called upon to create a special gadget for a cripple or infantile paralysis sufferer—the engineers set out to improve and simplify the devices, and to invent new, basic and simple aids.

As the gadgets were developed, they were installed in a car at Percy Jones General Hospital for testing. The car was successfully operated by men who each had lost from one to three limbs. As the men drove the auto and offered suggestions, further refinements and improvements were made. It was discovered, for instance, that the need for special devices is actually much less than had been anticipated.

To lower the expense of purchasing and installing the special equipment, vehicle manufacturers plan to supply packaged units which can be installed in any standard make of car by the neighborhood mechanic. The power to operate the brakes or clutch is gained from a vacuum power cylinder and control valve placed beneath the hood of the car.

These special devices will not interfere with other members of the family who want to drive the car in the usual

manner. It may be, however, that others will find some of the conveniences useful on long drives and changes in the design of all automobiles eventually result from this study.

Devices Listed

No passenger car will ever need to be equipped with all the gadgets which have been developed for attachment to steering wheel post, dashboard or foot pedals—the type of disability determines which aids will be needed.

About 95% of those who have lost limbs in this war have only one arm or one leg missing. Those who have lost one leg number 9,625, three-fifths of these having lost the leg below the knee, so that their control over the artificial leg is greater. Thus far 2,875 men will return to civilian life minus an arm. Civilians also, who have lost an arm or a leg, will benefit by the training and research now being conducted to make it easier for amputees to drive.

A number of driving aids will accommodate scores of combinations of limb amputations and impairments:

Modified steering-wheel knob can be firmly gripped by a mechanical hook or artificial hand.

Hand starter control does away with

the familiar foot starter button.

Steering wheel throttle and brake levers, extending either to the right or left from the steering column as desired, make it possible for a man without legs to stop the car or step on the gas.

Clutch-pedal bar permits a one-legged man to operate either clutch or brake pedal or both at the same time.

Accelerator treadle extension lets the accelerator be operated by either foot.

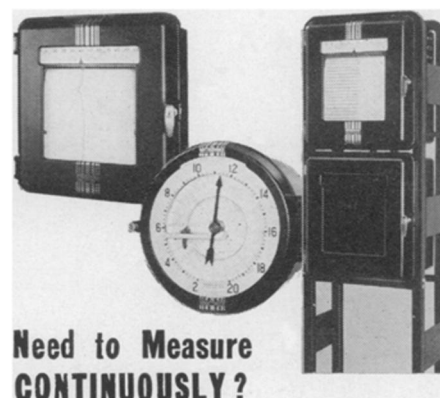
Hand service brake control permits a man without legs to stop quickly.

Automatic clutch control allows operation through accelerator treadle or interconnecting hand throttle control.

Electric direction signal eliminates hand signaling for turns.

Hill-holding device, connected with the brake and clutch, prevents the car from rolling backwards on an incline.

These devices, now receiving their final preliminary approval, will probably be available within a few months. Only a short time is needed to become accustomed to them. Prices have not yet been determined, but no profit is anticipated through their distribution. In fact,



Shown here are three Recorders for reliable measurements with any null-type electrical measuring circuit: Model S strip-chart Micromax draws an exceptionally detailed record—shows as many as 16 points. Model R round-chart Micromax indicates with unusual clearness—can record one or two points. Speedomax Recorders measure and record with exceptional speed. We'll be glad to send catalogs.

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Do You Know?

Sweet potatoes will not stand frost, nor grow well in cool weather.

Mobile *flour mills* for liberated areas in Europe are being made in England.

Lobster eggs develop for approximately 10 months under the tail of the mother.

Flying insects have descended from wingless ancestors.

A portion of *blood plasma* leaves the capillaries to form tissue juices and is returned to the blood by lymphatic vessels.

Tomato juice is usually the most practical alternate for citrus juices at times when oranges and grapefruit are scarce or expensive.

Vegetables to be *quick-frozen* need not be sterilized but should be subjected to a blanching or scalding process to prevent loss of color, flavor, and nutritive value during the freezing storage.

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ALL AMERICAN
Tool & Manufacturing Co.
1014 Fullerton Ave., Chicago, Ill. (14)

one auto manufacturing company has already announced that special equipment will be provided free of cost to

disabled soldiers who drive that particular make of car.

Science News Letter, August 11, 1945

PSYCHIATRY

Unaware of Others

► AN unusual mental illness affecting children of intelligent parents in which the small patients live in a strange world of their own completely without people has been observed by Dr. Leo Kanner, child psychiatrist of Baltimore. Nearly half the families of these children are represented in *Who's Who* or in *American Men of Science*, or both.

Loving hands dressing or caring for these children are to them just hands—objects not belonging to any person. And when an adult takes away a toy or steps on something the child wants, the child becomes angry at the offending hand or foot but never so much as looks up at its owner.

Seven of the 20 children so far observed with this illness have never learned to talk, but even those who did learn to talk did not, over a period of years, use language to convey any meaning to other people. They usually do not pay any attention when they are spoken to and show no interest whatever in conversation going on around them.

Although, at one time or another, all of these children have been thought to be feeble-minded because of their strange behavior, actually all have good intelligence. Some were even considered as infant prodigies. One little boy, Charles, in a family with considerable musical talent was able at the age of only a year and a half to discriminate between 18 symphonies. He recognized the composer as soon as the first movement started and would say his name. Paul at three years knew the words of 37 songs as well as many nursery rhymes.

But the tragedy of the illness is summed up in the words of Charles' mother, "The thing that upsets me most is that I can't reach my baby." Apparently from the beginning of life these babies have lived alone "in a shell" and shut out, ignored, disregarded anything that came to them from outside. Nearly every mother reported that never had her baby held up his arms to be picked up.

Left alone, however, the children seem happy and they handle inanimate objects with skill and pleasure.

They have an anxiously obsessive desire for sameness. Changes of routine, of surroundings, even of furniture arrange-

ment may be violently upsetting to them.

Dr. Kanner raises the question as to whether the gifts of the parents might not have actually contributed to the illness of their children. For the most part, parents, grandparents, uncles and aunts are persons strongly preoccupied with abstractions of a scientific, literary, or artistic nature and are limited in genuine interest in people. Even some of the happiest marriages are rather cold and formal affairs.

And yet the children's aloneness from birth makes it difficult to attribute the illness entirely to relations with the parents.

Science News Letter, August 11, 1945

Different varieties of *tomatoes* have different amounts of vitamin C.



JUST HANDS—Mother's hands dressing or caring for her baby are only hands and nothing more to the infant suffering from an unusual mental illness of children of intelligent parents. The child never looks up at the person belonging to the hands. This photograph was posed by the Science Service staff photographer, Fremont Davis, to show how a child with this illness might react to a mother's care.