

## INDEX

	PAGE
Acceleration of flying shear, device reduces initial.....	104, 105
Adjusting mechanism, three-axis.....	123
Arcs with inaccessible centers, plotting circular.....	447-449
Assembly machine, mechanism for orienting pins in.....	400
Assembly operation mechanized.....	340-343
Backlash, dial's moving witness mark compensates for.....	443-445
dual gear train diminishes.....	452-457
eliminated by torque filter .....	262-264
Bag-folding device, eccentric gears feature of.....	250, 251
Bag-making machine, rapid intermittent and reciprocating movement of rack in.....	22-24
Ball bearing serves as planetary reduction gear.....	279-281
Ball-clutch, overload slipping.....	94-99
Bead chain drive turns shaft on moving perpendicular axes.....	178-180
Boring-bar, moving supports for long.....	292-294
Bottle caps, designing hopper feeds for.....	380-395
Brake, three-speed gear conversion unit for bicycle coaster.....	288-292
Cam-actuated mechanism for varying spacing in weave of woven-wire product.....	20, 21
Cam, and link system produces varying rotation rate.....	403-405
and ratchet intermittent mechanism.....	63, 64
change of timing of.....	410, 411
controls stock feed of wire-forming machine.....	9-11
crank-driven plate obtains near-uniform velocities through compensating .....	206
drives glue-transfer mechanism.....	15-17
eliminates shock in rack movement.....	22-24
intermittent motion from.....	32, 33

	PAGE
Cam, which produces motion on alternate revolutions.....	1-4
with half-cycle dwell.....	168-170
Cam-controlled differential mechanism.....	409, 410
Cam-jaw chucks for twisting rod.....	129-131
Cam-operated stock clamp for piercing and blanking dies.....	137
Cam timing, gear mechanism for varying.....	20, 21
Centerless grinding machine with automatic feed mechanism	
with quick-return motion.....	351-355
Chain and levers increase movement.....	176, 177
Chain drive mechanism, intermittent rotary movement from.....	30-32
linear movement reduced by differential.....	185-187
produces continually variable rotation.....	405-407
turns shaft on moving perpendicular axes.....	178-180
Chucks for twisting rod, cam-jaw.....	129-131
Circular arcs with inaccessible centers, plotting.....	447-449
Circular motion into variable reciprocating movement, con- verting oscillating.....	194-197
Clamp for piercing and blanking dies, cam-operated stock.....	137
Clamping and indexing mechanism for drill jigs.....	141-144
Clamping mechanism for cylinder boring fixture, air- operated .....	140, 141
Clamping work at four points with toggle-action drill jig.....	135, 136
Clamp with wide work capacity, quick-acting.....	127-129
Clutch, adaptable to various dwell periods.....	432-434
and gear mechanism for variable operating conditions.....	182-185
automatically disengaged after required number of strokes .....	113-115
one-half turn trip.....	428, 429
positive-action one-revolution.....	431, 432
tape drive slip.....	420, 421
two-revolution .....	423-425
which permits reversal of driven shaft.....	287, 288
Coil-winding machine, sensitive feed arrangement for.....	145, 146
Cold-roll forming machine, reducing initial acceleration of fly- ing shear on a.....	104, 105
Compensating device for height gage, pitch-error.....	464-468
Conveyor belt ratchet mechanism.....	76-78
Copying lathe, hydraulically operated cross-slide for a.....	457-460
piloted feed control mechanism for a.....	319-323

	PAGE
Copying system controls two lathe tools, hydraulic.....	461-464
Counter with dwell interval operated through slotted discs.....	157-159
Counting device for high speed operation.....	72-74
Coupling connects displaced shafts.....	407-409
Crank, constant horizontal velocity from a.....	307-311
controls shuttle between supply and discharge chutes.....	399
provides a dwell in reciprocating motion.....	204, 205
Crank-driven plate obtains near-uniform velocities through compensating cam.....	206
Cross-slide for a copying lathe, hydraulically operated.....	457-460
Cutting-off machine with one-revolution clutch with positive action .....	431, 432
Cutoff device, high-speed.....	272, 449-451
Cylinders fed one at a time down a ramp.....	328-330
Cylindrical parts, transfer device for.....	336-338
Deep-hole drilling machine, feed system for a.....	350, 351
Die-cutting, machine "stops" roll labels momentarily for high- speed .....	313-315
of developed form.....	13-15
Differential chain drive mechanism, linear movement reduced by .....	185-187
Differential mechanism, cam-controlled.....	409, 410
Differential screw assembly for a slide.....	297, 298
Disc-stacking device.....	124, 125, 397-399
Displaced shafts, coupling connects.....	407-409
Drawing dies, adjusting size of "iris".....	120-123
Drilling machine, feed system for a deep-hole.....	350, 351
Drilling parallel rows of holes.....	251-254
Drive, direction-changing .....	159-162
for reciprocating members with varying relative motion....	211-214
for two slides with partially synchronized travel.....	231-234
functions around roller chain.....	181, 182
gives variable output automatically.....	416-419
prevents reverse movement of driven shaft.....	421-423
produces continually variable rotation.....	405-407
with reverse-locking feature.....	119, 120
Drive direction, unidirectional rotation regardless of changes in .....	411-413

	PAGE
Driven shaft, changing of timing of.....	413, 414
driving mechanism prevents reverse movement of.....	421-423
Drive-shaft actuates slide at variable speed and stroke, oscillating .....	209-211
Dwell, adjustable indexing mechanism with 180-degree.....	70-72
adjustments facilitated by lever type driving mechanism.....	228-231
clutch adaptable to various periods of.....	432-434
in reciprocating motion.....	204, 205
operated through slotted discs.....	157-159
reciprocating cam with half-cycle.....	168-170
safety overload mechanism permits adjustable.....	102-104
Eccentric, adjustable.....	219, 220
driving mechanism permits stroke adjustment during operation .....	220, 221
gears feature of bag-folding device.....	250, 251
produces a variable throw.....	223, 224
provides adjustable die stroke.....	190-192
provides rest interval.....	172-174
rapid return and dwell period provided by spring-loaded.....	200-202
Ejection system for punch press, self-contained pneumatic.....	360-362
End-cycle reversal, intermittent rotary movement with.....	33-35
Epicyclic gear train which produces multiple revolutions.....	74-76
Escapement mechanism, feeds cylinders one at a time down a ramp.....	328-330
feeds rods of various diameters.....	327, 328
provides regular intermittent drive.....	37-41
with pendulum.....	37-41
Feed arrangement, for bottle caps.....	380-395
for coil-winding machine.....	145, 146
for square and hexagonal nuts.....	372-380
for strip material.....	362, 363
for surface grinder.....	317, 318
Feed control mechanism, piloted.....	319-323
Feeding and sorting shells closed end first.....	367-370
Feeding of cylinders one at a time down a ramp.....	328-330
Feeding rods of various diameters, escapement mechanism for .....	327, 328

	PAGE
Feeding wrappers at constant pressure.....	338-340
Feed mechanism, designed to eliminate manual re- engagement .....	315-317
for small headed parts.....	330, 331
improves efficiency of thread roller.....	344-348
"jamproof" .....	395-397
punch press.....	365-367
quick-return motion.....	351-355
Feed system for a deep-hole drilling machine.....	350, 351
Flying shear, device reduces initial acceleration of.....	104, 105
Fool-proof indexing mechanism.....	35-37
Forming press, cam for producing motion on alternate revolu- tions of a.....	1-4
Gage, pitch-error compensating device for height.....	464-468
Gear conversion unit for bicycle coaster brake, three-speed....	288-292
Gear drive, produces variable output motions.....	401-403
springs cushion shock loads in.....	105-107
variable intermittent movement derived from.....	60, 61
Geared five-bar linkage for straight-line motion.....	167, 168
Geared speed reducer changeable under load.....	282-287
Gear-grinding screw, wheel-dressing attachment for a.....	24-26
Gear mechanism, for variable operating conditions.....	182-185
for varying cam timing.....	20, 21
Gear ratios control motion time, Geneva drive in which.....	64-68
Gears feature of bag-folding device, eccentric.....	250, 251
Gears in transmission line increase shaft oscillation.....	254, 255
Gear-shift control for speed-change mechanisms, hydraulic....	294, 295
Gears which facilitate change of timing of driven shaft, sun....	413, 414
Gear train, diminishes backlash.....	452-457
produces multiple revolutions.....	74-76
Geneva drive, blocking device for a.....	78, 79
gear ratios control motion time in a.....	64-68
half revolution.....	81-91
reversing two-speed.....	150-152
sprocket operated.....	245, 246
Glue-transfer mechanism, single closed-track cam drives.....	15-17
Governor, for handwheel of lathe tailstock.....	111-113
instant acting centrifugal.....	299-305

	PAGE
Grinding machine, fine feed arrangement for a surface.....	317, 318
gyroscopic setup for a.....	440-443
with automatic feed mechanism with quick-return motion.....	351-355
with table feed mechanism designed to eliminate manual re- engagement .....	315-317
Gun barrel boring-bar, moving supports for long.....	292-294
Gyroscopic grinding setup.....	440-443
Handling mechanism turns strip in transfer.....	332-334
Harmonic motion, oscillating shaft driven with simple.....	199, 200
Height gage, pitch-error compensating device for.....	464-468
Homogenizer, unique pumping mechanism applied to a.....	197, 198
Hopper feeds, for bottle caps.....	380-395
for square and hexagonal nuts.....	372-380
Hydraulic gear-shift control for speed-change mechanisms.....	294, 295
Indexing, rotary work-table with mechanism for automatic.....	41-43
Indexing attachment, pi-ratio universal rack.....	323-326
that controls ratchet operation.....	17-20
Indexing die for piercing drawn sheet-metal parts.....	113-115
Indexing fixture, ratchet and two pawls control movement of.....	79-81
Indexing mechanism, fool-proof.....	35-37
for drill jigs.....	141-144
high-speed .....	91-93
with 180-degree dwell, adjustable.....	70-72
Indexing movement that starts without shock.....	29, 30
Intermittent and pressure applying mechanism.....	43-46
Intermittent and reciprocating movement in a rack.....	22-24
Intermittent drive, escapement provides regular.....	37-41
with reverse-locking feature.....	119, 120
Intermittent feed for strip material.....	362, 363
Intermittent mechanism, cam and ratchet.....	63, 64
Intermittent motion, from continuously rotating shaft.....	61-63
from gear drive.....	60, 61
from two synchronized cams.....	32, 33
Intermittent ratchet mechanism, adjustable.....	47-49
Intermittent rotary movement, chain driven.....	30-32
for instrument pointers.....	425-427
with end-cycle reversal.....	33-35

	PAGE
Intermittent rotary movement, with linear movement.....	272-274
Intermittent speed change, sun and planet gears produce.....	257-259
Intermittent variable-speed movement.....	318, 319
Intermittent worm-gear train.....	27, 28
 "Jamproof" feeding mechanism.....	 395-397
Jigs, clamping and indexing mechanism for drill.....	141-144
Jig that clamps work at four points, toggle-action drill.....	135, 136
 Latch mechanism, instant-release.....	 363-365
Lathe, hydraulically operated cross-slide for a copying.....	457-460
hydraulic copying system controls two tools.....	461-464
piloted feed control mechanism for a copying.....	319-323
pressure governor for handwheel of tailstock.....	111-113
swing stop for automatic.....	137-140
Lead-screw pitch errors, mechanism compensates for.....	451, 452
Lever driving mechanism.....	192-194, 228-231
Levers, and chain increase movement.....	176, 177
straight-line motion through.....	348-350
Lineal travel, linkage for combined or independent.....	110, 111
Linear and rotary movement, intermittent.....	272-274
Linear feed with adjustable stroke, reversing.....	155-157
Linear movement reduced by differential chain drive mechanism.....	185-187
Linkage, for combined or independent lineal travel.....	110, 111
for straight-line motion.....	167, 168
replaces ball bearings.....	246, 247
replaces three gears.....	251
Link and cam system produces varying rotation rate.....	403-405
Lock for reciprocating slides, variable stroke and quick-action.....	131-133
Locking feature, intermittent drive with reverse.....	119, 120
 Magazine feeds wrappers at constant pressure.....	 338-340
Mandrels, mechanism for varying rotation of winding.....	414-416
Materials-transfer mechanism that turns strip.....	332-334
Mounting that provides double action for compression spring.....	109, 110
 Nuts, designing hopper feeds for square and hexagonal.....	 372-380

	PAGE
One-half revolution—one-half pause mechanism .....	428, 429
Oscillating circular motion into variable reciprocating movement, converting .....	194-197
Oscillating drive-shaft actuates slide at variable speed and stroke .....	209-211
Oscillating movement, from rotating shaft .....	248-250
from uniform angular velocity .....	259, 260
Oscillating shaft, driven with simple harmonic motion .....	199, 200
increasing the movement of an .....	255, 256
Oscillation, gears in transmission line increase shaft .....	254, 255
Oscillator, pneumatically actuated mechanical .....	445-447
Output motions, two-gear drive produces variable .....	401-403
Overload mechanism permits adjustable dwell on reciprocating drive .....	102-104
Overloads, safety devices protect slides against .....	99-102
Overload slipping ball-clutch .....	94-99
Overriding of remotely controlled lever, simple device allows manual .....	427
Over-running drive, cylinder ratchet mechanism for .....	54-56
Packaging machine, which increases movement by levers and chain .....	176, 177
which obtains intermittent motion from two synchronized cams .....	32, 33
Paper-converting machine with constant horizontal velocity from a crank .....	307-311
Pawls and ratchet control movement of indexing fixture .....	79-81
Pickup extender obviates lifting heavy stacks, vacuum .....	358-360
Piloted feed control mechanism .....	319-323
Pins in assembly machine, mechanism for orienting .....	400
Pi-ratio universal rack-indexing attachment .....	323-326
Pitch errors, compensating device for height gage .....	464-468
mechanism compensates for lead-screw .....	451, 452
Planet and sun gears produce intermittent speed change .....	257-259
Planetary reduction gear, ball bearing serves as .....	279-281
Pneumatic ejection system for punch press, self-contained .....	360-362
Pointers, intermittent rotation for instrument .....	425-427
Positioning of work-transfer arm mechanism for rotary .....	356-358



	PAGE
Pressure applying mechanism, intermittent and.....	43-46
Printing press, adjustable indexing mechanism.....	70-72
finger holds down paper stack on.....	133-135
shaft driven with simple harmonic motion.....	199, 200
simple device reciprocates rotating roll.....	268-270
vibrating roll drive for fountains on.....	277, 278
Programming by ratchet wheel, automatic.....	68-70
Pumping mechanism applied to a homogenizer.....	197, 198
Punch press, feed mechanism for.....	365-367
self-contained pneumatic ejection system for.....	360-362
Quick-return motion, automatic feed mechanism with.....	351-355
Rack-indexing attachment, pi-ratio universal.....	323-326
Rack movement, cam for eliminating shock in.....	22-24
Railroad car wheel lathe, hydraulic copying system controls two lathe tools for.....	461-464
Ratchet mechanism, additive and subtractive.....	56, 57
adjustable intermittent.....	47-49
controls cut-off length of sheets.....	49-51
controls movement of indexing fixture.....	79-81
designed for cylinder operation.....	51-54
for feeding wire screening.....	17-20
for over-running drive.....	54-56
intermittent cam and.....	63, 64
two-speed double-action.....	76-78
with forward and reverse movements.....	152-155
Ratchet operation, indexing attachment that controls.....	17-20
multiple-revolution.....	74-76
on alternate strokes.....	58, 59
Ratchet wheel, automatic programming by.....	68-70
Reciprocating and intermittent movement in a rack.....	22-24
Reciprocating cam with half-cycle dwell.....	168-170
Reciprocating drive, functions around roller chain.....	181, 182
safety overload mechanism permits adjustable dwell on.....	102-104
Reciprocating members with varying relative motion, drives for.....	211-214
Reciprocating movement, converting oscillating circular motion into variable.....	194-197

	PAGE
Reciprocating movement, from one source to two slides.....	174-176
from uniform rotation.....	187-190, 217-219
in synchronism on a single shaft.....	234-237
of grinding wheel obtained from high-speed drive.....	166, 167
safety attachment designed for a.....	115-118
varying.....	221-223
Reciprocating rotating printing roll.....	268-270
Reciprocating slide, adjustable-stroke driving mechanism.....	192-194
Reciprocating strokes for one, generating two.....	202-204
Reciprocating traversing device with an adjustable stroke.....	148-150
Reciprocations with one drive-shaft revolution, two.....	170-172
Reduction gear, ball bearing serves as planetary.....	279-281
Release for tapping, torque-controlled drive.....	107-109
Release for thread cutting, automatic half-nut.....	429-431
Release latch mechanism, instant.....	363-365
Rest interval, modified eccentric provides.....	172-174
(see also <i>Dwell</i> )	
Return and dwell period provided by spring-loaded	
eccentric.....	200-202
Reversing mechanism, excessive-torque.....	146, 147
Reversing shaft-traversing device replaces troublesome cam,	
instantaneous.....	435-438
Reversing traverse mechanism, adjustable.....	162-165
Reversing two-speed Geneva drive.....	150-152
Roll drive for printing press fountains, vibrating.....	277, 278
Roller chain, pressing pins into side plates of cotter-pin.....	400
Rotary and linear movement, intermittent.....	272-274
Rotary motion from continuous to oscillating, converting.....	247, 248
Rotating and sliding mechanism used in polishing rectangular	
frames.....	274-277
Rotation, adjustable drive produces continually variable.....	405-407
Rotation rate, cam and link system produces varying.....	403-405
Safety attachment designed for a reciprocating movement.....	115-118
Safety devices protect slides against overloads.....	99-102
Safety overload mechanism permits adjustable dwell on recip-	
roating drive.....	102-104
Scanner, high-speed spiral.....	265-268
Scrap-stripping device, rotary.....	13-15

	PAGE
Screw assembly for a slide, differential.....	297, 298
Shaft oscillation increased by gears in transmission line.....	254, 255
Shock absorber for a rotating shaft.....	94
Shock in rack movement, cam for eliminating.....	22-24
Shockless indexing movement.....	29, 30
Shockless startup of inertia.....	104, 105
Shock loads in gear drive, springs cushion.....	105-107
Simple harmonic motion, oscillating shaft driven with.....	199, 200
Slide motion differential.....	237
Slides, adjustable-stroke driving mechanism reciprocating.....	192-194
differential screw assembly for.....	297, 298
driven with rapid variable strokes.....	239-241
imparting variable and unequal strokes to opposed reciprocating.....	226-228
operated longitudinally and one also crosswise.....	242-244
reciprocated in synchronism on a single shaft.....	234-237
with automatic reversal and adjustable stroke.....	238, 239
Sliding and rotating mechanism used in polishing rectangular frames.....	274-277
Sorting and feeding shells closed end first.....	367-370
Speed-change mechanisms, hydraulic gear-shift control for.....	294, 295
sun and planet gear.....	257-259
Speed measurement, synchronizer that insures precise.....	305-307
Speed reducer, changeable under load.....	282-287
shaft-mounted.....	281, 282
Spindle-quill travel, remote control presets.....	260-262
Spiral scanner, high-speed.....	265-268
Spring, mounting provides double action for compression.....	109, 110
Sprocket operated Geneva drive provides wide design possibilities.....	245, 246
Stacking device, disc.....	124, 125, 397-399
Steplessly variable stroke movement.....	225, 226
Stock feed of wire-forming machine controlled by a cam.....	9-11
Stop for automatic lathe, swing.....	137-140
Stoppage for high-speed die-cutting, momentary.....	313-315
Straight-line motion, geared five-bar linkage for.....	167, 168
through levers.....	348-350
Straight-line reciprocation from uniform rotary motion, variable.....	217-219

	PAGE
Strip material, intermittent feed for.....	362, 363
turned in transfer.....	332-334
Stroke adjustment during operation, eccentric driving mechanism permits.....	220, 221
Stroke and dwell adjustments, lever type driving mechanism permits .....	228-231
Strokes, fixed converted into variable.....	215-217
generating two from one reciprocating.....	202-204
imparting variable and unequal.....	226-228
modified eccentric provides adjustable die.....	190-192
slide with automatic reversal and adjustable.....	238, 239
two opposed slides driven with rapid variable.....	239-241
Sun and planet gears produce intermittent speed change.....	257-259
Sun gears which facilitate change of timing of driven shaft.....	413, 414
Surface grinder, fine feed arrangement for a.....	317, 318
Swing stop for automatic lathe.....	137-140
Synchronized cams, intermittent motion from two.....	32, 33
Synchronized travel, common drive for two slides with partially .....	231-234
Synchronizer that insures precise speed measurement.....	305-307
 Tape drives, slip clutch suitable for.....	420, 421
Tape reel has quick action and constant gripping pressure.....	125-127
Tappet screws, mechanism for checking the torque of.....	469-471
Tapping, torque-controlled drive release for.....	107-109
Thread cutting, automatic half-nut release for.....	429-431
mechanism that compensates for lead-screw pitch errors in.....	451, 452
Thread-grinding machine, mechanism that compensates for lead-screw pitch errors in.....	451, 452
Thread roller, semiautomatic work feeder improves efficiency of .....	344-348
Throw, adjustable eccentric produces a variable.....	223, 224
Timing of cam changed while machine is in motion.....	410, 411
Timing of driven shaft changed while running.....	413, 414
Torque checking of tappet screws.....	469-471
Torque filter eliminates backlash.....	262-264
Transfer and reversal of pad position, simultaneous.....	334-336
Transfer device for cylindrical parts.....	336-338
Transfer of small parts from one chute to two chutes.....	399

	PAGE
Transmission remotely controlled by triple-action cylinder....	438-440
Transmitting uniform speed between shafts having variable centers .....	312
Transversing device with an adjustable stroke, reciprocating .....	148-150
Unidirectional rotation regardless of changes in drive direction .....	411-413
Uniform rotation, variable reciprocating motion derived from .....	187-190
Variable and unequal strokes imparted to opposed reciprocating slides.....	226-228
Variable reciprocating movement, converting oscillating circular motion into.....	194-197
Variable stroke movement, steplessly.....	225, 226
Varying cam timing, gear mechanism for.....	20, 21
Warp machine counter with dwell interval operated through slotted discs.....	157-159
Wheel-dressing attachment for a gear-grinding screw.....	24-26
Winding head for skeins of embroidery floss.....	207-209
Wire-bending machine, with common drive for two slides with partially synchronized travel.....	231-234
with gear and clutch mechanism.....	182-185
Wire-coiling machines, tension regulating device for.....	460, 461
Wire ends, mechanism for looping and twisting.....	11-13
Wire fabricating machine, chain driven intermittent rotary movement for.....	30-32
with bead chain drive that turns shaft on moving perpendicular axes.....	178-180
with gears in transmission line that increase shaft oscillation .....	254, 255
with two slides operated longitudinally and one also crosswise .....	242-244
Wire-forming machine, cam controls stock feed of.....	9-11
with driving mechanism which prevents reverse movement of driven shaft.....	421-423
with intermittent motion derived from continuously rotating shaft .....	61-63
with intermittent rotary movement with end-cycle reversal.....	33-35

	PAGE
Wire screening, interrupted movement of.....	17-20
Work feeder improves efficiency of thread roller, semi-automatic .....	344-348
Work-table with mechanism for automatic indexing, rotary.....	41-43
Work-transfer arm, mechanism for rotary positioning of.....	356-358
Work-transfer device, rotary.....	343, 344
Worm drive gives variable output automatically.....	416-419
Worm-gear train, intermittent.....	27, 28
Wrappers fed at constant pressure.....	338-340
Wrapping machine, with lever type driving mechanism that permits stroke and dwell adjustments.....	228-231
with two opposed slides driven with rapid variable strokes.....	239-241