

# I LIKE VELVET STOLONS

... Says Everett J. Pyle, Hartford (Conn.) Park Department, Who Describes His Planting Methods

SOME factors which have impeded the general use of the velvet bents in planting greens are: (1) the high cost of seed; (2) the poor quality of much seed on the market; (3) the scarcity of seed of the more desirable strains; (4) the almost total absence on the market of stolons of the better strains. Some clubs are avoiding the high cost and uncertainty of velvet seed and are establishing nurseries on their courses in which to propagate stolons of some particularly choice strain for their own use.

I prefer the stolon method of planting velvet bent. Excellent results may be obtained if the work is done properly, and there is no reason why a green planted in the fall cannot be ready for play the following spring.

For real success, the first fundamental is drainage. The green should be well under-drained, either by a natural condition which exists because of a sandy or gravelly subsoil from which it has been constructed, or by tile installation. A good grade of land tile, no smaller than 4", is the best to use. The joints should be about  $\frac{3}{8}$ " to  $\frac{1}{4}$ " open and the top half of each covered with a narrow strip of roofing paper. Calcium chloride bags cut into strips 4" wide may be used.

Covering the tile with 4" to 6" of  $\frac{3}{4}$ " to 1" trap rock is good insurance against dirt getting into the line. It is well worth

while to do the job right the first time. The herringbone system, with all but the main line running at an angle to the slope of the green, can be used in most cases; however, the design of each green will determine the location of tile lines. The important thing to remember is to get them placed where they will intercept the sub-surface flow of surplus water.

The spacing may be between 10 and 30 ft. apart and the depth from 20" to 30" below the putting surface. Both spacing and depth depend on the character of the subsoil in the green. Surface drainage is very essential, no matter what type of under-drainage is provided. It is necessary at all times, but especially so when the ground is so frozen that no sub-surface drainage can function.

Stolons planted where both under- and surface-drainage is provided will have a healthy appearance and will fill in rapidly. Poor drainage will greatly retard the growth of velvet bent stolons into a smooth putting surface.

The careful selection of the putting green topsoil is important. A sandy loam,



An ensilage cutter prepares the stolons for planting. Tussocks as they come from the nursery are in foreground.

free from weed seed, encourages rooting and spreading of the velvet bent stolons without any competition from weeds and foreign grasses. Velvet bent will in time crowd out most weeds, but their presence in a newly planted green retards the filling-in process. Hand weeding is expensive and the traffic on the young stolons is detrimental. Sandy loam, because it is open and porous, does not pack nor become baked. It will receive water readily but will not get soggy and devoid of air. Any of the velvet bents will do better in this type of soil than in any other.

#### Proper Make-Up of Topsoil Is Vital

The character of the topsoil is so important that if the proper soil cannot be found nearby, it is a good idea to modify the native loam. The addition of sand, humus or clay in varying amounts until that desirable loamy, sandy texture is obtained, while it may be expensive in some instances, is really cheaper in the long run. The time to prepare the soil on a putting green is *before* planting, and this is always the least expensive. If sand and humus, for instance, are to be mixed with a clay loam, these materials can be spread in layers, evenly, over the surface of the green and mixed with a double-disc harrow or by some smaller machine such as the Tillivator or Rototiller. The two last mentioned are slower but do a perfect job and do not disturb the contours on the green. A thorough mixing is essential. Under no circumstances should these materials be left in layers or only partially mixed.

After the topsoil is firmed, raked and smoothed, a liberal quantity of a complete fertilizer, one containing nitrogen, phosphoric acid and potash, should be applied. Raking the fertilizer into the

first inch of topsoil is advisable. It is best to allow about one week after applying the fertilizer before planting the stolons, and if the soil is very dry, a good watering will help to set the fertilizer and to eliminate any danger of burning. Arsenate of lead may be applied with the fertilizer and worked into the soil at the same time. Both before and after the fertilizer application, there is no better tool for smoothing the surface than the steel mat used for working topdressing into putting greens.

It may be necessary to roll the green several times to firm the surface just before spreading the stolons. If a man can walk across the green without leaving much of a footprint, the surface is firm enough. A quantity of screened soil is needed to cover the stolons. This should be screened and preferably the same material used for topsoil on the green. Two yards is plenty for a 6,000 sq. ft. green.

Baskets or pails are usually used in spreading the stolons and screened soil.

Velvet bent stolons growing in nursery rows differ in some respects from creeping bent. They are more compact and form very solid, tightly-knit tussocks. The joints or nodes are closer together and the stems and leaves are finer in texture. The runners are not long and rambling, as in creeping bent, but shorter and closer to the parent plant.

#### Use Cutter to Chop Stolons

Probably the best way to break up the stolons is to pull them apart by hand. In this way there is no waste of planting material and each small plant is complete with roots and joints. However, the amount of labor required when enough material to plant one or more greens is needed, is prohibitive. A much more economical method is to chop up the stolons with an ensilage cutter. If the tussocks are taken from the nursery with as little soil as possible and run through the ensilage machine twice, they will be cut up rather fine. After passing through the cutters, some hand pulling is necessary to break up larger masses of roots and joints. Every effort to get the material uniform should be made as this facilitates broadcasting and covering on the green. Absolute uniformity, however, cannot be obtained when velvet bent stolons are chopped in this way, because the pieces of roots will be more or less lumpy, while the rootless stems and



Two groups of workers are shown planting bent stolons on seventeenth green at Goodwin Park. The first group (left), broadcasting the stolons are followed closely by the other group who are spreading loam.

joints will be very fine. This irregularity calls for care when covering with screened sandy loam. If too much covering is put on, the small rootless joints will be smothered and will decay under the layer of soil.

About eight bushels of cut stolons will plant 1,000 sq. ft. of green surface. If stolons are in good condition this is the maximum amount. However, four to six bushels may be used, but only when the larger quantity cannot be obtained. Velvet bent stolons do not spread as fast as stolons of creeping bent and, if planted thinly, more weeding will be necessary and more time will be needed before the new green will be ready for play.

#### How Stolons Are Planted

With the surface firmed and the stolons and screened soil on hand, the green is ready for planting. The men who are to do this work must be carefully selected and the whole operation well supervised or the results may be discouraging. In broadcasting the stolons it is best to leave no spaces at all, but to cover the ground well. It is a good idea to have one or two men checking this work, to see that no area is skipped or planted too heavily. Then men should be divided into two groups. Those who broadcast the stolons must be followed closely by those covering with loam, so that no drying out is possible. Just enough soil to half cover the stolons is enough. The greatest danger here is to cover too much or to drop the

soil in bunches. Sifting the soil through the hands from pails or baskets is a good way to put it on evenly. A good rolling with a medium-sized roller following the covering will firm the soil over the joints and press the larger pieces of roots into the surface. This completes the planting.

#### Proper Watering Is Essential Step

From the time the green is planted until the stolons are well rooted, it should never be allowed to get dry. Watering a newly planted green is a job for trained and careful men. They must not walk over the planted area nor should they permit the hose to drag. In most cases it pays to let two men work together on the watering—one to hold the nozzle and direct the spray, the other to keep the hose from dragging out the stolons. The nozzle must give a fine spray which should fall on the green surface like a heavy mist to avoid washing the soil from the stolons. Stolon heads or hose nozzles are ordinarily used. On sunny days it may be necessary to spray the stolons every hour. After the first 10 or 12 days the green will show signs of life and it will not be necessary to water so often. Sprinklers may be used with safety about the time the green is ready to be cut.

Velvet bent stolons do not need cutting for four to five weeks after planting. A tee-mower, set to cut about one inch, will do the right job. There is no advantage in using a putting-green mower. The clippings may be left on the green if

they are not too heavy, and the whole surface *lightly* topdressed with screened sandy loam. However, unlike creeping bent, there will be very few joints or nodes in the clippings. Newly planted velvet bent greens are usually eight weeks old before any appreciable amount of new runners are noticeable, and most of these are close to the ground where the mower doesn't touch them. Light topdressing once a month will be sufficient to encourage the new runners to root. If the greens are planted in the fall they will do better if cut one inch high the remainder of the growing season. In the spring, if they have filled in well, the height of cut may be decreased gradually until they can be cut with the regular putting-green mower.

The amount of weeding necessary will depend on the season of year, the topsoil used on the greens, and the cleanliness of the stolons. Probably the worst weeds will be creeping bent, clover, crab grass and annual bluegrass. These should be removed as soon as they appear so there will be no competition for the young velvet bent plants. It is very difficult to keep the velvet bent nursery entirely free from weeds, but if this isn't done, most of the weeds are planted in the new green. However, if the new greens are planted in the fall on weed-free soil and with clean stolons, no weeding will be necessary.

The planting of greens with velvet bent stolons is in many ways similar to planting with creeping bent stolons. I have tried to make clear these similarities and at the same time to point out the differences in planting these two species of bent grasses. It is not difficult to establish velvet bent greens by the stolon method and it is the writer's hope that the ideas I have expressed will encourage and guide others who may wish to work with this fine grass.

### Huge Tournament Entry Lists This Season Indicate New Boom in Golf

**SIGNIFICANT** as signs of a new boom in golf have been the figures on tournament entries this year. National Amateur field of 550, although about half of last year's entry list, is surprisingly large considering location of the tournament at Portland, Ore.

Chicago District GA \$10,000 Open had the largest entry of any Open tournament played at one American club, there being 448 entrants. Two hundred and ten

of the field were pros, reports Robert E. Harlow, publicity director of the affair.

Minnesota's 1937 Amateur championship, played at the Country Club of Minneapolis had a record qualifying field of 198. Great scoring was done in the competition which was won by Bobby Campbell. Oldest of the semi-finalists was 24 years old, the youngster 19. Apparently a new crop of amateur stars is developing.

A. C. Statt, manager of the Country Club, reports that condition of the course after the tournament was played gave no reason for alarms that tournaments injure courses. Gallery at the Minnesota amateur was not less than 2,000 on any one day, and on Saturday between 4,000 and 5,000. The course was not damaged by players or by gallery.

Special tournament rules supplied on a separate card to all players were very helpful to the field.

### Memphis to Get Club Managers 1938 Convention, Jan. 18-20

**T**HE Board of Directors of the Club Managers Assn., guided by the vote of the members will hold the 1938 convention in Memphis, Tennessee, Jan. 18, 19, 20, 1938.

Elmer Ries of the Colonial CC, P. O. Box No. 721, Memphis, has been appointed General Chairman of the convention. He would appreciate hearing any suggestions from managers.

Harold Ross has again been engaged to manage the new 1938 Buyers Guide. He can be addressed at the Indianapolis (Ind.) Athletic Club. E. Park Akin is chairman of the Convention Educational Program. Park would appreciate suggestions on features for the convention. Address him at the Columbia Club, Indianapolis.

**Big Coast Dough**—A bulletin from the Southern California section of the PGA announces the California winter schedule as follows:

Nov. 13-14—Reno, Nevada .....	\$3,000
Nov. 19-21—Sacramento, Calif.....	3,000
Nov. 26-28—Oakland, Calif. ....	5,000
Dec. 1-5 —San Francisco, Calif.....	5,000
Dec. 10-12—Santa Monica, Calif.....	4,000
Dec. 16-19—Pasadena, Calif. ....	3,000
Dec. 26-27—San Diego, Calif. ....	3,000
or (Bing Crosby)	
Jan. 2-3	
Jan. 7-10 —Los Angeles, Calif.....	8,000
Total .....	34,000

# The cheapest part of golf is GOLF

Your expenses to and from the club—the clothes you wear playing golf—the drinks you drink—the orchestra for your Saturday night parties—the luncheon and dinner you eat at the club all cost you more than the actual cost of your golf.

And, if you're financially able to belong to the club you've joined, you don't kick. You're getting your money's worth in enjoyment.

The clubs, the balls, the bags, the course maintenance equipment—all essential to golf—are but a minor part of the money spent annually for "golf".

One reason the actual golf expense is so amazingly low is that for some mysterious reason the prices of essentially golf material have lagged far behind prices in other markets.

And to deepen the mystery, consider fairway mowers, for which, a decade ago, five years was considered an average efficient life by the clubs. Today the clubs push the average service life to seven or more years, an unreasonably long period in view of constant wear, obsolescence and cost of low speed operation;

... or consider the standard brand 1936 golf balls with a service life practically double the 1928 golf ball;

... or consider the golf clubs in racks at representative pro shops which average more than 5 years old, notwithstanding the innumerable score-reducing im-

provements in shafts, heads and grips made by leading manufacturers during the past five years.

When you consider what the golf manufacturers have given without asking price increases even modestly in ratio to the sharp increases in their raw materials, labor, taxes, etc., you as a good businessman must wonder how long present prices in the golf market can last.

That answer is easy.

Present prices cannot last. If you can possibly do so, order today for tomorrow's needs and duck the inevitable increases.

There are more rounds of drinks bought at golf clubs than there are rounds of golf played. No one kicks about that. If the members want good liquor, the manager supplies them. They have to pay for it.

If the members want good golf, they'll have to pay for good golf, too.

Golf must be a good business for the golf manufacturers, or it won't be a good game for your members.

And without inevitable, overdue increases in the prices of golf playing and courses maintenance equipment golf will be no business at all. So reconcile yourselves to golf price-increases. Golf has to be a business for some people. It hasn't been much fun for them for the past seven years.

(The costs of printing this advertisement are the highest in GOLF-DOM'S history. Business in general is much better because prices generally are much better—except at present in the golf business.)

# MORE APPLESAUCE ABOUT EZRA

By MYLES COEN

**I**F we keep on publicizing Ezra Applesauce, people will be writing the editor for his address in the hope of getting a lesson from him. Other famous teaching reputations have been built upon no sounder foundation.

W. C. Jackson involved me in this controversy by quotation in June GOLFDOM. Just to hold the franchise I would like to toss in a few random notes.

1. Don't build too big a fire under Ezra. We entrenched professionals may feel the heat ourselves. Ezra might say: "All right. So I'm not a qualified teacher. Show me your license." That would be very tough to answer.

We PGA members seem to think that heaven has bestowed the teaching concession in these United States upon the Professional Golfers Assn. That may be true through some mysterious arrangement that I have not heard about, but we have yet to prove that we deserve it.

Membership in the PGA is based on tenure of service and not upon ability under any heading. As Jackson pointed out, the PGA is becoming a trade association, with a sideline in promoting golf tournaments. Teaching seems to be one of those necessary evils to which no decent man would refer.

2. I am all for Ezra if he is a competent man. If I were an amateur I would rather take a lesson from an Ezra Applesauce who had made an honest effort to learn something about teaching golf than from a professional of many year's standing who had never made any such effort. I do object to the fact that we have no way of knowing whether Ezra or any other instructor knows what he is talking about. A man might be the Einstein of golf teaching and he would not rate knee-high in public estimation compared with the subject of the most recent ballyhoo or the last winner of the Potter's Field Open. For God's sake let's set up some system of finding out who knows what he is talking about and who doesn't.

3. Jackson brought up the point of the amateur who turns pro over-night. The amateur who is a student of the game with a definite intention of making professional golf his livelihood should be welcomed.

I do object to the amateur who has al-

ways intended to turn pro but is happy to enjoy the prestige of an amateur meanwhile. I am a believer in the old-fashioned definition of an amateur as a gentleman who plays golf with his friends and fellow amateurs for his own amusement. I don't like the fake amateur who uses the amateur side as an easy way of building up a reputation and the pro side as a convenient means of cashing in. In other words, I don't like amateurs when I have to compete with them for a living.

4. In all talk of licensing teachers it seems to be assumed that this is a job for the PGA. I cannot see this. The PGA, as the organization representing professional golfers, has the obvious duty of initiating and supporting a campaign for the examination and certification of golf teachers. It cannot reasonably be empowered as the sole arbiter in the matter, nor approval reserved for its membership. Any man who can prove his qualifications before an impartial body should be allowed to teach and should be encouraged to do so. I speak as a loyal member of the PGA. Loyal even to its mistakes.

5. In contra-distinction to most of those who talk about licensing teachers, etc., I happen to know something about it (an exception is granted to Jackson). That sounds like egotism. It is.

Just to prove it I will make one point. A license is only as good as the enforcing power behind it. Suppose the PGA granted licenses as teachers to some or all of its members. So what? The public would go serenely along taking lessons from Ezra and all his relatives. It might be possible to get legal recognition of the golf teacher but that would throw the whole thing into political hands and would mean dickering with each individual state.

The United States Golf Assn. is the logical body to get behind such a move. The duty of protecting amateur golfers from fakers and charlatans is implied in the nature of that organization. The USGA would have no financial interest in such a program and has the prestige to make its endorsement mean something.

Nothing in this is to be interpreted as a criticism of W. C. Jackson.



Here the locker-room clerk is shown registering a sale and recording the amount on the check. Duplicate information prints on the cash machine's locked-in detail tape, providing a valuable record of the day's business for the management.

## HOW PORTAGE CONTROLS BAR SALES

By HARRY ODLE

**M**ORE than 30 years of experience has taught the management at Portage CC at Akron, O., many things about efficient methods of operation. One of the things they have learned at Portage is the value of machine records that assure correct charges and accurate monthly statements to the club's members. "This feature contributes as much to club member satisfaction as our watering system for the fairways, or the new air-conditioning equipment for the grill room," declares Manager N. G. Plumer.

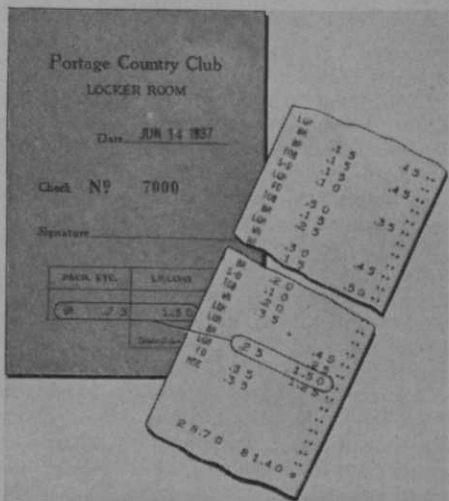
One of the most popular spots in the clubhouse is the traditional "nineteenth hole" in Portage's large locker-room. Here there is particular need for a fool-proof system of recording all beverages, food, tobacco and other sales. A specially designed cash registering machine, used in conjunction with locker-room sales tickets, provides the necessary protection for both club members and the management.

The locker-room checks are serially numbered and each waiter is held strictly accountable for those he receives each day. After taking an order he goes to the bar and gets the drinks, food, or other items desired.

The sales check is then inserted in the cash registering machine and the correct amount is recorded on the check as the sale is registered. A split keyboard on the machine permits the recording of liquor sales in one column, and the total of all beer, wine, tobacco and other sales in another column (thus a sale of both liquor and beer can be recorded in one operation by the locker-room clerk). All sales are described by character keys, which print the abbreviations FD (food),

LQR (liquor), etc., beside the amounts. This same information also prints on a detail tape, which is locked in the machine and is accessible only to the management.

After the sales check has been recorded in the machine, it is then presented to the member at the time the order is served, and he either pays in cash or signs the check. In either case, the check is re-



Two records are provided by the cash machine located in the locker-room. As sales are recorded on the locker-room check (left), the amount and description also prints on the locked-in detail tape (right). At the close of the day, the machine prints separate totals for liquors and for other commodities on the detail tape. Charge sales tickets and cash in drawer must equal these two totals.

turned and filed, a separate spindle being kept for cash and charge tickets. The cash is put in the drawer by the clerk.

At the end of the day's business the machine provides two locked-in totals—(1) liquor sales, and (2) all other sales combined. The charge tickets are then added and the charge total deducted from the grand total of all sales to find the amount of cash sales. This figure must balance with the cash in the drawer, which also proves that no charge tickets have been lost.

Since all sales are listed on the machine's detail tape and are identified by character key descriptions, they can easily be recapped according to commodities. This distribution of sales permits a close check on the activity of each commodity, provides a record for inventory purposes, and gives the management a valuable means of control over this department.

Incidentally, the cash registering machine can always be used as a convenient adding machine to total charge tickets, and for other listing work. On semi-private and public golf courses it can also be used to register and record green-fees, and it is equally adaptable to recording sales and services in pro-shops.

At Portage, full protection for members and management is also provided by a beverage checking machine in the grill room. Here again the waiters are responsible for a certain quantity of serially numbered checks, and are assessed \$5.00 for each check lost.

The drinks are priced by the machine, not by the waiters, and the amounts cannot be altered. The machine accumulates a total of all beverage sales. This total must equal the cash in the drawer plus the charge sales for the day.

"This checking system has worked out to our entire satisfaction," states Manager Plumer. We have had practically no question from club members as to the accuracy of their monthly statements, even though the bills are not itemized and we have a very high percentage of charge items.

"Other plans may provide partial protection, but our method of checking and recording orders assures both fair prices to members and full collections for the club."

**EVERETT LEONARD** and Jack Taylor, pro and greenkeeper respectively, of the Butte des Mortes GC, Appleton, Wis., have issued a challenge to any pro-green-

keeper team in Wisconsin at an 18-hole match. The other boys can name the money.

The defi is only one of those in which Everett Leonard figures. The six Leonard brothers, all pros, are ready to take on any other six brothers—pros or amateurs, or mixed—in golf, if opposition of that type can be presented. If there's no other brother act in golf big enough, the Leonard brothers are willing to take on any six members of any one club, later on this year when the Leonard boys feel they can spare time from the club jobs to which they are closely attached during summer.

**HARRY KRUEGER**, manager, Evanston (Ill.) CC, is said by many liquor authorities to have the most complete wine card presented at any country club in the United States.

Krueger drew on his extensive European and American experience in establishing the Evanston CC wine cellar, and himself admits that if there's a country club that can beat his selection there will be some immediate shopping done by him.

The Evanston wine card is an imposing looking affair with class in every detail. It has been a positive factor in building a large beverage business for the club, both in club sales and for members' home consumption.

**HARRY VARDON** left approximately \$55,000, by far the largest estate left by any golf pro in England. Vardon's will was published July 17.

The famed veteran professional expressed the desire that his trophies be given to a museum "or similar place" in Jersey, Vardon's birthplace. The will stated, "I should like to know that my other prizes will be looked after and not given away any old way."

One of the last letters written by Harry Vardon was that he sent to Larry Nabholz, pro at Lakewood CC, Dallas, Tex.

**Egan Memorial Ready**—Bobby Jones will dedicate the H. Chandler Egan memorial fountain, to be placed in front of the Medford (Ore.) CC clubhouse, Aug. 22. Egan was designer of the Medford course and a resident of that neighborhood. Cooper, Smith, Thomson and Little, the "Four Coursemen" also will participate in the ceremony.

The Egan memorial fountain was designed by Whitehouse and Church, architects of the new Oregon state capitol.



Ted Longworth (right) and Ivar Unis hold some of the clubs members donated to junior golfers.

## PORTLAND PLAYERS BOOST JUNIOR GOLF WITH 400 CLUB DONATIONS



**M**ORE than 400 golf clubs, some of which were rather late models, and a dozen golf bags were collected for Oregon junior golfers as a result of the campaign conducted by PGA members in Portland, and George Bertz, sports editor of the Oregon Sunday Journal of Portland. Clubs were given contestants in the junior championship. Bertz explains:

"The clubs were not offered as prizes, as was the first idea, but were given the players defeated in the second round of the even-numbered flights and the first round of the odd-numbered flights. In that manner we were able to give the players who did not have complete sets some of the clubs and spread them out among the greater number of players. The youngsters were given a chance to designate what clubs they wanted.

"Some were given complete sets, two players from Kelso, Wash., about fifty miles from Portland, who hitch-hiked here with borrowed clubs, and did work around the course for their meals, sleeping in the machinery house at nights, were given sets of eight clubs as well as bags."

Collecting the clubs and refinishing them before the implements were passed on to the youngsters, were the following pros: Ted Longworth and his assistant, Ivar Unis, of Waverly CC; Lawrence Lamberger, pro, and "Red" Hagen, Portland GC; Ivan Johnson, Tualatin CC; Bill Brower, West Side practice course; Joe Mozel, Lloyd course; Emory Zimmerman, Columbia-Edgewater CC; Al Zimmerman, Alderwood CC; Boyd Bustard, Lake Oswego CC.

Officials of the Oregon Golf association, headed by Charles Wintermute, president,

and Roscoe Hurst, who directed playing of the junior event, and Fred Zaugg, president of the Riverside G & CC, scene of the championship, declared the campaign was the best thing ever done for the development of young golfers in Portland.

The club solicitation campaign will be conducted again next year prior to the junior tourney. The junior championship for boys and girls from ages of 10 to 18 was started in 1927 by Mel Smith, now pro at French Lick Springs, Ind. In 1928 the Oregon GA, through Ralph Tomlinson, took over sponsorship of the event. The tournament is open to juniors from any part of the United States. About 30 lads and lassies from without the Portland territory competed in this year's tournament.

The Portland pros in this fine, foresighted golf promotion tie-up with the Oregon Journal, gave kid golf a strong boost in the district and provided a tip-off to other pros that the junior idea associated with the plan for collecting unused clubs makes a lively newspaper publicity idea.

The Journal is especially strong in golf coverage, Bertz having C. T. Haas conducting a golf rules question box among other features and news treatment.

ON OUR FRONT COVER—

# THE NEVER-MISS PUTTER!

AS EVERY experienced greenkeeper knows full well, a missed putt is not due to condition of the greens but is caused by improper putting technique, hangovers, cumulative syndicates, money and matrimonial troubles and numerous mortal frailties. Nevertheless greenkeepers have been compelled to take the rap for bum putting. This condition, long a mar on the high principles of golf, at last has been corrected by the genius of three petroleum engineers of the staff of the Union Oil Co. at Santa Fe Springs, Calif. These brilliant scientists, Pete Erwin and his assistants Joe Bartlett and Walter McMillan, devised Pete's Precision Putter which is shown on GOLFDOM'S front cover this issue.

Nestling snugly in their bunks, the dreamy fumes of opium perhaps swirling around them, the three talented scientists worked out the putting contrivance, which is to be dragged around by any player who chronically complains of his putting. News of the discovery leaked out through a family entrance, to which a reporter for the "Petroleum World" was no stranger. The journalist, a classmate of GOLFDOM'S editor (Keeley Institute, class of 1919) relayed to GOLFDOM the illustration and instructions for operation of Pete's Precision Putter, the Greenkeepers' Life-saver.

Instructions read:

1. Make sure all working parts are operating smoothly. If necessary, douse freely with No. 20 oil from reservoir on left rear limb of frame.

2. Adjust machine roughly so that ball lies approximately on a straight line between the putter and the hole. Fine adjustments are not necessary at this point—these will be made later.

3. With putter as axis, swing machine gently around so that direction finder points north.

4. Take solid stance behind observatory.

5. By means of level on crossbar set apparatus in an exact horizontal plane.

6. Observe temperature (t) on recording instrument on upper right tower.

7. Determine wind velocity (v) by means of gauge on upper left tower.

8. Use automatic feeler on front left limb to secure accurate measurement of length of grass (l), and moisture content (m).

9. (a) If wind is in the north co-efficient of resistance should be determined in the following manner:

$$\frac{v \times t}{1^m}$$

(b) If wind is in the south co-efficient will be determined by merely taking the Napierian log of the wind velocity and substituting  $\pm r^2$ , thus:

$$\frac{v - \text{Log N of } v \pm r^2 \times \sqrt{t}}{1^m}$$

(c) If wind is in the east, let the easterners worry about it.

(d) If wind is in the west, take a couple of snifters and you'll never feel it.

10. All calculations may be quickly worked out on the abacus on the lower right tower.

11. Having determined the co-efficient of resistance, keep it cool in a dry place.

12. Now determine the angle of inclination as follows:

(a) Sight carefully through 10-inch telescope, until cup comes into view, and at least eight people behind you are yelling "fore". Eight times "fore" are 32, which is the angle of incidence.

(b) Read the indication on the upper quadrant, multiply this by your telephone number, and take away the angle of incidence if nobody is using it. The result will be the angle of inclination.

13. Nothing is left now but to make a simple calculation of the mean effective force required to roll the pellet into the cup. Again using the abacus, extract the cube root of the resistance co-efficient, eliminate all like terms, add the juice of