but with a strong, thick flannel, especially manufactured for this use.

The proper automobile cap, with an extra long face-mask and goggles combined, and a pair of earmits, ought to keep any head comfortable during fast going on cold days. The hands are best protected by fleece-lined buckskin gauntlets with cuffs wide enough to take the sleeve and hold it in.

As a rule the novice chauffeur will do a great deal of thinking to make his initial tour a success, and generally he returns to his starting place—unless the railroad carries him—finding that he has been doing his most sagacious thinking on the wrong side of the problem. He thought of rain storms and took a mackintosh with him; he thought of a scorching sun and provided himself with a monster Panama hat; he thought of cold feet and added a footbag of furs to his inventory. Now, as a matter of fact, a mackintosh is a most irritating kind of garment when automobiling in a rainstorm. It has a tendency to fly up over the knees, interfere with the quick handling of levers, and is invariably stepped on or torn, on leaving the vehicle hurriedly. Between a kite and a Panama hat for automobiling there is but little choice, only a difference in the time elapsed before it flies off. Nothing equals a footbag for overheating the feet, and ensnaring them in such a way that if you leave the vehicle in a hurry, you are pretty sure of striking the ground head first.

In place of the mackintosh, which only affords partial protection, get a seaman's suit of oilskin clothes, which is sure to protect you completely under the most adverse weather and road conditions, while it is out of the way all of the time. Several of the contesting chauffeurs in the great New York-Buffalo Endurance Trial were only too happy to exchange their insufficient and impractical outer garments for an oilskin jacket, a pair of trousers and a so'wester to match.

Instead of the fur bags or similar contrivances for keeping the feet warm during the cold season, it is advisable to dress the feet so comfortably that they will be able to retain their natural heat even in frosty weather. The men employed in the ice-harvesting business on the Great Lakes have solved this problem in a very thorough manner. Adopt their footwear and you need never bother with furbags, soapstones and such cumbrances. Briefly described, this footwear consists of a coarse, heavy-soled rubber, laced boot, into which is slid a sort of thick felt stocking reaching to the knee. The leg is thrust into the felt stocking. This arrangement affords a rubber covering to fight off dampness, a felt shell to fight off the cold, and a trouser-leg and a pair of woolen stockings to retain the heat of the limb. Heavy woolen or flannel underwear under a sporting suit and a heavy-weight sweater ought to give comfort, especially when a corduroy-lined leather coat is the outer garment.

Furs are not advisable for long-distance touring, whereas they yield much comfort during a few hours of driving, and suggest an air of style not obtainable with more sensible clothing. Furs could be made preferable as an all-around winter garment if we would but learn from the Eskimos how to ventilate fur clothes, but there is no indication that we will ever take the hint.

During the summer season, instead of the ubiquitous Panama, the Japanese palm-leaf sun-hat will be found more practicable, since it will not fly off during the swiftest pace. The regulation auto cap, of extra light stock, would be the ideal headgear, if such caps could be had with the sweatband constructed in the same manner as that of the English army sun helmet—but hatters have yet to dream of this. A khaki suit with trousers cut on the cavalry order, so as to permit of canvas gaiters or leather leggings on the legs, would be one of the most practical things for summer wear.

Next in importance to practical clothing comes such luggage as the chauffeur may care to take along, either for his personal comfort or for camping by the roadside. The best of sportsmen in Europe are already beginning to patronize the "camping-out" idea.

To fit out an automobile for a long continuous tour, camping by the roadside, is equivalent to making the machine your nomadic home for the time being. There is nothing impracticable about it, for when a soldier is able to carry on his back his entire camp outfit in addition to his weapons, the smallest automobile on the market ought to carry everything needed to make its passengers comfortable in camp.

Breakables should be avoided entirely. Things that may be duplicated in any country store should not be given space unless "unknown regions" are to be invaded. Combustibles are to be discountenanced. A canvas tent on the military order with a folding center pole will house two people in good shape. A rubber air-mattress furnishes the best possible resting device. It is easily and quickly inflated, and can be rolled snugly to the size of a man's arm, taking up but a minimum of space. It is the best protection against ground moisture. An air cushion for a headrest, and an army blanket for bed covering, complete the camp bed. Before going to bed, be sure to lock the manipulating devices on your automobile so that no one may appropriate the carriage while you sleep. You might also place a good six-shooter under your pillow. You will sleep just as well, and it might come handy. When you make up in the morning, your breakfast is, or ought to be, in the basket you are carrying with you strapped to the stern body of the vehicle. Most of the basket outfits made for touring are most adorable objects of admiration, fit almost for a jeweler's showcase, but when you come to use them on the road your fancy is made to take many a sad shock. A better auto basket than any of those retailing from fifty to two hundred dollars can easily be improvised for a small amount of money. A wicker basket of the size of a small steamer trunk will do. Have a water and dust-tight cover of rubber made to fit it snugly with leather mounting on the corners. Arrange straps on the inside of the lid to hold several plates, forks, knives, cups, saucers, etc., together with the necessary cooking utensils for making meals readily and conveniently. All such utensils should be of aluminium. A moderate supply of spices and groceries may be packed in a wooden box so as not to be mixed up with the other contents. If the tour is through a hunting or fishing region, the chauffeurs ought to be able to supply their own "table" by some skill with the rod and the gun. In fact, this would give a genuine zest to the entire undertaking, and afford the intrepid sportsman a solid feeling of having gone to the bottom in the matter. If the tour is through populated country districts, most of the camping is likely to be done in village inns, while the cooking, in such a case, would be intrusted to the innkeeper's "chef." To make an automobile camping trip a success you must choose an out-of-the-way route that will compel you to camp out and "do" yourself.

Something that is almost always invariably overlooked in making up an outfit is a supply of drugs, medicines and plasters. Accidents are liable to happen in a hundred unthought-of ways, and sometimes minor bruises and scars from slipping or falling become quite annoying from not being attended to promptly. A man not accustomed to use his hands for manual labor is practically doomed to hurt himself more or less during a long-distance trip involving the going into camp nightly.

A canvas folder with pockets for various-size bottles, boxes and rolls, containing drugs and medicines, would in the majority of cases be found to be of practical use.

The personal effects of two passengers could easily be packed in two portmanteaus, as all that is needed, besides the clothes they are continually wearing, is changes of underwear and stockings, handkerchiefs, extra pair of shoes, and such little extra items as the taste of the chauffeur may fancy and the season of the year may require. The point should be to take along as little as possible and yet be comfortably fitted out.

Having followed this outline in the main the intending auto tourist should take special care in packing his outfit. Careless packing will make the most ingeniously chosen outfit sound like a barrel of tin cans. Everything needed can be packed in three pieces. First, the rubber-covered basket. Pack the rubber mattress, tenting, and the blankets in that to prevent rattling of the eating and cooking utensils. Second, the portmanteaus with clothing, medicine, etc. Third, a canvas-incased rod and gun strapped together, and put in a cylindrical leather case with rubber covering.

AUTOMOBILE NOTES.

A motor exhibition will be held in Copenhagen from April 11 to 27 next.

Italy's King has passed an examination before the Commissioners of Police and has been granted a license to operate his vehicle within the limits of the Eternal City.

It is said that Fournier, the celebrated French chauffeur, received $50,000 for the use of his name alone, without services, in the recent incorporation of an American company bearing his name.

Entries for the international blue ribbon event of the year will this year be confined to English and French machines. Several American firms had expressed an intention of entering vehicles but failed to do so.

The Automobile Club of America will inaugurate the next summer's campaign with a 100-mile endurance run and mile and kilometer time trials. No date has as yet been set for the "carnival," which will consume two days.

An honest enemy has at least the respect of his adversary. San Francisco boasts of an association of stable and carriage owners, and at a recent meeting the members came out flat-footed with a resolution to the City Council asking that body to forbid the use of the public parks to self-propelled vehicles!

An evidence of the growth of the automobile industry in this country may be had from the statement that the repair and disposition of second-hand vehicles has become a most important part of the business of every dealer. As was the case in the palmy days of the bicycle, wealthy automobile operators "trade in" their old machines each year for new ones of the latest pattern.

Those in charge of Cleveland's parks have no nonsensical notions regarding self-propelled vehicles. The privilege of operating lines of public conveyances therein is let out annually to the highest bidder, and the powers that be have intimated that they would prefer to have automobile service.

American automobilists entering Canada from the United States in their own vehicles may now do so duty free. The regular duty of 25 per cent is still assessed as usual when crossing the boundary line, but it is returned if the vehicle recrosses the frontier within six months. A full description of the machine, together with a statement of the probable time it will remain in the country, must, however, be filed with the customs authorities.

An automobile tire of the single-tube pneumatic type that is meeting with much favor has the tread "armored" with vulcanized rubber. This armor is in four parts, its central portion being supported by a core of pure rubber, side pieces of slightly vulcanized rubber supporting the core, the whole being incased in an outer covering of tough, thoroughly vulcanized rubber. The feature of this tire is that, despite the fact that it is practically non-puncturable, it still retains all the resiliency of an unarmored tire.

An interesting instance of the application of the automobile principle to commercial uses is given in the outfit recently furnished by the Electric Vehicle Company, of Brooklyn, N. Y., to the Hall Safe Company, of the same city. A heavy truck supplied with three motors—two of which drive the rear wheels, the third used for hoisting safes—makes possible a great saving of time and labor in the work of installing heavy receptacles for valuables. A comparison of the utility of the new scheme with the former plan of installation shows that in placing a 4-ton safe on the seventh floor of a building but three men are required as against eight, and but 6½ minutes are necessary as against 2½ hours.

A punctured tire is rendered a practically negligible quantity by the combination pneumo-cushion tire of F. W. Skinner, of Valley Falls, R. I. A transverse section of this tire shows an inner air chamber taking up about half the space within the tube, the outer or tread portion having its inner face (resting on the covering of the air chamber) shaped like an arch, the center of this arch being hollow. This and the space on either side of the crown of the arch form a cushion which protects the inner pneumatic section from puncture unless the penetrating object be quite long and the angle direct. This combination of the pneumatic and cushion principles is said to possess all the resiliency of the average pneumatic tire designed for heavy automobile use.

One of the inconveniences connected with the operation of a gasoline vehicle is the necessity of starting the motor from the outside by means of a crank. Among the various devices to obviate this, that of Walter Mitchell is not the least meritorious. Keyed on the motor shaft is a hub having a ratchet face that can engage with corresponding teeth on the hub of a disk that supports a spiral spring. This hub and disk are free to turn on another hub extending into it from the right and having at its right side a face that is adapted to engage a friction clutch keyed to the shaft. The engaging of the friction disk with its corresponding male member, and moving the spring disk and the teeth on its left and longitudinally on the shaft are done by means of a clutch lever. Longitudinal separation of the hubs of the two disks is provided against by a pin or pins in the one engaging an annular groove in the other—the two disks being thus left free to revolve independently. One end of the spiral spring is fastened near the periphery of the spring disk and the other (inner) end to the hub of the clutch disk. On the peripheries of both the spring and clutch disks are ratchets which are engaged by spring pawls connected with the clutch lever. When the clutch disk is revolved by contact with the friction clutch it coils up with the spring, the spring disk being held stationary by engagement of the ratchets with the spring pawls, whose outer ends are immovably connected with the vehicle frame. When fully wound up the friction clutch is disengaged and the spring pawl prevents reverse rotation of the clutch disk. The parts remain in this position in readiness for use. When it is desired to start the engine the clutch lever is moved to cause the toothed ratchet on the hub of the spring disk to engage the ratchet on the hub that is keyed to the shaft. This hub has an inclined face that causes an arm on the spring disk to release the pawl that holds this disk against revolving. The release of this permits the coiled spring to act directly on the shaft and to throw the engine over, compressing the charge, until one or two charges have been exploded, when the engine is in operation.