to sink down into the water basin, from which it might be recovered and utilized.

A porous dam 130 feet long was built across a narrow place in the channel. At one end a 40-foot wing set at right angles was constructed. There is one main barrier for the full length and two supplemental front barriers. Iron posts 3 inches in diameter or angle irons were planted in the stream bed and given a height above it of perhaps $6\frac{1}{2}$ feet. Wire guys were anchored upstream back of the posts and served to assist the posts in resisting downstream thrusts. These wires were perhaps $\frac{3}{4}$ -inch in diameter and reached back, say, 10 feet. There might be several guys to a post, the conditions naturally ruling in the matter. The anchorages were made to heavy boulders and were apparently sufficiently secure, as they withstood a flood in February, 1920. The upright posts were connected up by means of angle irons, and the frames thus produced were covered with wire mesh. This consisted of a fabric made of $\frac{1}{4}$ -inch wire leaving 6-inch apertures. The fabric was, at the bottom, carried upstream for about 16 feet and the apron so formed weighted with boulders.

The February flood tried out the dam. After it was over, the structure was seen to be undamaged. On February 22, the water was flowing over the top of the upper dam in a stream 4 feet deep. On the following day, the water had dropped 3 feet, but was of course still covering the structure.

It is claimed that the back-cutting action of the overflow from a built-up dam of this description differs from that which occurs in the case of the ordinary solid dam. The inventor says: "After this mattress is completed, the overflow then acts exactly as it would in the case of the solid dam, with the difference that the back-cutting can only proceed to where it encounters the mattress previously built by the stream itself, when the menace ceases. With a solid dam, when the back-cutting reaches this same point, it connects with the water percolating from the reservoir and a channel is apt to be opened under the structure, which automatically enlarges until the solid dam fails."

The stream here resisted has a gradient of nearly 4 per cent. It may be almost or quite non-existent or it may have a depth of 4 to 8 feet and width of 500 feet. Boulders and small pieces of solid matter are carried or rolled along by the swift current. Bed rock is everywhere out of sight near the location of the dam, covered up doubtless by the material brought to the spot and deposited in the years gone by.

The foregoing account refers to a system patented by Mr. Pratt June 4, 1918. A basic idea of the scheme contemplates the establishment of a central series of dams located along the longitudinal line of greatest depression in the bed of the stream. These dams will be of short or moderate cross-section and do not seek to dam the entire stream. In fact, each may be only a fraction of the cross-section of the stream in flood. The one located farthest downstream is set at any point considered favorable. The next upstream from it will have its bottom on a level with the top of the first or perhaps a trifle lower. The successive dams of the central series, as one goes upstream, will have their bottoms at the level or a little below the top of the next dam downstream in the series. This central series serves to locate and define the course of the stream at all times whether it is in flood or not. To each side of it, another longitudinal series is also arranged. The foremost dam in each series will be abreast of the leading dam of the control course, but set at a level such that its bottom will be at substantially the same height as the top of the dam in the central series. The next dams upstream in these side series will be similarly located with respect to the next dam upstream of the central line. And so on up the river. Other side series are similarly set up, the bottom of any dam in a trans-

verse series being at substantially the same level as the top of the adjacent dam on the side of the center of the stream. The ends of dams are now connected with the ends of others downstream that are at the same level. Compartments will thus be formed of rectangular plan. The wire-mesh walls toward the center and downstream are at the level of the tops of the mattresses formed in the adjacent compartments. When the mattresses are all complete, the whole affair will be a series of steps whether one views it crosswise or longitudinally. The stream will flow between two flight of steps.

The steps tend to become permanent elements in the stream bed because of the sand and other hard and imperishable material arrested by the mattresses of vegetable debris that form. If there should be a poor natural supply of such debris, the deposition of sand and the like might have to be assisted either by using a closer mesh or by providing vegetable waste. What is essential is that the water be checked in its flow, as this is the manner of getting deposits to form. Of course, if there is quite a flow of small boulders, these may become an equivalent of vegetable debris. They will be halted by the wire mesh and build up a loose, open pile. This in turn will check the impetus of the water and bring about the deposition of sand and the like.

After the flood. Receding waters have eroded the deposited sands in accordance with the layout of the structure. In fact, the channel is automatically self-cleaning

Some Simple Pointers on How to Keep a Car By Harold Hollingshead

SOME people wonder why they are sick when they don't take a bath but once in two weeks, and some people wonder why their car won't run when they don't clean it but once a month, and then never touch the inside of the motor. What we need is not greater motors, but drivers who will study the construction of a car and treat it as though it were human.

The very first thing is a familiar warning—keep the inside of a motor free from carbon; but everybody does not know how to do it. To start with, have the valves properly ground and adjusted and all carbon burnt out. After this is well done, a teacupful of kerosene put through the pet-cocks twice a week will keep the motor in good shape. After the kerosene is equally distributed through the various cylinders, the motor should be given about ten turns, either by hand or by using starter. This will soak the entire motor with kerosene. Then apply the switch, giving the motor a medium amount of gas. In cold weather this remedy should be applied after the motor is warmed up, or in returning to the garage in the evening, otherwise the motor will require some skill to start. After the motor is started and gets warmed up, running at a medium speed, open one pet-cock at a time, while

motor is in operation, and you can notice the fine pieces of carbon coming out. This kerosene can also be applied by using a small oil can, applying the kerosene through the air adjustment of the carbureter while the motor is warm and running at a medium speed, as the motor dies down. While kerosene is being applied, keep hand on the throttle of carbureter and increase speed.

Another point is removing the plugs once a week and soaking them in a pail of kerosene overnight, then using a little emery on the points, drying them well; also adjusting all the points accurately to the thickness of a dime. Then see that none of the porcelains is broken, which will cause a missing cylinder. Also see that all the porcelains are thoroughly tightened by small nuts that are at the top of porcelains. After this is done, each plug should have a washer and be thoroughly tightened in the cylinder head.

Most people have trouble with their motor heating up, and it is no wonder when the water that is in the radiator has collected so much rust and grit that it has shut off the circulation through the various cylinders. This grit is removed by running the front of the car over a manhole or drain, while the motor is in operation. You will find a small outlet plug at the bottom of the radiator on all makes of cars. After opening this, take off the cap from the radiator water intake and apply a hose with running water. Let the motor run until the water from the outlet pipe becomes clear. You can easily notice the collected rust and grit as it comes from the outlet pipe. This operation once in two weeks, together with keeping the cooling fan well oiled and in perfect running condition, will give you a perfect cooling system.

Oil should be drained from the crank case once in three months and new oil applied. The same should be done in the transmission and differential cases, and these cases should at all times have the proper amount of a good quality of oil and grease. An occasional application of neatsfoot oil to the clutch will keep it in good condition, together with keeping the grease cup well filled.

The brakes should be properly adjusted. After jacking the rear of the car up, with the motor running in low gear, one man should operate the foot brakes back and forth, while another applies kerosene to the brake bands. This will remove all grease and grit and give perfect action on the brakes. If the brake linings are badly worn, and you want to come down a steep hill without relining brakes, apply hose of running

water for about five minutes, soaking each brake lining in water. This will expand your brakes and give you quick action for a short time. Keep all parts of machinery oiled, and tires properly inflated to the proper number of pounds. One drop of oil applied to the valve of the inner tube before air is applied will prevent any air from escaping from tire.

A rag partially dampened in kerosene and oil is an excellent remedy to remove all sand and grit from the body. To keep from scratching the paint on the body, great care should be taken to shake out the cloth thoroughly as you go along, as this cloth will accumulate much grit, which is very injurious to paint. After this is done, a clean piece of silk cloth from an old shirtwaist will wonderfully brighten up the paint.

In driving a car do not advance spark on starting, or on a hill or heavy pull, or your motor will start knocking. Restart your spark and you may not get the speed, but you will eliminate the knock and make your motor last twice as long and save your repair bill. In running your motor idle, slow down to lowest possible speed. This will keep the motor from heating up and eliminate the collection of carbon in the motor and will also save the gas bill. In starting and stopping at all times shift to low or intermediate gears, which will save you the strain which would come on the motor by pulling in high gear.